The Early Years Enriched Curriculum Evaluation Project EYECEP

Final Report Phase 1 (End of Fourth Year)

Full Report

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1. Background and Purpose

1.1 Scope of the Report

This report presents an overview of findings from the first four years (Phase 1) of the Early Years Enriched Curriculum Evaluation Project (EYECEP) which has been conducted in schools in Northern Ireland since September 2000. For the first group of six schools (nine classes) in the Greater Shankill area, the evaluation covers the period September 2000-June 2004 and the children involved have now completed Key Stage 1 or their first four years of primary schooling. For the second group of six schools (8 classes), called the Contrasting Area Schools, the evaluation covers the period September 2001-June 2004 and the children have now completed three years of primary schooling. The next phase of the evaluation which began in September 2004 will include a further twelve schools drawn from outside Belfast. It should be noted that a much larger number of schools who are not part of the evaluation sample are now implementing the Enriched Curriculum (EC) so that the total number of schools involved is more than 120.

The evaluation was initially commissioned by CCEA in August 2000 for one year only, and funding was then extended for a further three years. The design and evaluation strategy evolved as the scope and scale of the evaluation increased and as the reach of the project became apparent. This final overview report for Phase 1 was preceded by six other reports: 4 annual reports (October, 2001; October, 2002; November, 2003; September, 2004); an interim report on additional testing in the 4th year (March, 2004); and a statement on the rationale for the research design (March, 2003). From the beginning it was recognised that any positive effects of the EC could only be expected in the longer term, hence the commitment to a longitudinal design.

1.2 Development of the Enriched Curriculum (EC)

The Enriched Curriculum was devised jointly by the Northern Ireland Council for Curriculum, Examinations and Assessment (CCEA) and the Belfast Education and Library Board (BELB) to address the perceived problems in the formal traditional curriculum, particularly in disadvantaged areas. Curriculum Advisory Officers from the BELB led the project in the early stages. The work was influenced by the experiences of principals, teachers and curriculum advisory officers in the Shankill area that the traditional curriculum was not

meeting the needs of children and some schools were already exploring alternative approaches. In addition, the evaluation of a pre-school project, the Greater Shankill Early Years Project (Sheehy, Trew, Rafferty, McShane, Quiery & Curran, 2000), had drawn attention to the difficulties faced by children in the area progressing through the established first year primary curriculum. On a wider scale, the House of Commons Select Committee on Education Report detailed some of the failures of early years' education in the UK and proposed moving closer to the continental model (Early Years Report, 2000). These trends were consistent with international movements in early years' education (Bertram and Pascal 2002).

In the first year, six schools (9 classes) in the Shankill, which were introducing the EC, were included in the evaluation. The EC was extended in the second year to other Education and Library Boards in Northern Ireland which we have called the Contrasting Areas. A sample of 6 schools (8 classes) were chosen from the Contrasting Areas to illuminate the implementation of the curriculum in other Education and Library Boards and to be more representative of the Northern Ireland school population in terms of (i) the range of intake characteristics of the children, such as the development of their oral language skills; (ii) school location, such as suburban, small town or village; and (iii) socioeconomic characteristics of the catchment area. The sample was not random; schools volunteered to take part.

The principal aspirations and qualities of the Enriched Curriculum can be summarised as follows:

- Removing the early experience of failure and the concomitant promotion of self-esteem for the child is seen as a primary goal;
- Improving oral language skills through such activities as shared reading, circle time and structured play;
- Postponing the use of formal reading schemes whilst concentrating on oral language and emergent literacy activities, and by activities to enhance phonological awareness and to lay the basis for phonic skills;
- Postponing formal recorded arithmetic whilst laying the foundations for a strong sense of number through sorting, matching, counting and other basic activities;

- Promoting good motor development at gross and fine levels through appropriate indoor and outdoor activities;
- Encouraging creativity through activities such as role-play, art and music-making;
- Encouraging children to take responsibility for their own learning.

In the initial stages, the Enriched Curriculum was characterised as an evolving curriculum and this was seen as a strength, in that it allowed the teachers to exercise their professional expertise within the framework and it engendered a sense of ownership. Fostering a sense of ownership is recognised as one of the characteristics of successful interventions (Ellmore, 1980; Fullan and Stiegelbauer, 1991). As the curriculum expanded to include new teachers, new schools, additional ELBs, and children as they progressed through Years 2, 3 and 4, both the strengths and weaknesses of the evolving nature of the curriculum have become apparent (see later sections). The main issue has been the consistency and integrity of implementation across contexts.

Over the lifetime of the project, the CCEA framework document for the early years (CCEA 2002) has been developed. It embodies most of the aims and aspirations of the Enriched Curriculum.

1.3 Purposes of the Evaluation

The main objectives of the Phase 1 evaluation were:

1.3.1 To assess the short- and longer-term impact of the Enriched Curriculum on children's learning dispositions and on their progress in literacy and numeracy in two samples: the initial cohort of children in the Greater Shankill up to the end of Year 4, and the children from the Contrasting Areas schools up to the end of Year 3.

1.3.2 To investigate the perceptions of teachers and parents about the appropriateness of the revised curriculum for children as they progressed through the early primary school years.

1.3.3 To collect information on some of the factors that impact on the effectiveness of curriculum implementation, for example, teacher in-service training, external support and resourcing.

1.3.4 To examine the processes of implementation and collect information on programme integrity through structured classroom observations.

Although the major focus of the evaluation was on the quantification of pupil outcomes, it should be emphasised that outcome measures say little or nothing on the manner of implementation of an intervention. Good evaluations of educational innovations also examine the processes of implementation and collect information on programme integrity (Objectives 3 and 4). Consequently, the evaluation was designed to provide CCEA with detailed knowledge of the strengths and weaknesses of the EC as it was being implemented, hence the focus on the quality of children's learning experiences in the classroom, the perceptions of teachers and parents who are major stakeholders in any revised curriculum and the quality of support, resourcing and training available to teachers as they became involved in the EC.

In addition to providing annual summative evaluations on the children's progress, the scope of the evaluation provided formative feedback to CCEA and the other major stakeholders on emerging issues related to the development and delivery of the EC. Suggestions and recommendations were made at the end of each year. To facilitate this formative role, a communications committee was established in the second year of the project (2001-2002) which included representation from the major stakeholders involved in the EC – CCEA, ELBs, teachers, and members of the QUB evaluation team. The purposes, roles and responsibilities of this group were outlined in the report EYECEP: Rationale for the Research Design (Sproule et al., 2003).

2. Design, Sample, Measures and Method

2.1 Longitudinal Design

With regard to pupil outcomes, the general design of the evaluation was a longitudinal pre/post quasi-experimental design with carefully selected comparison groups. Comparisons were made between children who participated in the EC and those who experienced the pre-existing curriculum. Baseline measures were collected when the children entered school in their first year and outcome measures were collected at the end of each school year for four years (Shankill Schools) and for three years (Contrasting Area Schools). The selection of appropriate control groups was identified as a problem at an early stage. In view of the difficulty experienced with achieving adequate matched control schools in the first year (First Year Report), a strategy was adopted to use year-ahead and two-year ahead classes from the *same* schools as control samples to act as a point of comparison for the progress of the EC sample. Use of these controls minimises the influence of potential confounding effects, such as school intake, differences in ethos between schools and so on. In addition to these within-school controls, the use of standardised measures for the main attainment measures means that the EC classes can be systematically compared with a large UK national sample.

Nine hundred and forty-three children (477 boys and 466 girls) are now participating in the evaluation study, either in the EC sample or in a control class. Table 1 shows the sample size for EC and control samples in both the Shankill and Contrasting Areas schools. Note that in some years only 50% of the classes were randomly selected for testing, while in other years, all the children present in class on the day were tested – hence the substantial differences in the size of the subgroups. All PIPS testing is based on this sample size with minor variations due to children changing schools, absences on the day and so on. Strategies have been adopted to maximise the size of the longitudinal data set, using accepted procedures for dealing with missing data. The sample sizes are much smaller for some of the other tests and exact sample sizes will be included in these tables when findings are being reported.

Table 1. Sample Size in each subgroup for both Shankill and CA Schools

Group	**Sample Size**				
	Baseline	End Yr **1**	End Yr **2**	End Yr **3**	End Yr **4**
Shankill Enriched Curriculum	74	69	75	131	64
Shankill Control (1 year ahead)	87	72	67	55	149
Shankill Control (2 years ahead)	130	128	NT	NT	91
Contrasting Areas Enriched Curriculum	92	81	179	79	NT
Contrasting Areas Control (1 year ahead)	NT[1]	93	87	166	51
Contrasting Areas Control (2 years ahead)	NT	NT	NT	87	NT
Total per Year	**383**	**443**	**408**	**518**	**355[2]**

2.2 Pupil Outcome Measures

A variety of outcomes measures was reviewed and selected as potentially useful to evaluate pupil learning outcomes as a result of being part of the EC. The selection of measures was made against a number of criteria: the sensitivity of the measures to the learning goals of the EC; the psychometric properties of the instruments with regard to validity and reliability; the appropriateness of the measures to the developmental levels of the children over the time course of the evaluation; the practicalities of testing young children (concentration and

[1] The Shankill study and evidence from the Contrasting Areas schools own testing has established the stability of the baseline from year to year in samples of this size to within 0.5 standard points, although we will also be able to check performance in CA schools against proxy IQ scores.
[2] Year 4 pupils for EC sample in CA schools are not included in this total.

attention, individual vs. group testing); the cost of the measures in terms of value for money, specialist knowledge required to administer, researcher time and effort, etc. A fuller explanation and justification for the selection of instruments is outlined in the report called Rationale for the Research Design (March, 2003).

2.2.1 Reading and Mathematics Attainment

At the core is a robust measure of basic attainment with a specific focus on literacy and numeracy, the **Performance Indicators in Primary Schools (PIPS),** which was used as a baseline measure when children began school and as an end-of-year assessment for each of the four years of the evaluation. This is augmented by a range of age-appropriate measures to assess oral language (Years 1 and 2), mathematical concepts (Years 1 and 2), written expression (Year 4); and aspects of self-concept and self-esteem (Years 2, 3 and 4). In addition, a teacher rating of children's classroom behaviour and social competence was devised as an index of teachers' perceptions of a child's disposition for learning in the classroom and was completed from the second year of the evaluation for each child for all three years.

The PIPS suite of age-appropriate tests was chosen as a cost effective measure with high reliability and validity (PIPS 2001). PIPS measures achievements across a wide range of domains pertinent to the National Curriculum in England. The PIPS database is managed by the Curriculum, Evaluation and Management (CEM) Centre for the University of Durham and now contains data on thousands of children in more than 4000 schools. Despite the psychometric sophistication of PIPS, it should be pointed out that the measures were not well attuned to the learning goals of the EC[3], especially in Years 1 and 2 where formal reading schemes were postponed in favour of oral language, emergent literacy, and phonological awareness, and formal recorded arithmetic was postponed in favour of developing a strong number sense through more practical mathematical activities. Nevertheless, the baseline PIPS measure assesses aspects of literacy and numeracy that sample many known predictors of later achievement. For example, the correlation of PIPS baseline measure with children's performance at the end of their third year at school in England is .65 for mathematical achievement and .70 for reading (Tymms, Merrell & Henderson, 1998). Even if PIPS end-of-

[3] There is currently no test available which does match the learning goals of the Enriched Curriculum.

year tests are not sufficiently sensitive to the EC curriculum in the early school years, they will pick up important aspects of children's achievement in numeracy and literacy in the later years. In addition to measures of reading and mathematics, the end-of-year assessments after Year 1 provide a measure of picture vocabulary (verbal reasoning) and non-verbal reasoning which, when combined, can be used as a proxy IQ score or a measure of 'developed' ability, to use PIPS terminology. Value-added scores can also be calculated. All Key Stage 1 PIPS tests have stop rules which come into effect for very weak pupils in order to prevent undue distress.

In summary the PIPS suite consisted of:

Baseline PIPS provides a single score and assesses the child's skill at writing his or her own name; picture vocabulary; ideas about reading (e.g., reading moves from top to bottom of page); phonological awareness (rhyming words); ability of repeat sounds, including nonsense sounds; knowledge of letters; word recognition skills; knowledge of basic mathematics concepts; counting; cardinality and invariance aspects of number; subtraction with picture cues; addition with picture cues; Arabic numeral recognition; two and three-digit number recognition. The test is individually administered and takes 20 minutes.

End-of-Year PIPS consists of measures of reading and mathematics, verbal (picture vocabulary) and non-verbal reasoning (e.g., identifying dots in patterns, fitting jigsaw pieces together). Year 1 PIPS is individually administered and takes about 20 minutes per child. The child completes those aspects of the baseline assessment which had not been successfully completed at baseline and if able, goes on (i) to read simple text and complete a passage choosing the appropriate word from three options; and (ii) to attempt further mathematics questions, consisting of mental computation and problem solving and computation questions presented in formal mathematical notation format. Years 2, 3 and 4 PIPS are group tests, with group size being determined by the child's age and ability and tests being completed in several sessions of appropriate length for the age and ability of the child. Reading sub-tests at this stage consist of further 'choose a word' passages and comprehension passages while mathematics tests comprise items which address all aspects of the English National Curriculum, including estimation, graph and table work, and problem solving.

2.2.2 Oral language

A prominent goal of the EC is the improvement of oral language skills but PIPS does not assess oral language directly. Accordingly, a supplementary test of oral language was included as an outcome measure, the Bus Story Test which is part of the Renfrew Language Scales (1969). The test consists of telling the child a short story with picture prompts and then inviting the child to retell the story while following the pictures in the booklet. Children's responses are audio recorded and then transcribed. Three scores are derived. *Information score*: reflecting the content of what the child retold. Scores vary from 0 - 82. High scores indicate that the child has attended to and understood the story and has the ability to sequence and remember the events. Low scores generally indicate that children did not attend, did not remember the sequence of events, could not make themselves understood or lacked the confidence to retell the story. *Sentence length*: is simply the average length of the five longest sentences the child has used and is a measure of the child' expressive language skills. *Number of subordinate clauses used*: An additional measure of above.

This test was used at the end of Years 1, 2 and 3 and was discontinued as children began to find the content too 'childish' and displayed obvious signs of reluctance and/or embarrassment despite having previously having completed the task successfully.

2.2.3 Mathematical Concepts

The section devoted explicitly to mathematical concepts in PIPS end-of-year 1 is short. Accordingly, an age-appropriate form of the Boehm Test of Basic Concepts (2000) was used to assess understanding of 50 concepts needed for early mathematical development. Concepts include 'biggest', 'an equal number of' and 'skip one and choose the next'. Raw scores can vary from (0-50). This test was used in Years 1 and 2.

2.2.4 Written Expression

As children progress through the EC curriculum they are expected to show enhancement in writing, and particularly in aspects of creative/independent writing. Improvements in oral language skills and a widening experience of books should interact with children's developing self-confidence in narrative writing. Thus, at Year 4 the Wechsler Objective

Language Dimensions Tests of Written Expression (WOLD, 1996) was included in the testing. It is only age appropriate from eight years of age. Children are presented with a scenario and are asked to write a piece arising from that scenario in twenty minutes. The test generates scores on the following scales: ideas and development; organisation, unity and coherence; vocabulary; sentence structure and variety; grammar and word usage; capitalisation and punctuation. The first three address the child's ability to generate an accurate, coherent and interesting script, the latter three address formal aspects of language, including the sophistication of the forms used.

2.2.5 General Self-Concept

The EC makes a point of fostering both the child's self-esteem in general and encouraging positive attitudes to all aspects of school work. The Harter Test of Self-Competence (Harter and Pike, 1980) is a well-established measure of a child's self-esteem in four areas: with peers, with the mother (or significant other), in schoolwork and in physical play. It also gives an overall index of the child's evaluation of self. Each item is rated on a four-point scale. Individual scale scores can vary from 1-24 and the overall score ranges from 1-96. This measure was used in Years 2, 3 and 4.

2.2.6 Social and Behavioural Competence (in the classroom)

As the focus of the EC was on the development of children's dispositions for learning, it was important to get some indication of their behaviour and general social competence in the classroom. During the first year of the project, teachers were asked to complete the Adaptive Social Behavioural Inventory (ASBI) for each child (Hogan, Scott and Hauer, 1992). Completion of the scale constituted a major burden for the teachers and the response rate was very low, despite the persistence of the research team. Accordingly, it was decided to construct a shorter scale with six items to be rated on a four point scale. The items are: makes an effort with his or her work; is confident about his or her work; gets on well with other children; seems happy and well adjusted; has problems maintaining attention; has behaviour problems. Each of the items has clear face validity in relation to the stated goals of the EC. Factor analysis yielded a single factor that we have called Disposition for Learning and the internal reliability of the short scale is high (Cronbach's Alpha = .86). In addition, there is a statistically significant correlation between the total score on the short scale and the

scores on the original ASBI (r=.65, p<.0l). Moreover, this scale focuses more directly on attributes of the child that might enable him/her to take advantage of learning opportunities in the classroom and has proved to be a very useful predictor children's educational attainment in multiple regression models after controlling for ability, although sample sizes are too small to allow us to introduce it as an additional variable in the multi-level models. This measure was used at the end of Years 2, 3 and 4.

2.2.7 Other sources of information

The following data were also collected for each child: special needs status; attendance; free school meals status; percentage of free school meals in the whole school; social-economic status for the child's postcode or for the school if the former was unavailable; teacher-pupil ratio in each year of the project[4].

2.3 Classroom Observation

Quality of Learning: The purpose of the classroom observation in the evaluation was to gain some insight into how the principles of the EC were being translated into the classroom and to assess the children's quality of learning insofar as this can be judged through observation of classroom processes. The only instrument which is designed specifically to examine early-years primary school classrooms is the Quality of Learning Instrument (QLI), initially designed by Dr Glenda Walsh who is a member of the research team (Walsh & Gardner, in press). A number of alternatives were considered, ECERS-R (Harms, Clifford & Cryer, 1998) and ECERS-E (Sylva, Siraj-Blatchford, & Taggart, 1999), but these are designed for nursery school classes. The QLI is superior in its match to early primary school classes and is unique in recognising that **all** aspects of the classroom – the interactions between the teacher's performance and the children's responses, the interactions between the children themselves, and the physical learning environment – are determinants of the quality of the child's learning experience. Nine dimensions of classroom processes are assessed that match the learning goals of the Enriched Curriculum:

[4] The Year 1 ratio has been found to be particularly important for outcomes, especially with children at risk of failure (Baltchford et al. 2004).

- Motivation to learn (Motivation)
- Powers of concentration (Concentration)
- Levels of independence within the learning process (Independence)
- Confidence in children's own ability to succeed in learning (Confidence)
- Acquisition of social skills (Social Interaction)
- Respect for people and property (Respect)
- Social and emotional character (Well-being)

In addition, the QLI includes two dimensions that focus on giving children's tools to succeed in education rather than the traditional concentration on passive knowledge acquisition.

- Higher-order thinking skills (HOTS)
- Multiple skill acquisition

Each of these dimensions is rated on a six-point scale by trained observers who have observed a target classroom for one day. Three items are rated for each dimension, giving 27 items overall. Total scores can therefore vary from 27 to 162. During the course of the evaluation, the QLI has been subjected to considerable validity and reliability analyses. The initial nine dimensions have been confirmed by a panel of six international early years' experts as important for early year's primary classrooms and a calibration study indicated high inter-rater reliability among the expert panel. (Walsh and Gardner, in press). For the purposes of the current evaluation study, early-years student teacher observers are trained in the use of the instrument using videos. Inter-rater reliability has remained high among each cohort of observers who have been trained (ranging from .69 to .89 using Krippendorf's alpha) and comparisons with the inter-reliability shown by the expert group is good. Factor analysis of the nine scales indicates that they do represent a single construct and that scores on the separate scales can be added together to give an overall index of the quality of learning in the classroom.

2.4 Teachers' Views – Survey and Interviews

As the EC was being rolled out it became clear it had implications for all teachers at Key Stage 1. Thus, as the children progressed from Year 1 to Year 4, we assessed the views of each year group of teachers as they encountered the EC for the first time. All 59 teachers who taught classes in our EC sample completed questionnaires and were either interviewed or took part in a focus group with their colleagues[5]. Seventeen Year 1 teachers, sixteen Year 2 teachers, sixteen Year 3 teachers, and ten Year 4 teachers (confined to Shankill Schools as Contrasting Area children did not enter Year 4 until September 2004). Teachers were asked about: implementation and delivery of the curriculum; perceived outcomes for children; responses of parents; changes in teachers' beliefs about early years learning; preparation, training and support from Education and Library Boards and from inside the school itself; resources, including classroom assistants.

Interviews were based on an interview protocol which was continually refined over the course of the project to reflect teachers' own ideas of important questions and the research team's developing knowledge of the issues. Teachers' interviews were recorded, transcribed and content analysed for recurring themes.

2.5 Parents' Views - Written Questionnaires and Interviews

All parents whose children were participating in the EC sample were approached each year and asked to complete a questionnaire and about 10% of these each year was then asked to take part in an interview or focus group. Parental replies were anonymous although the majority volunteered their names. Because of the anonymity, it is difficult to find out exactly how many parents made **separate** responses each year. Nevertheless, we can be confident, at minimum that 188 or 53% of parents responded **at some point** over the 3/4 years. An estimated maximum response rate, assuming each anonymous questionnaire was from a different parent, was 82%. However, in any one year, the response rate was much lower – Year 1 (34%), Year 2 (29%), Year 3 (29%), Year 4 (12% - Shankill schools only). It seems likely that, unless they felt strongly on an issue, parents did not respond consistently every year.

[5] With one exception in the final year which was the result of industrial action.

3. Results

Before reporting the results on pupil outcomes, it is important to emphasise the differences between the two samples of schools that we have been tracking within the evaluation framework. Table 2 shows differences between the schools on three indicators which highlight the extent of the different 'resources' (social, physical and academic) which the children bring to school on the first day.

***Table 2**: Indicators of the social and academic context in the two groups of schools*

Indicator	**Shankill schools** Mean score averaged over the number of children in the year group	**CA schools** Mean score averaged over the number of children in the year group
Percentage of free school meals for the school	62.0	16.0
Noble child poverty index for the school's catchments area*	73.0	32.3
Standardized baseline total score for PIPS (national mean =50)	43.3	51.3

*Supplied by Northern Ireland Statistical Research Agency

The average percent of free schools meals for the CA schools (M=16%) is superior with regard to the average for Northern Ireland (M=21%), while 62% of the children in the Shankill schools are eligible for free school meals. A similar pattern can be seen from the Noble child poverty index for the schools' catchment areas. These differences are reflected in the PIPS baseline measures relating to literacy and numeracy; the CA schools are close to the UK average (M=51.3 compared with 50) while the Shankill schools baseline is two-thirds of a standard deviation below average. These are clearly two very different samples and their educational progress may not follow similar pathways. For the most of our analyses we report findings from the Shankill and CA schools separately. When we do combine the data to increase the number of participants, and thus the power in some of the statistical analyses, we check that the patterns in the findings are similar for both samples.

3.1 Pupil Outcomes

The pupil outcome measures will be reported in the following order:

- Descriptive statistics for the EC and control classes in both the Shankill and CA schools for PIPS measures – reading attainment, mathematics attainment, verbal reasoning (picture vocabulary) and non-verbal reasoning – across four years.
- A multi-level model analysis to assess the impact of both school and child variables (gender, age beginning school, baseline PIPS, school group) on educational progress in reading and mathematics at the end of Year 3 and 4 and whether being in the EC had any effect above and beyond these other predictors.
- Descriptive statistics on children's progress across four years for the additional age-appropriate literacy and numeracy measures, and for the measures relating to dispositions, and self-esteem. Because of the incompleteness of these datasets and psychometric issues that emerged with regard to some measures, it was not possible to subject them to strong inferential statistical analyses.

3.1.1 PIPS: Reading and Mathematical Attainment

All PIPS scores are standardised to a mean of 50 and a standard deviation of 10 where the standardisation sample is a large cohort of over 4000 English schools. Age-corrected simply indicates that if the data were collected at a different time in the year in comparison to the standardisation sample, the scores have been adjusted accordingly, plus an adjustment for the two months age differences between our year groups and English year groups. Tables 3 and 4 show the average standardised scores in reading and mathematics for the EC classes, and for control classes in the same school, for the Shankill and for the CA samples separately.

For the Shankill schools, their baseline reading scores are considerably below the national average (M=42-43) and are very stable across the three years of testing the pupils who are starting school. The main point to note is that children's reading scores for the first two years are lower than at baseline and in the final two years they begin to show improvement. For the control samples, this pattern is more uneven. By the end of Year 4, there is no noticeable difference between the groups. Numerically they are almost identical. The pattern for mathematics attainment in the Shankill schools (Table 4) is almost identical with the EC children doing marginally better than the control group at Year 4.

Table 3. PIPS Reading Attainment: Mean Age-Corrected Standardized Scores

UK national sample: Mean = 50 and SD = 10	**Mean (Standard Deviation)**				
	Baseline	End Yr **1**	End Yr **2**	End Yr **3**	End Yr **4**
Shankill Enriched Curriculum (EC)	43.1[6] (7.1)	37.6 (6.1)	39.0 (8.4)	41.3 (7.8)	43.5 (8.1)
Shankill Control (1 year ahead)	43.2 (7.1)	45.2[7] (9.7)	47.2 (9.1)	42.0 55	43.2 (9.7)
Shankill Control (2 years ahead)	43.4 (7.6)	39.7 (8.2)	NT[8]	NT	43.1 (8.5)
ContrastingAreas EC	52.3 (9.0)	44.7 (8.1)	44.1 (9.9)	49.4 (10.2)	NT
Contrasting Areas Control (1 year ahead)	NT[9]	48.7 (9.0)	47.6 (10.8)	50.1 (9.3)	50.3 (9.5)
Contrasting Areas Control (2 years ahead)	NT	NT	NT	48.6 (9.7)	NT

[6] *All* baseline scores in this table are not only age corrected but compensated, on the basis of data supplied by PIPS, for the extra teaching from September until our testing time of November in each year (Tymms 2002).
[7] Estimated by age correction from November 2001 round of testing, but does not allow for two months teaching or forgetting over the summer period. Includes all schools in the Shankill group.
[8] NT means these groups have not been tested in respect of these specific tests.
[9] We believe that the Shankill study and evidence from the Contrasting Areas schools own testing has established the stability of the baseline from year to year in a sample of this size to within 0.5 standard points, although we will also be able to check performance in CA schools against proxy IQ scores.

Table 4. PIPS Mathematics Attainment: Mean Age-Corrected Standardized Scores

UK national sample: Mean = 50 and SD = 10	**Mean (Standard Deviation)**				
	Baseline	End Yr **1**	End Yr **2**	End Yr **3**	End Yr **4**
Shankill EC	43.6[10] (7.9)	40.1 (6.6)	38.5 (7.8)	41.4 (9.1)	44.8 (7.3)
Shankill Control (1 year ahead)	42.2[11] (8.0)	44.4[12] (8.5)	44.2 (8.6)	42.3 (7.7)	43.4 (7.4)
Shankill Control (2 years ahead)	43.5 (8.5)	41.3 (7.9)	NT[13]	NT	43.6 (7.1)
Contrasting Areas EC	50.3 (10.0)	45.4 (8.2)	42.4 (8.7)	49.0 (11.2)	NT
Contrasting Areas Control (1 year ahead)	NT[14]	48.8[15] (8.6)	46.2 (10.6)	47.7 (9.1)	49.4 (9.6)
Contrasting Areas Control (2 years ahead)	NT	NT	NT	47.0 (8.9)	NT

[10] *All* baseline scores in this table are not only age corrected but compensated, on the basis of data supplied by PIPS, for the extra teaching from September until our testing time in November of each year (Tymms 2002).
[11] Does not include one of the larger Shankill schools, which did not take part in the Greater Shankill project in 1999-2000. From the baseline data for other Shankill cohorts, this would be expected to lower the mean of the group comprising the rest of the schools by 0.3 points i.e. it would be estimated at 42.5 after correction for the absence of this school. This would bring it more into line with the other Shankill baseline means. This **only** applies to this baseline score and does not affect other comparisons between Enriched Curriculum groups and controls.
[12] Estimated by age correction from November 2001 round of testing, but does not allow for two months teaching or forgetting over the summer period. Includes all schools in the Shankill group.
[13] NT means these groups have not been tested in respect of these specific tests.
[14] The Shankill study and evidence from the Contrasting Areas schools own testing has established the stability of the baseline from year to year in samples of this size to within 0.5 standard points, although we will also be able to check performance in CA schools against proxy IQ scores.
[15] Estimated from November 2001 round of testing using data supplied by schools in the project.

For the CA EC schools data is available for the first three years only. The CA baseline scores are similar to the national average. For both reading and mathematics, the end-of-year scores are depressed in the EC sample but they improve noticeably in Year 3. In the control classes the pattern is more uneven. By the end of Year 3, there is no substantial difference between the two groups, if anything, the EC children are forging ahead in mathematics.

It should be remembered that PIPS assesses more formal aspects of reading and mathematics at the end of Years 1 and 2 than the EC curriculum will be delivering and this can account for the more noticeable differences between EC children and control classes in these first two years. The CA children have more than caught-up in Year 3 in contrast to the Shankill classes where catch-up becomes evident only at Year 4.

3.1.2 PIPS: Verbal and Non-Verbal Reasoning

The PIPS suite of tests includes a test of picture vocabulary as a measure of verbal reasoning as well as a non-verbal reasoning test (jigsaws, re-arranging dots, etc). Scores on these two tests can be combined to give a measure of 'developed' ability or proxy IQ. This composite measure is not a full IQ score; nevertheless, it should show a degree of stability over time and act as a point of reference for the changing patterns observed in the attainment scores. Table 5 shows the composite scores for all the relevant subgroups. Two points are worth noting. The CA scores approximate the national average while the Shankill scores are more than half a standard deviation below. There is remarkable stability in these scores over time both within and across the CA and Shankill samples.

Table 5. PIPS 'Proxy IQ' scores: Mean Age-Corrected Standardized Scores

UK national sample: Mean = 50 and SD = 10	**Mean (Standard Deviation)**		
	End Yr **2**	End Yr **3**	End Yr **4**
Shankill Enriched Curriculum	44.1 (5.3)	43.2 (5.8)	43.9 (6.0)
Shankill Control (1 year ahead)	46.3[16] (6.0)	44.4 (6.0)	44.0 (6.8)
Shankill Control (2 years ahead)	NT	NT	43.5 (6.9)
Contrasting Areas EC	49.1 (6.8)	50.1 (7.1)	NT
Contrasting Areas Control (1 year ahead)	50.8 (8.8)	50.6 (7.2)	48.8 (7.6)
Contrasting Areas Control (2 years ahead)	NT	50.4 (8.0)	NT

[16] This score does not include one of the Shankill schools, which did not take part in the Greater Shankill project in 1999-2000. Looking at the baseline data for other Shankill cohorts, this would be expected to lower the mean of the group comprising the rest of the schools by 0.3 points i.e. it would be estimated at 43.4 after correction for the absence of this school. This **only** applies to the baseline score and does not affect other comparisons between Enriched Curriculum groups and controls.

3.1.3 Modelling Progress in Reading and Mathematics Attainment

In Section 3.1.3 the progress of EC children in mathematics was compared to the controls based on mean performance. In this section, using multi-level regression analyses, we try to identify the contribution of a number of other variables to reading and mathematics attainment and to see the extent to which - if at all - that they interact with participation in the EC. We also want to confirm if the pattern of differences between the EC children and the control classes that we identified in Tables 3 and 4 are statistically significant when the effects of other variables are accounted for.

Like all regression analyses, multi-level regression models allow us to estimate the effect of participation in the EC vs. the pre-existing curriculum while controlling for other effects that might impact on attainment such as age or baseline performance when starting school (which we already know is substantial between the Shankill and CA schools). In addition, multi-level modelling permits us to take into account the effects of clustering in the data – the fact that pupils are grouped into classes in particular schools, and schools are grouped into areas (Shankill or CA). Our longitudinal design also allows us to examine not just pupils' attainment at one point in time, but the growth curves in attainment for pupils participating in the EC compared to the pupils being taught under the conventional curriculum. All this can be done using a 'difference-in-difference' approach (See Appendix 1 for a technical description of the approach adopted).

Just a word of caution about modelling. Modelling data is complex and requires various assumptions to be made about the nature of the variables, their likely effects and how they might change over time. The same data can be modelled in various different ways and be plausibly interpreted. So there are no right answers in these circumstances; we are often looking for a best fit or even a good fit. With this in mind, several models of the data were estimated for pupils' level of attainment over time. We had several theoretical questions that we wanted to answer.

We already know that the Shankill and CA children differ substantially in terms of the academic, social and personal resources they bring to school. This is reflected in the PIPS baseline scores which will impact on their progress. An important question is whether school

type makes a difference beyond the impact captured in the baseline scores and whether there are specific EC effects?

There is continuing concern about gender differences in attainment, particularly boys 'underachievement'? Does gender make a difference? Are boys/girls advantaged or disadvantaged by participating in the EC?

Children in a single class can vary in age by 12 months and there is considerable evidence to indicate that month-of-birth impacts on children's progress in school. Does this variable matter for children pursuing the EC compared to the pre-existing curriculum?

In some educational settings, a phenomenon characterised as the "rich get richer" has been reported (Stanovich, 1986). It refers to the finding that pupils who are well off in terms of a specific intellectual resource (e.g., IQ, literacy) make better progress in that domain than those with fewer resources, as if they are able to capitalise beyond the average on the learning opportunities within their specific domain. In the context of the EC it would be important to know how children of different abilities progress relative to the control groups of similar abilities. For example, do the 'rich get richer or poorer'? Do the poor get richer of poorer? Or do all ability levels progress at the same rate?

With these questions in mind, several multi-level regression models were estimated. The results of a model that estimated the general and specific effects of School Type (Shankill vs CA), Gender (Male/Female), Month of Birth, Level of IQ (High, Medium, Low)[17] and participation in the EC (EC/Control) on the pupils' attainment over time will be reported. Separate models were estimated for mathematics and for reading attainment and they take into account initial differences in baseline PIPS scores (see Appendix 2 for Tables showing details of the model estimates).

[17] High=>55; Medium=45-55; Low=<44.99 using standardised scores on PIPS proxy IQ measures (composite picture vocabulary and non-verbal reasoning)

Multi-level Model Summary for Mathematics Attainment

For mathematics attainment there were no effects of being in a Shankill vs a CA school *beyond that accounted for by differences in other relevant variables*. For example, a child with a certain baseline score and a certain IQ level made similar progress irrespective of the area in which the school he/she is attending is located.

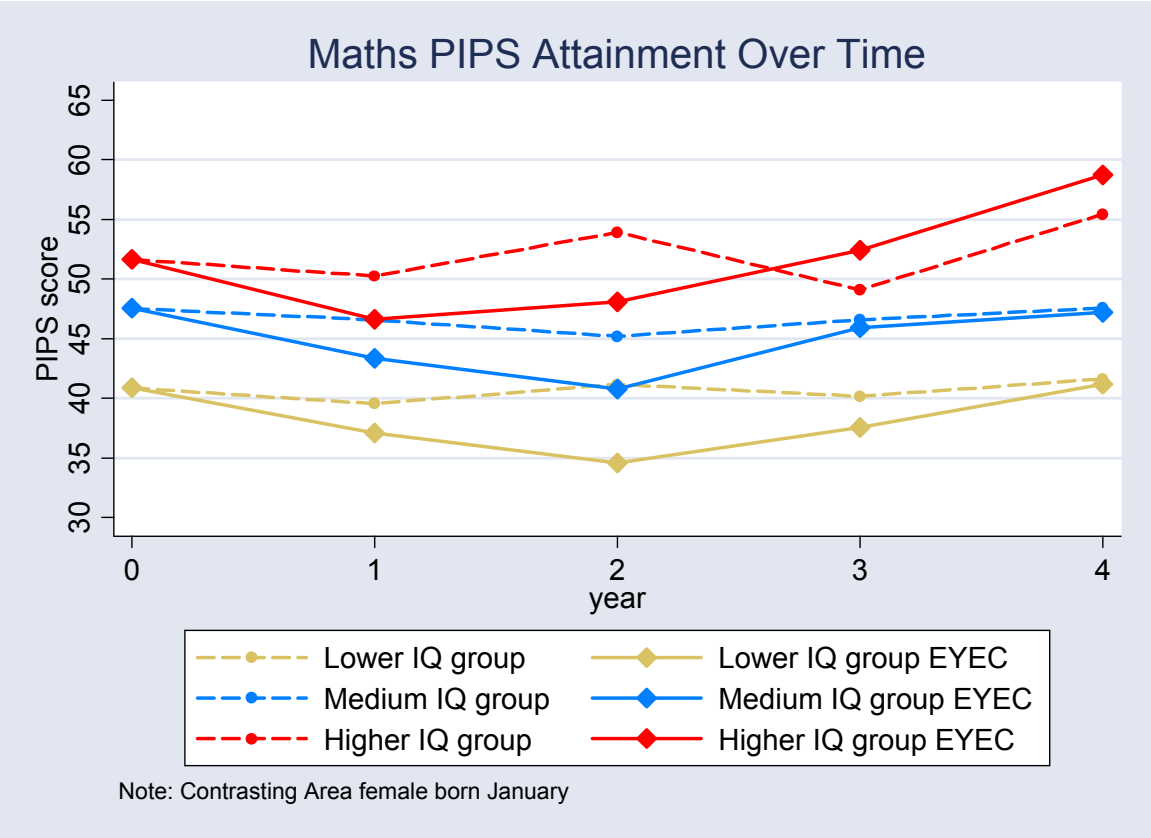
There were no significant differences between boys and girls in mathematics attainment and this was a general effect across the sample.

There was a significant effect of month-of–birth, indicating that older children do better by .26 of a standardised point per month and this is not affected by their participation in the EC curriculum.

There was a general effect of level of ability and in the anticipated direction; the higher ability levels made better progress in mathematics than mid-level ability children who did better than the low ability children.

Figure 1 shows the effect of participating in the EC on mathematics attainment over time at different levels of ability for EC (indicated by the solid line) and control groups (indicated by the broken line). The first point to note in Figure 1 is that the EC classes were significantly lower than the control classes in Years 1 and 2 for all ability groups (significantly so in 5/6 cases). At Year 3, EC children's performance began to improve such that by the end of Year 4, there were no statistically significant differences between the groups. This confirms the pattern reported earlier in Table 4 in Section 3.1.1.

Figure 1. PIPS Mathematics Attainment over Time for EC/Control group at different levels of ability (EC = solid line; Control=broken line)



The second point to note is that EC children of all ability levels showed an upward trajectory after Year 2, in contrast to the control classes where the time effect was flat or uneven. And the third point is that, in the High IQ group in Years 3 and 4, the EC pupils numerically outperformed the control in mathematics, although this specific effect does not reach statistical significance. Even so, it does suggest that the rich are indeed beginning to get richer faster than the other ability groups in mathematics. Figure 1 illustrates the effect for female pupils in CA classes with a January birthday. It should be noted that the *pattern* of responses remains the same throughout the dataset except that the overall *level* of performance shifts up or down depending on the general impact of a variable. For example, Shankill classes have the same pattern with lower attainment levels over the subgroups, while children with October birthdays have slightly higher levels of attainment and so on.

Multilevel Model Summary for Reading Attainment

The pattern of results was similar for reading attainment but there were some differences.

In contrast to the results for mathematics, there was an effect of being in a Shankill school vs. a CA school beyond the contribution of initial baseline differences and ability levels (see Table 5). Research has shown that these early deficits in schools in disadvantaged areas persist in school leavers and adults (e.g., Tinklin, 2003).

Boys reading attainment was significantly poorer than girls – on average 3.9 standardised points for the whole sample.

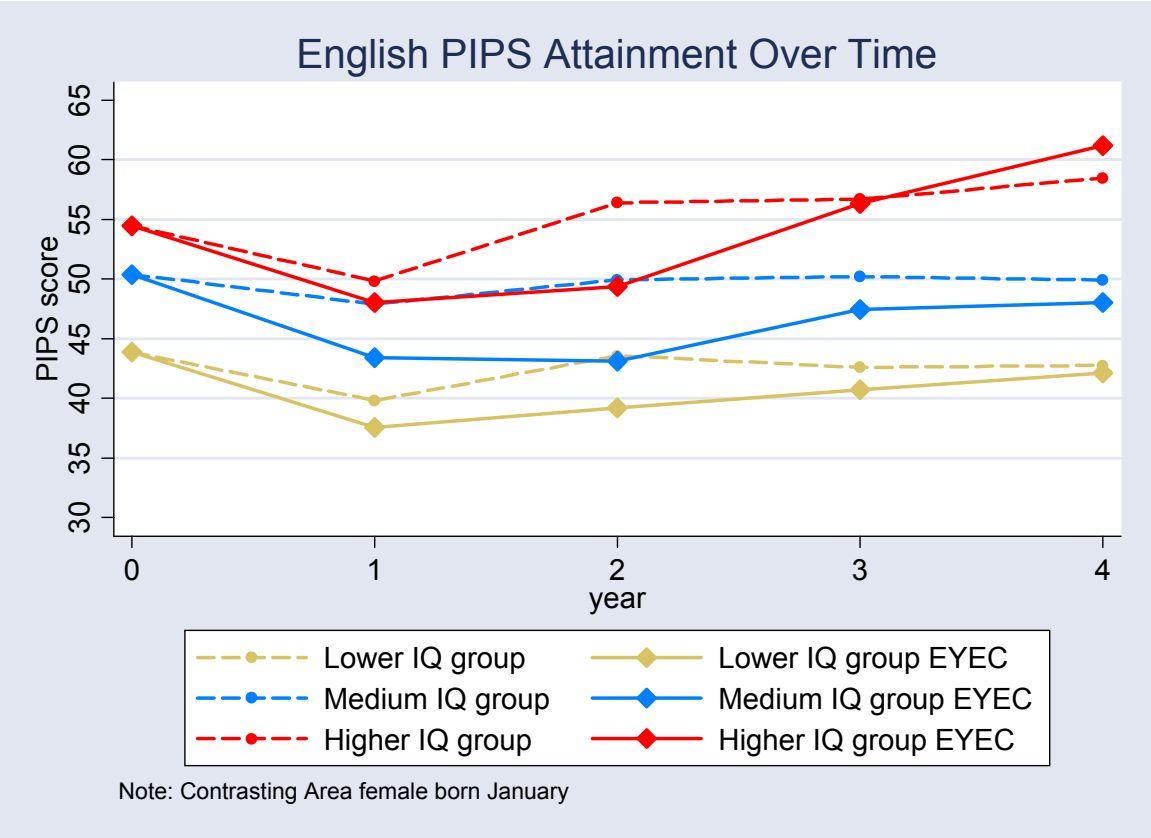
There was a significant effect for month-of-birth, indicating that, on average across the sample, older children do better by .17 standardised points in reading

A child's level of ability (measured by the proxy IQ scores on PIPS) affected their progress in reading attainment and in the anticipated way.

Figure 2 shows the reading (English) attainment scores at the end of each year for the High, Medium and Low Ability Groups for EC (solid line) and control classes (broken line). The first point to note in Figure 2 is that the EC classes were lower than the control classes in Years 1 and 2 for all ability groups (and significantly so in 4/6 cases) At Year 3, EC children's performance began to improve such that by the end of Year 4, there were no statistically significant differences between the EC groups and controls. This confirms the pattern reported in Table 3 in Section 3.1.1.

As in the maths attainment, all EC ability groups showed an upward growth after Years 2 and there was a tendency for the High IQ EC group to outperform the controls in Year 4 only but this was not statistically significant.

Figure 2. PIPS Reading (English) Attainment over Time for EC/Control group at different levels of ability (EC = solid line; Control= broken line)



School Effects

As indicated earlier, multilevel models are complex and there is sometimes argument in the literature between statisticians about which of several multilevel models is the most appropriate. The one chosen above, known as a random effects model, is the one most favoured in educational research, the rationale for its use being described in Appendix 1. After allowing for the effects of pupil ability, curriculum, etc. random effect models assume that the remaining individual school specific effects are essentially random and so do not permit meaningful or substantive analysis of these differences. Alternative models, called fixed effect models, do not make this assumption and so allow substantive and meaningful statistical analysis of any estimated effects. Three slightly different models of this were also tested; the output may be found in Appendix 3. All show one school, number 8, doing very well in reading, with the differences between other schools being more variable depending on

which model is chosen. We believe that there is sufficient agreement between the models to identify School 8 as a centre of excellence in reading, and this is reflected both in the school's EC and control classes. Similarly, in mathematics, School 8 and School 10 show outstanding performance in mathematics relative to the rest of the sample, with evidence of somewhat greater variability over the rest of the schools than was found in reading. Again, these schools show excellent performance in both their EC and control classes.

3.1.4 Additional age-appropriate Literacy and Numeracy Measures

As outlined earlier in the report, the PIPS measures were augmented by a battery of age appropriate tests and the nature of these tests changed over the course of the evaluation period. Also, due to limited resources, it was not always possible to collect a full set of measures for these additional tests each year, so trade-offs had to be made between collecting quantitative pupil outcome measures, classroom observation and teacher/parent interviews. In addition, year-ahead control data in the CA schools were not available in Year 1 and sometimes in Year 2. Nevertheless, we have been able to collect sufficient data over four years to identify patterns for EC compared to control children, even if the tables below are not as complete as for the PIPS measures.

Oral language skills: At the end of Years 1 and 2, oral language and basic mathematics concepts were assessed to supplement the PIPS measures. The Bus Test, which required children to retell a story with visual prompts, yields two scores – *information* and *sentence length* (the third possible score, *use of subordinate clauses*, was not calculated due to lack of evidence for these in the children's utterances). The information score shows the extent to which the child has attended to and can understand the story, has the ability to remember and sequence the events and the language skills to retell the story. Sentence length is simply the average length of the five longest sentences the child has used. Tables 7 and 8 show the raw scores on the test for EC and control classes in the Shankill and CA schools. The EC sample in the Shankill schools had very poor scores on both aspects of the test when they started school and were significantly worse than the comparison control classes. These data show how impoverished their oral language skills were; for many children their sentence length scores were more were typical of much younger children and some children used telegraphic speech which is characteristic of toddler age.

Nevertheless, the EC control group in the Shankill schools made very good progress in the first two years, with their Year 2 information and sentence length scores being almost identical to the Year 3 control classes. However, their progress in Year 3 was not as impressive and this may be due to issues related to the reduced focus on oral skills in Years 3 and 4 which emerged from the teachers' interviews.

For the CA schools, the data are more limited for this measure. The pattern shows that there was very little difference between the EC and control classes in these schools and that they were, on average, about one year ahead of the Shankill schools. Although scores on the test were far below ceiling for any of the groups, the older children began to find this test childish and were reluctant to participate. Consequently, the validity of the Year 3 might be questionable and, consequently, the use of the test was discontinued.

Table 7. Oral language: Information scores (raw) on Renfrew Bus Story Test

Group (Number tested)	**Mean scores**					
	Baseline Nov Yr 1	June Year 1	Nov Year 2	June Year 2	Nov Year 3	June Year 3
Shankill EC (N ≥ 35)	15.8*	21.9	30.4	36.8	NT**	40.6
Shankill control (N ≥ 34)	17.2[18]	23.3[19]	NT	NT	31.8	38.3
Contrasting Areas EC (N ≥ 34)	23.7	32.3	NT	42.4	NT	NT
Contrasting Areas control (N ≥ 45)	NT	NT	NT	40.0	NA	45.2[20]

* *Significantly lower than control, p< .05* ** *NT: Not tested at this round of testing*

[18] This score refers to the matched schools group used in the first year of the study.
[19] This score refers to the matched schools group used in the first year of the study.
[20] At this stage, children acted as though they found the test childish. Consequently, the validity of Year 3 testing was called into question and it was discontinued.

Table 8. Oral language: Sentence length scores (raw) on Renfrew Bus Story Test

Group (Number tested)	**Mean scores (Corresponding age norm)**					
	Baseline Nov Yr 1	June Year 1	Nov Year 2	June Year 2	Nov Year 3	June Year 3
Shankill Enriched Curriculum (N ≥ 30)	6.4[21]*	7.7	9.2	10.0	NT[22]	10.4
Shankill control (N ≥ 34)	7.3[23]	7.7[24]	NT	NT	9.1	10.7
Contrasting Areas EC (N ≥ 34)	7.8	9.5	NT	10.7	NT	NT
Contrasting Areas control (N ≥ 45)	NT	NT	9.4	10.8	NT	11.8[25]

* *Significantly lower than control, p< .05*
** *NT: Not tested at this round of testing*

Basic Mathematical Concepts: Table 9 shows the data for the development of basic mathematical concepts using the pre-school version of the Boehm Test of Concept Development at the end of Year 1 and the advanced version (Boehm 3) at the end of Years 2 and 3. The EC and control classes were very similar at baseline and made similar progress in the first year. By the end of Year 2, the EC classes were scoring as well as the control classes who were tested several months later in Nov Year 3. Although the data for the CA schools is more limited, a similar pattern was evident. EC Year 2 classes were doing as well

[21] The children were well off the bottom of the scale. We estimate it by extrapolation of the regression line at the level of 3years 6months on average. Many children used telegraphic speech, which is characteristic of even younger children, that is, those of toddler age.
[22] Not tested at this round of testing.
[23] This score refers to the matched schools group used in the first year of the study.
[24] This score refers to the matched schools group used in the first year of the study.
[25] Children were found at this stage

as, if not better than, Year 3 control classes. A problem was encountered with both versions of the test. The maximum score on the test is 50 and as older children began to approach this score, the test was discontinued.

Table 9. Mathematical Concepts: Raw Scores on Boehm Test of Concept Development

Group (Number tested)	**Mean scores**				
	Boehm: Pre-school version		Boehm 3: Advanced version		
	Baseline Nov Yr 1	*June Year 1*	*Nov Year 2*	*June Year 2*	*Nov Year 3*
Shankill EC (N ≥ 34)	45.6	48.4	38.9	43.7	NT*
Shankill control (N = 31)	44.0[26]	48.9	NT	NT	43.8
Contrasting Areas EC (N ≥ 46)	48.1	**	40.6	43.2	NT
Contrasting Areas control (N = 45)	NT	NT	NT	NT	42.8

For those children who were tested with the pre-school version of the Boehm at baseline, the Boehm raw score is a better predictor of mathematics attainment in Years 3 and 4 than the PIPS baseline total score. This is evidence in support of establishing basic concepts early in the child's schooling. However, it cannot be used in the multi-level models because of the small numbers tested.

[26] This score refers to the matched schools group used in the first year of the study.

Written Expression. The WOLD test was introduced at the end of Year 4 to assess the impact of the Enriched Curriculum on the development of writing, particularly the compositional aspects of writing. Table 10 gives the first results for the Shankill schools.

Table 10. Written Expression: Mean Total Score and Subscale Scores on the WOLD for the Shankill sample at the end of Year 4

WOLD Score	**Shankill EC (N=102)**	**Shankill Control (N=282)**
Total*	8.63	8.16
Ideas	1.65	1.58
Organisation and Coherence***	1.66	1.46
Vocabulary***	1.52	1.32
Sentence Structure	1.25	1.25
Grammar and Words	1.22	1.27
Capitals and Punctuation	1.33	1.30

** p=.054 almost significant*
**** P<.001 highly significant*

The first point to note is that the scores were relatively low for both samples. The total score can vary from 6-24 and the average for both groups in the evaluation was between 8-9. For the subscales, scores varied from 1-6 and the highest subgroup average was 1.6. Nevertheless, on four of the six subscales and on the total score, the EC sample outperformed the control group. The two subscales that do show statistically significant differences are related to the organization and coherence of the writing and the use of vocabulary – important features of composition. The main reason for the difference is that the EC children were literally "getting off the bottom of the scale"; fewer children in the EC sample (26%) scored at the bottom of the scale between 6-7 than did the control children (44%).

3.1.5 Academic Self-Concept and Dispositions for Learning

Two measures of children's dispositions for learning were included in the testing. One measure (the Harter Self-Concept) asked children to rate their feelings of competence along a variety of dimensions – with peers, with a significant other (usually mother), in schoolwork

and in physical play. Scores on subscales can vary from 1-24 and an overall score can also be calculated for general feelings of self-worth and self-esteem. Table 11 shows the results for the various subgroups on the domain related to schoolwork – the academic self-concept.

Table 11. Harter 'Academic' Self-Concept: Children's Self-Ratings on the Academic Sub-scale

Group (Number tested)	**Mean scores**		
	Year 2	Year 3	Year 4
Shankill EC (N ≥ 75)	19.8	21.3	19.9
Shankill control (N ≥ 103)	NT	20.5	21.0
Contrasting Areas EC (N ≥ 147)	20.1	20.5	NT
Contrasting Areas control (N ≥ 101)	20.2	20.2	NT

After Year 2 in which children were individually administered this instrument, all children rated themselves relatively high on this subscale, with many children having the maximum score of 24. There was very little variation between the sub-groups suggesting that the children were responding in a socially desirable way and/or that the scale was not sufficiently sensitive to the context. Scores on the other subscales and the total score were also high and showed little variation; hence they will not be reported.

The other measure, constructed specifically for the evaluation, asked teachers to rate the children on aspects of their social competence, behaviour, attention and well-being in the classroom. Table 12 presents the total scores on this short scale. A mixed picture emerges,

showing increases and decreases in inconsistent ways. (This scale appears to correlate with attainment but is not sensitive to the differences between EC and traditional classrooms in the ways that we had anticipated).

Table 12. Dispositions for Learning: Teacher Ratings for Children

Group (Number tested)	**Mean scores**		
	Year 2	Year 3	Year 4
Shankill EC (N ≥ 75)	19.2*	19.8**	18.1*
Shankill control (N ≥ 103)	NT	NT	19.1
Contrasting Areas EC (N ≥ 147)	21.3	20.3**	NT
Contrasting Areas control (N ≥ 101)	NT	20.3	NT

*p<.05 Year 2 Shankill EC significantly lower than Year 3 Shankill EC
*p< .05 Year 4 Shankill EC significantly lower than Year 4 Shankill control
**p<.001 Year 3 Shankill EC significantly higher than Year 4 Shankill EC
**p<.001 Year 3 CA EC significantly lower than Year 2 CA EC

3.1.6 Summary with regard to Pupil Outcomes

- On the more traditional indices of attainment, evidenced by PIPS reading and mathematics scores, the EC children's performance was depressed relative to the controls in the first two years of primary school but they improved in Years 3 and 4 such that there was no substantial difference between the two groups in Year 4 for the Shankill schools and in Year 3 for the CA schools. In the early primary school years, the EC curriculum deliberately postponed the more formal aspects of reading and mathematics that PIPS assesses, so perhaps it is not surprising that attainment differences occurred in the earlier

stages. Nevertheless, despite this postponement, the differences have disappeared by the end of Key Stage 1.

- The above pattern was confirmed statistically through multi-level regression model analyses of the PIPS reading and mathematics attainment scores. . In addition, it was clear that the post-Year 2 improvements were evident for all levels of ability (grouped into High, Medium, and Low proxy IQ groups). There was some evidence that the High Ability EC group was beginning to outperform the High Ability controls, particularly so in mathematics.
- There was no difference between the Shankill and the CA schools in PIPS mathematics attainment when baseline scores and proxy IQ scores were taken into account. However, even after taking these into account, differences remained between the two groups of schools in PIPS reading attainment, indicating that Shankill children are likely to encounter specific problems in progressing their literacy skills.
- Boys and girls performed equally well in PIPS mathematics, but girls outperformed boys in PIPS reading (3.9 standardised points higher) across the whole sample.
- Children's age in a single class can vary by up to 12 months. The multi-level model analyses showed that there was a significant relationship between month-of-birth for both mathematics and reading attainment (.26 of a standardised point per month in mathematics and .17 for reading).
- Additional measures were included in the testing battery as developmentally more appropriate and more closely matched to the learning goals of the EC. EC children showed slight advantages on these measures compared to controls, although we are cautious about this conclusion given the psychometric difficulties we encountered with some of these measures and the incomplete dataset. Nevertheless, in Years 1, 2 and 3, both for oral language skills and mathematical concepts development, the EC children made good progress relative to the control group, such that the EC children were performing at the end of Year 2 at a similar level to the controls who were tested either several months later (maths concepts) or one year later (oral language). It was not possible to track these changes into Year 4 as the test items became too easy or too 'childish' for use with older children.
- In Year 4, a test of narrative and expressive writing was introduced. Although we have data for the Shankill schools only, it does appear that the EC children were superior to the

control group on this test, and particularly on aspects of organisation and coherence in their writing, and on vocabulary measures. It should be noted that scores on this test were very low and that EC children's performance as well as control performance was not impressive.

- In summary then, for cognitive measures in the traditional areas of reading and mathematics attainment, EC children were performing at a similar level to the control groups but not until the end of Years 3 or 4. In the cognitive domains that were more closely matched to the EC curriculum processes (oral language, developing mathematical concepts, narrative and creative writing), then the EC children began to show learning advantages.
- Two measures of children's dispositions for learning were included in the testing. Neither produced consistent evidence with regard to the effects of the EC children relative to the controls but this may be due to inadequacies with regard to the psychometric properties and rather than the reality with regard to differences between the groups. Teachers' and parents' views on children's progress in school can be used to extend the rather limited quantitative measures on this dimension.

3.2 Classroom Observation: Quality of Learning in Enriched Curriculum Classrooms

The Quality Learning Instrument (QLI) is a classroom observation schedule that consists of ratings by trained observers who have observed a target classroom/teacher for one day. The QLI gives some indication of how well the principles of the EC are being enacted in the classroom and can be used as in index of programme integrity. The quality of learning in the classroom is rated, using a six-point scale, on 9 nine indicators (27 items) that are well tuned to the aims and goals of the EC. Scores can be reported as mean scores (1-6) or as total scores for the 27 items (27-162) and they give an overall picture of the quality of learning for the children in the classroom. It should be remembered the QLI evaluates not only aspects of the teacher's performance in the classroom, but also children's responsivity as well as the quality of the physical learning environment.

The QLI builds on early years' classroom observation research that was conducted prior to the current EC evaluation project (Walsh, 2000). It was originally designed for Years 1 and 2

but was adapted for Years 3 and 4 during the course of this evaluation. Unlike for Years 1 and 2, where data from 38 'traditional' classrooms had been collected prior to the start of the evaluation project, we do not have comparison data for control classes in Years 3 and 4 and funding considerations precluded collection of such data. In addition, we were not able to get access to all classes in Years 3 and 4. For these reasons, we will report results separately (and differently) for Years 1/2 and Years 3/4.

3.2.1 QLI: Year 1 and Year 2 classes

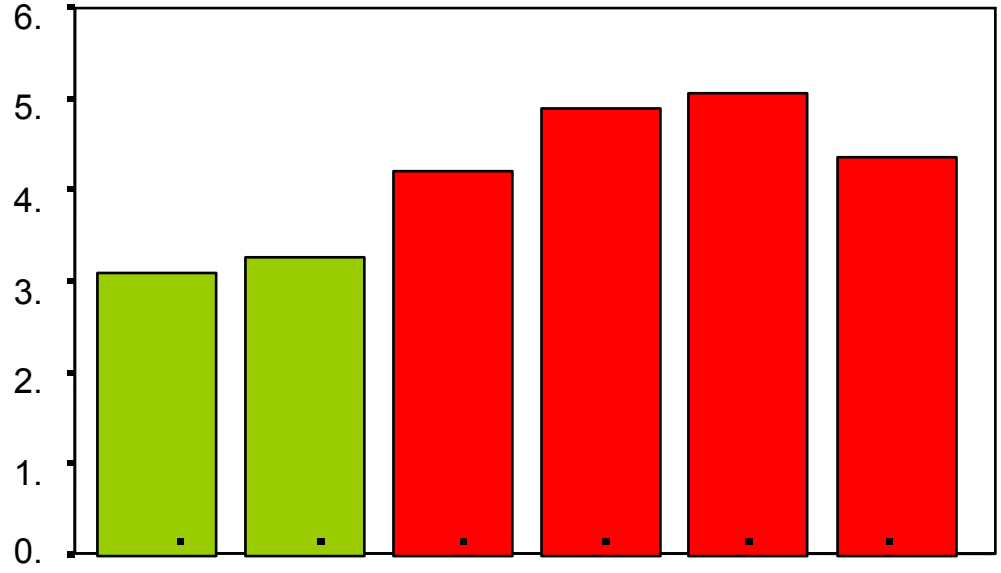
Figure 3 shows the mean scores on QLI for various groups of classes/teachers who have been observed using the QLI as an observation instrument. Sample sizes are too small to allow inferential statistical comparisons; qualitative comparison must suffice.

EC classes v. control classes. The two left hand bars (green) represent data from control Year 1 classes and the four bars to the right (red) come from observations made in EC Year 1 and Year 2 classes. The first control group consists of 38 'traditional' Year 1 classes that were part of Walsh's study and they are from schools in areas of deprivation similar to Shankill schools. The second control group consists of three Year 1 classes from the sample of matched control schools from the first year of the evaluation (from schools in a deprived area of North Belfast).

The first point to note is that all the EC groups were superior to the control groups on average, indicating that EC teachers had moved their practice in the direction of the more child-centered and developmentally appropriate principles of the EC. This was confirmed from interviews with Year 1 teachers who reported shifting away from their previous more formal curriculum style of teaching. There was further confirmation of these findings in a study into teachers' beliefs and practices carried out from Queens University Belfast (See Appendix 4).

Effects of experience. The third column is for nine Year 1 classes in the first year of the evaluation in the Shankill schools. The fourth column shows those same teachers in their second year of teaching the EC to Year 1 classes. The effect of experience is clearly seen; their mean QLI score increased as teachers moved to their second year of teaching the EC. Further, there was little variability in scores between teachers in either year.

Figure 3. Composite QLI scores for various Year 1 and Year 2 groups



Group	Traditional N=38	Matched schools N=3	Novice Shankill EC1, N=9	Experienced Shankill EC2, N=9	CA schools EC1, N=8	Shankill EC1 N=8
Class	*Year 1*	*Year 1*	*Year 1*	*Year 1*	*Year 1*	*Year 2*
Year data collected	Before 2000	2000-2001	2000-2001	2001-2002	2001-2002	2001-2002

Shankill vs CA classes. In the fifth column, we see the performance of teachers in CA Year 1 classes in their first year of teaching the EC. The mean scores were higher than for Shankill teachers in their first year. The difference is attributable mainly to those indicators of the QLI that captured children's responsivity and the quality of the learning environment and resources rather than the aspects of teachers' performance: The latter tends to confirm teacher reports of poor resources, such as dedicated play space, in some Shankill schools.

Stability. Finally, we see the Shankill Year 2 teachers in their first year of teaching the EC. This result is remarkably similar to that for their Year 1 colleagues.

The effect of experience is tabulated in more detail in Table 13 and shows the separate QLI scores for each of the nine dimensions for the Shankill Year 1 teachers in their first year of

teaching compared to their second year teaching the EC. The data show that there was improvement across all nine indicators. In particular, independence, which was one of the lowest scores in the first year of teaching increased substantially in the second year. In contrast, higher order skills, which was the other low score in the first year, improved to a lesser extent, and remained the lowest score in the second year. The development of higher order thinking remained problematical for many groups and, in the teacher interviews, it emerged that few teachers had explicit strategies to address learning in this domain. It is an area that future training should specifically focus on - and can easily be linked with the development of oral language skills.

Table 13. The effects of experience on nine QLI indicators for Shankill Year 1 classes

Indicators	Shankill Year 1 Classes Teachers in their lst year (2000/2001)	Shankill Year 1 Classes Teachers in their 2nd year (2001/2002)
Motivation	4.0	5.1
Concentration	4.3	4.9
Confidence	4.5	4.9
Independence	3.8	5.0
Well-being	4.3	5.1
Multiple skill acquisition	4.6	5.1
HOTS*	3.8	4.7
Social interaction	4.5	4.9
Respect	4.3	4.7

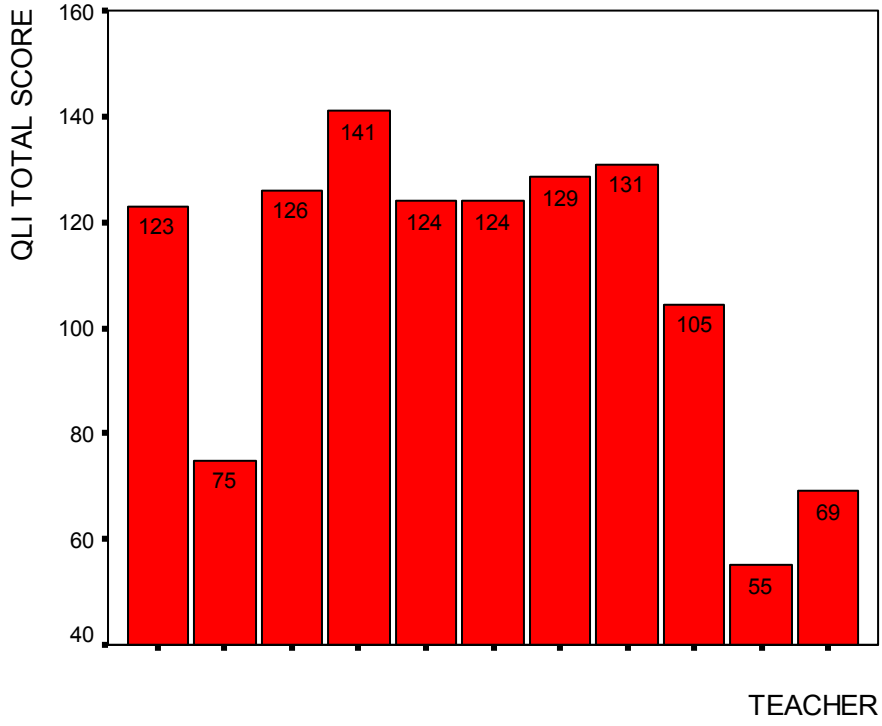
*Higher order thinking skills

3.2.2 QLI: Year 3 and Year 4 classes

For a variety of reasons, including industrial action, we were not granted access to all classes in these year groups. The numbers are small and the data are incomplete; hence we have decided not to present the means for comparison with other groups. In addition, there was much more variation between teachers in these year groups which may be related to the amount of training available to this group, as evidenced from the teacher interviews. Figure 4

shows some data for individual teachers. Scores in the figure are total scores (27-162), not mean scores (1-6).

Figure 4. Composite QLI total scores individual Year 3 and 4 teachers in 2003-04



Individual differences related to training. The graph shows one teacher with very high QLI scores (141); the majority of teachers were grouped between 123 and 131, and three had very low scores (75, 69, and 55). All three of the teachers with low scores missed the training completely through no fault of their own. The picture for Year 3 teachers in the previous year was similar, although the variability was not quite as marked. Again, there is evidence that low scores were related to little or no training which can, in turn, be linked back to teacher interviews in Years 3 and 4.

3.2.3 Conclusion

The most important finding from QLI is that it clearly differentiated EC classes from traditional classes, with children in Years 1 and 2 EC classes getting an experience that is more consistent with the principles and desired practices of the EC than the control classes.

As far as we can judge, QLI gives some indication of programme integrity at this stage. Ironically, the depressed PIPS scores for PIPS mathematics and reading attainment in Years 1 and 2, relative to the controls, also confirm that something different was occurring in EC classrooms.

For Years 3 and 4, our dataset was more fragmented. Nevertheless, it does appear that training is related to quality of QLI scores - at least at the lower end. From the teacher interviews it was confirmed that those with less/no training were more uncertain about the aims of the new curriculum and of what constituted good practice in this context. This variability poses questions about programme integrity for these year groups but also raises questions about what constitutes developmentally appropriate EC practices as children move into Years 3 and 4.

To date, a very small sample suggests that QLI scores improve as teachers get more experienced with their EC practices. Again, novice teachers in interviews reported that they looked forward confidently to "doing it better" in subsequent years. In Phase 2 of the evaluation, which is under way in the current school year, there are plans to further examine the effect of experience.

In addition, careful analysis of individual indicators on the QLI helped to analyse possible reasons for differences between school types. For example, resource deficits in classrooms – as in some Shankill schools[27] – can adversely affect scores on QLI. Also, children's responsivity, which is related to their oral skills, their confidence and social interaction, can also be reflected in QLI scores. Furthermore, consistently low scores on QLI indicators can help to show areas where teachers do not have strategies for improving learning (e.g., higher order thinking skills) and where there may be training gaps.

We have attempted to relate QLI scores (for different teachers over 3/4 years) to learning outcomes such as reading and mathematics attainment at Year 4, but the data are incomplete and sample sizes are too small. The best we can say is that there is a loose association

[27] Lack of appropriate and interesting books for less able readers in Years 3 and 4 were a particular concern.

between QLI and these outcomes, although two classes show anomalous results in this respect.

3.3 Teachers' Views

Teachers' views constituted a major strand of the evaluation, given the importance of teachers in delivering the curriculum and the unique vantage point they have in observing the immediate effects of the curriculum on the children's learning and on their dispositions for learning in the longer term. All 59 teachers who taught EC classes completed questionnaires and were interviewed. Many also participated in focus group discussions. Each year a new cohort of teachers was interviewed as the children progressed through Key Stage 1 from Primary 1 to Primary 4. Data will be presented therefore year-by-year to show how teacher views changed and developed as the children progressed from Year 1 to Year 4. Each new cohort of teachers therefore reflects the fresh views of teachers as they meet and teach for the first time a class of children, whose experience of school is framed by the Early Years curriculum rather than the traditional curriculum. It should also become clear from these Year1-Year2-Year3-Year 4 teachers' views what implications the Enriched Curriculum have for future cohorts of teachers – and for children - in the various primary age groups within Key Stage 1 and beyond. Teachers' views are often corroborated by data gathered from parents, for example, in regard to many children's enthusiasm for work and positive attitude to school.

3.3.1 Teacher Interviews in Year 1 (N=17)

Shankill Area: The Shankill Year 1 teachers were the first group of teachers to join the EC. Teachers' views were collected from a focus group of nine teachers and individual interviews with these nine teachers. At this early stage, the curriculum was evolving and teachers were able to bring their own previous professional experience and expertise to bear on its implementation. Teachers varied in the speed and extent to which they changed their teaching practice to bring it into line with the Enriched Curriculum. Many of the teachers perceived themselves as "too formal" for the new curriculum but planned a less formal approach for subsequent years. The EC asked many teachers to make extensive changes to their working practices and it is not surprising that these changes were not fully implemented in the first year. Generally however, teachers reported they did more whole-class work, more

talking and listening, shorter lessons, more practical lessons, more structured play and more picture-book reading. The 'new' curriculum also provided some teachers with an opportunity to introduce new teaching activities or extend the use of some teaching activities, which were not necessarily central features of the Enriched Curriculum (e.g., circle time, Brain Gym, music and rhythm, shared reading). All Year 1 teachers saw it as a primary goal of the new curriculum to remove persistent early failure from the experience of the child.

Even at this early stage, teachers noted differences in children's dispositions, particularly increases in self-discipline, independence, maintenance of attention and concentration, and oral language skills. It was not entirely clear what aspects of curriculum innovation were responsible for these perceived developments in children's learning.

Another feature of teachers' views was their awareness of the impact of social and contextual factors which impinged on the delivery of the curriculum and the children's experiences of it. Such factors included Year 1/Year 2 composite classes and competition from other projects which were running in the classroom. An additional problem was the requirement of promoting change itself, which carries within it to some extent an implicit critique of the previous curriculum and their former methods of teaching.

Contrasting Areas group: Teachers' views in the CA group of schools were gathered through structured interviews. Teachers in the CA group were overwhelming positive about the Enriched Curriculum in Year 1. They seemed more certain and less daunted by the deployment of the new curriculum, because they were able to draw on the experiences of the Shankill teachers, the increasing degree of consensus about what constituted the EC, and because the burden of innovation had been lightened for them to some extent by the work already undertaken by the Shankill teachers.

As with the Shankill group, the CA group became more aware of the importance and usefulness of developmentally appropriate practice, that is, practice that closely matched the teaching/learning activities to the developmental level of the child. Many these teachers reported that their beliefs on how children learn had changed fundamentally. For instance, they had become increasingly aware of children's physical development. As in the Shankill

area, the teachers in the CA group found it hard to let go of their former practices entirely. Yet they valued the opportunity to "slow down" the pace of the curriculum in order to ensure that foundation skills were better established.

Differences between Education and Library Boards in how they perceived and implemented the Enriched Curriculum became evident within the Contrasting Areas group. They shared the beliefs of Shankill teachers in the importance of the prevention of early failure. There was also a general agreement (also shared with the teachers in the Shankill schools) about the importance of oral language, listening and social skills. Like the Shankill teachers, such learning activities as "Show and Tell" and Circle Time were a feature of the new programme. Other similarities between the groups were (i) development of positive self-esteem, (ii) greater independence and (iii) enhancement of creativity. Interestingly, at least some of the schools in both groups of schools saw Health Education and Promotion as an explicit part of the Enriched Curriculum. A particular feature of this was the promotion and/or supply of healthy foods and healthy breaks in school.

On the other hand, the CA children came from more socially advantaged areas than the Shankill children, and consequently were able to move more quickly through the curriculum. CA teachers said they were surprised that the EC was able to cater so well for academically more able children. Their initial concerns that the EC might not transfer so well from social disadvantaged areas to academically more able children were assuaged. Indeed, some felt that the ablest children might have the greatest advantage under the new programme. However one issue which was problematic for the CA teachers was the lack of written structure underlying the EC which combined with unevenness in the amount of training provided across Education and Library Boards. This led to some misunderstandings about 'reading readiness'. In particular, some teachers believed that they were required to wait for reading readiness rather than prepare children for it. This was contrary to the teachers' own beliefs. Teachers tended to act on their beliefs rather than on their misunderstandings of the curriculum, though not without some misgivings.

3.3.2 Teacher Interviews in Year 2 (N=16)

Shankill area: At the beginning of the school year, the Year 2 teachers in the Shankill area tended to feel confident in the preparation provided by their training despite the fact that they had much less training than the Year 1 teachers. However, as the year progressed, the slightly lower level of training given to Year 2 teachers, their lack of volunteer status, the lack of additional resources provided to support the curriculum and a generally less supportive environment, produced some longer lasting feelings of anxiety and uncertainty in this group. Some teachers felt that the EC in Year 2 necessitated the help of appropriately trained classroom assistants, which were eventually provided for this cohort through funding by CCEA but might not be provided in the future.

Although still extremely positive about the programme overall, this group of teachers had some concerns in the areas of literacy and assessment. The Shankill teachers were very aware that at the end of Year 2 there was still a substantial number of children who were not ready to move on to a formal reading scheme. They feared that the Year 3 teachers would not be best pleased with receiving such an intake of pupils. Yet these Year 2 teachers were still confident that groups of children (e.g., boys, less able children, less mature children) who might have done less well under the traditional curriculum seemed to be doing better, or would ultimately do better, under the Enriched Curriculum. By the time of the teacher interviews early in the summer term, the teachers felt that the children had caught up with where they would have been under the traditional curriculum, although the PIPS attainment testing showed that that this was not quite so. On the other hand, the results of the tests for oral language and mathematical concepts do confirm teachers' views.

As indicated above, some Year 2 teachers were thinking about the implications of the Enriched Curriculum for teachers further up the school. One source of this concern was their recognition that the lower ability children in Year 2 were not as ready for formal reading at this stage as was formerly believed to be the case under the pre-existing curriculum. The teachers also recognised that the children's written work was also less advanced at this stage. Yet they were also aware that the children had much better practical skills, better oral language skills, better interest in reading and a more independent style of learning. There was still concern however among Year 2 teachers that Year 3 classes might not be fully

prepared to build on these strengths and, in some cases, might not perceive some of the skills (such as independence) as a strength. There was also some concern that Year 3 classes were not adequately resourced to meet the children's rather different learning needs.

Contrasting Areas (Year 2): It was clear from the teachers' comments that the degree of training and support varied greatly between Boards, as did provision of resources across Education and Library Boards. Also, individual schools varied in their ability and/or willingness to divert funding into resources for the EC. However, like the Shankill teachers, the CA teachers were impressed by the sheer enthusiasm of the pupils for learning. Again, as in the Shankill, the teachers were struck by the improvement in children's oral language and communication skills and their confidence in 'speaking out', as was also noted and approved by parents. The majority of teachers in CA schools believed the improvement in the children's oral language skills was one of the greatest benefits of the Enriched Curriculum. At the same time, some of the teachers were taken aback by the lack of formal progress in reading made by the children whom they received into their classes in September. Some of the teachers were not that optimistic that the children could catch up by the end of the year. It is true to say that, for some of the teachers at least, a degree of uncertainty about the value of the EC lingered in their minds at that time. At the same time, teachers were impressed by the children's attitudes, work rates and social skills. Yet Year 2 teachers were still fully committed to the project and could already see some accruing benefits, despite ongoing concerns about the development of formal reading skills. It is fair to say that there was anticipation but also uncertainty about the course upon which they had set out. At the same time some of the teachers clearly wished to clarify or even modify some aspects of the new curriculum even though they recognised its value. However, when asked explicitly, none of the teachers wanted to return to the old teaching methods.

3.3.3 Teacher Interviews in Year 3 (N=16)

Shankill Area: Many of the Year 3 teachers expressed their view that they had insufficient training to deal with the changed curriculum. There was a feeling among the teachers that they did not receive nearly as much support as had the teachers in the lower classes, particularly those teaching Year 1. From their perspective, the changes for them were almost

as daunting as they were for Year 1 teachers. Yet unlike Year 1 teachers, significant additional resources and new reading material had, for the most part, not been provided.

Teachers were still conscious of children's poor oral language skills in the Shankill area, despite the improvements which they had noticed. Speech difficulties were a significant cause for concern. Poor diction and weak vocabulary were greatly contributing to many children's difficulty with letter-sound correspondence Teachers were aware at this stage that the EC had not proved a cure-all for poor language skills and they seemed prepared to accept a more realistic view. Picture vocabulary scores on PIPS Year 3 and Year 4 tests tend to support the teachers' view. Nevertheless, teachers continued to try to focus effort on oral language skills despite increasing competition and encroachment from other areas of the curriculum.

The level of literacy of children entering the class in September 2002 was the greatest source of apprehension for Shankill Year 3 teachers. Typically they were somewhat taken aback by what they perceived as 'low entry' standards. It is apparent that teachers had insufficient warning of what to expect. By the time all the teacher interviews had been conducted however, teachers were accepting that, in most cases, the children were making fair or good progress despite their low attainment on the traditional measures when entering Year 3.

As far as mathematics is concerned, teachers wanted training in the extension of the practical mathematics schemes upwards to cover place value and early multiplication because these skills were now being introduced into the curriculum for those children who were ready. Teachers' confidence in teaching basic mathematics skills now contrasted with their lack of confidence in teaching higher order mathematics skills.

Teachers were still aware of the increased confidence which the EC children displayed. Teachers were also aware of the need to continue to promote the development of emotional and social skills through activities such as Circle Time. At the same time, teachers were very clear about increasing pressures within the curriculum to adopt more traditional approaches, and how the more informal activities were increasingly being forced out by the more formal activities.

Contrasting Areas: Year 3 teachers in both Shankill and Contrasting Areas were more moderate in their praise of the Enriched Curriculum than Year 2 or Year 1 teachers in these areas. On the other hand, CA teachers in Year 3 were more positive than their counterparts in the Shankill schools. Most CA teachers reported that the Enriched Curriculum had changed not only the early years teaching but had also influenced the approach to teaching throughout the whole school, because senior staff and teachers of the more senior classes had become aware of the demonstrated advantages of activity-based learning evident for the younger age groups; they saw how it might be extended into Key Stage 2. A minority of Shankill teachers reported that this had happened within their own schools.

3.3.4 Teacher Interviews in Year 4 (N=10 Shankill sample only)

Shankill Schools: Teachers in the Shankill schools in Year 4 expressed the view that unrealistic expectations might have become attached to the EC. Though the children were doing as well at this stage as the children on the pre-existing curriculum, teachers were not experiencing any dramatic upgrading of attainment levels. Parents seemed to have become aware of this as well as teachers. Also, the influence of the peer group was growing and developing in a way that rivaled the influence of school and home. In addition, some of the Shankill teachers continued to perceive inadequate levels of support both inside and outside their schools.

The Shankill teachers were also very conscious of the pending end of Key Stage 1 assessment process. For many of these teachers, budget and resource deficiencies also served to underline the lack of educational opportunities available to their pupils. By contrast, books in abundance were to be found in most CA schools. Even with these difficulties, many Year 4 teachers in Shankill schools were still very supportive and positive about the EC and all teachers were supportive to some extent as indeed were the majority of parents who took part in the survey.

Teachers in the Shankill schools tended to concentrate on the difficulties of their weaker groups, which contrasted with the focus of the teachers in the CAs on the enthusiasm and success of their most able readers.

3.3.5 Teachers' General Perceptions of the Enriched Curriculum: Survey Results

As well as participating in the interviews, twenty–one teachers from Years 2 to 4 in the Shankill schools and 22 teachers from Years 1 to 3 in the schools in the CAs completed a questionnaire at the end of their first year teaching the EC. This provided some insight into to their general impressions of the curriculum and corroborates views expressed in the interviews. As Table 14 indicates, 30% of teachers considered that they were poorly or very poorly prepared for the Enriched Curriculum when they started the year but only one teacher (2%) still considered that they were poorly prepared by the time of the survey at the end of the year. Indeed, three-quarters of the teachers at this stage indicated that they were well prepared for teaching the EC.

Table 14. Preparation for teaching the Enriched Curriculum

	Very well prepared	*Well prepared*	*Just adequately prepared*	*Poorly prepared*	*Very poorly prepared*
At the start of the year (n=42) % of teachers	2	26	41	19	12
Now (n=43) % of teachers	4	65	23	0	2

Most teachers rated the EC as more demanding or much more demanding than the 'old style' curriculum but 2 of the 14 Year 2 teachers considered that the EC was less demanding. A majority of teachers distinguished the stress felt under the pre-existing curriculum, arising in response to unrealistic curriculum demands for low-ability children, from the physical and class management demands of teaching the EC.

All but three teachers from Years 3 and 4 in the Shankill schools rated their own attitudes to the EC as positive or very positive and the EC as appropriate or highly appropriate for their class.

The teachers generally saw the attitudes of ELB officers and their principal to the EC as positive or very positive but 1 in 5 of the teachers saw the attitude of their colleagues as

neutral or negative, and 1 in 4 of those who were teaching the older age groups saw the attitudes of parents as neutral or negative.

Although teachers tended to rate EC very positively, over half (57%) of them considered the resources supplied to their classroom or school to support the changes in teaching during the year were just adequate, and 9 teachers with Years 2 to 4 classes viewed the resources as completely inadequate or inadequate. None of the Year 3 teachers saw the resources as completely adequate.

Overall, the questionnaires clearly showed that the teachers, especially in Years 1 and 2 were very positive in their ratings of the EC but most considered that their work is under-resourced.

3.3.6 Summary of teachers' views

- *Introduction of the Enriched Curriculum:* Teachers introducing the Enriched Curriculum changed their teaching practices slowly, gradually and incrementally. They reported that they were not likely to be delivering the full Enriched Curriculum until the year after they had begun to introduce it.
- *Children's Learning:* There was widespread agreement among teachers that pupils improved in oral language skills, independence skills and in practical maths under the Enriched Curriculum. Nevertheless, Shankill teachers were concerned that some of the pupils in their classes still had speech difficulties[28] and a low level of oral skills which would in turn impact adversely on their reading skills.
- *Training*: The amount of training provided varied considerably between Education and Library Boards, and overall was less available in Year 4 than in Year 3, in Year 3 than in Year 2, and in Year 2 than in Year 1.
- *Provision of resources*: Many teachers expected extra resources to support the implementation and delivery of the curriculum. The majority of the teachers in Year 2 thought that the Enriched Curriculum could not be provided properly without the help of a trained classroom assistant. As was the case for training, additional resources

[28] It was reported by Shankill teachers that parents were unwilling for children to attend speech therapy because of the stigma attached to it locally.

were less available in Year 4 than in Year 3, in Year 3 than in Year 2, and in Year 2 than in Year 1. Some Year 3 teachers felt that this was an unsatisfactory state of affairs. Some Year 3 and 4 Shankill teachers were particularly conscious of a lack of resources, particularly in relation to books suitable for all levels of reading ability.

- *Workload:* The workload for a teacher embarking on the Enriched Curriculum for the first time was reported to be extremely high. Much of this work seemed related to the provision of structured play activities and to new assessment techniques. When teachers did not have a classroom assistant, the ongoing demands on the teacher were reported to be particularly high.
- *Teacher Beliefs*: Teachers reported that they had discovered a lot about how young children learn. They now believed that action-based learning was appropriate for early year's children. In some schools (particularly in Contrasting Areas), teachers of Key Stage 2 classes had been influenced in their teaching by some of the ideas which permeated the Enriched Curriculum.
- *Support for the Enriched Curriculum:* On the whole, teachers remained very supportive of the Early Years Enriched Curriculum though teachers of Year 1 were still the most enthusiastic. Year 3 and 4 were still positive but not quite as enthusiastic. Shankill teachers in Years 3 and 4 were less positive than Contrasting Areas teachers, perhaps because of the ongoing negative impact of educational disadvantage and perceived restrictions on resources/support within Shankill schools.
- *Practical Mathematics:* The practical mathematics aspects of the curriculum were seen as a great success, accompanied by a wish to have further training to apply these activities-based approaches to the higher order mathematics skills required for the older classes.
- *Constituents of the Enriched Curriculum:* There was considerable variation in what teachers believed to be the essential constituents of the Enriched Curriculum.
- *Structured Play:* There was a lack of clarity about the nature and role of structured play within the Enriched Curriculum.

- *Guided Reading:* There appeared to be no agreement about what was meant by the term 'guided reading', though it was perceived as a key element of the Enriched Curriculum.
- *Handwriting:* There was also some confusion about the role of handwriting within the Enriched Curriculum. Some Year 1 and Year 2 teachers, having moved away from teaching letter formation, had latterly returned to it, albeit not quite in the very structured way which was used before.
- *Tensions within the curriculum:* There was a tension between child-centred approaches which were seen as part of the Enriched Curriculum and the demands of mixed ability teaching.

3.3.7 Issues arising from a consideration of teachers' views

It is perhaps surprising that there was so much variation in teacher views about what constitutes the Enriched Curriculum. Initially, it seems to have been largely defined by a delay in the introduction of a formal reading and mathematics programmes until the second year of primary school. This allowed time and opportunity for the provision of learning activities in Year 1 and at the beginning of Year 2, which were developmentally appropriate to the children undertaking them. What was initially defined in rather general terms as a developmentally appropriate curriculum became characterised as a play-based curriculum or an activity-based curriculum. Teaching approaches relating to child-centered education were soon drawn upon and incorporated into this general approach and implemented.

The play-based curriculum came to be seen by many teachers as definitive of the Enriched Curriculum. However teachers, new to the play-based curriculum, soon discovered how demanding it was in terms of the planning, physical and mental energy, time and resources required. Highly skilled class management was a prerequisite for it, combined with a system of differentiation closely matched to the needs of the children, in turn implying finely tuned assessment skills on the part of the teacher. It was physically very demanding and seemed to all teachers to require a well trained classroom assistant in every class for it to be properly implemented. It also required a wide range and generous supply of resource materials. Despite the many problems of providing a play-based curriculum, teachers took on the challenge with enthusiasm and hard work. Moreover, the play-based curriculum had the

advantage of being a developmentally appropriate curriculum and thus fitted in with their ideas and understanding of what constituted good practice. In addition, teachers were aware from the training provided that in the hands of certain teachers at least, it could be made to work very successfully.

Though a play-based curriculum may have been seen as definitive of the Enriched Curriculum, teachers drew on a much wider range of teaching and learning activities within their everyday classrooms. These activities included whole-class and teacher-led approaches, many of which seem to have been activity-based and developmentally appropriate in character. Shared reading sessions were seen as crucial. Teacher initiative was therefore able to extend children's learning activities beyond a play-based curriculum, and in a way which was consistent with the basic principles (developmentally appropriate, activity-based) of the Enriched Curriculum and yet matched the teachers' own views of what should be the intended learning outcomes for the pupils. In this way the Enriched Curriculum was able to develop a new realism and flexibility for many teachers, while at the same time being limited to some degree by its definition as a play-based curriculum.

3.4 Parents' Views

The views of parents were an important component of the Enriched Curriculum evaluation. Most parents in Northern Ireland enroll their children in the local primary school and in 2000 in the Shankill and in 2001 in the Contrasting Areas, parents were informed that their children's schools were to pioneer a new curriculum. Each school had to explain to parents the reasons why the curriculum was changing, what they might expect to happen during the first year and their own role in the process. The provision of extra resources, such as large-scale play equipment and shared reading books, demonstrated the commitment of the Education and Library Boards and CCEA to this project and there was also some local media coverage of the innovative proposals. However, parents' views of the Enriched Curriculum over time will have been strongly influenced by their own beliefs and aspirations, as well as the ongoing communication between school and home and observations of their children's progress.

From the beginning, the evaluation was concerned that parents should feel free to be critical of the project. Every year, all parents were sent short questionnaires, which included space for them to write about their own views as well as a series of closed questions. It was felt important that parents could maintain anonymity and in the first year of the evaluation they were not asked for their names. Subsequently, many parents were willing to provide their names but a proportion did not. It is therefore not possible to establish exactly how many of the same parents responded over the years but a total of 332 questionnaires were completed by parents over the four years (See Table 15). At least 46 parents who identified themselves responded on more than one occasion.

It is notable that whereas there is a sharp drop in the number of parents from Shankill area schools who responded to the questionnaire over the years, the numbers responding to the questionnaire in the Contrasting Areas increases somewhat in the third year. Parents in the Contrasting Areas, who completed the questionnaires, also tended to write more detailed comments than those in the Shankill. The general findings from the quantitative analysis of the questionnaires are summarised here followed by a brief overview of the main themes relating to the content of the curriculum as they emerged each year in the comments made on the questionnaire or during the interviews that were held with a small number of parents.

Table 15. Numbers of parents responding to the survey in each year group

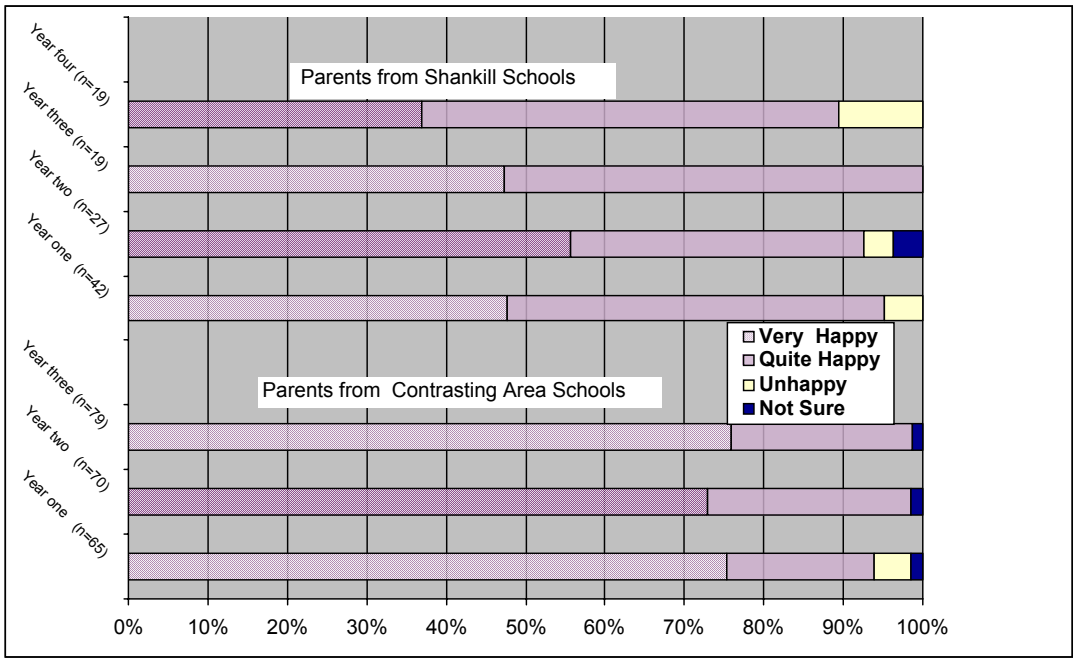
Total number of questionnaires = 332 Max possible number of parents = 296	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Shankill EC	42 26.2%	28 17.5%	19 11.9%	19 11.9%
Contrasting Areas EC	75 41.7%	70 38.9%	79 43.9%	*
Total	117 34.4%	98 28.8%	98 28.8%	19 11.9%

3.4.1 Parents' General Views of the EC

Enjoyment of school. Figure 5 illustrates parents' responses to the question "How did your child feel about school this year?" It shows that all but a few parents considered that their child had been happy in school. Indeed, none of the parents in Years 2 and 3 of the Contrasting Areas and in Year 3 the Shankill schools reported that their child was unhappy.

Figure 5. Responses to the question – "How did your child feel about school this year?"

(Parents in Year 1 in the Shankill only had choice of Happy or Unhappy)



Although 10% of Shankill parents in Year 4 reported that their child was unhappy at school, this only represented two children. Over the four years of the evaluation there were parents who expressed some dissatisfaction with some aspects of the curriculum but, as the responses to this question show, the vast majority of parents were generally very satisfied that their child was enjoying their early years at school.

Perceived impact of the Enriched Curriculum on child's future success. Table 16 shows that in Years 1 and 2, the majority of parents considered that the Enriched Curriculum would help their children to succeed in education. The wording of this question was changed for parents of children in Year 3 so that parents were asked about the effect of the Enriched

Curriculum on the child's future success rather than their success in education. Only 4 parents considered that the Enriched Curriculum had a detrimental effect on the child's future success but 4 out of 10 parents who completed the questionnaire considered that the Enriched Curriculum would make no difference to their child's future success.

	Contrasting Area Schools			***Shankill Schools***			
	Year 1 %	**Year 2 %**	**Year 3 %**	**Year 1 %**	**Year 2 %**	**Year 3 %**	**Year 4 %**
Do you think that the EC will help your child succeed in his or her education?							
Yes	94	84		98	78		
No	3	10		0	15		
Can't say/ Don't know	3	6		2	7		
Number of parents	63	70		42	27		
What has been the effect of the EC on your child's future success?			66 19 4 13				
Has improved			*79*			60	53
No difference						20	42
Has worsened						5	0
Not sure						15	5
Number of parents						*20*	*19*

Table 16. Parents' views of the future impact of the Enriched Curriculum

Overall it is notable that although the number of parents responding to the questionnaire had fallen in the Shankill but risen in the Contrasting Areas, a similar pattern emerged in both areas over time. The vast majority of parents were generally satisfied that the new curriculum would help their child's education and future success but the overwhelming endorsements that were observed at the end of the first year tended to be replaced by more considered responses in the third and fourth years.

Comparison between the Enriched Curriculum and traditional curriculum and impact of the curriculum on parents' interactions with child. At the end of the first year, almost all of those with older children in the Shankill schools and two out of three parents in the Contrasting Areas preferred the new way of teaching to the previous approach (See Table 17). However, by the end of the second year, although very few parents in either the Shankill

or Contrasting Areas preferred the old way of teaching, many of the parents in the Shankill reserved their judgement about the efficacy of the Enriched Curriculum. The primary reasons why parents rated the new curriculum so highly were that it was more enjoyable, less pressurised and more motivating than the traditional approaches.

	Contrasting Areas Schools		***Shankill Schools***	
	Year 1 %	**Year 2 %**	**Year 1 %**	**Year 2 %**
If older child, EC child better or worse progress? (only if applies)				
Prefer old way	4	8	0	14
Prefer new way	59	54	83	43
Not sure	36	38	3	43
No difference	0	0	14	0
Number of parents	22	26	29	14
Has the EC changed the way you work or play with child?				
Yes	51	51	63	41
No	49	45	37	59
Don't know	0	4	0	0
Number of parents	63	69	41	27

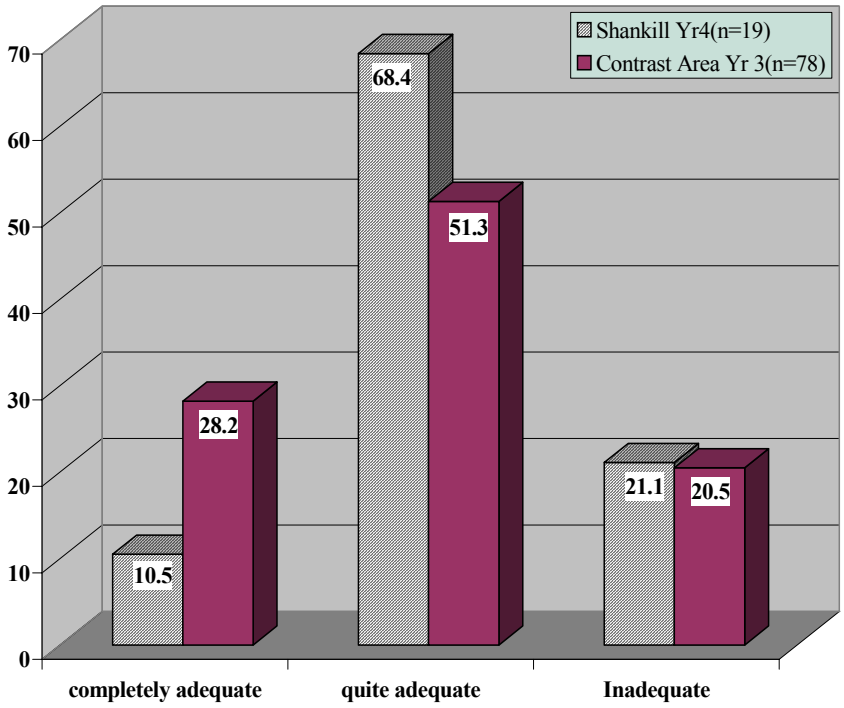
Table 17. Parents' responses to questions asked in Years 1 and 2

Almost two-thirds of the Shankill parents but only half of the parents in the Contrasting Area schools indicated that the Enriched Curriculum had made a difference to how they interacted with child during the first year of schooling. In the Shankill there was strong evidence that parents enjoyed greater involvement with their child in school – related activities and they noted greater time spent reading, talking, and engaged with creative work and play.

Parental views of information from school on the Enriched Curriculum. There was one area of the Enriched Curriculum that was not viewed as positively as most others. Parents' comments had indicated that there was a certain amount of misinformation about the project and uncertainty about how best to help with homework. Parents in Year 3 in Contrasting Area schools and Year 4 in the Shankill schools were asked to rate the quality of information they received on the Enriched Curriculum and their child's progress. Figure 6 shows that the majority of parents rated the quality of the information they received from the schools as

'quite adequate' and one in five of the parents in both the Shankill and Contrasting Areas rated it 'inadequate'. This is unfortunate as the informed parents are also probably more likely to be appropriately helping the child at home. The evaluation team consistently stressed the need for schools to inform parents using techniques such as informal contacts, parents meetings, booklets with appropriate information for parents and even, as in some of the Shankill schools in the first year of the Enriched Curriculum, short courses designed to help parents develop their role as co-educators

Figure 6. Responses to the question: "How do you rate the amount of information the school has given you about the Enriched Curriculum and your child's progress in it?"



3.4.2 Parents' Views about the Curriculum Content

This section summarises the parents' views for each year group. During the first two years the questionnaire was mainly concerned about parents' general view of the impact of the Enriched Curriculum and did not focus on specific aspects of teaching. The parents' views of the teaching of reading, writing, mathematics and the homework provision were sampled during the interviews and from parental comments together with some of the teachers'

observations. When the children were in the third year in the CA schools and in the fourth year in the Shankill schools, parents were asked specifically about their views of the teaching of reading and mathematics and these responses are also reported here.

Parents' Views on the Curriculum in Year 1

Shankill Area: The teachers noted that despite their efforts to explain the new curriculum, some parents had doubts. However over time they had become progressively more enthusiastic. Parents welcomed the new resources and compared the new equipment favourably with that of neighbouring schools. Parents had described to teachers how relaxed and happy the children were at school. The teachers also noted that many of the parents had reading difficulties themselves, but in the context of the shared reading of books this was less important than it had been with a reading scheme. Several parents had expressed great pleasure in this activity to teachers.

In general, parents' comments indicated that they welcomed the Enriched Curriculum. They appreciated the lack of pressure on children, the way that learning was presented in an enjoyable way and the opportunity for their child to express his or her creativity. The impact of the Enriched Curriculum on building confidence was noted favourably. The parents welcomed their child's interest in books. The parents of less able children recognised the value of the gradual transition from nursery education to formal work.

Contrasting Area: Teachers noted the initial efforts involved in convincing parents of the merits of the EC and how some parents had been concerned that their children were 'just guinea pigs.' However, parents in the CAs, as in the Shankill were very positive about the EC by the end of Year 1. They were very favourably impressed with the breadth and/or extent of learning during the year and, as in the Shankill, noticed its creative aspects and many of them were generous, even lavish, in their praise of teachers. As in the Shankill, those parents with children with special needs or young-for-year children felt they would particularly benefit under the EC. A substantial minority of parents had concerns about one or more aspects of the EC including issues involved in moving on from this curriculum, either to Year 2 or to other schools.

Many parents believed their child's listening and/or language skills had improved and were impressed with the training for public speaking during such activities as 'Show and Tell'. Reading was the single topic that attracted a degree of criticism from a significant number of parents but only a very small number were very negative. In general, parents had reserved their judgement on the teaching of reading, while some of them were just happy with their child's progress and showed no sign of viewing reading as a major issue. Some wholeheartedly approved of the move away from flash cards or at least considered them unnecessary. Parents were often impressed with the early introduction of punctuation and/or grammar work.

Parents expressed their children's great appreciation of books and reading in a number of ways. Sometimes it was in contrast to an older sibling's experience. For many, it was the child's behaviour during library visits while other parents reported children playing games with words. Parents of both boys and girls reported on children's enjoyment of voluntary writing activities, often in the context of home play. A small number of parents wrote appreciatively about the fact that all children's writing was valued.

Many parents were delighted with progress in mathematics and. some parents perceived that progress in numeracy could be achieved without some of the laborious work that had previously accompanied the process. As in the Shankill, a sizeable group of parents talked about children engaging in voluntary mathematics activities. There was a lot of evidence that homework was no longer a source of conflict, it had been transformed for parents and children alike into a positive experience. Most of the parents who spoke of homework did so in relation to becoming more involved with their child's education under the Enriched Curriculum.

Many parents remarked on the manner in which the Enriched Curriculum allowed children to develop their own personality, often with consequent good effects on children's attitudes: There were many references to the way in which the Enriched Curriculum promoted friendships between children and good relationships with older children and adults, including

the teacher. A great number of parents referred to their child's increased confidence, both for academic tasks and in social situations.

Parents' Views on the Curriculum in Year 2

Shankill Area: The views of only a small minority of parents of Year 2 children in Shankill schools were available for analysis. These parents could still be described as positive about the project, but not quite as positive as the sample of Year 1 parents. Some of the parents comments suggested they did not enjoy quite the same good relationship with teachers as seemed evident from parents' responses during the first year but some parents clearly had maintained their enthusiasm or had been converted to a belief in the efficacy of the EC and others were at least moderately pleased, if not more so, with progress and/or with the EC. Some parents confirmed that they were very involved with helping their child to learn and set time aside to do homework every night and found this work enjoyable and productive.

Contrasting Areas: Many parents with children in the CA schools commented favourably on the holistic nature of the Enriched Curriculum approach. They frequently remarked on the wider range of interests shown by the children. There were a few negative comments, although this did not necessarily mean that the parent had a totally negative view. Many parents indicated that their children had good, confident reading skills and read avidly for pleasure including instructions for games. As one parent noted '*He has learnt to read fluently and enjoys doing so*' and another indicated: *'Reading is a pleasure for him rather than being seen as work.'* A number of parents had been concerned about their child's reading but were pleasantly surprised over the year as they observed their child's rapid progress in reading and writing. As one parent commented 'he *suddenly 'took off' in P2 without any pushing or prompting'*.

Parents' Views on the Curriculum in Years 3 and 4

Parents of children in the Shankill schools who completed the questionnaires in these years wrote few comments but their views on their children's progress in reading and mathematics can be sampled directly from questionnaire items introduced for parents of Year 4 children in

the Shankill Area and Year 3 children in the CAs. Responses to these questions are shown in Table 18. This shows that the majority of the parents from both the Shankill and CA schools viewed their children's progress in mathematics and reading as better than expected and their attitudes to these subjects as positive.

Table 18. Parents views on their children's progress in mathematics and reading

	Year 3 CA Schools (N=79) %	Year 4 Shankill Schools N=19 %
How is progress in reading?		
Much better than expected	39	42
Better than expected	36	26
As expected	14	16
Not as good as hoped	9	16
Not good at all	3	0
Attitude to reading?		
Very good	57	47
Quite good	32	42
Not as good as hoped	9	11
Not good at all	2	0
How is progress in mathematics?		
Much better than expected	33	39
Better than expected	24	33
As expected	36	17
Not as good as hoped	6	11
Attitude to mathematics?		
Very good	53	47
Quite good	34	42
Not as good as hoped	11	11
Not good at all	1	0
How do you rate child's attitude to learning?		
Very eager to learn	53	32
Eager to learn	35	53
Not as eager as I would like	11	16
Amount of formal work?		
About right	83	89
Too little	9	6
Don't know	8	6

The parents who completed the questionnaires also believed that their children had positive attitudes towards learning with only a small minority of parents viewing their child as 'not as eager as I would like'. Finally, with only a few exceptions, parents considered that their children received about the right amount of formal work. It would seem that after three or four years the vast majority of parents who completed the questionnaires are very supportive of the EC and the education their children have received in the early years.

Shankill: Some of the teachers in one of the Shankill schools revealed that they have low expectations of parents after Year 2 and saw little prospect of receiving the level of co-operation that had been shown in the previous years. On the other hand, a teacher in a different Shankill school believed parents were still co-operating with shared reading and enjoying doing so. Feedback from parents indicated that at least some of them were trying to assist their children in Years 3 and 4 and were actively engaged in their role as co-educators.

Contrasting Areas: All but a few parents with children in the CA schools maintained their generally positive view of the Enriched Curriculum and their children's progress. One in five of all parents spontaneously remarked on a sudden dramatic improvement in their child's level of attainment in Year 3, often in regard to reading but also across the whole curriculum. Some of these respondents made the point that this was achieved without pressure on the child. As one parent noted, *'It was like magic, and reading and spelling particularly just seemed to click into place and improve without any difficulty'*. Another said, *'He just took off, almost overnight'*. And a third reported that *there is dyslexia in the family. I had concerns - she seemed slower to read. However, it all seemed to click post Christmas'*.

Parents were pleased with the interest and pleasure shown by their child for books and reading at home and some parents compared their child's reading favourably with that of children attending other schools. Fluency was often emphasised in this regard as a particular area of superiority in reading skills. In interviews, some parents remarked on the pleasing variety of texts introduced to the children, including non-fiction, poetry and plays. Others remarked on the availability of texts tuned in to the children's interests. In contrast, other

parents felt that their children spent too long on one text[29]. Parents described how their children possessed excellent word attack skills and the motivation to persevere with new and/or difficult words. They also commented favourably on the range and maturity of verbal expression shown by the children. They related this to the range of activities in class that supported oral language work, for example circle time, diary time and role play.

Reports from parents on reading skills were not uniformly positive and the families of at least two children were employing a private tutor to help their child learn to read. There were some other parents who were concerned about the identification of reading problems and some evidence that the EC tends to be blamed for a child's lack of progress. There were also some concerns about handwriting expressed by a small number of parents.

3.4.3 Summary of findings and issues arising from parental accounts

- Overall parents had a very positive response to the Enriched Curriculum and very few parents expressed criticisms of the whole curriculum. In particular, parents welcomed the lack of stress on children in Years 1 and 2 and noted the obvious enjoyment their children had in going to school and doing homework and the development of their children's verbal fluency.
- Many parents expressed some concern that their children were not reading fluently in Year 1 but a sizeable minority reported children's dramatic improvement in reading either in Year 2 or 3.
- Parents were generally pleased with progress in mathematics and numeracy was not generally seen as an area of concern.
- Across all four years of the project, a small number of parents in distress were deeply opposed to the project but, although some of these parents had encountered specific problems which could not necessarily be attributed to the EC, a few parents highlighted problems of the failure of schools to identify children in need of remedial help with reading and writing at an early stage.
- Parents in some schools were still very dissatisfied with the level of information supplied to them. Many, who had felt they had been well informed in Year 1 but not

[29] Teachers indicate here a misunderstanding about how they intended the text to be used. However, that in turn may be further evidence of poor communication with parents.

subsequently, considered that a similar level of information should be available every year. Some did not know that the EC had extended into Years 3 and 4 until they received the questionnaire.

4. Conclusions

4.1 Preliminary Points

EC is a pioneering curriculum that was introduced into Shankill schools in September 2000 and extended to a wider range of schools, the Contrasting Areas schools, one year later. The EC is characterised as a developmentally appropriate curriculum[30] and is more play-based and activity-led than the pre-existing curriculum. Significantly, in Years 1 and 2, it involves postponing the introduction of formal reading schemes to concentrate on oral language and emergent literacy activities, and postponing formal recorded arithmetic in favour of activities that lay foundations in basic mathematical concepts. The main aim of the evaluation was to assess the impact of this new curriculum on the progress of children's learning up to the end of Key Stage 1, to gather information about teachers' experiences and perceptions of teaching the new curriculum and related issues, and to find out about parents' views.

From the evaluation point of view, the first point to note is that the project grew from a local evaluation of a short-term project in a number of schools in the Shankill Area to an evaluation which will have national consequences with regard to changes in the Northern Ireland Curriculum, resources for schools, teacher training and so on. As an example of a national trial, it is still relatively small scale involving 900+ children (including controls), 17 intervention classes and 12 schools - though curriculum innovations are often introduced without evaluation of this scope and quality.

It is now a longitudinal project. Any positive effects of the EC can only be judged in the longer term, and from the 2nd year of the project, there was a strong recognition by the funding body that it would be necessary to monitor children's progress over time. Now, after

[30] By implication therefore, it should negate the possibility of persistent early failure for the child.

four years, we have paused to examine the summative effects on pupil outcomes, teachers' experiences and perceptions, parents' views and so on, but we have neither any theoretical reason nor any reason arising out of the data for believing that 3 or 4 years is a sufficient amount of time to reach sensible conclusions on the effects of the EC on children's learning. In these kinds of projects, time lag effects can be very long.

We have collected a complex set of data – quantitative measures on pupil learning outcomes as well interview and survey data from teachers and parents. In addition, we have data from classroom observations that have been quantified. These sources may be viewed with different levels of confidence and there is a tendency to put greater weight on the quantitative pupil measures than on the testimonies from teachers and parents. The research team would like to point out that different kinds of data have their strengths and weaknesses. Objective tests can have different levels of reliability and validity and be more or less sensitive to the learning outcomes being pursued. Even at best, they only assess the children's performance at a particular point in time. In contrast, teachers and parents have the advantage that they are observing children over the long term and in a wider range of contexts than a single test. Although interview and questionnaire data are subject to personal beliefs and biases, they reflect the reality and context in which the children's learning take place and will have powerful effects in their own right.

The strength of the current evaluation is that it has access to so many sources of data and each source should be weighted appropriately. The challenge is to create a composite picture especially when data from several sources may seem conflicting.

4.2 The effects of the Enriched Curriculum on Reading and Mathematics Attainment using the PIPS measures

The most robust psychometric measure of pupil outcomes was the PIPS suite of tests that included baseline literacy and numeracy measures, end-of-year reading and mathematics attainment tests, and measures of children's general level of ability ('proxy' IQ scores). The main finding with regard to reading and mathematics attainment was that the EC children's attainment was significantly depressed at the end of Years 1 and 2 relative to the children in

the same schools who were following the pre-existing curriculum. As the EC curriculum deliberately postponed introducing the more formal aspects that PIPS assess, it is not surprising that attainments difference were observed in the early stages. Despite the postponement, the differences had disappeared by the end of Year 4 for the Shankill schools and the end of Year 3 for the CA schools. The differences between schools groups was due almost entirely to differences in the initial 'developed resources' children bring to school (literacy, numeracy, ability)

The post-Year 2 pattern showed an upward trajectory, so the crucial question is whether this 'growth' will continue or whether it will settle at a level similar to the control children. It is not possible to know for certain what pattern will emerge. However, in some pockets of the data EC children were beginning to show advantages relative to the controls. For example, although the post-Year 2 improvements were evident for all levels of ability, there are indications that EC children with higher ability outperformed comparable children who were following the pre-existing curriculum, particularly in mathematics but also in reading. And this pattern holds for higher ability children in the Shankill schools as well as in the CA schools. On the assumption that it may take longer for the positive effects to show in middle and lower ability children – or in children with lower baseline literacy/numeracy scores (e.g., Shankill schools) – then we would predict growth. On the other hand, it may be that only higher ability children will benefit to any great extent and that we will witness another example of the 'rich getting richer'. This is speculating beyond the current data set.

Two points should be emphasised at this stage. Despite the postponement in formal teaching in reading and mathematics for almost two years, children following the EC were not disadvantaged at the end of Key Stage 1. In addition, although the developmentally appropriate curriculum had been initially conceived as best tuned to socially-deprived or low achieving children (in terms of avoiding persistent early failure), it is emerging that high ability children might be the ones who are benefiting most. Nevertheless, even the weakest children in the sample, in terms of their 'developed' resources when starting schools, did as well in Year 4 as children who were following the pre-existing curriculum. We will have to wait and see how these less advanced children fare over the next few years.

4.3 The Enriched Curriculum in Years 1 and 2: A Composite Picture

Drawing the data together from several sources and creating a composite picture, there is good evidence to suggest that Years 1/2 and Years 3/4 need to be commented on separately in terms of the likely dynamic between children's learning, support for teachers in terms of training and resources, teachers' concerns about the children's progress, and parents' perceptions.

In Years 1 and 2, EC children's progress on traditional measures of attainment is depressed relative to the control children. Yet when additional measures of oral language and basic maths concepts understanding are considered, then the EC children make good progress relative to the controls. For our purposes, the additional measures can be viewed as more sensitive to the desired learning outcomes of the EC than the end-of-year PIPS measures for Year 1 and 2. When the classroom processes are observed, using the QLI, then teacher practices move in the direction of EC principles and teachers report adopting a less formal approach (though not without some difficulties according to their own reports). Ironically, the depressed scores on the PIPS measures can be taken as an index of good programme implementation at this stage, as they do show that something different was taking place in the EC classrooms compared to more traditional classrooms. The QLI scores showed that the 'difference' was in line with good practice early years' teaching.

Year 1 teachers also have a good quality level of support and training. They seem clear about their practice, and report positively on children's progress in oral language skills, concentration and attention, and social skills. In Year 2, teachers continue to be impressed with children's oral language and communication skills and their increased ability to work independently. Nevertheless, they begin to express concerns about children's literacy development, particularly in the Shankill schools. Also, the workload demands and the lower level of support and training available to teachers in Year 2 were connected to the request for classrooms assistants at this stage. At this stage, parents made very specific positive comments about the impact of aspects of the curriculum on their children's progress; for example, that the children were less pressured and were more expressive, had better language skills and more interest in books and playing word games. Despite some initial reservations

about what might be involved, parents (at least those who responded) were satisfied with their children's progress.

4.4 The Enriched Curriculum in Years 3 and 4: A Composite Picture. The picture in Years 3 and 4 is more difficult to paint because Year 4 data are available for the Shankill schools only, and the QLI data are incomplete.

During Years 3 and 4 the PIPS reading and mathematics attainment begin to rise and matched the control groups in Year 3 in the CA schools and in Year 4 in the Shankill schools. In addition, for the test of narrative writing which was introduced in Year 4, the EC children show slight advantages relative to the control group. The fact that the children's progress did not match the control group until Year 4 – one year later than in the CA groups – is reflected in the Shankill teachers' comments in Years 3 and 4. They are increasingly concerned with aspects of literacy and the pending end-of-Key Stage 1 assessment. In addition, they are dissatisfied with the level of support and training they received, compared to the teachers in the earlier years. The QLI scores show greater variability and there is less consensus about what constitutes good practice at this stage. Nevertheless, the vast majority of the parents who replied in Years 3 and 4 consider that their child was making progress in reading and mathematics "as expected, better than expected, or much better than expected".

4.5 Training and Resources

One of the main aims of the evaluation was to collect information on factors that might impact on the effectiveness and implementation of the curriculum. The main source of information on this came from teacher interviews and surveys and we have very detailed data from almost all teachers. The teachers' interviews told the story of different levels of training across Years 1, 2, 3 and 4 and in the different Education and Library Boards; the lack of suitable learning resources to support the curriculum change, especially after Year 1; increased workloads; and lack of support from colleagues and senior management. As outlined above, the situation seemed to be more acute in Years 3/4 than in Years 1/2. It is difficult to assess the full impact of these variations on classrooms and on the progress of pupils. The main source of data comes from classroom observation where the QLI scores shows good programme integrity in Years 1 and 2 and much more variability in Years 3 and

4. In addition, teachers' interviews showed that there is still a lack of agreement about the essential constituents of the EC and various aspects of good practice as children progress through the curriculum.

It should also be remembered that, for all the teachers involved in the evaluation, it is the first time they have implemented the EC. In that sense, they are all novices to the new curriculum. What data we have on more experienced teachers (from QLI scores) shows that teachers become more attuned to the demands of the new curriculum when they teach it for the second time. On the one hand, we would therefore expect that the quality of learning in the classroom would become more aligned with the principles and practices of high quality early years' education in subsequent years; on the other hand, it could become diluted if the conditions and resources in the school do not continue to support the concepts and practices of the EC.

4.6 Involving Parents in Curriculum Change

The evaluation strategy included contacting parents each year to find out their views on the new curriculum and their perceptions of how it was affecting the educational progress of their children. The response rate from parents was low, although we have estimated that at least 50% of the parents responded at some point over the 4 years. In the Shankill schools, the response rate tended to decrease over the four years of the project.

The parents who did reply were generally positive about the curriculum and some made very specific comments about particular aspects of the changes they perceived in their child's attitude and achievements at school. When concerns were expressed they tended to be about literacy rather than numeracy. As well, many parents felt that they had not been kept adequately informed by the schools about what was required of them, signifying how important parental involvement is for the proper management of curriculum change.

4.7 Implementing and Managing Educational Innovations

One of the striking achievements of the Enriched Curriculum is that a large cohort of teachers/schools embarked on implementing a pioneering curriculum and remained enthusiastic and committed over a period of four years. It was largely a teacher and school-

led initiative, at least in the early stages, and the degree of ownership has been influential in maintaining teacher commitment and motivation. Several themes have emerged from the evaluation that are required for the continuing successful implementation of this pioneering curriculum. They include: a clearer conceptualisation of the main constituents of the EC, especially in Years 3 and 4; clear school leadership and whole school commitment; professional development for teachers; and extensive liaison between schools and parents. There is no point in underestimating the extent to which this kind of innovation will need to be resourced if it is to shift from the level of a local initiative to the level of national curriculum reform.

5. Recommendations

These recommendations are made on the assumption that the full story of the EC[31] has not yet been told and that the curriculum will continue to be developed and fine-tuned. Whatever the scale and scope of future developments (which are outside the remit of this evaluation), they will need to build, not only on the outcomes of the evaluation but also on the knowledge and expertise with regard to EC practices that have been acquired by teachers, schools and curriculum advisors. Future developments will need to be clearly staged and managed. Consequently, the purposes of the recommendations are:

> To deepen teachers' understanding of the meaning and implications of a developmentally appropriate curriculum and to refine pedagogical practices (Recommendations 1-5 below);
>
> To clarify models of teacher professional development so that best uses can be made of people and other resources to promote children's learning (Recommendations 6-9 below);

[31] The term 'Enriched Curriculum (EC)' is used to describe the current pilot project, but the principles and practices associated with this curriculum will become part of the statutory revised Northern Ireland Curriculum for the Foundation Stage and Key Stage 1.

To identify specific research agendas that will provide additional knowledge to inform the direction of change (Recommendations 9-13 below);

To capitalise on the knowledge, expertise, enthusiasm and commitment of the teachers and schools who have led the innovation during the past four years (Recommendations 6, 14 below).

Principles and Pedagogical Practices

Recommendation 1

With a focus on literacy and numeracy in Years 3 and 4, we recommend that the meaning of the EC and pedagogical practices be refined with regard to: the development of oral language, particularly for children with poor language skills; the continuation of phonological/phonics work into Years 3 and 4: the meaning of 'guided reading' in Years 3 and 4; the clarification of approaches to spelling and writing; and the development of more advanced mathematical skills beyond basic numeracy, using activity-based learning;

Recommendation 2

With a focus on Years 1 and 2, we recommend that pedagogical practices for explicitly developing children's attention, concentration and memory strategies should have a stronger presence in the EC.

Recommendation 3

We recommend that the opportunities within the EC for explicitly developing children's thinking skills should be more vigorously pursued, with special emphasis on developing a language for talking about thinking.

Recommendation 4

We recommend that the role of learning through play in the EC is further clarified, particularly how practices change as children progress from Years 1 to 4.

Recommendation 5

In supporting Recommendations 1-4, we recommend that CCEA (in partnership with other stakeholders), publish a guidance framework document for the EC as a matter of priority, with guidance material at an appropriate level of detail (drawn from existing EC good practice). The full range of the EC framework should be articulated (e.g., personal development, physical development, learning through play, creativity, developing attention, listening and memory skills as well as literacy and numeracy).

Professional Development and Resources

Recommendation 6

We recommend that the amount and level of professional development available for teachers who are embarking on the EC is clarified and is consistent across Education and Library Boards and that there are opportunities for teachers to continue to share ideas for good practice, both within their own schools and with colleagues in other schools. Opportunities for sharing practice about leading and managing the EC should be pursued among principals.

Recommendation 7

We recommend that an audit is conducted on the current level and use of classroom assistants in EC classrooms, on their qualifications and how they are inducted into EC practices, with a view to examining how they can help to further promote children's learning.

Recommendation 8

We recommend that particular attention is given to making available classroom resources to support the EC and to ensuring that such funding meets classroom needs, particularly in areas of social disadvantage.

Recommendation 9

In areas of social disadvantage, we note that many of the difficulties that children will experience in school achievement are already established *before* they come to school. We recommend that attention be drawn to international and local research evidence on the

potential impact of fully-integrated pre-school intervention programmes, drawing on health services, parental support initiatives as well as educational interventions.

Directions for Future Research

Recommendation 10

We recommend that, to get a fuller understanding of the impact of the EC, the evaluation of the educational progress of the current cohort of children be continued until the end of Key Stage 2.

Recommendation 11

We recommend that particular research questions be formulated, methodologies identified or developed, for evaluating children's dispositions for learning as they progress through their primary school years.

Recommendation 12

We recommend that research continues on developing the validity and reliability of the QLI (Quality of Learning Instrument) as a research tool for observing quality learning in early years classrooms (particularly in Years 3 and 4), but also as a potential tool for helping teachers to develop and change their pedagogical practices.

Recommendation 13

We recommend that additional research be initiated about models and practices for promoting and developing school/home partnerships.

Innovation and Change

Recommendation 14

In making these recommendations, we recognise that in managing educational innovation and change there will be tensions between more centralised directions and school/teacher autonomy. We recommend that these tensions are managed imaginatively and productively for the benefit of children's learning.

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Appendix 1

Measurement of the effects of EYEC on academic attainment relative to the conventional curriculum over time.

Model used to estimate the effects of the EYEC on academic attainment over time uses the standard economic theory of Human Capital (HCT) which underpins much of the School Effectiveness Research (SER). The model assumes a production function approach whereby the educational output of an individual is a function of several inputs such as latent child ability; family background; educational resources, including whether the child follows the conventional curriculum or Early Years Enriched Curriculum (EYEC); and some random element. A multi-level regression model is used to decompose the production function and determine the systematic incremental effect of the EYEC on a child's expected attainment holding all other inputs the same (including time invariant unobservable characteristics within and between pupils and schools.) A difference-in-difference model is used to plot the, potentially non-linear, expected levels of attainment over time for conventional curriculum and EYEC children. The difference between the two trajectories over time thus represents the empirical estimate of the effect of the EYEC on PIPS educational attainment. MLwiN with maximum likelihood estimation is used for all estimations and standard statistical tests may be applied to detect significant differences.

More formally the general model of attainment is:

$$y_{ijkt} = \beta_0 + \beta_1 x_{ijk} + \gamma_1 z_{jk} + \tau_k + \upsilon_{jk} + \nu_{ijk} + \varepsilon_{ijkt}$$

where

y_{ijkt} = pupil i in school j in area k attainment score at time t
x_{ijk} = a vector of observable pupil characteristics for pupil i in school j in area k
z_{jk} = a vector of observable school characteristics for school j in area k
τ_k = time invariant school area fixed effect
υ_{jk} = time invariant school random effect
ν_{ijk} = time invariant individual random effect
ε_{ijkt} = standard econometric random error term (noise)

Individuals are clustered within schools and within school areas (Contrasting Areas or Shankill Group). The multi-level modelling allows inference to be made despite unobservable individual or school characteristics entering the individual's production function - the estimate of the effect of EYEC will be unbiased and efficient. Random effects are chosen, except for when modelling the unobserved effects of the school areas, where a

fixed effect is estimated. The reason for this small departure from random effects is that Shankill Group schools, particularly at the time of the intervention, are very distinct and may not be reasonably interpreted as representing a random draw from the population of schools in Northern Ireland. A fixed effect (aka least squares dummy variable approach) will allow us to make inference on the unobserved characteristics of the Shankill group and allow for clustering within these groups without being restricted by the distributional assumptions required for random effects estimation. Furthermore, given that there are only two groups in this cluster, estimating a fixed effect does not require any further degrees of freedom than that required for estimation of a random effect (specifically estimating the standard deviation of the random effects).

The difference-in-difference approach will be used to specify the trajectories over time of a representative individual completing a) the conventional curriculum and b) the EYEC. To measure the conventional curriculum trajectory, a set of dummy variables are constructed which represent the time point at which the attainment is measured. In our data we observe 5 time points (baseline [t= 0]; end of year1; end of year 2; end of year 3; end of year 4) and will construct four dummy variables (yr1; yr2; yr3; yr4) with baseline year being the omitted category. If we include these dummy variables in the regression model then the estimated coefficient on these dummy variables may be interpreted as the estimated effect the school has had on academic attainment at that time point (e.g. end of school year 1). By specifying each year as a dummy and thus obtaining a coefficient for each year, we allow for a flexible non-linear transition over time. We note that the dependent variable the PIPS score of academic attainment is age-standardised, thus the estimated coefficients on the time dummies will pick up the school's relative effect on attainment rather than an absolute effect. The incremental effect on this trajectory of the EYEC is captured by inclusion in the regression model of interactions of the year dummies with an EYEC indicator dummy (i.e. yr1*eyec; yr2*eyec; yr3*eyec; yr4*eyec). Thus for the observation that refers to an EYEC pupil in year four, the dummy variables yr4 and yr4*eyec will be set to one and all others set to zero. For a conventional curriculum year 4 pupil only the yr4 dummy will be set to one, all others to zero. The estimated effect of the school with an EYEC curriculum at the end of school year one is therefore measured by the sum of coefficients on yr 1 and yr1*eyec. The hypothesis test on whether the EYEC curriculum has a different expected academic attainment than the conventional curriculum is the standard statistical hypothesis test on whether the coefficient on yr1*eyec is significantly different from zero. Again, by using dummy variables for each EYEC year we allow for a non-linear transition over time.

Given the multiple observations per school and school group, we have some scope for assessing whether the EYEC effects (or indeed the conventional curriculum) are consistent across schools and/or school groups. Specifically random coefficient models were used to test whether the EYEC had different effects across schools and/or school groups. These models were not significantly different and are not reported here.

The model can also be expanded to check for systematic differences in transition for children of differing ability, again by using a difference-in-difference approach, we can estimate whether any heterogeneous effect on ability occurs across both the conventional curriculum and EYEC. The conceptual problem is that we do not directly observe a child's ability, rather we have several candidate proxy measures. One set of candidate measures could be

attainment PIPS scores, say at baseline where a child's ability has not yet been influenced by formal schooling. There are several problems with this approach. Firstly, given the proposed model, baseline PIPS score is considered endogenous (determined within the model) and inclusion of endogenous variables on the right hand side of regression models violate the assumption that all explanatory variables are exogenous (the problem occurs through potential correlation of the error terms). However, since the baseline score will clearly be determined before the scores at the end of years 1, etc, then the relationship is not quite simultaneous, and hence the problem may be specified as inclusion of a lagged dependent variable. Nevertheless, inclusion of a lagged dependent variable leads to 'substantial complications' Greene (2003) [page 307] in estimating both fixed and random effects models. Secondly since we do not have observations on baseline measurement for all individuals (only 385 out of 942 pupils) it would involve omitting a majority of pupils (or less commonly attempting to impute baseline values) from the regression. For these reasons we seek an alternative measure of latent ability.

Our preferred measure is thus the measured the mean measured IQ of the individual. The greater coverage (824 out of 942 pupils) lessens the problem of omitting individuals from the regression because of missing explanatory variables. We do, however, assume that the IQ is broadly exogenous, specifically that it is not a function of schooling. However, we may be less reasonable to also assume that IQ is not a function of observable pupil characteristics, such as gender or month they were born in. Given that we are unable to reasonably rule out the possibility that IQ is endogenous, we explore two solutions: produce a reduced form model in which the endogenous variables are omitted, this has the obvious undesirable consequence that we will be unable to make inference about heterogeneous affects across ability levels, but the advantage that the estimations of the other elements will be unbiased; produce a full model with IQ scores included and ignore the potential endogeneity of the IQ variable. To allow for a non-linear relationship between IQ and attainment, pupils were grouped in to below average (below 45), average (45 to 55) and above average IQs (above 55) groups and difference in difference models were calculated for these three groups.

Not all individuals have a full set of PIPS results and as such the panel of data is considered unbalanced, with 94% of individuals having at least one missing outcome variable. Technically an unbalanced panel poses no additional problems for estimation if maximum likelihood procedures are used, as are done in MLwiN. However, in order to avoid self-selection bias, the mechanism by which the data are missing must be missing at random or missing completely at random. Missing completely at random requires the stronger assumption of the two conditions, it assumes that each data point has a consistent probability of being observed. This is true in certain cohorts where pupils do not have observations because they were not chosen by the entirely random selection of which pupils to include. However, this is not true across the entire sample as certain control cohorts are missing all data on particular years because of the timing of data collection. Nevertheless and importantly, the data are not missing because of the values the outcome variables would take (i.e. they are not missing because data collectors thought the values were too low or high). Thus the data are missing with a probability related to the observed characteristics, but having allowed for that effect, are unrelated (conditionally independent) to the outcomes. Thus despite the fact the data is not missing completely at random it may be considered missing at random. The missing mechanism is thus considered ignorable or non-informative

and poses no additional problems for the analysis. A more complete discussion on this topic is contained in Schafer and Graham (2002).

Hypotheses

Reading

1. There will be no incremental effect of the Enriched Curriculum in reading.
2. There will be no gender differences between boys and girls in reading.
3. There will be no effect of month-of-birth in reading.
4. There will be no effect of school group (Shankill or CA schools) in reading.

Mathematics

5. There will be no incremental effect of the Enriched Curriculum in mathematics
6. There will be no gender differences between boys and girls in mathematics.
7. There will be no effect of month-of-birth in mathematics.
8. There will be no effect of school group (Shankill or CA schools) in mathematics.

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Appendix 2

Multilevel random effects model: Estimates for PIPS Reading

		Coefficient	*Standard error*
Constant term		50.39	0.92
Baseline differences between EC and control groups		ns	
Effect of school group on outcomes over EC and control children together (whole sample)	Shankill schools	-2.19	0.74
Gender	Female	+3.19	0.48
Month of birth compared with January	Per month	±0.17	0.17
Ability: EC and controls together	High IQ	+4.10	1.53
	Middle IQ	0	
	Low IQ	-6.50	0.81
Interactions: EC and controls together	High IQ in Year 3	ns	
	Middle IQ in Year 3	ns	
	Low IQ in Year 3	ns	
	High IQ in Year 4	+3.97	1.86
	Middle IQ in Year 4	ns	
	Low IQ in Year 4	ns	
Yr 2 interactions: EC group only	High IQ	-7.03	2.02
	Middle IQ	-6.84	1.12
	Low IQ	-4.40	1.30
Yr 3 interactions: EC group only	High IQ	ns	
	Middle IQ	-2.78	1.13
	Low IQ	ns	
Yr4 interactions: EC group only	High IQ	ns	
	Middle IQ	ns	
	Low IQ	ns	

ns – not significant

Multilevel random effects model: Estimates for PIPS Mathematics

		Coefficient	*Standard error*
Constant term		47.54	0.90
Baseline differences between EC and control groups		2.45	0.93
Effect of school group on outcomes over EC and control children together (whole sample)	Shankill schools	ns	
Gender	Female	ns	
Month of birth compared with January	Per month	±0.26	0.06
	High IQ	+4.12	1.39
	Middle IQ	0	
	Low IQ	-6.67	0.74
Interactions: EC and controls together	High IQ in Year 3	ns	
	Middle IQ in Year 3	ns	
	Low IQ in Year 3	ns	
	High IQ in Year 4	+3.78	1.86
	Middle IQ in Year 4	ns	
	Low IQ in Year 4	ns	
Yr 2 interactions: EC group only	High IQ	-5.81	1.85
	Middle IQ	-4.42	1.02
	Low IQ	-6.61	1.17
Yr 3 interactions: EC group only	High IQ	ns	
	Middle IQ	ns	
	Low IQ	-2.59	1.06
Yr 4 interactions: EC group only	High IQ in Year 4	ns	
	Middle IQ in Year 4	ns	
	Low IQ in Year 4	ns	

ns – not significant

Appendix 3
Outcome details of several fixed effect models showing individual school effects

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School number nine is coded as zero. All other school effects are by comparison with this school. <u>Only</u> highlighted effects are significant.

log: C:\ eyec\eyec schools fixed effect.log
log type: text
opened on: 12 Jan 2005, 12:07:20

Variables: xtreg acpe gender agemonth eyec i.schoolno yr1 yr2 yr3 yr4 yr1_eyec yr2_
> eyec yr3_eyec yr4_eyec, i(pup_id)
i.schoolno _Ischoolno_1-12 (naturally coded; _Ischoolno_9 omitted)

Random-effects GLS regression Number of observations = 1899
Group variable (i): pup_id Number of groups = 851

R-sq: within = 0.1602 Obs per group: min = 1
between = 0.2072 avg = 2.2
overall = 0.2270 max = 5

Random effects u_i ~ Gaussian Wald chi2(22) = 428.54
corr(u_i, X) = 0 (assumed) Prob > chi2 = 0.0000

Reading	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Gender	-2.450641	.5513467	-4.44	**0.000**	-3.531261	-1.370022
Agemonth	.3464173	.0773363	4.48	**0.000**	.1948409	.4979937
eyec	.3796999	.8282646	0.46	0.647	-1.243669	2.003069
_Ischoolno_1	-3.849905	1.630603	-2.36	**0.018**	-7.045829	-.6539813
_Ischoolno_2	-4.287756	1.502263	-2.85	**0.004**	-7.232137	-1.343374
_Ischoolno_3	-4.421073	1.776226	-2.49	**0.013**	-7.902411	-.9397348
_Ischoolno_4	-4.786346	1.499771	-3.19	**0.001**	-7.725844	-1.846848
_Ischoolno_5	-3.298992	1.79441	-1.84	0.066	-6.815972	.2179876
_Ischoolno_6	-1.703292	1.352711	-1.26	0.208	-4.354556	.9479719
_Ischoolno_7	.5015325	1.617814	0.31	0.757	-2.669325	3.67239
_Ischoolno_8	6.32029	1.579714	4.00	**0.000**	3.224107	9.416473
_Ischooln~10	4.952717	1.38758	3.57	**0.000**	2.233111	7.672323
_Ischooln~11	1.791903	1.761727	1.02	0.309	-1.66102	5.244825
_Ischooln~12	.2587997	1.382321	0.19	0.851	-2.450499	2.968099

yr1	-3.789659	.6558839	-5.78	**0.000**	-5.075168	-2.504151
yr2	-.3720916	.7014863	-0.53	0.596	-1.746979	1.002796
yr3	-.5894626	.6671445	-0.88	0.377	-1.897042	.7181166
yr4	-.646285	.5240999	-1.23	0.218	-1.673502	.380932
Interactions						
yr1_EC	-2.896789	.8832929	-3.28	**0.001**	-4.628011	-1.165567
yr2_ EC	-5.462494	.8910467	-6.13	**0.000**	-7.208914	-3.716075
yr3_ EC	-2.036384	.8949521	-2.28	**0.023**	-3.790458	-.2823105
yr4_ EC	-1.069066	.9669918	-1.11	0.269	-2.964335	.8262028
_cons	48.31552	1.321631	36.56	**0.000**	45.72517	50.90587

sigma_u	6.8855284
sigma_e	5.2185566
rho	.6351563 (fraction of variance due to u_i)

Variables: xtreg acpe gender agemonth eyec i.schoolno yr1 yr2 yr3 yr4 yr1_eyec yr2_e
> yec yr3_eyec yr4_eyec meaniq iq_yr1 iq_yr1_eyec iq_yr2 iq_yr2_eyec iq_yr3 iq_y
> r3_eyec iq_yr4 iq_yr4_eyec, i(pup_id)
i.schoolno _Ischoolno_1-12 (naturally coded; _Ischoolno_9 omitted)

Random-effects GLS regression Number of obs = 1840
Group variable (i): pup_id Number of groups = 817

R-sq: within = 0.1694 Obs per group: min = 1
between = 0.4756 avg = 2.3
overall = 0.4433 max = 5

Random effects u_i ~ Gaussian Wald chi2(31) = 967.02
corr(u_i, X) = 0 (assumed) Prob > chi2 = 0.0000

Reading	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
gender	-3.054114	.4581792	-6.67	**0.000**	-3.952129	-2.156099
agemonth	.0888415	.0651519	1.36	0.173	-.0388538	.2165368
eyec	1.103111	.7849381	1.41	0.160	-.4353398	2.641561
_Ischoolno_1	-.4901051	1.376673	-0.36	0.722	-3.188334	2.208124
_Ischoolno_2	-2.168656	1.237759	-1.75	0.080	-4.594619	.2573065
_Ischoolno_3	-.5695409	1.485654	-0.38	0.701	-3.48137	2.342288
_Ischoolno_4	-1.095429	1.253385	-0.87	0.382	-3.552018	1.361161
_Ischoolno_5	-.761132	1.507899	-0.50	0.614	-3.716559	2.194295
_Ischoolno_6	.4872503	1.128121	0.43	0.666	-1.723826	2.698326
_Ischoolno_7	.9515674	1.321412	0.72	0.471	-1.638353	3.541487
_Ischoolno_8	5.188234	1.292553	4.01	**0.000**	2.654876	7.721592
_Ischooln~10	.8041823	1.161739	0.69	0.489	-1.472785	3.08115
_Ischooln~11	-.7237044	1.442491	-0.50	0.616	-3.550935	2.103527

_Ischooln~12	-.2049128	1.140074	-0.18	0.857	-2.439417	2.029591
yr1	-3.505085	.9680041	-3.62	**0.000**	-5.402338	-1.607832
yr2	-.3980979	.7810709	-0.51	0.610	-1.928969	1.132773
yr3	-.4555603	.7366477	-0.62	0.536	-1.899363	.9882425
yr4	.1154999	.6747882	0.17	0.864	-1.207061	1.43806
Interactions						
yr1_ EC	-3.46187	1.148171	-3.02	**0.003**	-5.712244	-1.211497
yr2_ EC	-5.97458	.9288927	-6.43	**0.000**	-7.795176	-4.153983
yr3_ EC	-1.648602	.9447078	-1.75	0.081	-3.500195	.2029911
yr4_ EC	-.4576947	1.334862	-0.34	0.732	-3.073977	2.158587
meaniq	.6745067	.0579085	11.65	**0.000**	.5610081	.7880053
iq_yr1	-.0057224	.1002815	-0.06	0.954	-.2022705	.1908258
iq_yr1_ EC	-.0784643	.1228868	-0.64	0.523	-.319318	.1623894
iq_yr2	.02558	.0886256	0.29	0.773	-.148123	.1992829
iq_yr2_ EC	-.1485678	.0970532	-1.53	0.126	-.3387886	.0416529
iq_yr3	.1033433	.0753268	1.37	0.170	-.0442945	.2509811
iq_yr3_ EC	.0410686	.0907619	0.45	0.651	-.1368214	.2189587
iq_yr4	.142859	.068864	2.07	**0.038**	.0078881	.2778299
iq_yr4_ EC	.1025168	.1560947	0.66	0.511	-.2034231	.4084567
_cons	50.13072	1.164204	43.06	**0.000**	47.84892	52.41252

sigma_u	5.0716643
sigma_e	5.1913167
rho	.48834295 (fraction of variance due to u_i)

Variablesi: xtreg acpe gender agemonth eyec i.schoolno iqgrp1 iqgrp3 liq_yr1 liq_yr
> 1_eyec miq_yr1 miq_yr1_eyec hiq_yr1 hiq_yr1_eyec liq_yr2 liq_yr2_eyec miq_yr2
> miq_yr2_eyec hiq_yr2 hiq_yr2_eyec liq_yr3 liq_yr3_eyec miq_yr3 miq_yr3_eyec hi
> q_yr3 hiq_yr3_eyec liq_yr4 liq_yr4_eyec miq_yr4 miq_yr4_eyec hiq_yr4 hiq_yr4_e
> yec, i(pup_id)
i.schoolno _Ischoolno_1-12 (naturally coded; _Ischoolno_9 omitted)

Random-effects GLS regression Number of obs = 1840
Group variable (i): pup_id Number of groups = 817

R-sq: within = 0.1726 Obs per group: min = 1
between = 0.4121 avg = 2.3
overall = 0.3920 max = 5

Random effects u_i ~ Gaussian Wald chi2(40) = 793.66
corr(u_i, X) = 0 (assumed) Prob > chi2 = 0.0000

Reading	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
gender	-3.126798	.4883694	-6.40	**0.000**	-4.083985	-2.169612
agemonth	.1802264	.0688097	2.62	**0.009**	.0453619	.3150909
eyec	1.471289	.8007064	1.84	0.066	-.0980666	3.040645
_Ischoolno_1	-1.491934	1.465676	-1.02	0.309	-4.364605	1.380738
_Ischoolno_2	-2.468973	1.319218	-1.87	0.061	-5.054593	.1166468
_Ischoolno_3	-1.186437	1.582921	-0.75	0.454	-4.288906	1.916031
_Ischoolno_4	-1.968972	1.331248	-1.48	0.139	-4.578171	.6402275
_Ischoolno_5	-.5751523	1.612754	-0.36	0.721	-3.736092	2.585787
_Ischoolno_6	.3250339	1.201241	0.27	0.787	-2.029355	2.679422
_Ischoolno_7	1.302586	1.409306	0.92	0.355	-1.459603	4.064775
_Ischoolno_8	5.491602	1.376183	3.99	**0.000**	2.794333	8.18887
_Ischooln~10	1.588789	1.237949	1.28	0.199	-.8375464	4.015124
_Ischooln~11	-.4799997	1.542365	-0.31	0.756	-3.50298	2.542981
_Ischooln~12	.1649651	1.213067	0.14	0.892	-2.212603	2.542533
iqgrp1	-6.458907	.8121642	-7.95	**0.000**	-8.050719	-4.867094
iqgrp3	4.357274	1.542201	2.83	**0.005**	1.334616	7.379931
Interactions						
liq_yr1	-4.029402	.9566698	-4.21	**0.000**	-5.90444	-2.154364
liq_yr1_ EC	-2.404929	1.253549	-1.92	0.055	-4.861839	.051982
miq_yr1	-2.544773	1.160018	-2.19	**0.028**	-4.818366	-.2711797
miq_yr1_ EC	-4.39504	1.396101	-3.15	**0.002**	-7.131348	-1.658732
hiq_yr1	-4.645326	2.667926	-1.74	0.082	-9.874366	.5837137
hiq_yr1_ EC	-1.811025	3.029699	-0.60	0.550	-7.749126	4.127076
liq_yr2	-.3587728	1.094109	-0.33	0.743	-2.503188	1.785642
liq_yr2_ EC	-4.37375	1.304049	-3.35	**0.001**	-6.929638	-1.817862
miq_yr2	-.6823363	.9303697	-0.73	0.463	-2.505827	1.141155
miq_yr2_ EC	-6.55327	1.113075	-5.89	**0.000**	-8.734858	-4.371682
hiq_yr2	1.439997	1.989221	0.72	0.469	-2.458805	5.338799
hiq_yr2_ EC	-6.648959	1.996921	-3.33	**0.001**	-10.56285	-2.735065
liq_yr3	-1.485942	.9302268	-1.60	0.110	-3.309153	.3372694
liq_yr3_ EC	-1.817042	1.182729	-1.54	0.124	-4.135148	.5010647
miq_yr3	-.39502	.8856773	-0.45	0.656	-2.130916	1.340876
miq_yr3_ EC	-2.537329	1.120928	-2.26	**0.024**	-4.734306	-.3403506
hiq_yr3	1.710654	1.734626	0.99	0.324	-1.68915	5.110458
hiq_yr3_ EC	.1663265	2.064178	0.08	0.936	-3.879388	4.212041
liq_yr4	-1.126615	.6910743	-1.63	0.103	-2.481096	.2278658
liq_yr4_ EC	-.7763919	1.216054	-0.64	0.523	-3.159814	1.60703
miq_yr4	-.6142319	.787547	-0.78	0.435	-2.157796	.9293318
miq_yr4_ EC	-1.763646	1.466166	-1.20	0.229	-4.637279	1.109987
hiq_yr4	3.770002	1.860358	2.03	**0.043**	.1237679	7.416237
hiq_yr4_ EC	3.171547	4.434486	0.72	0.474	-5.519887	11.86298
_cons	49.79505	1.271977	39.15	**0.000**	47.30202	52.28808

```
    sigma_u  | 5.5664661
    sigma_e  | 5.2105187
       rho   | .53299249   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
Variables: xtreg acpm gender  agemonth eyec  i.schoolno yr1 yr2 yr3 yr4 yr1_eyec yr2_
> eyec yr3_eyec yr4_eyec, i(pup_id)
i.schoolno        _Ischoolno_1-12     (naturally coded; _Ischoolno_9 omitted)

Random-effects GLS regression           Number of obs      =      1901
Group variable (i): pup_id              Number of groups   =       851

R-sq:  within  = 0.1559                 Obs per group: min =         1
       between = 0.2161                                avg =       2.2
       overall = 0.2091                                max =         5

Random effects u_i ~ Gaussian           Wald chi2(22)      =    424.74
corr(u_i, X)       = 0 (assumed)        Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      Maths |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
     gender |   .1559248    .515156     0.30   0.762    -.8537625    1.165612
  agemonth  |   .4301789   .0722713     5.95   0.000     .2885298     .571828
       eyec |   .7303946   .7682066     0.95   0.342    -.7752626    2.236052
_Ischoolno_1 |  -.8307349    1.52423    -0.55   0.586     -3.81817     2.1567
_Ischoolno_2 |    .684064   1.404042     0.49   0.626    -2.067808    3.435936
_Ischoolno_3 |  -2.822685   1.660521    -1.70   0.089    -6.077247    .4318773
_Ischoolno_4 |  -1.801843   1.401925    -1.29   0.199    -4.549567    .9458797
_Ischoolno_5 |   .1274353   1.677503     0.08   0.939    -3.160411    3.415281
_Ischoolno_6 |   -1.55682   1.264122    -1.23   0.218    -4.034455    .9208142
_Ischoolno_7 |   2.504025   1.510186     1.66   0.097    -.4558856    5.463935
_Ischoolno_8 |    5.57847   1.476359     3.78   0.000     2.684859    8.472081
_Ischooln~10 |   9.367326   1.296628     7.22   0.000     6.825983    11.90867
_Ischooln~11 |   3.750509   1.646301     2.28   0.023     .5238176    6.977201
_Ischooln~12 |   .7388801    1.29139     0.57   0.567    -1.792198    3.269958
        yr1  |  -1.582601   .6020781    -2.63   0.009    -2.762652   -.4025496
        yr2  |  -1.091127   .6447938    -1.69   0.091     -2.3549    .1726452
        yr3  |  -.6941137   .6137245    -1.13   0.258    -1.896992    .5087641
        yr4  |   .5897312   .4813593     1.23   0.221    -.3537158    1.533178
  Interactions
    yr1_ EC  |  -2.582921   .8109057    -3.19   0.001    -4.172267   -.9935747
    yr2_ EC  |  -5.032671   .8184642    -6.15   0.000    -6.636831    -3.42851
    yr3_ EC  |  -.9975351    .822553    -1.21   0.225    -2.609709    .6146391
    yr4_ EC  |  -.0898851   .8876037    -0.10   0.919    -1.829556    1.649786
       _cons |   43.74376   1.232524    35.49   0.000     41.32806    46.15946
```

```
-------------+----------------------------------------------------------------
    sigma_u  | 6.4444969
    sigma_e  | 4.7690304
        rho  | .64615195   (fraction of variance due to u_i)
------------------------------------------------------------------------------

Variables: xtreg acpm gender agemonth eyec  i.schoolno yr1 yr2 yr3 yr4 yr1_eyec yr2_e
> yec yr3_eyec yr4_eyec meaniq iq_yr1 iq_yr1_eyec iq_yr2 iq_yr2_eyec iq_yr3 iq_y
> r3_eyec iq_yr4 iq_yr4_eyec, i(pup_id)
i.schoolno        _Ischoolno_1-12     (naturally coded; _Ischoolno_9 omitted)

Random-effects GLS regression           Number of obs      =      1842
Group variable (i): pup_id              Number of groups   =       817

R-sq:  within  = 0.1728                 Obs per group: min =         1
       between = 0.5075                                avg =       2.3
       overall = 0.4606                                max =         5

Random effects u_i ~ Gaussian           Wald chi2(31)      =   1059.59
corr(u_i, X)       = 0 (assumed)        Prob > chi2        =    0.0000
------------------------------------------------------------------------------
       Maths |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      gender |  -.4445238   .4181775    -1.06   0.288    -1.264137    .375089
    agemonth |   .1905599   .0594731     3.20   0.001     .0739947    .3071251
        eyec |   1.529839   .7172273     2.13   0.033     .1240996    2.935579
_Ischoolno_1 |   2.477804   1.256992     1.97   0.049     .0141437    4.941463
_Ischoolno_2 |   3.072228   1.129971     2.72   0.007     .8575262    5.286929
_Ischoolno_3 |   .6948649    1.35634     0.51   0.608    -1.963514    3.353243
_Ischoolno_4 |   2.113186   1.144497     1.85   0.065    -.1299872    4.356359
_Ischoolno_5 |   3.420046   1.376619     2.48   0.013     .7219209     6.11817
_Ischoolno_6 |   1.144554    1.03012     1.11   0.267    -.8744433    3.163552
_Ischoolno_7 |   2.981761   1.204473     2.48   0.013     .6210376    5.342485
_Ischoolno_8 |   4.702403   1.180528     3.98   0.000     2.388611    7.016195
_Ischooln~10 |   5.538996    1.06073     5.22   0.000     3.460004    7.617988
_Ischooln~11 |   1.875003   1.316951     1.42   0.155     -.706173     4.45618
_Ischooln~12 |   .5214938   1.041013     0.50   0.616    -1.518855    2.561843
         yr1 |  -1.304205   .8835521    -1.48   0.140    -3.035935    .4275256
         yr2 |  -1.065705   .7128024    -1.50   0.135    -2.462772    .3313621
         yr3 |  -.5296751   .6721128    -0.79   0.431    -1.846992    .7876419
         yr4 |   .9268328   .6159102     1.50   0.132     -.280329    2.133995
  Interactions
     yr1_ EC |  -2.945604   1.048264    -2.81   0.005    -5.000163   -.8910445
     yr2_ EC |  -4.984693   .8476789    -5.88   0.000    -6.646113   -3.323273
     yr3_ EC |   .1359406   .8626339     0.16   0.875    -1.554791    1.826672
     yr4_ EC |  -.0136244   1.218512    -0.01   0.991    -2.401863    2.374614
      meaniq |   .6444987   .0528594    12.19   0.000     .5408961    .7481012
       iq_yr1 |  -.0274201   .0915326    -0.30   0.765    -.2068207    .1519804
```

```
 iq_yr1_ EC   | -.0117673   .112162   -0.10   0.916   -.2316008    .2080662
    iq_yr2    | -.0019692   .0808906  -0.02   0.981   -.1605119    .1565735
 iq_yr2_ EC   |  .0811413   .0884612   0.92   0.359   -.0922395    .2545222
    iq_yr3    |  .0562623   .068752    0.82   0.413   -.0784892    .1910137
 iq_yr3_ EC   |  .3048519   .0828356   3.68   0.000    .142497     .4672068
    iq_yr4    |  .0446896   .0628544   0.71   0.477   -.0785028    .1678819
 iq_yr4_ EC   |  .0788858   .1424433   0.55   0.580   -.200298     .3580696
     _cons    |  45.06127   1.062922   42.39   0.000    42.97798    47.14456
--------------+------------------------------------------------------------------
    sigma_u   | 4.6286932
    sigma_e   | 4.7382045
      rho     | .48831029   (fraction of variance due to u_i)
------------------------------------------------------------------------------

Variables: xtreg acpm gender   agemonth eyec  i.schoolno iqgrp1 iqgrp3 liq_yr1 liq_yr
> 1_eyec miq_yr1 miq_yr1_eyec hiq_yr1 hiq_yr1_eyec liq_yr2 liq_yr2_eyec miq_yr2
> miq_yr2_eyec hiq_yr2 hiq_yr2_eyec liq_yr3 liq_yr3_eyec miq_yr3 miq_yr3_eyec hi
> q_yr3 hiq_yr3_eyec liq_yr4 liq_yr4_eyec miq_yr4 miq_yr4_eyec hiq_yr4 hiq_yr4_e
> yec, i(pup_id)
i.schoolno       _Ischoolno_1-12     (naturally coded; _Ischoolno_9 omitted)

Random-effects GLS regression          Number of obs      =      1842
Group variable (i): pup_id             Number of groups   =       817

R-sq:  within = 0.1914                 Obs per group: min =         1
       between = 0.4539                               avg =       2.3
       overall = 0.4116                               max =         5

Random effects u_i ~ Gaussian          Wald chi2(40)      =    908.27
corr(u_i, X)       = 0 (assumed)       Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      Maths |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
      gender |  -.5164862   .4443392    -1.16   0.245    -1.387375    .3544026
   agemonth  |   .2743019   .0626194     4.38   0.000     .1515701    .3970337
        eyec |   1.866961   .7266423     2.57   0.010     .4427685    3.291154
_Ischoolno_1 |   1.504008   1.334401     1.13   0.260    -1.111369    4.119385
_Ischoolno_2 |   2.746819   1.200741     2.29   0.022     .3934094    5.100228
_Ischoolno_3 |  -.0314429   1.440959    -0.02   0.983     -2.85567    2.792784
_Ischoolno_4 |   1.246225   1.211913     1.03   0.304    -1.129082    3.621531
_Ischoolno_5 |   3.608467   1.468111     2.46   0.014     .7310224    6.485911
_Ischoolno_6 |   .8771909   1.093434     0.80   0.422      -1.2659    3.020282
_Ischoolno_7 |   3.342729   1.280762     2.61   0.009      .832482    5.852976
_Ischoolno_8 |   4.894927   1.252844     3.91   0.000     2.439398    7.350455
_Ischooln~10 |   6.012816   1.126697     5.34   0.000      3.80453    8.221101
_Ischooln~11 |   1.836207   1.403744     1.31   0.191    -.9150807    4.587494
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_Ischooln~12 |   .7853677   1.104002     0.71    0.477    -1.378437    2.949172
  Interactions
     iqgrp1    |  -6.689554   .7373461   -9.07   0.000    -8.134726   -5.244382
     iqgrp3    |   4.093397    1.39906    2.93   0.003      1.35129    6.835503
     liq_yr1   |  -1.370342   .8649752   -1.58   0.113    -3.065662    .3249781
liq_yr1_ EC    |   -2.40506   1.133682   -2.12   0.034    -4.627036   -.1830836
     miq_yr1   |  -.8847272   1.048916   -0.84   0.399    -2.940565    1.171111
miq_yr1_ EC    |  -3.315407    1.26279   -2.63   0.009    -5.790429   -.8403845
     hiq_yr1   |  -1.344203   2.412753   -0.56   0.577    -6.073113    3.384707
hiq_yr1_ EC    |  -3.684141   2.740946   -1.34   0.179    -9.056297    1.688015
     liq_yr2   |   .3606269    .989948    0.36   0.716    -1.579636    2.300889
liq_yr2_ EC    |  -6.626415   1.178632   -5.62   0.000    -8.936492   -4.316338
     miq_yr2   |  -2.366675   .8417273   -2.81   0.005     -4.01643   -.7169195
miq_yr2_ EC    |  -4.431328   1.006506   -4.40   0.000    -6.404042   -2.458613
     hiq_yr2   |   1.724715   1.801935    0.96   0.338    -1.807014    5.256444
hiq_yr2_EC     |  -5.207762   1.810136   -2.88   0.004    -8.755564   -1.659961
     liq_yr3   |  -.7206512   .8420462   -0.86   0.392    -2.371031    .9297289
liq_yr3_ EC    |  -2.582962   1.068343   -2.42   0.016    -4.676876   -.4890484
     miq_yr3   |  -1.066725   .8010831   -1.33   0.183    -2.636819    .5033686
miq_yr3_ EC    |  -.5632703   1.016469   -0.55   0.579    -2.555513    1.428972
     hiq_yr3   |   1.883279   1.572331    1.20   0.231    -1.198432    4.964991
hiq_yr3_ EC    |   4.021711   1.870613    2.15   0.032     .3553765    7.688046
     liq_yr4   |   .8099143   .6249719    1.30   0.195    -.4150081    2.034837
liq_yr4_ EC    |  -.5090797   1.099577   -0.46   0.643    -2.664211    1.646052
     miq_yr4   |    .148519    .712465    0.21   0.835    -1.247887    1.544925
miq_yr4_ EC    |  -.5193851   1.326011   -0.39   0.695    -3.118319    2.079549
     hiq_yr4   |   3.809264   1.683789    2.26   0.024     .5090992    7.109429
hiq_yr4_ EC    |   3.365033   4.010554    0.84   0.401    -4.495509    11.22557
       _cons   |   45.05898   1.156275   38.97   0.000     42.79272    47.32523
---------------+------------------------------------------------------------------
     sigma_u   |  5.0760138
     sigma_e   |  4.7049235
         rho   |   .53788562   (fraction of variance due to u_i)
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. log close
  log:  C:\Chris\eyec\eyec schools fixed effect.log
  log type:  text
  closed on:  12 Jan 2005, 12:07:24
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Appendix 4

Developmentally Appropriate Beliefs and Practice within the Enriched Curriculum[32]

Developmentally appropriate practice (DAP) has been internationally recognised as a set of standards to which all high quality early years education programmes should adhere (Goldstein, 1997). Developmentally appropriate practices are those that fit young children's stages of development both relative to their age, individual development, family and cultural backgrounds (Bredekamp & Copple, 1997). DAP emphasises the whole child (physical, social, emotional and cognitive), while taking into account individual and cultural differences. The DAP curriculum, therefore, is not an inflexible, prescriptive 'one-fits-all' approach but rather it is intended to be a framework that is adaptable to each individual group of children (Taylor, 1995).

Motivation for learning within a Developmentally Appropriate Practice classroom is derived from children's natural curiosity and desire to make sense of their world (Hart, Burts & Charlesworth, 1997). Developmentally appropriate practice thus provides an environment for young children where knowledge can be constructed through the children's own actions during concrete, authentic experiences in contrast to inappropriate practice that relies on paper and pencil workbook or worksheet, lecture, and other abstract experiences. Developmentally appropriate teachers actively facilitate interactive, child-centred learning, using direct and indirect instruction as appropriate (Bredekamp & Copple, 1997).

In contrast, Developmentally Inappropriate Practice (DIP) is characterised by learning through workbooks, seatwork, and rote drill/practice activities that focus on discrete skills which must be completed by all children within an inflexible time frame (Hart, et al., 1997). The curriculum is compartmentalized into the traditional content areas (maths, science, etc.), with no attempts to integrate across these domains through relevant and meaningful child hands-on activities. Moreover, little opportunity is allowed for children to move around the

[32] This appendix is drawn from a thesis undertaken by Deborah McGovern, 2003 for the MSc Developmental and Educational Psychology.

room, make choices, and actively explore a carefully crafted learning environment full of concrete experiences.

A growing body of research have associated negative consequences with developmentally inappropriate practice. Children enrolled in classrooms that have

been identified as low quality and/or developmentally inappropriate, have been found to display more negative academic achievement, behavioural, and motivational outcomes when compared with children attending more child-initiated, developmentally appropriate classrooms (Marcon, 1993). In a follow up study by Hart, Charlesworth, Burt & Dewolf (1993), children who had attended developmentally inappropriate early-years classrooms were rated by their upper primary school teachers as less prosocial, more distractible, and less willing to follow directions. Positive long-term effects of developmentally appropriate practice are suggested by higher rates of high school graduation, fewer arrests and acts of misconduct, and higher monthly incomes among adults who had participated in the model High/Scope Programme (Schweinhart & Weinhart, 1997).

Hart, et al. (1997) reviewed research on academic performance in children in developmentally appropriate and developmentally inappropriate classroom settings and found that lower socio-economic status (SES) and ethnic minority children gained as much academically in developmentally appropriate classrooms as did white higher-SES children. They did, however, fall behind their white higher-SES counterparts in developmentally inappropriate practice classroom settings.

Research relating teaching practices to stress outcomes suggests that children who attend less developmentally appropriate classrooms exhibit twice the levels of stress-related behaviours when compared with those in more developmentally appropriate programmes (Hart, et al., 1997). Children who appeared to be most adversely affected in this manner by DIP classrooms were economically disadvantaged children. According to Hart, Burts, Durland, Charlesworth, Dewolf & Fleege (1998), developmentally appropriate practice can mitigate stress-related behaviours of lower socio-economic students. Hart at al.'s (1997) finding, that lower SES children displayed significantly fewer stress behaviours in developmentally

appropriate practice classrooms than in developmentally inappropriate practice classrooms, is largely consistent with such an hypothesis.

Boys, in general, seem to be more negatively affected by developmentally inappropriate practice than girls. Huffman & Speer (2000) suggest that this may be owing to their preference for less structured activities. Marcon (1999) found that boys were detrimentally affected in DIP or academically oriented classrooms and were better supported in developmentally appropriate practice classrooms. Purves and Elley (1994), in an examination of the results of the International Association for Educational Achievement, indicated that the three countries where children begin formal instruction at the age of five showed very large gaps in achievement between boys and girls. A report by the U.K.'s Qualifications and Curriculum Authority (1998) confirmed this deficit in the literacy achievement of boys as evidenced by the national test figures. In addition to concern about the relationship between boys' achievement in literacy and the age of formal schooling, Barrett (1989) notes that alienation and disaffection from school is now evident in early-years classrooms within the UK. David, Curtis & Siraj-Blatchford (1992) point to evidence which warns of children 'burning out' by 'too early formalisation'.

The dichotomy between developmentally inappropriate practices versus developmentally appropriate practice is clearly a common theme in British and American education. In theory, it is fairly simple and often useful to categorize instructional practices as developmentally appropriate or inappropriate. However, in practice, individual teachers occupy different positions along the continuum of teaching practice (Bredekamp & Copple, 1997). Stipek and Byler (1997) propose that decisions about whether to implement a more developmentally inappropriate or a developmentally appropriate curriculum are embedded in teachers' fundamental beliefs about how children learn. So, to understand the guiding theory that determines teachers' decisions in planning, teaching and assessing, it is important to investigate what teachers believe to be important and what they believe not to be important. Teachers' beliefs have, as a result, become the focus of particular research interest. Pajares (1992), does however, call our attention to the need for more research on teacher beliefs, particularly in relation to how they relate to teaching practice.

Teacher Beliefs

Teacher beliefs can be broadly defined as teachers' implicit assumptions about students, learning, classrooms, and the subject matter to be taught (Kagan, 1992). A teacher's implicit assumptions or theories are the ideas about children, learning, and instruction that teachers develop from their personal experience based on their practical knowledge (Charlesworth, Hart, Burts, Mosley and Fleege, 1993). According to Spodek (1988), implicit theories differ from the explicit theories that are taught in college texts and other professional literature. Although the term 'teacher belief' is not used consistently by researchers, with some referring instead to teachers' 'principles of practice', 'personal epistemologies', or 'perspectives' (Kagan, 1992), empirical studies have yielded quite consistent findings in regard to two generalisations. First, teachers' beliefs appear to be relatively stable and resistant to change (Brousseau, Book & Byers, 1988). Second, teachers' beliefs tend to be associated with a congruent or similar style of teaching that is often evident across different classes and grade levels (Kagan, 1992).

Given the degree to which teachers' beliefs and practices are consistent, it is firstly important that teachers' beliefs or theories are firstly aligned with successful learning or teaching, and secondly, translated into effective practices. Evidence of such a translation was found by Kagan and Smith (1988) in their investigation of kindergarten teachers' beliefs and practices; kindergarten teachers' self-reports about beliefs were found to be strongly consistent with their observed classroom practices. Spidell (1988), who investigated year one[33] teachers' beliefs about play also found teachers' actions to be related to their beliefs. Smith and Shepard (1988) studied the relationship between kindergarten teachers' beliefs and practices concerning kindergarten readiness and retention in grade and again found basic agreement. Charlesworth, Hart, & Burts, (1991) also found support for a consistency between kindergarten teachers' beliefs and their instructional practices.

Unfortunately, there is often a mismatch between teachers' beliefs and teacher practices. Bennett and Kell (1989) found evidence of this mismatch in their investigation of four year

[33] In Great Britain, year one is termed reception class.

olds in sixty schools in three different local authorities in Britain. They interviewed teachers and head teachers and conducted in-depth observations of children in their classrooms and found that there was a gulf between the aims that the teachers wished to pursue and the practices they attempted to achieve. Verma and Peters (1975) also found such a discrepancy between teachers' reports about their beliefs and their observed classroom practices; teacher beliefs were more developmental than behavioural but their practice was more behavioural than developmental. Hatch and Freeman (1988) found such discrepancies between beliefs and practice in their study of kindergarten teachers, elementary principals, and supervisors.

Bennett and Kell (1989) propose that pressure from parents to achieve progress in basic skills is an important issue in accounting for the aforementioned mismatch between teacher beliefs and practices. Parents are often suspicious of classrooms where it looks like children do nothing but play (Stipek, Rosenblatt and DiRocco, 1994). The contrast between a classroom that appears to be fairly noisy and chaotic and a classroom that appears to be quiet and orderly, where children are sitting at their tables with pencils in hand, is quite powerful and can be alarming to parents who are concerned about their child succeeding academically in primary school.

School effectiveness research and instructional leadership research indicate that Principal teachers can influence what happens in classrooms. Smith and Shepard (1988) suggest that teachers' beliefs and practices are constrained by Principals who are under pressure to raise achievement test scores. Hitz and Wright (1988) in a study of Principals and teachers found that significant conflict arose over the block of time that should be devoted to free play, with teachers supporting more allocated time than Principals. Charlesworth et al. (1993) similarly found that Principals were much less supportive of developmentally appropriate practice than were teachers.

Davis, Konopack and Readence (1993) further suggest that the degree of inconsistency between beliefs and practices could also stem from varying psychological, social and environmental realities of the teachers' schools that either create an opportunity for or constrain teachers from implementing their beliefs. It is within this context that Margaret Lampert (1985) aptly portrayed the teacher as a 'dilemma manager'. As teachers are often

faced with making choices among dichotomous choices such as whether to promote developmentally appropriate or inappropriate practice, to foster independence and creativity or maintain standards and expect everyone to meet them (*ibid*.), to help children to become 'learners' or 'knowers' (Gayle, 1992), to adopt an explicit and skills-based approach or foster productive skills and generalised abilities (Fang, 1994), it is not difficult to understand why there is often a discrepancy between teachers' reported beliefs and their practices. Fang (1996) concludes that teachers' beliefs are situational and are transferred into practice only in relation to the complexities of the classroom.

The present study

If the Enriched Curriculum is an example of a developmentally appropriate curriculum, then one would expect teachers of the Enriched Curriculum to have more developmentally appropriate beliefs, and fewer developmentally inappropriate beliefs, also more developmentally appropriate practices and fewer developmentally inappropriate practices than teachers of the traditional curriculum.

To test this out, McGovern (2003) sent a questionnaire covering developmentally appropriate beliefs (36 item Teacher Beliefs Scale) and developmentally appropriate practices (34 item Instrumental Activities Scale) to all 895 primary schools in Northern Ireland. 390 (44%) Teacher Questionnaires and 442 (49%) Principal Questionnaires were returned.

Of those, 80 Year 1 teachers (21%) were teaching the Early Years Enriched Curriculum and 310 Year 1 teachers (79%) were implementing the traditional curriculum.

Beliefs and practices of Year 1 teachers in N Ireland

Table 1: Means and standard deviations of year one teachers' beliefs and practices in Enriched Curriculum schools and traditional National Curriculum schools.

Summary measure	Respondent	Mean	Standard Deviation
Developmentally appropriate beliefs	Enriched Curriculum Teacher	17.90	1.28
	Traditional Curriculum Teacher	17.03	2.04
Developmentally inappropriate beliefs	Enriched Curriculum Teacher	4.29	0.90
	Traditional Curriculum Teacher	5.13	1.02
Developmentally Appropriate practices	Enriched Curriculum Teacher	16.20	2.03
	Traditional Curriculum Teacher	14.12	2.22
Developmentally Inappropriate practices	Enriched Curriculum Teacher	9.75	1.82
	Traditional Curriculum Teacher	12.47	2.03

The results were that Enriched Curriculum had more Developmentally Appropriate Beliefs, fewer Developmentally Inappropriate Beliefs, more Developmentally Appropriate Practices and fewer Developmentally Inappropriate practices than teachers who were implementing the Traditional Curriculum. All results were highly significant ($p<.01$) and the strength of the effects were fairly substantial (effect size about 1SD) for developmentally appropriate practices and beliefs, and developmentally inappropriate practices. The effect size for developmentally appropriate beliefs was about half this (0.5 SD).

Though reservations have to be expressed about the interpretation of results when not all those surveyed returned the questionnaires, and when developmentally appropriate practices are declared in a questionnaire rather than observed in real life, the results are powerful enough to permit some confidence in their interpretation. It is concluded therefore that the teacher beliefs and self-declared practices of Enriched Curriculum teachers are more in keeping with the beliefs and practices relevant to a developmentally appropriate curriculum than are the beliefs and practices of teachers who are teaching the traditional curriculum.

To what extent teachers of the Enriched had these beliefs prior to the introduction of the Enriched Curriculum; it is not possible to say. If, as seems likely, their beliefs were similar to traditional curriculum teachers prior to the introduction of the Enriched Curriculum, then it may be that teaching the Enriched Curriculum has confirmed and strengthened these beliefs.

Such developmentally appropriate beliefs and practices are consistent with the delivery by Year 1 Enriched Curriculum teachers of a developmentally appropriate curriculum. This, in its turn, suggests that the Year 1 pupils who are taught by means of the Enriched Curriculum will benefit from this in a number of different ways. They will be more prosocial, less distractible and more willing to follow directions (Hart et al, 1993). Lower socio-economic status (SES) and ethnic minority children will be less disadvantaged academically and lower SES pupils will exhibit fewer stress behaviours (Hart et al, 1997). Boys will also be less at a disadvantage academically (Marcon, 1999).

It will be interesting to see if these predicted benefits are borne out.