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**An Evaluation of the Impact of the POPS Reading Scheme on the Reading  
Attainment of Pupils with Down's Syndrome in a Special School Setting**

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## **Abstract**

Reading can open a world of possibilities and enhance a child's life in many ways. It provides access to information, knowledge, entertainment and enjoyment. It can accelerate the development of speech and language, improve working memory skills, enhance personal and social development and have a positive impact on self-esteem.

Despite reading being widely accepted as a fundamental learning experience, the educational research focusing on reading instruction for children with Down's syndrome is minimal. Until recently, very few reading schemes were available that were designed to specifically meet the needs of children with special educational needs, particularly for those children with Down's syndrome.

This study was conducted in order to improve practice in a special school setting by testing and evaluating a recently published reading scheme, designed to capitalise on the strong visual processing skills many children with Down's syndrome possess.

An action research design was used, incorporating quantitative and qualitative methods of data collection. Quantitative progress data was collected for a participant group and a comparison group over a six-month period. The data was analysed to determine whether the reading scheme had a statistically significant effect on reading skill development. Qualitative evidence was collected via questionnaires and supported interviews and yielded original, valuable and interesting data.

The results of this study show that, in this situation, for these pupils, the reading scheme was effective. The average progress percentage for the participant group was 47.5%, compared to an average progress percentage for the comparison group of 19.625%. The study concludes with recommendations for future research and future development of the reading scheme.

## **Chapter 1 Introduction**

The researcher is currently employed as team leader with responsibility for literacy in a special school, catering for pupils with severe learning difficulties (SLD) and profound and multiple learning difficulties (PMLD), between the ages of two and nineteen. The vast majority of these pupils are working within the P level range, which breaks down 'working towards level one' of the National Curriculum into eight smaller levels. The pupils work up through the levels from one to eight, then move onto level one of the National Curriculum. Very few pupils in this setting are working beyond this. This study presented itself after a review of the reading provision in this setting. The Oxford Reading Tree scheme was used throughout the school and was successful for some pupils, but assessment scores highlighted that many pupils were making only limited progress in their pre-reading and reading skills within the P levels. Pre-reading skills are outlined within P levels one to six and include targets such as sharing a book with an adult, recognising characters, pointing out named objects in pictures, turning the pages of a book and matching short words. The later P levels concentrate on targets such as following text with a finger, talking about events in a story and beginning to recognise some words.

Anecdotal evidence from both school staff and parents suggested that the pace of the Oxford Reading Tree scheme was too fast and there were concerns that some of the story lines were not suitable for older pupils. The decision was made to trial a variety of reading approaches and schemes in order to engage more pupils with reading. Books were selected from a range of publishers and colour banded to cater for the wide range of abilities and interests the pupils possessed. Pupils became actively engaged in selecting their own reading material from a choice of genres, at an appropriate level for their reading skills.

After one term, further analysis of the assessment data showed that the majority of pupils were engaged successfully in developing their pre-reading and reading skills. However, the pupils who were not performing as well were those who had Down's

syndrome and language delay in varying degrees. These pupils were highly visual learners and their teachers noted that they were struggling to develop phonic knowledge. It became evident that a gap remained in the provision for a reading scheme which teaches pupils to read using a sight vocabulary, often termed the 'whole word approach', which many researchers such as Buckley and Bird (2000) and Alton (2006) suggest is the most successful approach to reading for pupils with Down's syndrome. This research will aim to examine the possible reasons for this, and ascertain whether this approach is successful for pupils with Down's syndrome in this setting.

Documents from the Qualifications and Curriculum Authority (QCA) and the Department for Education and Skills (DfES), including Planning and Assessing the Curriculum for Pupils with Learning Difficulties (2001) and The Code of Practice for Special Educational Needs (2001) provide guidance for working with children who have a wide range of educational needs, including Down's syndrome, but as each school has a distinctly different population, such documents offer no recommendations for specific reading approaches or schemes to use, but encourage schools to determine which best suits their pupils.

The introduction of the Early Years Foundation Stage and the renewal of the Primary Framework for Literacy provide a welcome opportunity to innovate current provision in schools. The Rose Review (2006) informed these documents by examining best practice in teaching reading, including the place of synthetic phonics. It acknowledged that some children have neuro-developmental disorders and other special educational needs that may present obstacles to learning to read, asserting that schools must provide effectively for such children by offering coherent reading programmes. Authors such as Hofkins (2006) and Coe (2006) discuss criticism of the Rose Review, which suggests that teachers are told to teach *all* children in the same way. Often, in a special school, it can be difficult to teach all pupils in the same way. Teaching and learning is usually highly individualised to cater for the wide variety of needs and abilities. The Rose Review also suggests that engaging young children in interesting pre-reading

activities ensures that most children will begin systematic phonic work by the age of five. Some pupils within special schools will still be at the pre-reading stage across the age range, but the Rose Review guidance is still followed in that pupils are exposed to multi-sensory, individualised and worthwhile pre-reading and phonic activities.

In order to provide for the identified group of pupils not responding to the updated reading scheme, a suitable scheme that used a whole word approach was introduced. Short for 'Plenty of Potential', the POPS reading scheme aims to engage and motivate children through interesting stories about the POPS family. The youngest member of the family, Kal, has Down's syndrome. The manufacturer of the POPS reading scheme suggests that their resources support the reading development of children who are differently abled, in particular those children who are visual learners and those with language delay. The books progress in small, graded steps and focus on building a sight vocabulary of functional and common words using repetition, word matching and flash cards. The books use a clear font and include bright illustrations that relate exactly to the text. Associated games are provided which are repetitive and involve both phonics and a selection of primary functional words.

The aim of this research study is to test the claims of the manufacturer of the POPS reading scheme by investigating the impact of the programme on the reading attainment of pupils with Down's syndrome in this setting. Progress will be monitored through the school assessment system, 'B Squared'. This system explodes each P level into smaller targets and measures pupil progress by percentages within a single P level, thus ensuring that progress can be shown for even the least able pupils. Record sheets from B Squared will be included later as appendices. This is context appropriate as none of the pupils involved in the study are able to gain a score on a standardised reading test. For comparative purposes, the progress made by a comparison group of similar pupils will also be monitored. This study will also explore the views of pupils and the adults supporting the pupils during the intervention through supported interviews and questionnaires.

The findings from this study will inform the future development of reading provision in this setting for the pupils who are highly visual learners and learn to read words initially by 'sight'. It will also inform future provision for those pupils who have language delay and are struggling or unable to acquire phonic knowledge. As every child is different, adaptations will be made to the POPS reading scheme to suit individual needs. The individualised programmes will then continue to be used with those children who benefit from it. Other children who may also benefit will then be introduced to the resources. Recommendations will be made for children who make limited, or no progress on the programme. This will ensure that the findings benefit each child and their class teachers. This study will inform the researcher's professional practice and could have implications for other special schools looking for new approaches to develop reading provision.

### **A definition of Down's syndrome**

Dr. John Langdon Down provided residential care for people with learning difficulties in the nineteenth century and in 1866, he described in detail the characteristics of a distinct group of people in his care. The characteristics he found included delayed development, oblique eyes, a flat nasal bridge, a small mouth often with a protruding tongue, low muscle tone, small and low set ears and fine skin and hair (Clarke and Clarke in Stratford and Gunn, 1996; Ayers, 2006). Medical complications could include congenital heart defects, upper respiratory infections, delayed speech, impaired hearing and vision difficulties. The syndrome that Dr John Langdon Down described, now bears his name. It was not until 1959 that the cause of Down's syndrome (also called Down syndrome) was discovered as being a genetic abnormality. Further description is offered by Farrell (2003), who explains that the cause of Down's syndrome (from herein abbreviated to DS), in about 95 percent of individuals is the nondisjunction of an additional chromosome. Chromosome 21 occurs three times instead of twice, sometimes termed, 'trisomy 21' (Lorenz, 1998). Most people with the syndrome have learning difficulties that range from mild to moderate, although small numbers have a severe form. In a small number of cases, as Ayers (2006) describes, chromosomal

structure is affected due to the process of translocation or mosaicism. It is suggested by Ayers (2006) that in these cases, intellectual disability and physical differences may not be so marked.

DS occurs in all ethnic groups with approximately 1 in 700 babies born with the syndrome (Ayers, 2006). There is some disagreement in reported sex ratios, as Steele in Stratford and Gunn (1996) discusses, some studies conclude that ratios are not significantly different to the general population, i.e. that there is a slight excess of males being born, whereas other studies report that there is a much greater excess of males being born with DS than would be found in the general population. Life expectancy has increased greatly in all but the most disadvantaged of countries, therefore Wishart in Lewis and Norwich (2004) asserts that prevalence rates are rising.

The research by Carr (1992) is described by Clarke and Clarke in Stratford and Gunn (1996) as exemplary. Her twenty-one year study tracked children with DS from birth to adulthood, noting their development. She found that people with DS had a surprisingly wide range and variation of abilities. Lorenz (1998) discusses studies that corroborate this view and also reminds us that some children with DS have additional difficulties due to unrelated conditions such as autism, Attention Deficit Disorder (ADD) or epilepsy. McConkey clarifies these assertions in stating:

“People with Down’s syndrome have only one thing in common – trisomy 21. Thereafter, their physical characteristics, personalities, intellectual abilities, family circumstances and life histories can be as varied as for any other human grouping based on a genetic characteristic, such as ginger hair.” (McConkey in Stratford and Gunn, 1996: 451)

### **Brief historical context of children with Down’s syndrome**

As reported by Male in Florian (2007), Mittler (2000) claimed that up until 30 years ago it was widely accepted that many young people with learning difficulties were deemed uneducable, spending their time in long-stay hospitals with little expected of them.

Buckley et al. (2002) confirm this view and believe that although young people with DS

are now deemed educable, the tendency until recently to segregate them from other children means that they have still been subject to impoverished social and educational experiences. Some writers, such as Clarke and Clarke in Stratford and Gunn (1996) suggest that the general level of functioning of children with DS is poor or very poor, with their prospects of real independence almost non-existent. The researcher argues strongly against generalising in this way, referring to many writers and researchers (Carr, 1992; McConkey in Stratford and Gunn, 1996; Martin, 2006), as well as personal experience of teaching children with DS, which clearly demonstrates that all children with DS are individuals, with significantly differing levels of ability and independence.

Research conducted by Shepperdson (1988) found that although some of the teenagers with DS involved in his study were unquestionably incapable of reading, there were others who he felt had the ability to learn to read if they were exposed to the experience. He found that the most common complaint from the parents of these teenagers was the limited teaching of reading. He suggested that some educationalists were clearly against wasting time on teaching children with DS to read, as they felt that it would not be done well. However, the findings demonstrated that 82 percent of the teenagers with DS were able to listen to a five minute story, 53 percent were able to answer questions about the story, 31 percent were able to tell the story in their own words and 65 percent were able to read some words.

By the 1990's, more children with DS were given access to appropriate schooling and the numbers of children making significant progress began to increase, as suggested by Cunningham et al. (1998). They acknowledge that pupils with DS began to attend mainstream primary schools and made more advanced progress. Their view, along with that of other researchers (Cuckle and Wilson, 2002; Wishart in Lewis and Norwich, 2004), that many children with DS move from mainstream into special school as they age, reflects the general pattern in this Local Authority. Primary schools cater well for pupils with DS who are working close to, or on the National Curriculum levels, but as the gap widens between pupils with DS and their age peers, parents may choose for their child to access special school provision for their secondary education. This is reflected

in this setting, where there are only a small number of pupils with DS in the primary department, but many pupils with DS in the secondary and post sixteen departments.

Buckley et al. in Stratford and Gunn (1996) argue that it is fortunate that increasing numbers of children with DS are accessing a mainstream education with appropriate additional support. They believe that special schools for children with severe learning difficulties limit literacy teaching to a social sight vocabulary. The researcher disagrees with this view having taught in special schools, which are still required to provide a broad and relevant literacy curriculum, which adheres to the National Curriculum and National Frameworks. This view is shared by Farrell (2006) who suggests that approaches are regularly monitored and adapted to ensure that the needs of the pupils are being met in special schools today, as this research aims to do for this setting.

## **Chapter 2 Literature Review**

This review will consider the value of reading and the specific difficulties associated with DS that may impact on the success of reading instruction. The controversy surrounding the teaching of reading will be considered in the context of the leading theories on how children learn to read and how this applies to children with DS.

### **The value of reading**

The researcher believes that all children should be offered reading tuition, regardless of whether or not they have a learning difficulty. As Kumin (2002) and Downing (2005) assert, reading is an important skill that can enhance the quality of life by providing access to information, knowledge and enjoyment. It is also suggested by Martin (2006) and Farrell in Stratford and Gunn (1996), that learning to read can help accelerate the development of speech and language and improve working memory skills. Studies suggest that reading skill development can also have a significant impact on other areas of cognitive development, for example Vygotsky (1962), quoted by Glenny in Benton and O'Brien (2000) found that adults who had never learnt to read, performed differently than readers of a similar intelligence on tasks that required abstract thinking. Reading can enhance personal and social development and many writers (Glenny in Benton and O'Brien, 2000; Martin, 2006; Al-Yagon and Margalit, 2006) suggest that reading achievement can also have a positive impact on self-esteem.

### **Difficulties associated with DS and the impact on reading instruction**

It is suggested by Wishart that:

“Developmental researchers largely ignore Down’s syndrome in favour of more recently identified and ‘interesting’ conditions such as autism and Williams syndrome; there is currently very little research being conducted with children beyond pre-school years. Despite learning and teaching being inextricably intertwined, the educational literature on children with DS is even thinner.” (Wishart in Lewis and Norwich, 2004: 87)

Wider reading confirmed that educational literature and research studies specifically involving children with DS are limited, however, much of the literature that does exist considers reading skill development. Research studies investigating reading instruction for children with DS prior to 1990 are scarce, most probably due to the assumption in the past that most children with DS were not able to learn to read (Male in Florian, 2007; Mittler, 2000). Kumin (2002) shares this view and argues that it was only from the 1990's that professionals and parents started to agree that actually, most children with DS could learn to read.

A growing number of studies have investigated the reading skills of children with DS, providing a valuable insight into the methods which educators and children with DS employ in order to engage with the reading process (The Down's Syndrome Association, 2003; Down Syndrome Educational Trust, 2007). These studies include single case studies (e.g. Duffen, 1976; Gallaher et al., 2002) which explain testing of reading instruction methods on a single participant, articles which discuss the cognitive strategies that children use to read (e.g. Cossu et al., 1993; Evans, 1994) and research surveys of the reading skill development of small numbers of children (Lorenz et al., 1985; Bayliss, 2000; Bochner et al., 2001; Cardoso-Martins and Frith, 2001). The early research study carried out by Lorenz et al. (1985) involved 58 pupils with DS aged between five and seven and found that forty four per cent of the participants were able to read 5 to 10 words. Later research from Bochner et al. (2001) found that of the thirty young adults with DS involved in their study; all but one had learnt to read. Miller et al. (1999) reviewed 35 studies that were published on reading skill development among children with learning difficulties from 1992 onwards. They assumed that many of the children who would have participated in these studies would have had DS and summarised that the studies were optimistic about the ability of these children to learn to read through sight-word instruction and word-level analysis. The work of Oelwein (1995) and the Down's Syndrome Association (2003) maintains that most children with DS can benefit from reading instruction regardless of how *reading* is defined.

Sue Buckley, Director of Research and Science at The Down Syndrome Educational Trust and the mother of a child with DS, has been at the forefront of international research into the education and development of children with DS for nearly 30 years. Much of her research considers methods of reading instruction for children with DS (Buckley et al., 1993; Buckley and Bird, 1993, 2000) and claims that children with DS employ the same strategies as typically developing children when learning to read. Buckley et al. writing in Stratford and Gunn (1996) maintain that although children with DS may progress from one stage to the next at a slower pace in their reading, the same teaching methods should be applied for all children, taking into account a possible language delay. The researcher is of the opinion that there are many more factors that need to be considered which may make reading skill development more difficult for children with DS and believes that it is fundamental that reading programmes are tailored to meet specific individual needs. Wider reading, personal experience and studies that compare channels for learning, as discussed by Kumin (2002), Wishart in Lewis and Norwich (2004) and Alton (2006), have found that children with DS frequently have strengths in visual processing and difficulties in auditory processing, memory, speech and language and it is important for educators to try to remove or reduce these barriers as far as possible in order to aid reading instruction.

## **Vision**

Although pupils with DS tend to be strong visual learners and are able to use this strength to access the curriculum (Alton, 2000) it is widely accepted that many children with DS have a visual impairment (Rogow, 1997; Wishart in Lewis and Norwich, 2005), with some studies suggesting that visual difficulties affect *all* children with DS (Courage et al., 1994). The most common visual difficulties in individuals with DS, as discussed by Hammond and Mills in Stratford and Gunn (1996) are refractive error (short sight or long sight) cataracts and strabismus (squint), “which exists when the visual axes of the eyes are out of alignment so that only one eye is directed at the object” (Hammond and Mills in Stratford and Gunn, 1996: 127). It is important for educators to take visual impairments into consideration when teaching children with DS to read, as they may

benefit from wearing spectacles and using books with large, clear print. Once these necessary adjustments are made, children with DS will be more able to use their strong visual processing skills to aid their reading acquisition.

## **Hearing**

Davies, writing in Stratford and Gunn (1996) summarises a study of auditory function in 100 individuals with DS which was carried out by Brooks et al. (1972). The individuals with DS were matched for age and sex with a control group of individuals with learning difficulties other than DS. The study found that there was a significant difference between the two groups, with 21 percent of the individuals with DS under 20 having a sensori-neural hearing loss, compared to 15 percent of the control group. In the individuals aged over 21, 55 percent of those with DS had a sensori-neural hearing loss compared to only 10 percent of the control group. The study concluded that individuals with DS might develop a sensori-neural hearing loss in later life, therefore suggesting that the risk of developing such a loss is greater in individuals with DS than in individuals without the condition. This has an important implication for educators, as older children with DS may have more limited hearing, therefore it is important to work in conjunction with audiologists to promote effective hearing.

Frederickson and Cline (2002) suggest improvements to acoustic conditions by adding carpet, curtains and soft furnishings to a room to reduce the background noise, or testing the many different types of hearing aids that are available. Many writers note particular difficulties which may hinder reading skill development that are associated with such hearing impairments, for example Chapman in Miller et al. (1999) whose studies show that children with DS who have a hearing impairment may also have specific impairments in auditory processing, sentence memory and story recall. Hearing impairments and auditory short-term memory are also said to limit syntactic comprehension in children with DS by researchers such as Marcell and Weeks (1998). However, Miller et al. (1999) argues that listening and comprehension have been

documented as a strength of people with DS, despite the fact that they may have hearing impairments.

### **Memory**

Research suggests that short-term memory is adversely affected in children with DS affecting their ability to process, understand and assimilate spoken language long enough to respond to it (Marcell and Weeks, 1998; Miller et al., 1999; Martin, 2006). There may also be “significant memory problems in recall and recognition along with semantic delay or deficiency due to a symbolic processing deficit” (Ayers, 2006: 28). Miller et al. (1999) also suggest that children with memory problems may have poorer language production, as language production requires word selection and formulation skills that are memory dependent. Studies from Buckley and Bird (1993, 1994) suggest that teaching even a small sight vocabulary to pupils with DS may improve working memory function.

### **Speech and Language**

Research has shown that children with DS sometimes have language production difficulties which are disproportionate to their general cognitive difficulties (Messer, 1994; Donaldson, 1995; Miller et al., 1999). Donaldson (1995) asserts that the language abilities of most children with DS do not usually develop beyond the level of non-delayed three year olds, however Wishart in Lewis and Norwich (2005) argues that there is considerable variation in the eventual level of linguistic development of different children. Suggested reasons for restricted language production are the difficulties associated with poor muscle tone in the tongue and lips (Wishart in Lewis and Norwich, 2004) and the increased incidence of hearing problems (Donaldson, 1995), thus hindering them from hearing language spoken by others. Research by Miller et al. (1999) found that 60 – 75 percent of individuals with DS had impairments in language production. They found that as the children in their studies got older, they experienced increasing difficulty in acquiring complex language production skills.

Miller et al. (1999) and Martin (2006) remind us of the importance of not underestimating cognitive skills due to limited language production, affirming that children with DS often have better language comprehension skills than production skills and should therefore be spoken to at an appropriate level, within improved hearing conditions (Frederickson and Cline, 2002). Where children with DS are struggling with speech intelligibility, they may reduce their utterances to single words in their efforts to be understood (Miller et al., 1999). Ayers (2006) also suggests that particular phonemes may cause more difficulties for children with DS, namely the fricative phonemes such as f, v, s, z, sh and th. This has immediate implications for the teaching of phonics, therefore it is fundamental to work alongside speech and language therapists to identify and work on particularly difficult phonemes for the individual child.

Farrell in Stratford and Gunn (1996) states that it is usually assumed that language skills are a prerequisite for literacy. Children with DS generally experience so much difficulty with receptive and expressive language that they may, in fact, be helped to learn language through literacy instruction (Buckley and Bird, 1993; Martin, 2006). It is argued by Buckley et al. in Stratford and Gunn (1996), that reading instruction should be considered as soon as a child has single-word comprehension. Their research suggested that the earlier a child is able to establish a sight vocabulary, the greater the benefit for their language, comprehension and cognitive development. This argument is contradicted by the research findings of Laws and Gunn (2002), whose five year study of 30 children and adolescents with DS found no evidence that learning to read had a significant impact on later language comprehension.

Gibson (1978 cited in Shepperdson, 1994) was of the opinion that only 'a few' people with DS could learn to read. More recent research demonstrates that reading is often a strength of pupils with DS, with many pupils excelling in this area of the curriculum (Down's Syndrome Association, 2003; Alton, 2006). Each child with DS is an individual, and their specific complex difficulties must be assessed, with barriers to reading removed or reduced as far as possible in line with the suggestions given above. Different reading instruction strategies must be selected and tailored to cater for

individual strengths and preferred channels of learning, and may require further adaptation when teaching different reading sub-skills. Buckley et al. in Stratford and Gunn (1996) group the suggested strategies generally used to teach reading under three overarching headings which are useful for this discussion: 'phonological', 'visual' and 'contextual'.

### **Phonological**

Advocates of a pure phonics method, such as McGuiness (1997) cite the large reading vocabulary that pupils can theoretically obtain through the 'phonological' strategy. Phonics instructs pupils to become aware of sounds, as Duncan and Parkhouse (2001) and Birsh (2005) suggest. They learn to sound out and then blend sound combinations to identify the word from their store of spoken word forms and it is argued by Lloyd (2005), that blending is the only effective route to becoming a good reader. This method requires direct teaching of sounding out methods and memorisation of pronunciation rules (Bayliss, 2000; Duncan and Parkhouse, 2001).

There are many arguments surrounding the use of phonetic programmes with pupils with DS. Many writers (Gibbs, 2004; Martin, 2006; Alton, 2006) suggest that for many children with DS, problems with hearing, auditory discrimination, memory, processing and problem solving skills will inevitably make learning phonics harder for them. Halliwell (2003) and Alton (2006) criticise the use of phonetic programs in the early stages of reading instruction for pupils with DS, acclaiming that some pupils may learn the letter sounds but find it difficult to 'blend' them to produce sensible speech and charge that many pupils with DS will fail at each one of the methods mandatory skills. It is also suggested that pupils can learn to pronounce a sentence without ever learning to understand it. Some scientific investigations have been carried out to investigate this difficulty to develop phonological awareness, for example Vicari et al. (2004), who conducted a study that confirmed impaired verbal short term memory in children with DS. However, the data provided little support for defective functioning of their phonological store, with no evidence found to suggest that this would be due to a

dysfunction of the articulatory loop. They concluded that alternative explanations of defective verbal short-term memory in DS, such as a central executive system impairment, must be considered.

Studies by Cossu et al. (1993) involving 10 children with DS aged between 8 and 15 and Evans (1994) involving 6 children with DS aged between 7 and 11, indicated that children with DS did not show evidence of phonological awareness and concluded that phonological awareness does “not necessarily embody those skills which are crucial to reading” (Evans, 1994: 102). Bayliss (2000) discusses the criticism of these studies, highlighting the arguments of Byrne (1993) and Bertelson (1993) who claimed that the studies were badly designed, noting that no phonological awareness measures were taken prior to the reading instruction. Their findings were contradicted by Bayliss’ (2000) own research, after studying the reading skills of 34 children with DS, she found that phonological awareness did contribute to their reading skills. This contradiction was echoed by research from Cupples and Iacono (2000) and Cardoso-Martins and Frith (2001) whose studies involving large groups of participants with DS also concluded that phonological awareness and phoneme segmentation skills were directly associated with better reading.

Research carried out by Farrell and Elkins (1995) also came to similar conclusions, however, although the pupils with DS in their study had acquired phonological knowledge, the writers argued that they did not have the prerequisite knowledge and skills to use it to aid their reading. This prerequisite knowledge is fundamental in order to develop reading skills, as it is suggested that when phonics is introduced without this, literacy development overall may be delayed (Goldman and Conboy, 2004). Edwards (1999) highlights the limited success of phonics teaching for children with DS, but it remains the majority view that reduced phonological awareness skills will eventually cause reading acquisition progress to slow down or even stop (Kennedy and Flynn, 2003; Alton, 2006).

## **Visual**

The sight word method of reading, termed the 'visual' strategy, is not synonymous with the whole language approach, but is often considered to be part of it. It is also sometimes known as a logographic or global approach (Frith, 1985). This is when the reader memorises the appearance of words, then recognises them when they are reading by comparing words to the visual images they have stored. There is strong criticism of this method from researchers such as Orton (1929) who argues that the sight method of teaching reading actually causes reading difficulties and McGuinness (1997) who asks educators to consider the large number of words in our written vocabularies, and suggests that children with DS would be unable to learn enough words through a whole-word approach needed to be as literate as they could be.

Many children with DS have strong visual processing skills (Oelwein, 1995; Miller et al., 1999) and research has shown that pupils with DS can be taught a sight vocabulary at a very early age (Duffen, 1976; Buckley and Bird, 1993; Halliwell, 2003). It is also recognised that many children with DS have a sight word recognition which is actually higher than the number of words, or signs that they can say (Miller et al., 1999; Martin, 2006). Case studies by researchers such as Clare in Booth et al. (1992) confirm that pupils with DS are able to indicate understanding by assimilating sight vocabulary to a set of questions requiring a one word answer, and answering them spontaneously. Research with non-disabled children has shown that an extensive automatic sight vocabulary facilitates access to text meanings (Adams and Huggins, 1985), demonstrating that the acquisition of a sight vocabulary is an important beginning skill. The general literature indicates a wider view that whole word approaches work well for pupils with DS in the initial stages of reading development (Halliwell, 2003; Alton, 2000; Kumin, 2002) to encourage children to recognise words in print, then to use them in speech or sign. Buckley and Bird (1993) assert that once reading and oracy are established, children with DS are more able to gain phonic knowledge. It is considered by Adams (1990) that the acquisition of further sight vocabulary is more rapid when readers can use phonemic and orthographic knowledge to identify unknown words.

## **Contextual**

The 'contextual' strategy is where the reader guesses an unknown word which will fit the story using the illustrations, surrounding words or text (Buckley et al. in Stratford and Gunn, 1996). Contextual clues can aid pupils with DS to access a text, therefore it is important to look for reading material with a clear font and well positioned illustrations, as Edwards (1999) suggests. Edwards (1999) also highlights the importance of characters and content that the pupils can relate to. From wider reading there was a minority of writers such as Glenny in Benton and O'Brien (2000) who felt that illustrations were only a decorative distraction. The majority of writers argued that illustrations confirmed the meaning of the text for pupils with DS (Halliwell, 2003; Down's Syndrome Association, 2003; Mackinnon, 2008).

## **Theories of Reading Instruction for pupils with DS**

"Reading is a complex skill, and whilst there is agreement as to the processes that make up reading, there is considerable debate about the best way to teach it." (Glenny in Benton and O'Brien, 2000: 116). The literature review has revealed an ongoing debate over whether these strategies should be taught separately or simultaneously, and which of these processes should be given precedence. McGuinness (1997) argues against mixed method reading tuition, claiming that when children receive contradictory or conflicting instruction, they will often adopt a sight word strategy, which limits their progress. Glenny in Benton and O'Brien (2000) suggests that the arguments for teaching the sub-skills of the reading process explicitly, such as orthographic and phonological processing, are particularly strong for children with reading difficulties, but notes the research evidence of Sylva and Hurry (1995) which highlights the success of broadly based approaches for such children.

Writers such as Kumin (2002), Martin (2006) and Alton (2006) recommend the visual approach in the early stages of reading using photographs of the children and their immediate daily experiences with text underneath. This method is useful for introducing

functional language (Oelwein, 1995), which is important for pupils with DS as they will usually have considerably less language knowledge than other children at their reading level (Buckley et al. in Stratford and Gunn, 1996). It is a commonly held view that pupils with DS respond well to this method due to strong visual processing skills (Martin, 2006; Alton, 2006) but it is also advocated by some writers that phonics should be taught alongside (Rose Review, 2006; Bateman, 1991; Martin, 2006) in order for children to build the capacity to decode words as their reading skills develop and they encounter longer and more complex words. Single case studies offer interesting evidence of the success of one to one teaching methods such as the case study carried out by Gallaher et al. (2002), which explains how a pupil was tutored in phonics and sight word reading methods simultaneously, yielding significant progress data and improved comprehension skills.

Buckley et al. in Stratford and Gunn (1996) argue that phonic teaching should begin after a small sight vocabulary is established, using the words the child can already read to teach letter-sound correspondences, “which shows them from the start how the letter-sound knowledge can help them to read an unfamiliar word” (Buckley et al. in Stratford and Gunn, 1996: 274). They advocate that reading skills develop faster when the educator assists the child to progress slowly but steadily in using all three strategies. This approach confirms the theory of Frith (1985), which suggests that children move from a logographic (visual) stage to an alphabetic (phonological) stage and then to an orthographic stage (automatic identification). The guidance materials for teaching children with DS to read written by the Down’s Syndrome Association (2003) also advocate this theory, but recognise that most children with DS will not develop alphabetic strategies before they achieve a reading age of at least seven, therefore it is suggested that they will maintain their progress in reading by relying on logographic visual memory strategies in the earlier stages of reading. The researcher believes that that there is no ‘correct method’. It is important to look at the compatibility and interdependence of the different strategies, with consideration for the characteristic strengths and weaknesses of learning profiles in order to meet individual needs (Martin, 2006).

## **Chapter 3 Research Methodology**

The aim of this study is to investigate and evaluate the impact of the POPS reading scheme on the reading attainment of a group of pupils with DS, educated in a special school setting. This section offers some discussion of the two competing views of the social sciences that have influenced educational research and outlines why an action research approach was deemed the most appropriate method for this study. It describes the design, implementation, data collection and the strategies employed in the evaluation of the impact. This chapter concludes with an examination of ethical issues.

### **Educational Research**

A commonly cited definition of research is that of Stenhouse (1975) who asserts that research is systematic inquiry, made public. In education, research can take many forms, ranging from individual projects to multi-school initiatives and aims to methodically collect data in order to identify and better understand problems and processes (Lankshear and Knobel, 2004). There are two main overarching research paradigms employed in educational research, which represent opposing worldviews.

Quantitative research is rooted in the 'positivist' paradigm, which Mertens and McLaughlin (2004) assert is the collection of objective data to develop confidence that a specific claim is true or false. This scientific approach deals generally with a large sample in a controlled setting, with statistical methods of data analysis. However, some writers such as Walker (1985) discuss common criticisms of quantitative research: "Quantitative methods...are technically inadequate in the face of real problems, usually inappropriately used and fail to explain most of the variance they do reveal." (Walker, 1985: 88) It is also the view of some writers that quantitative research is too rigid for educational purposes (Haaken, 1998).

The opposing paradigm is an 'interpretive' approach, rooted in the humanities and looks for qualitative information (Husen in Keeves 1990). This approach deals generally with

small samples in a real world setting and focuses on the exploration and understanding of specific occurrences. Qualitative data analysis is usually descriptive and interpretive. Bryman asserts “One of the accusations that is periodically levelled at qualitative researchers is that they are disinclined to instil theoretical elements into their research.” (Bryman, 1996: 85) It is also suggested that qualitative methods are subjective, unreliable and lack validity checks (Walker, 1985). While research methods are often characterised into quantitative and qualitative approaches, Hammersley (1992) suggests that these approaches are not mutually exclusive. Each approach has its strengths and weaknesses and its appropriateness depends on the nature of the study and the type of information required.

### **Action Research**

Action research is defined by Feldman (2007) as improving the practice of the educational situations with which we are involved. Winter clarifies in stating, “The central purpose of action research is to carry through some form of change in practice, so that an action research report necessarily describes a sequence of events developing through time.” (Winter, 2002: 143). In order to inform and improve reading provision for a distinct group of pupils in this setting, it was decided that an action research design was most appropriate. Hart and Bond (1995) presented a typology of action research that identified seven distinguishing characteristics: it has an educative base; it deals with individuals within groups; it is problem focused; it involves a change intervention; it aims at improvement and involvement; it is a cyclic process; and it is founded on collaboration between action researchers and participants. Action research is said to be a qualitative intervention, but qualitative and quantitative research methods may be employed to collect data. The main criticisms of action research have been summarised by Cohen and Manion (1994), who assert that samples are generally restricted, with objectives and findings restricted to the environment in which the research study is carried out.

Feldman (2007) argues that the action researcher needs to pay attention to validity in order to reduce criticism, highlighting the importance of detailed descriptions of how and

why data was collected and providing an explanation or theory of why the intervention works. He also suggests that representing the same data set in different ways can increase validity, offering opportunities for analysis. Winter (2002) also argues that using multiple perspectives will increase the validity of the study, such as asking for the views of the parents of participants as well as the participants themselves.

In order to investigate and evaluate the impact of the POPS reading scheme within a valid action research study, it was important to look at pupil progress and feedback from pupils, parents and staff about the content of the scheme compared to other reading schemes used by the school. To create a detailed study within the limited research time, a relatively small sample of eight pupils with DS from across the age range within this setting was selected at random as the participant group. Wishart in Lewis and Norwich (2004) asserts that when educational research focuses specifically on children with DS, the inclusion of a comparison group is rare, creating problematic interpretation of findings. In order to increase the validity of the study and provide opportunities for comparative interpretation, the three girls and five boys were matched by gender to pupils with (as close as possible) a similar age and ability, in order to formulate a comparison group. This also ensured that statistical significance between the groups was established, as recommended by Birsh (2005).

To limit disruption for the pupils, the reading intervention was delivered within their regular one to one literacy support sessions. The Higher Level Teaching Assistant (HLTA) who delivered these sessions was fully briefed as a research assistant, planning structured sessions using the POPS resources instead of the current reading scheme in partnership with the researcher. The HLTA was enthusiastic about the POPS approach and she held a personal interest in the findings as her own son had DS. By using a research assistant to deliver the intervention, the balance between participating in the activity and remaining separate to offer objective judgments was easily achieved.

Wishart in Lewis and Norwich (2004) maintains that interpretation of research findings can be difficult “especially when ability at entry to the study is poorly defined, and

progress is rather loosely measured.” (Wishart in Lewis and Norwich, 2004: 87) In order to ensure that progress evidence was robust, a detailed placement assessment was carried out with each of the pupils involved in the study using the school assessment system, B Squared. B Squared explodes the P level descriptors into smaller targets and measures progress as a percentage of a P level. This ensured that the progress made by the pupils of the lowest ability selected was still measurable. In order to evaluate the impact of the POPS reading scheme on the reading attainment of the identified group of pupils, summative assessment data was collected from the B Squared assessment system after each full term of the intervention.

During the first literacy support session in the autumn term, the selected pupils were introduced to the first pack of POPS books regardless of their reading levels. This provided opportunities to gauge enjoyment and provided a baseline of the words in the scheme that the more able pupils could already read before teaching began. Each pupil used the POPS scheme for twenty minutes, three times a week. A whole word approach was used where the pupil was encouraged to match words, select words and finally name the words. Adjustments made to the scheme were informally noted throughout. Spontaneous discussion about the story and illustrations was encouraged and was facilitated through appropriate means, for example speech, Makaton signing, or the provision of symbol cards. As the sessions progressed, the associated phonics games were systematically introduced where appropriate for the child. Both parents and school staff were asked to support the pupils by sharing their POPS book with them once a week at home or in the classroom environment. The comparison group continued to use books from the school reading scheme.

## **Limitations**

The time constraints and parameters of this assignment have allowed for only one cycle of the intervention to be completed with eight pupils. The researcher recognises that this is a small sample within one school setting and acknowledges that the findings from this study may not be generalised for all pupils with DS. However, the broad age, ability and difficulty range presented in the sample can be said to be representative of pupils with DS who are commonly educated within special school settings such as this one.

The main limitation of using the B Squared assessment system to measure the impact of the POPS reading scheme was the lack of standardised scores for accurate comparison, but as none of the selected pupils were able to score on a standardised reading test, this was felt the only fair and comparable method of assessment. The system was open for all staff to input assessment data at any time and it was noted that it would be too difficult to find out the specific impact POPS was having. In order to ensure that specific assessment data could be collected, the B Squared system was set up on a laptop computer, where only the researcher and the research assistant were able to input data. All progress measured from the baseline point was due to the POPS intervention. The data collected on the laptop will be imported and merged with the whole school intranet system after the study has been completed, in order to generate a combined measure of progress.

The POPS materials were sent home with the pupils at the end of each week. It was recognised that some parents shared the books with their child on a weekly basis, and some parents shared the books sporadically for a variety of reasons. In order to limit the impact of this on the progress information, pupils took home the book that they had already read and explored at school that week. This meant that parents were consolidating the learning rather than introducing new books.

In order to ascertain the views of pupils and parents on the POPS reading scheme, information was collected through questionnaires and an interview schedule.

### **Questions to parents**

The researcher advocates the importance of parental involvement, believing that parents have a vital role to play in helping their children and supporting the school in developing skills. Parents were introduced to the study before the intervention took place and their views were gathered via short questionnaires before and after the intervention. Suggested answers were given for the parents to circle, with further space offered for parents to make comments. This was completed with or without telephone support depending on their preference.

The initial questions asked were:

In general, does your child enjoy reading or being read to at home?

What are your opinions on the reading books that your child currently reads at school?

What is your child's opinion on the reading books they currently read at school?

Is your child happy to read / be read to from a school reading book at home?

Do you have a regular time for reading activities at home?

In a normal week, how often do you read with, or read to your child at home?

Does your child play any reading games at home? (E.g. letter or word jigsaws, word games on the computer)

What kind of reading material does your child prefer?

Does your child like books about a particular topic? (E.g. transport, horses, etc)

Do you think your child recognises words (E.g. their name, words in a familiar book) by 'sight' – by remembering and recognising their size and shape, or by phonics – where they are able to sound out a word 'c' 'a' 't' - 'cat', or both?

The final questions asked were:

What are your opinions of the POPS reading books that your child has been reading from?

What is your child's opinion of the POPS reading books?

Is your child happy to read / be read to from the POPS reading books at home?

Since the first questionnaire you completed, have you been reading with your child more at home? How often?

Has your child showed an improvement in their reading skills at home?

Do you feel that your child has developed any new skills, or have you noticed them doing anything different when they have been reading with you at home?

Interview schedules were used with the pupils and the HLTA within the familiar surroundings of the literacy support base. The supported interviews were carried out after one term of intervention by the researcher, who is experienced in facilitating communication with pupils with special educational needs through appropriate methods such as Makaton signing and provision of symbol boards. Great care was taken to ensure that the pupils expressed their own opinions and were not simply responding to leading questions. The pupils were prompted to add detail to their responses, for example using a symbol set to ask a pupil to explain why they liked the POPS books, or engaging the pupil in conversation about good places to read, in order to ascertain where in particular they liked to read and why. The interview schedule was short so as not to overwhelm those who were less articulate. Pupils were given adequate time to express their opinions, and their responses were scribed on their behalf. It was expected that more factual details of reading activities and preferences at home and school could be collected more accurately and conveniently from parents and school staff.

### **Questions to the pupils**

Do you like to read?

Do you like the school reading books? Why?

What kind of books do you like to read?

Where do you like to read?

Who do you like to read with?

The Every Child Matters (2004) agenda advocates the importance of listening to the child's voice, therefore the pupil interviews were invaluable in providing authentic opinions, depth of insights and unexpected information. The limitations of performing such interviews were however, that they were particularly time consuming and costly to perform. The parental questionnaires offered the opportunity to gain specific information about many performance indicators at once, but the limitations were that questions could be misinterpreted or left blank, or responses may be superficial. Despite the limitations, the data collected from the pupils with DS, their parents and school staff provided a wealth of material, which is discussed in some detail later.

The time constraints of this assignment allowed for one full cycle of the intervention to be completed. The data collected was then analysed to determine whether the intervention had a statistically significant effect on the development of reading skills. The findings informed conclusions and recommendations for future planning of the next cycle, in order to continue the intervention with those who were benefiting from it. The findings also enabled other pupils who may benefit to be identified.

### **Ethical Issues**

In order to fully consider the ethical issues relating to this study, the methodology was examined utilising the British Educational Research Association guidelines (1994). The following ethical considerations were deemed applicable to this study: consent, withdrawal from investigation, confidentiality and protection of participants.

As the participants in this study were children with special educational needs, extreme care was taken not to harm them either physically or mentally. As minors, children have a limited psychological or legal capacity to give informed consent; therefore consent must be gained according to relevant codes and practices. The British Psychological Society (2007) declares that this consent should come from parents, or those acting in '*loco parentis*'. In order to make the intentions of the research study clear to parents, a detailed participant information sheet was distributed and telephone discussions were

offered. Formal agreement was then sought. The pupils were provided with appropriate communication methods to ask any questions of their own, to ensure that their voices were heard as the Every Child Matters (2004) agenda advocates.

A formal withdrawal procedure was constructed and outlined to everyone involved in the research process. The rights of individuals to withdraw from the project were clearly stated and alternative arrangements were made available for any pupil who felt unable to continue. To ensure confidentiality, pupil names were removed from the research records and replaced by codes. A one name list was kept to enable coding to take place; this will be destroyed once the research is completed. A contract of confidentiality was also entered into with the school.

To protect the participants, individual performances were not discussed with school staff or parents, unless it was demonstrated that not to do so could lead to detrimental harm being suffered by the subject. Within the participant information sheet and subsequent telephone discussions, procedures were laid down for the contacting of the researcher in emergencies, should a protection issue arise. Termly debriefing sessions for school staff included a direct question appertaining to well being of individual subjects.

The researcher has fully taken into account the ethical considerations that are applicable to this study. By suggesting solutions to the ethical problems raised, this study has demonstrated adherence to the guidelines provided by BERA (1994) and the research ethics policy of John Moore's University.

## **Chapter 4 Research Focus**

Date:	03/09/07 to 14/03/08
Age range:	5 – 19 years
Pupil type:	Children with Down’s syndrome
Pupils in experimental group:	8
Pupils in comparison group:	8
Equivalence of groups:	All pupils have a statement of special educational needs and are matched by age and ability as closely as possible
Length of intervention:	2 terms
Assessment Method:	B Squared Assessment Tool

The aim of this research study is to test the claim made by the manufacturers of the POPS reading scheme on their website: “As your child enjoys their fun filled lives, their reading will improve this school year. Guaranteed!” This research study will test this claim by investigating and evaluating the impact of the programme on the reading attainment of eight pupils with Down’s syndrome who are educated in a special school setting. The findings from this study will inform the future development of reading provision in this setting for those pupils who are highly visual learners and learn to read words initially by ‘sight’. It is also hoped that the findings will inform future provision for pupils who have language delay and are struggling or unable to acquire phonic knowledge.

### **The POPS Reading Scheme**

As noted in earlier discussion, the POPS reading scheme, ‘Plenty of Potential’, is a new scheme that has been developed to use a whole word approach to reading. Marie Dunleavy, who is a parent of a child with DS, developed the POPS reading scheme and a detailed manual for teachers and parents. In this manual, Dunleavy (2006) claims that she wanted to write a scheme that incorporated appropriate and meaningful

content for her son, but which also included the first eight hundred words an English speaking child learns to say, to understand and to read. The books are based on the familiar family adventures of Kal, a boy with DS, and focus on building a sight vocabulary of functional and common words, remembered and recognised as whole words. The POPS catalogue with pictures of the POPS books is included in appendix 1. Within the first POPS series, termed the 'Red Elephant Series', there are four packs of books with four books in each pack. The books are graded one to four and progress in small steps. There are also word card sets for each book and phonics games to develop phonic knowledge alongside reading skills. Purchase of the entire scheme including the games and word cards is approximately £200.

### **Participants**

Within this setting there are a number of pupils with DS with a range of ages and abilities, from moderate to severe learning difficulties. Random selection of eight pupils from across the age range enabled a range of learning abilities for pupils with DS typically educated in special schools to be shown within the sample. All pupils had been accessing a variety of reading schemes and had a range of pre-reading and reading skills. Brief pupil profiles of the eight participants are outlined in appendix 2, to offer some background information on specific difficulties. Summative progress data was also collected from a comparison group of pupils with a similar age and ability who continued to read from other reading schemes during the intervention period.

### **Length of the Intervention**

The intervention ran from September 2007 to March 2008 during term time and is ongoing. Each child accessed three POPS sessions per week, lasting twenty minutes. If pupils were absent on a particular day, the sessions were rescheduled, enabling attendance to be maintained at one hundred percent. The sessions followed the curriculum support model already in place to avoid unnecessary disruption for the pupils. The sessions took place as follows:

## **Format of Sessions**

5 minutes	Recap discussion on previous book, character and word matching
10 minutes	Sharing the POPS book and using the associated word cards
5 minutes	Phonics games - sentence cards with illustrations based on consonant vowel consonant (CVC) words, elephant slider game to reinforce the phonics taught

## **Research Questions**

In order to investigate and evaluate the impact of the POPS reading scheme on the reading attainment of the participants, both quantitative and qualitative data collection methods were utilised. Quantitative data was collected from the B Squared assessment system in order to measure pupil progress. Qualitative data was collected in order to ascertain the opinions of pupils, parents and staff about the content of the scheme compared to other reading schemes used by the school. Three specific research questions were devised that would be answerable within the available time and provide a focus for this study:

- 1.) Is there a difference in the progress made between the participant group and the comparison group? In which particular areas?
- 2.) Is there a difference in the progress made by pupils of a higher or lower starting ability, or a higher or lower starting age?
- 3.) What are the opinions of pupils, parents and school staff on the content, layout, structure and pupil enjoyment of the POPS reading scheme?

## **Chapter 5 Research Findings**

A detailed placement assessment was carried out with each of the participants in order to ascertain a baseline. Summative assessment data from the end of the previous academic year provided a P level or National Curriculum level placement, which was followed by a more detailed assessment against the smaller targets exploded from each level, as set out within the school assessment system B Squared. A backslash was recorded against specific targets each time a pupil encountered or gained skills and understanding towards achieving them, documenting the breadth of knowledge gained. An achievement date was recorded as specific targets were mastered, allowing the B Squared system to accumulate a percentage of completion and demonstrating pupil progress within a level. The assessment record sheets detailing the smaller targets and the baseline percentage for each of the participants are included in appendix 3. Figure 1 presents the age distribution and the B Squared baseline assessment scores of the participants and the comparison group, collected in September 2007. It shows the wide age and ability range of the sample with eleven pupils working within the P levels (working towards National Curriculum level 1) and five pupils working within National Curriculum level 1.

In order to answer the research questions and to measure the impact of the POPS reading scheme on the reading attainment of the identified group of pupils, the research assistant added formative assessment data to the B Squared system after each intervention session. The class teachers continued to input data for the pupils in the comparison group as normal. Subsequent summative assessment data was collected from the B Squared assessment system after each full term for the participants and the comparison group. This progress data is recorded in figure 1. With pupils with severe learning difficulties (SLD) and profound and multiple learning difficulties (PMLD) there are often some targets that an individual cannot achieve, for example due to the limitations of their speech or physical ability. Therefore the B Squared package allows schools to set a 'best fit' measure to ensure that a pupil can move on to the next P level or National Curriculum level without having to achieve everything set out at the previous

level. The school has set the 'best fit' level at 80%, therefore as a pupil achieves this, they will automatically be moved onto the next level; the percent change recorded in figure 1 reflects this.

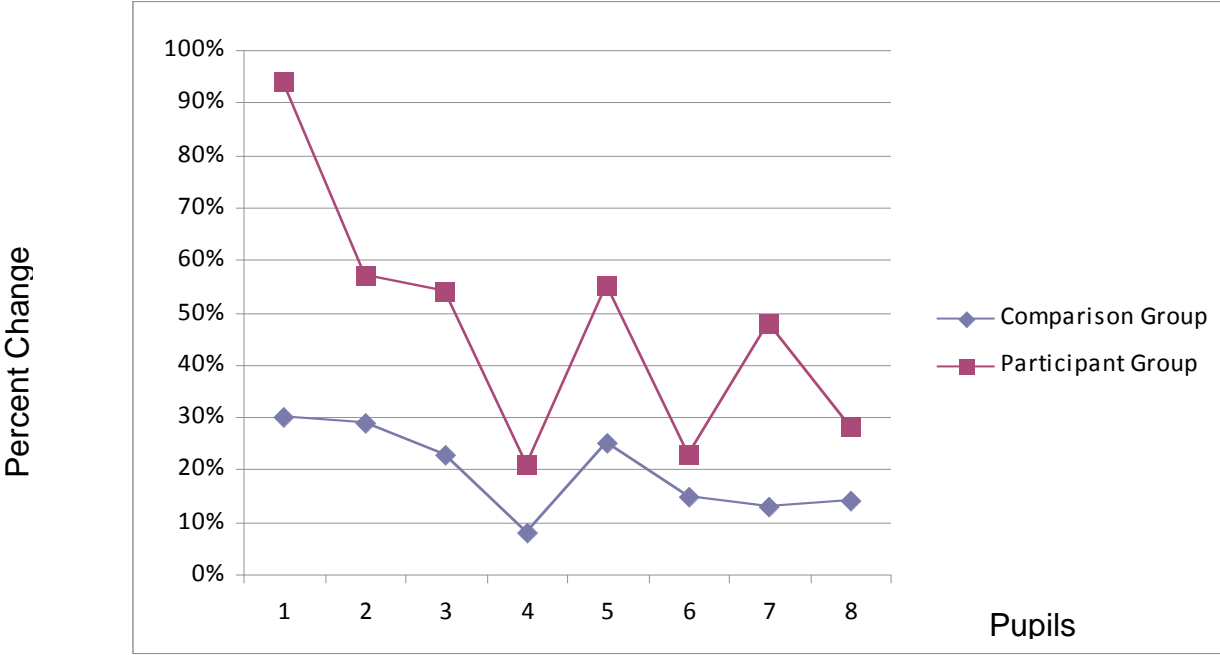
**Figure 1 Data table to show age distribution and assessment scores for participant group and comparison group**

Pupil Number	Chronological age September 2007	Baseline September 2007	End of Autumn Term December 2007	End of Spring Term March 2008	Percent Change
<b>Pupil 1</b>	5 y 10 m	9% of P5	59% of P5	23% of P6	94%
<b>Pupil 2</b>	12 y 8 m	28% of 1C	49% of 1C	5% of 1B	57%
<b>Pupil 3</b>	15 y 4 m	0% of 1C	22% of 1C	54% of 1C	54%
<b>Pupil 4</b>	16 y 0 m	5% of P7	13% of P7	26% of P7	21%
<b>Pupil 5</b>	16 y 2 m	36% of 1A	58% of 1A	11% of 2C	55%
<b>Pupil 6</b>	16 y 7 m	38% of P6	47% of P6	61% of P6	23%
<b>Pupil 7</b>	18 y 1 m	0% of P8	29% of P8	48% of P8	48%
<b>Pupil 8</b>	19 y 0 m	6% of P5	28% of P5	34% of P5	28%
<b>Pupil 9</b>	7 y 1 m	22% of P5	42 % of P5	52% of P5	30%
<b>Pupil 10</b>	12 y 7 m	67% of P8	78 % of P8	16% of 1C	29%
<b>Pupil 11</b>	15 y 8 m	7% of 1C	22 % of 1C	30% of 1C	23%
<b>Pupil 12</b>	14 y 9 m	0% of P7	4 % of P7	8% of P7	8%
<b>Pupil 13</b>	16 y 4 m	3% of 1A	11 % of 1A	28% of 1A	25%
<b>Pupil 14</b>	16 y 3 m	32% of P6	40 % of P6	47% of P6	15%
<b>Pupil 15</b>	17 y 2 m	62% of P7	69 % of P7	75% of P7	13%
<b>Pupil 16</b>	18 y 4 m	15% of P5	21 % of P5	29% of P5	14%

**1.) Is there a difference in the progress made between the participant group and the comparison group? In which particular areas?**

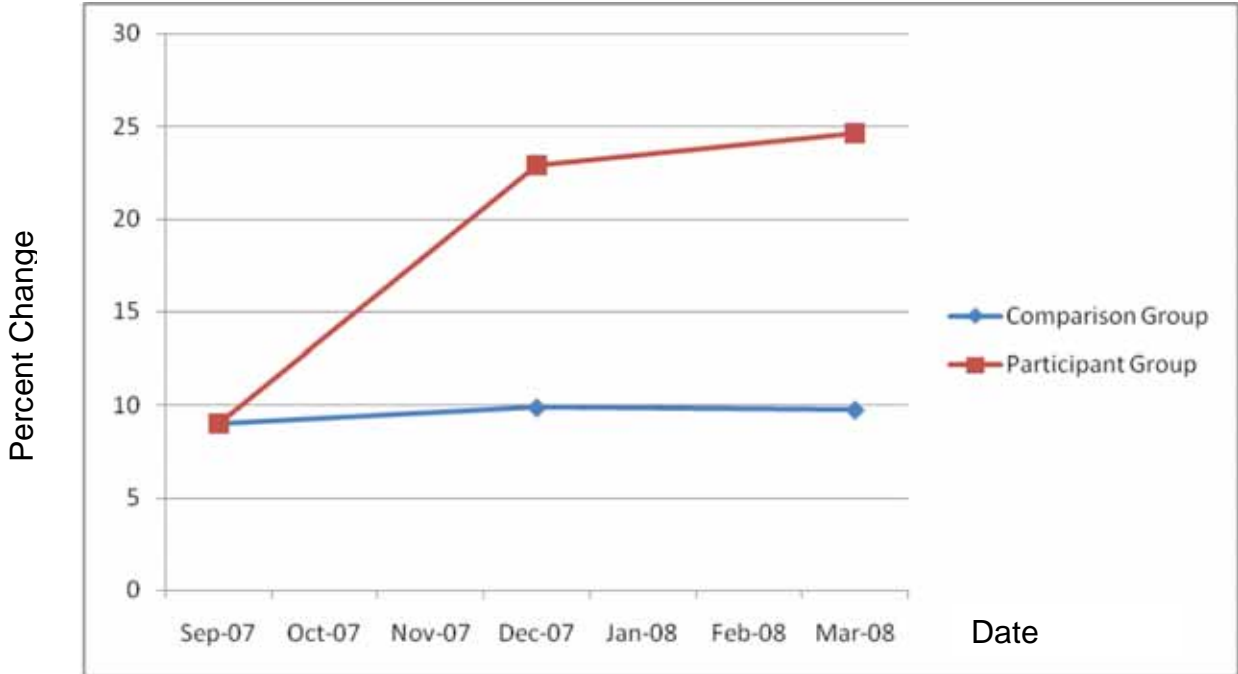
The summative assessment data presented in figure 1 shows the progress made in reading by the participant group and the comparison group after two terms. During these two terms, the participation group read from the POPS reading scheme three times a week and the comparison group, made up of pupils of similar ages and abilities, continued to read from the colour banded school reading scheme. The progress data clearly demonstrates that all pupils have made progress over time, from September 2007 to March 2008, however there is a significant difference between the progress made by the pupils in the participant group and the pupils in the comparison group. This progress information is presented as a line graph in figure 2, which highlights that the progress made by the pupils in the participant group is significantly higher than the progress made by the pupils in the comparison group. The evidence suggests that the participants have responded to the POPS reading programme and have made more rapid progress than those pupils still using the school colour banded reading scheme.

**Figure 2 Line graph to show the percent progress of the participant group and the comparison group after two terms**



To determine whether the intervention had a statistically significant effect on reading skill progression over time, the mean average progress of the participant group and the comparison group after each full term of the intervention was calculated. This average progress data is presented in figure 3. The mean average percent change of both groups from the previous term was 9%, offering a clear starting point from using the colour banded school reading scheme and the participant group changing to the POPS reading scheme. The evidence demonstrates that the comparison group of pupils with similar difficulties have made much less and much slower progress at a mean average of 19.6% change, than the participant group of pupils who are using a reading scheme that is clearly drawing upon their strengths, achieving a 47.5% change. From informal observations carried out by school staff, it is suggested that the pupils in the comparison group display limited interest and confidence when reading from the current school reading books.

**Figure 3 Line graph to show the mean progress of the participant group and the comparison group over time**



**Total Mean Percent Change**

Participant group  $380 \div 8 = 47.5\%$

Comparison group  $157 \div 8 = 19.625\%$

In order to ascertain which particular areas of reading the participant group have made progress in, it is useful to use the participant assessment record sheets. Assessment record sheets for each of the participants were also printed off after each full term of the intervention. This provided detailed information about specific areas of reading skill development. The participant assessment record sheets from the end of the autumn term are presented in appendix 4 and the participant assessment record sheets from the end of the spring term are presented in appendix 5. The assessment record sheets illustrate that progress has been made in all areas of reading, but there are also some specific points of interest pertinent to this study. For pupils working within the P levels, there is clear evidence that the POPS reading scheme has engaged their interest, for example pupil 1 achieving the target 'Share a book for 5 minutes' and pupil 8 achieving the target 'Sits for several minutes looking at a book by themselves'.

It is also noticeable that pupils working within the P levels are also beginning to develop their comprehension skills, for example pupil 4 who has achieved the target 'Answers questions about the story' and pupil 7 who has achieved the target 'Offers an appropriate word to complete a sentence'. Birsh (2005) advocates comprehension as the main goal of reading, and the researcher would suggest that the meaningful and familiar activities presented in the POPS books have enabled the participants to relate their own experiences and develop a deeper understanding of what they are reading, bringing this goal within their reach. During POPS sessions, it was also noted that the large, clear illustrations provided further support to enable pupils to answer comprehension questions about the story and as Rogow (1997) suggests, the repeated revisiting and reading of the same book helps the pupils to become even more familiar with the story events and associated language.

Evidence within the assessment record sheets for participants who are working within the National Curriculum levels shows that the POPS reading intervention has supported pupils to master many phonics targets under the headings 'letter names and sounds' and 'use of letter sounds', an area of difficulty previously identified for these pupils. Examples to demonstrate this increase in phonic knowledge are pupil 2, who has

achieved the target 'Identifies the sound of all letters' and pupil 3 who has achieved the target 'Identify the initial sounds of spoken words' since using the POPS reading scheme and associated phonics games. The evidence suggests that the combination of systematic teaching and the visual presentation of activities, in particular the flashcard matching element, provided by the POPS scheme have encouraged the more able pupils to build up their sight vocabulary and their knowledge of the letter names and sounds simultaneously. The POPS scheme is different from other reading schemes that have been used in this setting previously, as there is a much greater emphasis on using the visual and kinaesthetic channels of learning rather than the auditory channel, through the use of flashcards, matching activities and phonics games which include sliding parts.

This progress has enabled these pupils to begin to gain the skills needed to decode unfamiliar words, which will enable them to read an increasing range of words within familiar stories, as suggested by Adams (1990). There is also evidence of progress under the heading 'reading for information' demonstrating that the higher achieving pupils are able to apply their newly acquired reading knowledge in different contexts, for example to 'Use labels round the school' and 'Use wall notices to find information' as achieved by pupil 5. This evidence suggests that by engaging the pupils with a reading scheme that draws upon their particular strengths i.e. visual processing, as Kumin (2002), Martin (2006) and Alton (2006) remind us, pupils are more able to make progress within previous areas of difficulty.

## **2.) Is there a difference in the progress made by pupils of a higher or lower starting ability, or a higher or lower starting age?**

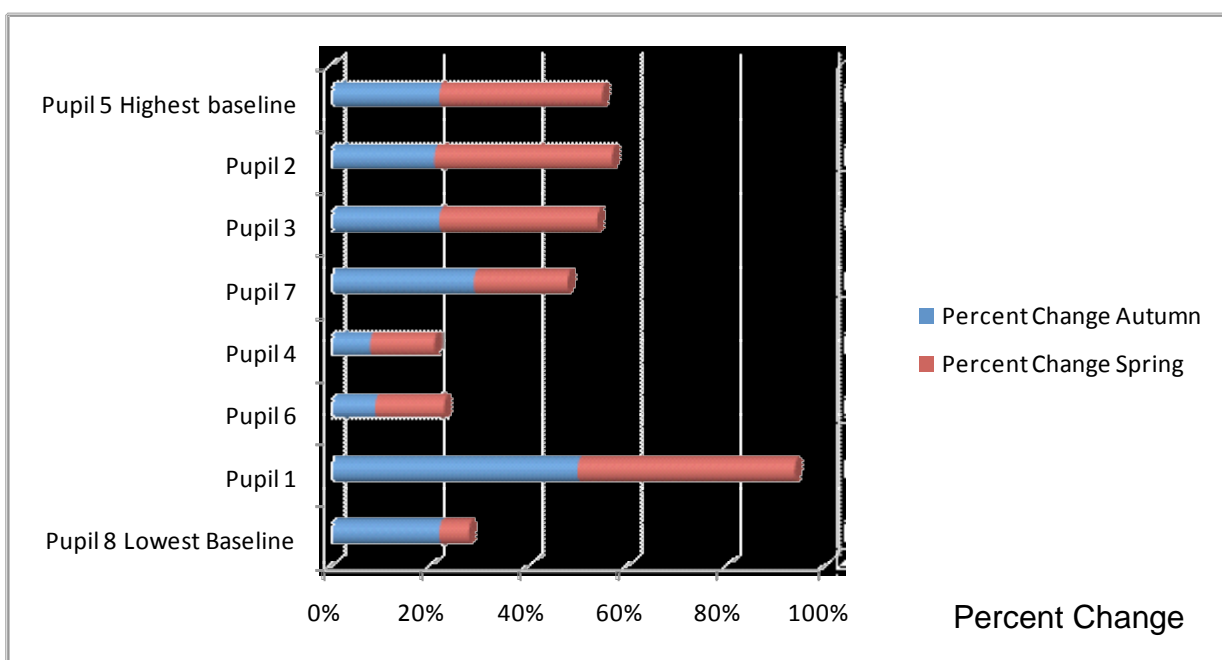
In order to analyse whether there is a difference in the progress made by pupils of a higher or lower starting ability, it is necessary to arrange the results in order of baseline assessment points. Figure 4 displays this information as a data table and as a bar chart. The data suggests that the most able pupils in the participant group, those who are working at P level 8 or National Curriculum level 1, have made the most progress.

The researcher suggests this is due to the cognitive ability of these pupils. The pupil profiles in appendix 2 illustrate that these pupils had less complex difficulties and had already made some progress with regard to their reading skills. These pupils had the ability to learn new vocabulary and were able to draw upon prior knowledge to help them to engage with the POPS reading scheme. These pupils were also more able to engage in discussion with the research assistant during the sessions, which aided their understanding of the POPS stories, providing increased opportunities for contextual knowledge to be improved.

The pupils working at P level 7 or below have made the least progress using the POPS reading scheme, although their progress is still significantly higher than their comparison group counterparts, as displayed in figure 1. This was to be expected, as these pupils had a lower cognitive ability and they also had more complex difficulties such as hearing difficulties. Some of the pupils also had visual difficulties although appropriate amendments were made to encourage access, for example enlarging the text on a photocopier. Pupil 4 has made the least progress overall, but as the pupil profiles in appendix 2 illustrate, the progress made is quite considerable considering her severe hearing impairment and her inability to speak. The research findings of Laws and Gunn (2002) yielded similar results, acknowledging that some of the differences in the reading ability of the 30 children and adolescents with DS involved in their study could be accounted for by some of the readers' significantly lower hearing thresholds. Rogow (1997) reminds us that it is a common misconception that pupils who are unable to speak cannot learn to read, and the progress made by pupil 4 corroborates this theory. Pupil 1 has made the most progress overall and is the anomaly as she started from a relatively low baseline within the participant group. The researcher suggests that the likely reason for this result is the participant's age. Pupil 1 is the youngest participant at six years old and research by Buckley et al. (1993), which explored teaching children with DS to read from a young age, found that rapid progress occurred, especially when the child had a production vocabulary of fifty words. Pupil 1 has a production vocabulary of around sixty words, therefore reflecting the findings of Buckley et al.

**Figure 4 Data table and bar chart to show differences in progress made by pupils from different starting points**

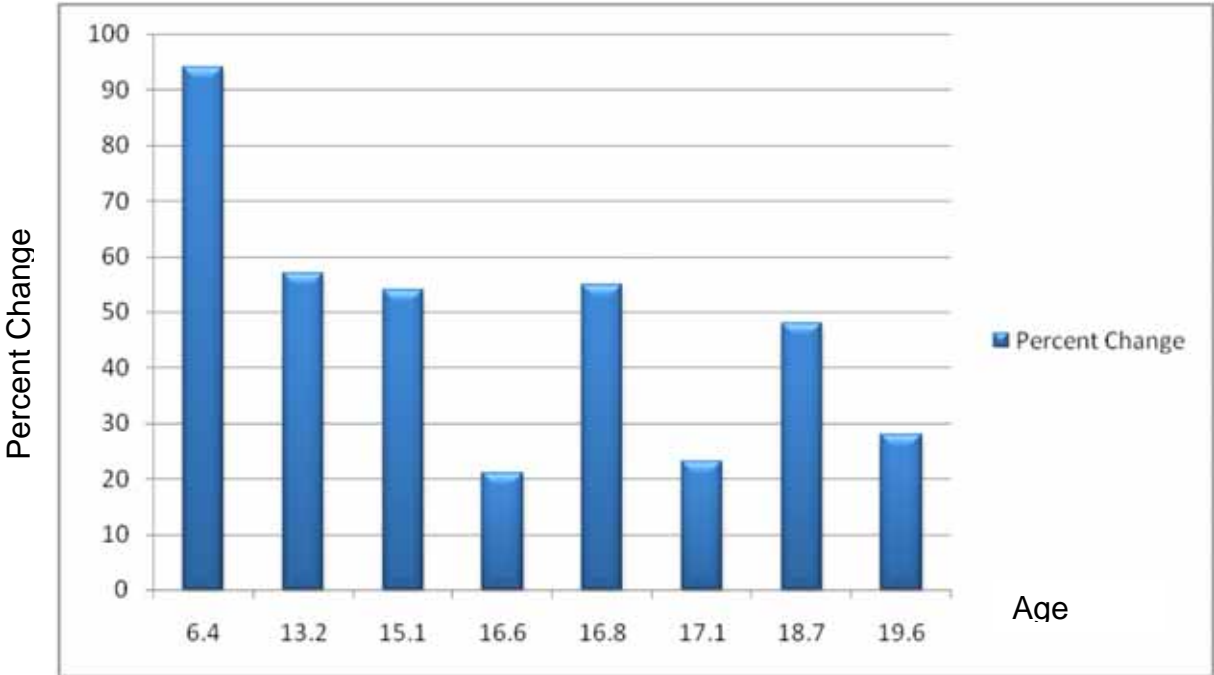
Pupil Number	Baseline September 2007	Percent change after two terms
<b>Pupil 5 Highest baseline</b>	36% of 1A	55%
<b>Pupil 2</b>	28% of 1C	57%
<b>Pupil 3</b>	0% of 1C	54%
<b>Pupil 7</b>	0% of P8	48%
<b>Pupil 4</b>	5% of P7	21%
<b>Pupil 6</b>	38% of P6	23%
<b>Pupil 1</b>	9% of P5	94%
<b>Pupil 8 Lowest baseline</b>	6% of P5	28%



In order to ascertain if there is a consistent correlation between age and progress and address the second part of the research question, it is necessary to look at the percentage of progress against the chronological age of the participants. Figure 5 displays this information as a data table and bar chart.

**Figure 5 Data table and bar chart to show differences in progress made by pupils of different ages**

Pupil Number	Chronological age March 2008	Percent progress made on the B Squared system after two terms
Pupil 1 <b>Youngest</b>	6 y 4 m	94%
Pupil 2	13 y 2 m	57%
Pupil 3	15 y 10 m	54%
Pupil 4	16 y 6 m	21%
Pupil 5	16 y 8 m	55%
Pupil 6	17 y 1 m	23%
Pupil 7	18 y 7 m	48%
Pupil 8 <b>Oldest</b>	19 y 6 m	28%



Research has found positive relationships between age and achievement in reading and language skills (Bochner et al., 2001). The data presented in figure 5 demonstrates that the correlation between age and progress is not perfect within this sample of pupils. However, the evidence suggests that the youngest pupils, pupils 1, 2, 3 and 5, have

made the most significant progress, reflecting the findings of Buckley et al (1993), Crombie and Gunn (1998) and Birsh (2005), who make a strong argument for early intervention. Pupil 4 does not fit the pattern and as discussed previously, her severe hearing impairment and inability to speak are the most likely reasons for her progress being statistically lower than older pupils within the participant group.

In analysing the data and considering the progress made by the participants, the researcher notes that the younger pupils repeatedly wanted to look at the same book, enjoying the familiarity of the storyline. It is suggested by some that repeated reading of the same book might help children who have language disorders to make progress with their reading skills, as the familiarity will assist children to anticipate story events and develop a more detailed comprehension (Rogow, 1997). Only one of the participants found the POPS reading books to be 'babyish'. Wishart, writing in Lewis and Norwich (2004) asserts that many pupils with DS have immature social skills. This was true of the remaining seven participants; they appeared to have no regard for the age of the POPS characters and thoroughly enjoyed reading the books.

As the literature review confirms, it is acknowledged that children with DS can successfully learn basic reading skills, but much less is known about continuing literacy development in older children and adolescents. Farrell in Stratford and Gunn (1996) suggests that this lack of research into literacy skill development of older children with DS may be due to teachers and parents assuming that pupils will not attain certain educational benchmarks if these have not already been achieved by early adolescence. This is termed by some writers as a 'ceiling of learning' or 'learning plateau' (Farrell and Elkins, 1991 cited in Gallaher 2002) and it is theorised that when young people with DS reach this in adolescence they are not able to progress beyond this (Stratford and Gunn, 1996), therefore the progress made by the older participants was of particular interest.

All post-adolescent pupils involved in this study have made progress. It is interesting to note that the progress made by the three oldest participants does not follow a particular pattern. Pupil 7 has made the most progress, possibly due to his higher baseline

starting point and higher level of cognitive ability than pupil 6 and pupil 8, who have complex difficulties, including visual, auditory and speech and language difficulties, as outlined in the pupil profiles in appendix 2. The findings from this study support the view of Male that “there is no evidence to support the myth that young people with Down syndrome reach a ceiling in adolescence and do not go beyond it” (Male in Florian, 2007: 510). The quantitative evidence highlights the range of literacy skills presented by a sample of the young adults currently educated in the post sixteen department of this setting and has clarified their capacity and ability to continue to make progress in their reading skill development.

### **3.) What are the opinions of pupils, parents and school staff on the content, layout, structure and pupil enjoyment of the POPS reading scheme?**

Initial parental opinions on the reading preferences of the participants were collected via questionnaires, which incorporated multiple choice answers and space for further comments. Parents were also invited to express their views about the reading books that their children read from, prior to the introduction of the POPS reading scheme in order to offer comparative evidence. All parents responded to the initial questionnaires and showed great interest in this research study. As two parents requested a full copy of the research report, a summary of questionnaire responses is presented in the appendices to ensure the confidentiality of participants. A copy of the initial parental questionnaire and the summary of responses are presented in appendix 6.

The questionnaire responses revealed mixed feelings about the previous school reading books, with three parents who liked them, two parents who remarked that they were too young and one parent who felt that the stories were not meaningful to their child. The majority of parents felt that their children liked the reading books, but were only sometimes happy to read them at home. Two parents suggested that a possible reason for this could be that their children preferred to read their own choice of material at home, such as television guides and wrestling magazines. Kumin (2002) claims that the factor found to be most highly related to learning to read is whether or not a child has

been read to. Although most parents reported that they read with or to their child a few times a week, the questionnaire feedback suggests that the older pupils did not particularly enjoy this activity. Informal discussions with some of the older participants within this study revealed that they preferred to play computer games or watch television at home. The researcher suggests that the technological developments of the Internet, electronic games consoles and other entertainment systems in the home environment have increased the interest of children in related leisure activities.

The parental responses showed that the participants enjoyed a range of reading material between them, with most preferring picture books. All but one parent reported that their child liked books about a particular topic, with examples given including animals and aeroplanes. The questionnaire aimed to ascertain whether parents had noticed their child using a particular strategy when reading at home. Two parents suggested that their child used sight recognition alone, and three parents felt that their child used both sight recognition and phonics. The remaining parents did not answer this question as they felt that their child was not able to recognise words. The varied feedback from the initial questionnaire confirmed that the wide range of reading preferences and interests of the participant group could be said to be representative of pupils with DS who are commonly educated within special school settings such as this one.

In order to gather pupil and parental opinions on the POPS reading scheme, supported interviews were carried out with each of the pupils after one term of the intervention. Parents were asked to complete a final questionnaire after the full research period of two terms. The supported pupil interviews are presented in appendix 7 and a copy of the final parental questionnaire and the summary of responses are presented in appendix 8.

Pupil enjoyment was high, with participants demonstrating an initial interest in the characters within the POPS books, which progressed over time to an excitement and keenness to read, with reports from school staff of repeated requests to read in between

sessions. The researcher is of the opinion that the success experienced by the pupils from reading with the POPS materials was increasing their confidence and self-esteem, encouraging them to want to revisit and engage in further reading and POPS activities. During the supported interviews, most pupils said that they liked to read, with all but one pupil stating that they liked the POPS reading books. This seemed to indicate that the pupils' achievement through POPS was increasing their confidence as readers, and this was reflected in discussions with school staff who worked with the participants on a day to day basis. Parental responses also displayed that the majority of parents liked the POPS reading books. The pupil who expressed a dislike for the POPS books having previously termed them 'babyish', stated that they were 'too much' during the supported interview. His parents also reported that they were 'not sure' about them. The researcher felt that the pupil's higher level of cognitive ability enabled him to recognise that the characters were younger than him, which made him feel that the books were not appropriate for him to read.

The rest of the feedback from school staff and informal discussions with pupils and parents about the content, layout and structure of the POPS reading books was positive. They reported that they found the layout of the POPS reading books to be clear, with colourful full page illustrations and a clear font typeface. They stated that the simple layout and short stories engaged the pupils' interest and stimulated skill development through the word matching box at the bottom of each page. School staff also specifically commented that the POPS scheme offered plenty of kinaesthetic activity with the elephant slider game and lotto games. The feedback suggested that the content was recognised as imaginative, with stories based on familiar activities and set in meaningful contexts. One parent declared that the POPS books had engaged their child's interest and enabled him to connect with story characters for the first time.

Only one parent commented on the fact that a character in the POPS books had DS and this was in a positive light. The parent described how the family had shared the POPS books together and stated that her older daughter had recognised that Kal had DS. Her daughter thought that this was 'cute' and liked Kal's 'quirky ways'. The parent reflected

in later discussion that her older daughter had likened Kal to her own brother who has DS. None of the pupils involved in the study recognised that Kal had DS. However, when a POPS book was shown to a mainstream visitor who attends the school on an integration placement, she instantly noticed that there was something different about Kal, questioning the height difference between Kal and the other characters in the story. She did not notice anything further than this and she continued to read from the POPS books with great enthusiasm. This proved to be an interesting discovery and the researcher would suggest that the participants may not have noticed due to their cognitive ability, or perhaps their own perception of disability and inclusion.

When asked which kind of books they preferred to read, half of the pupils expressed a preference for the POPS books, with one pupil stating that the POPS book 'The Doll's House' was his favourite book. When asked to give their opinions on whether their child had enjoyed reading the POPS books at home, parents expressed mixed views. Some parents remarked that they were still unable to encourage their child to read from a 'school' reading book at home, with a suggestion from one parent during a telephone conversation that their child was often 'too tired at the end of the school day for any further activities'. It is acknowledged that for some parents, it may prove too difficult due to issues such as family constraints, siblings or workload to find time to engage in after school activities. However, six parents found that their child was easier to engage in other reading activities and remarked that they were reading with or to their child more often at home, with examples of favourite reading material mentioned during the supported interviews such as Harry Potter and wrestling books. The researcher commends this, believing strongly that all reading is of great value to the holistic development of the child. It is also important to recognise the importance of providing a choice of reading material, especially within the home environment to allow children to read for pleasure. Most pupils said that they liked to read at home with their parents, and three pupils also said that they liked to read at school.

Responses from school staff indicated that they had noticed an improvement in the reading skills of the pupils within their classes, with seven of the parents also celebrating

this progress within the final parental questionnaires. Three parents specifically acknowledged that their child was able to talk about a story and answer questions. Three parents also stated that their child was able to point along with the words as they were reading to them. Class teachers were able to correlate progression in comprehension skills, also noting that children were able to articulate about the story and characters during class based sessions. The Down Syndrome Educational Trust (2007) have long advocated the use of reading as an effective way of developing speech and language skills, asserting that for children with DS, vision is an earlier route into language than auditory methods. Anecdotal evidence from school staff confirmed this view, indicating that all of the participants had learnt new words from the POPS reading books. They also suggested that there was evidence that the more able pupils were able to use and apply this knowledge in different contexts, demonstrating understanding. Two parents also remarked that they had noticed that their child was able to match and read new words. Duncan and Parkhouse (2001) assert that seeing and using words in different contexts is the key to ensuring that words become part of a child's visual memory.

Teachers in special schools are accustomed to drawing on the support of other professionals (Baker and Bovair, 1990) and often reap the benefits of having professionals such as speech and language therapists on site. The opinions of the speech and language therapists who work within this setting were sought on the POPS reading scheme and associated games. The therapists expressed the view that the POPS reading books were an excellent resource and were enthusiastic to use the associated games with the pupils with whom they were working. One therapist particularly commended the 'cumulative approach', where common words are revisited in each book. This reinforces familiar vocabulary in different settings enabling a pupil to develop a wider understanding of the meaning of common words. A good example of this is the POPS book 'Lunch at Cool Ketchup' where the POPS family visit a café for food. Familiar food related vocabulary is introduced and revisited in later books within the series. One pupil was able to apply his understanding and articulate a comparison of the ketchup in the story and using it on his burger during lunch in the cafeteria at

school. Pupil 1, the youngest pupil involved in the study, also made the connection with ketchup and another book she had explored, declaring that 'Kipper put ketchup in a cake'. This was later confirmed by school staff as an occurrence in a book from Oxford Reading Tree that the pupil had previously read at school.

The therapists suggested that a similar structure with photographs rather than illustrations would benefit pupils 4, 6 and 8 further. This view is corroborated by the Down's Syndrome Association (2003) who promote a reading approach which encourages families and educational practitioners to use familiar photographs and names of the child, family members, objects and familiar everyday activities revolving around the child's daily routine to promote early reading skill development. The speech and language therapists felt that using this approach to introduce the topic related words from the POPS books first would have aided the understanding of pupils 4, 6 and 8 before introducing the actual POPS story for that session. The photographs could then have been incorporated as a matching activity within the POPS session and promoted discussion related to everyday activities portrayed in the text.

## **Chapter 6 Discussion and Conclusions**

The aim of this study was to investigate and evaluate the impact of the POPS reading scheme on the reading attainment of a group of pupils with DS, educated in a special school setting. This chapter will aim to provide further discussion and comparison of the POPS resources with other studies. Recommendations for future development of the POPS resources and directions for future research will be suggested. This chapter will conclude with an overview of the second cycle of intervention and associated discussion of the importance of the use of specialist reading schemes within special school settings.

In keeping with the findings from other studies discussed in the literature review, it is clear that children with DS are able to learn to read when provided with appropriate resources and tuition. As evidenced from the quantitative data, all pupils made progress using the POPS resources that was greater to the progress made by pupils with similar ages, abilities and difficulties who continued to use a more conventional reading scheme and a phonics based approach. The POPS reading scheme is an excellent addition to school resources for use with those pupils unable to engage with reading through traditional phonics methods. The theories presented by several writers (Kumin, 2002; Martin, 2006; Alton, 2006) support the findings of this study, affirming that pupils with DS in the early stages of reading make more progress through a visual approach due to strong visual processing skills.

Bateman (1991) and Martin (2006) suggested that the other reading strategies should still be taught alongside a visual approach regardless of ability, but researchers such as Buckley et al. in Stratford and Gunn (1996) and The Down Syndrome Educational Trust (2007) maintain that phonic teaching should only begin after a small sight vocabulary of whole words is established. The findings from this study reflect the latter view, recognising that only the participants who had developed a sight vocabulary made specific progress in their phonic skills, as noted in the B Squared assessment records. Three class teachers reported that the participants working within the higher P levels or

National Curriculum levels had re-engaged with phonics and were applying knowledge gained from using the POPS phonics games during whole class phonics sessions. The participants working within the lowest P levels maintained some progress in their reading skill development by relying on logographic visual memory strategies. The format of the sessions will be adapted for some of these pupils to spend time during the session building up a small sight vocabulary rather than using the phonics games in the initial stages. They will still access phonic teaching during the whole class phonics sessions but their one to one time will be focused on building up a sight vocabulary which letter-sound correspondence teaching can then be based upon. The Down's Syndrome Association (2003) suggests that in order to aid the development of phonic skills, practitioners should use this sight vocabulary to teach simple word families with similar beginnings and endings, followed by initial sounds, graduating to consonant vowel consonant (CVC) words and simple blends.

The study was relatively small using a sample of eight pupils as a participant group, however the researcher believes that the broad age, ability and difficulty range presented in the sample could be representative of pupils with DS who are commonly educated within special school settings such as this one. The study explored the views of pupils and the adults supporting them during the intervention. Restricting the numbers in the study allowed for in-depth investigations that yielded a great deal of original, valuable and interesting data. The study also found progress evidence to confirm the theories of Birsh (2005), Edwards (1999) and Alton (2006), who promote the use of multi-sensory programmes which use all of the learning pathways in the brain: visual, auditory and kinaesthetic-tactile in order to enhance memory and learning. The POPS resources played to the strength of the participants as visual and kinaesthetic learners, assisting them to begin to develop their weaker channels of learning through the stronger ones. It was also evident that the greater the family involvement, the more benefit there was to the child (Crombie and Gunn, 1998). It was apparent that some families had more difficulties than others depending on differing constraints, however, it is recognised that being involved in interesting family conversations and social activities is just as important as sharing books. The meaningful stories in the POPS books based

on familiar family activities enabled the children in this setting, who have a vocabulary and general knowledge smaller than their typically developing peers, to derive meaning from the text, as Alton (2006) advocates. The researcher believes that educators, families and other agencies should make every effort to collaborate regularly, sharing knowledge and good practice, as this discussion highlights, it can make a fundamental difference to supporting children with Down's syndrome.

The POPS scheme introduces familiar and meaningful words within a cumulative approach, with the small steps progression enabling children to consolidate their knowledge over time and be successful in their reading. It also introduces functional words imaginatively and in familiar situations to aid understanding. Evidence from this study suggests that the participants were able to retain these words and use them in different contexts, possibly due to the detailed discussion provoked by the POPS books, which is more than the researcher has seen from other reading schemes. Difficulties associated with other schemes have been the rapid progression and too few books at each level, often only enabling children with DS to make limited progress (Edwards, 1999). This means that schemes have to be amended considerably by classroom practitioners, in order to make them accessible to children with DS. An example of such a scheme would be Storyworlds. The scheme has a controlled vocabulary but anecdotal evidence from practitioners alleges that the books move on too quickly for children with DS to continue to keep up. Practitioners have to produce additional books to supplement the scheme in order to slow the rate of progress down and reinforce the vocabulary. Another example would be the Breakthrough to Literacy materials, although the scheme progresses at a slower rate, classroom practitioners often have to produce vocabulary topic folders and flashcards as the basic folder has far too many words for the child with DS to search.

The author of the POPS reading scheme aimed to create a series of books that would overcome these difficulties. The researcher contacted the author of the POPS reading scheme, Marie Dunleavy, who claimed that her books were carefully designed to appeal to children with special educational needs with large text, colourful illustrations,

catchy stories, interactive games and a dose of humour. The findings from this study and the views of pupils, parents and school staff support this view. The author demonstrated considerable support for this study, requesting that a copy be sent to her as it adds to the general work and provides the first special school perspective on the scheme. The author is particularly interested in the recommendations that this study has to offer. The correspondence is presented as appendix 9 and offers an insight into how the author developed the resources, informed by the work of Sue Buckley at the Down Syndrome Educational Trust and Jennifer Wishart, Professor of Special Education at the University of Edinburgh, both of whom are referenced in this study.

As POPS is a new reading scheme, related literature and evaluations are limited, however, some research has been carried out with mainstream pupils with DS working within the National Curriculum levels for reading development and it is important to consider to what extent the findings from this study agree with the findings of others. An article published in the Primary Times (2006) expresses pleasure that a child with special educational needs is positively portrayed as a character within a reading scheme. The report asserts that POPS is a unique scheme that will dramatically improve reading for children with language delay, describing how some teachers have adopted the POPS resources after a string of reading schemes failed to lay to the strengths of the highly visual learners within their classes. The Down's Syndrome Association (2003) shares this view that relevant material and a visual approach provide easier access to reading skill development than more auditory approaches. This study strongly reflects these assertions, with the evidence suggesting an average progress increase for the participant group of double that of the comparison group, who continued to read from reading schemes without an emphasis on a visual approach.

The researcher was particularly interested in a study completed by Beadman (2007), which evaluated the use of the POPS reading scheme in three mainstream primary schools. The study concluded that the POPS scheme was flexible enough to use with each of the seven pupils with DS involved, regardless of their level of reading ability and reported that all pupils made significant progress. This study is similar in that all

participants made progress, however, the findings from this study confirm that some adaptation was required in order for the POPS materials to meet the needs of the participant group in this setting, in particular those pupils working at the lower end of the P level scale. These amendments will be discussed in some detail later. Beadman (2007) stated that the lotto game at the back of the POPS books proved very popular with all of the pupils involved in her study and claimed that the enjoyment and success experienced by the pupils provided a knock on effect of improved behaviour, self-esteem and attitude to learning within the trial schools. This study also recognised that the participants experienced success using the POPS materials, and there were noticeable improvements in self-esteem, with some participants asking to read more regularly at school. Beadman (2007) commended the POPS scheme for not 'playing safe' by limiting the vocabulary and content of the stories and noted that the pupils were more able to retain and use words they had learned in other contexts, reflecting the qualitative evidence from this study, as discussed in earlier chapters.

A criticism of the POPS scheme from Beadman's (2007) report was that one school felt that some of the content of the stories was somewhat inappropriate for the children with DS in their school. They did not use 'Belly Button Painting' and 'The Lost Keys' at the request of several parents who did not want the children to copy these behaviours. The other two schools involved in the study did not support this view. They felt that the books would offer opportunities to discuss right and wrong behaviours. The findings from this study seem to indicate that parents agreed with the view of the latter two schools, believing that the opportunities for personal and social discussion offered a new dimension to the pupil's learning experience during the POPS sessions. None of the parents of the participants suggested that any of the books were inappropriate for their child to read.

Research carried out by Campbell (2006) in a mainstream primary school found that teaching assistants using the POPS resources noted them to be highly effective for children with language delay. She described a pupil whose speech had started to develop after using the POPS resources for just one month. The assessment evidence

presented in this study suggests agreement that the POPS resources were highly effective for the participants with language delay and the entire participant group made considerable progress with their language skills during the intervention period. However, significant progress was not made in as short a time as Campbell (2006) noted, but this is to be expected as her subjects were mainstream pupils working within the National Curriculum levels and therefore had a higher cognitive ability than the participants in this study. Campbell (2006) heralded the small steps and structured progression of the POPS scheme with the first 800 words a child learns broken down into functional topics such as toys, clothes and animals as the reason for language skill development. She also endorsed the highly engaging illustrations which complemented the stories and promoted discussion. Earlier suggestions in this study also claimed that the clear illustrations provided further support to enable the participants to engage in detailed discussion and to answer comprehension questions about the story. The researcher notes that the studies carried out by Beadman (2007) and Campbell (2006) did not make use of a comparison group which would have increased their validity.

## **Recommendations**

The findings from this action research study indicate that the POPS approach was a success with the eight participants. The scheme was flexible enough to use with the more able pupils without amendment, however in contrast to the findings of Beadman (2007), this study confirms that some adaptation was required in order to meet the needs of the pupils working at the lower end of the P level scale in this setting. In order to make the books accessible to these pupils, school staff started to develop small photograph packs in order to support the pupils to derive meaning from the text, particularly where the events are outside of the pupils' experiences. It was necessary to further enlarge the text using a photocopier to allow a pupil with significant visual difficulties to access it. It was slightly disappointing to find that not all of the words were present in the word card packs to match each word within the sentences on each page of the book, only the key words from the bottom of each page were provided. For the pupils who had limited verbal capabilities but a high level of understanding, it was

necessary to adapt the scheme by making the missing cards in order to enable them to match the whole sentence.

Looking at the second series of POPS books, the Blue Elephant series, it is evident that some of the recommendations suggested in the studies carried out by Beadman (2007) and Campbell (2006) have already been incorporated. An example would be the recommendation from Beadman (2007) to include a comprehension box at the end of each story with key questions, choice answers and cloze procedure. The author has responded to this by incorporating two pages of comprehension activities at the end of each of the Blue Elephant books. The assessment information and the anecdotal evidence collected from pupils, parents and school staff during this study offered some further ideas for development of the POPS reading scheme. By incorporating some of the following recommendations, the researcher believes that the approach will benefit a greater number of pupils and increase the progress made by those pupils with severe learning difficulties working within the lower P levels.

The POPS scheme could be developed to incorporate an extended range of books to offer pupils a choice, which writers such as Farrell in Stratford and Gunn (1996), suggest will arouse the pupils' interest and encourage spontaneity. Different genres could add a further dimension to the scheme and cater for a wider range of learners. A non-fiction set of books could be developed, incorporating different members of the POPS family presenting simple information about different interests, for example transport, sea creatures or space, which may engage pupils who have similar interests. In order to enable pupils with low levels of understanding to derive meaning from the POPS books, the provision of photographs would be highly recommended. The non-fiction books could be developed including photographs alongside the text. Ready made photograph and symbol sets of key items from each of the Red Elephant and Blue Elephant story books would also be a useful addition for those pupils who are working at the lower end of the P level scale.

The findings from this study provide evidence that there is a gap in the market for high interest, low ability texts for older pupils. POPS could develop a set of texts based on social stories that would meet the criteria, with age appropriate life skills related topics such as road safety, bullying and personal hygiene providing the basis for the stories. They would need to offer opportunities for reading and language skill development through a word matching approach and photograph sequences to stimulate discussion. The genre of poetry could also be introduced, offering pupils different opportunities to join in with a text through the use of repetitive passages and phrases. Poetry books could also incorporate word matching games to help pupils to hear and recognise rhyming words.

It would be beneficial if the POPS books were available in different formats to further increase accessibility for pupils who are often educated in special school settings. For example, one of the participants had significant visual difficulties and the text in the POPS books needed to be further enlarged to allow him to access the reading materials. The POPS scheme is advertised as 'large, clear font', but for some pupils in a special school setting, it would be beneficial to be able to purchase the books in a font that is even larger. A symbolised version of the reading scheme may also be useful for those pupils who may still be unable to access the POPS books. The words should always accompany the symbols, building capacity for later reading skill development where appropriate, but this would enable pupils who read using Widget or Rebus symbols to enjoy a different set of story books. Incorporating ICT into the POPS scheme would add an interesting dimension and may help to engage the interest of more pupils, in particular those pupils working at the lower end of the P level scale. Talking stories with associated matching games on screen may further benefit visual and kinaesthetic learners. Passey (2006) acclaims the use of ICT to produce or modify resources for pupils with specific learning needs, and producing a simple CD Rom with images of the POPS family and familiar settings from the story would allow practitioners to produce individualised learning resources such as puppets and story boards to extend the learning opportunities for each POPS book as appropriate.

All of the words within each book should be provided on word cards, offering the opportunity to match whole sentences. This would be particularly useful for those pupils who may be verbally limited but have a high level of understanding. Extension activities would also be generated for more able pupils to create their own sentences using the word cards as they gain knowledge, skills and understanding. Many of the pupils in this setting have limited comprehension skills. There are comprehension pages at the back of the books from the Blue Elephant series, offering key questions and cloze procedure. It would be useful to have access to similar activities for the Red Elephant series, perhaps in the format of a set of comprehension activity cards, where pupils could use the Red Elephant series word cards within a different context.

An assessment package could be produced that includes pre-printed word lists and running records for each POPS book, offering a detailed record keeping system for practitioners delivering reading provision using the POPS resources. It is also suggested by Beadman (2007) that the POPS books could be used as a benchmark for key stage 1 Statutory Assessment Tests (SAT's), where pupils could be moderated against level 1 of the National Curriculum. As key stage 1 SAT's are teacher assessed, such records would provide the necessary evidence to level the pupils.

### **Directions for future research**

Marie Dunleavey (2006) has now published her Red Elephant and Blue Elephant series, and has a further series in development. She has plans to continue publishing until she has completed a comprehensive set of 100 titles and is also planning the release of a CD Rom later this year. Future research could focus on the introduction of the ICT element and what impact this has on pupils working at different levels. ICT would increase the multi-sensory appeal of the POPS scheme and offer further opportunities for learning through the kinaesthetic and tactile channels. It would be particularly interesting to conduct research into the progress made by those pupils working at the lower end of the P level scale in light of the recommendations of this study.

This study is a small contribution to the growing view that the POPS resources, originally created to support the reading development of children who are differently abled, in particular those children who are visual learners and those with language delay, can benefit pupils with a broader range of needs (Campbell, 2006; Roche, 2006). There is evidence to suggest that pupils with other difficulties have made progress using POPS after being unsuccessful on other reading schemes. Beadman (2007) reported that pupils with autism and communication difficulties had been introduced to the POPS scheme in her trial schools, with all pupils having made progress. In the correspondence in appendix 9, Marie Dunleavy also states that many children with autism are currently using the POPS resources. Roche (2006) maintains that any child with special educational needs, dyslexia, a developmental disability or even children learning English as their second language could use the POPS resources. It would be interesting to continue this research study by testing the POPS approach with different groups of pupils within this setting to ascertain if there is significant benefit for all pupils with SEN. The suggestion of the POPS resources benefiting children with English as an additional language would also be an interesting direction for future research.

The findings from this study have been shared with literacy subject leaders from local special schools during a recent literacy meeting, and it is hoped that special schools looking for new approaches to develop their reading provision will contact the researcher for further information. As Birsh (2005) suggests, the outcomes from a single study are not sufficient to generalise across all populations, therefore the identical replication of this study in a similar population by other researchers will ensure the convergence of evidence and offer opportunities to further improve the reading provision in special school settings.

## Conclusion

The findings from this action research study have changed and improved the reading provision and practice for the pupils in this setting who learn better through their visual channel, as they now have access to a reading scheme designed to use their strengths to overcome their areas of difficulty. It has particularly benefited those pupils who have language delay and are struggling or unable to acquire phonic knowledge, allowing them to re-engage with the reading process and build their self-esteem. The time constraints and parameters of this assignment have allowed for only one cycle of the intervention to be completed, however, the use of the POPS resources in this setting is ongoing. The resources have been adapted as outlined in the discussion and recommendations above for those pupils working at the lowest P levels, who made the most limited progress. A second cycle of intervention will commence for the participant group during the summer term, with the aim that the more able pupils will progress onto the second set of POPS resources, the Blue Elephant series. The findings from this study have enabled the identification of other pupils who may also benefit from the POPS approach in this setting. These pupils will also be introduced to the resources during their literacy curriculum support sessions as part of the second cycle of intervention.

The quantitative evidence from this study seems to indicate that all children working at or below level 1 of the National Curriculum would benefit from using the highly multi-sensory POPS resources. As Birsh (2005) reminds us, multi-sensory teaching simultaneously uses the sensory modalities: visual, auditory and kinaesthetic-tactile to enhance memory and learning. The POPS approach consistently makes links between these modalities, incorporating visual opportunities through the word cards and clear illustrations, auditory opportunities through the 'pair and share' page and listening to the story and kinaesthetic-tactile opportunities through the matching and lotto games and movement related phonics games. The multi-sensory techniques promote better retention as the research findings from this study have demonstrated. As the majority of pupils in this setting respond well to multi-sensory methods of teaching and learning, it has been recommended that the POPS resources should be made available to all

pupils. Based on the recommendations from this study, further packs of the POPS resources have been purchased, colour banded and integrated within the school reading scheme in order for all pupils to access them. As part of the second cycle of intervention, the reading skill progression of different groups of pupils within this setting will be monitored in order to ascertain if there is significant benefit for all pupils with SEN. The progress made by different groups of pupils will be compared and contrasted in order to offer recommendations for suitable adaptations.

The researcher has been invited to deliver a workshop on creative literacy at a conference organised by the Merseyside consortium of special schools in November. The findings and recommendations from this study will be shared with colleagues from special schools across the county, highlighting the use of the POPS resources as an example of good practice to develop reading skill progression and language development for children who are differently abled, in particular those children who are visual and kinaesthetic learners. Opportunities for creative teaching and learning will be suggested, such as using the familiar activities presented in the POPS books to engage pupils in detailed discussion and collaborative working, using the POPS books to promote story telling and to develop associated drama activities. The multi-sensory elements of the programme will provide suggestions for resource development opportunities to engage more pupils with reading and phonics. It is hoped that this study will pave the way for other researchers in the special school arena to share information and evidence of success and use this study to inform future research avenues. It is also hoped that the progress evidence will encourage other special school practitioners to trial the innovative resources with their own pupils.

In conclusion, this study confirms the claims made by the manufacturer of the POPS reading scheme, who guaranteed that the use of the POPS resources would ensure reading progress within a school year. Statistically significant progress in reading attainment was recorded for all eight participants who engaged with the POPS resources, which was interestingly more than double the progress made by the pupils in the comparison group. The interest that the author of the POPS resources has

expressed in this study is welcomed and it is hoped that the recommendations will be considered in future development of the POPS resources and initiatives.

The researcher is of the opinion that all children should be offered access to the important activity of reading and believes that reading tuition should be available to all, regardless of age, ability or difficulties. Reading instruction can be adapted through appropriate delivery, teaching and learning style or resources and it is our responsibility as educators to ensure that research into new developments and initiatives continues in order to ensure quality provision for our pupils. The value of reading is priceless. Reading opens up a world of possibilities by providing access to knowledge, understanding and information. Reading offers entertainment, enjoyment and enrichment of our every day lives. For pupils with learning difficulties, reading can also provide a vehicle to accelerate progress in other areas such as speech and language skills, working memory skills and enhance personal and social development and self esteem (Kumin, 2002; Downing, 2005; Martin, 2006).

It has been exceptionally worthwhile to research a method of reading instruction that has accelerated reading progression for children who have been excluded from the important activity of reading in the past. It is alleged by Sheppardson (1988) that the reason for this lack of access to reading was that some educators were against wasting time on teaching children with DS to read, as they felt that it would not be done well. Luckily, those times have changed and it is now recognised that for children with DS, reading is often a strength. Pupils with DS are now offered opportunities to further their knowledge, skills and understanding to levels not thought attainable in the past, thanks to pioneering manufacturers and educators whose products meet their specific learning needs.

Manufacturers are beginning to realise the market for multi-sensory reading schemes which appeal to different learning styles as a method of engaging children who are differently abled. The POPS reading scheme particularly engages strong visual learners and it is hoped that the introduction of an ICT component will engage strong

kinaesthetic-tactile learners with the same stories. We have now arrived at an exciting time of development where many researchers and manufacturers are preparing strategies and resources to suit a wide range of teaching and learning styles, designed to cater for the increasing interest in 'personalised learning'. It is fundamental that manufacturers continue to research and develop a variety of suitable reading schemes and resources to engage a range of learning styles and strengths. These resources will offer children who are differently abled access to reading which will open the world to them, broadening their horizons and enabling them to explore the rich tapestry of life.