

CHAPTER 2: Using the Toolbox Series for Literacy with Adult Struggling

Readers: A pilot case study

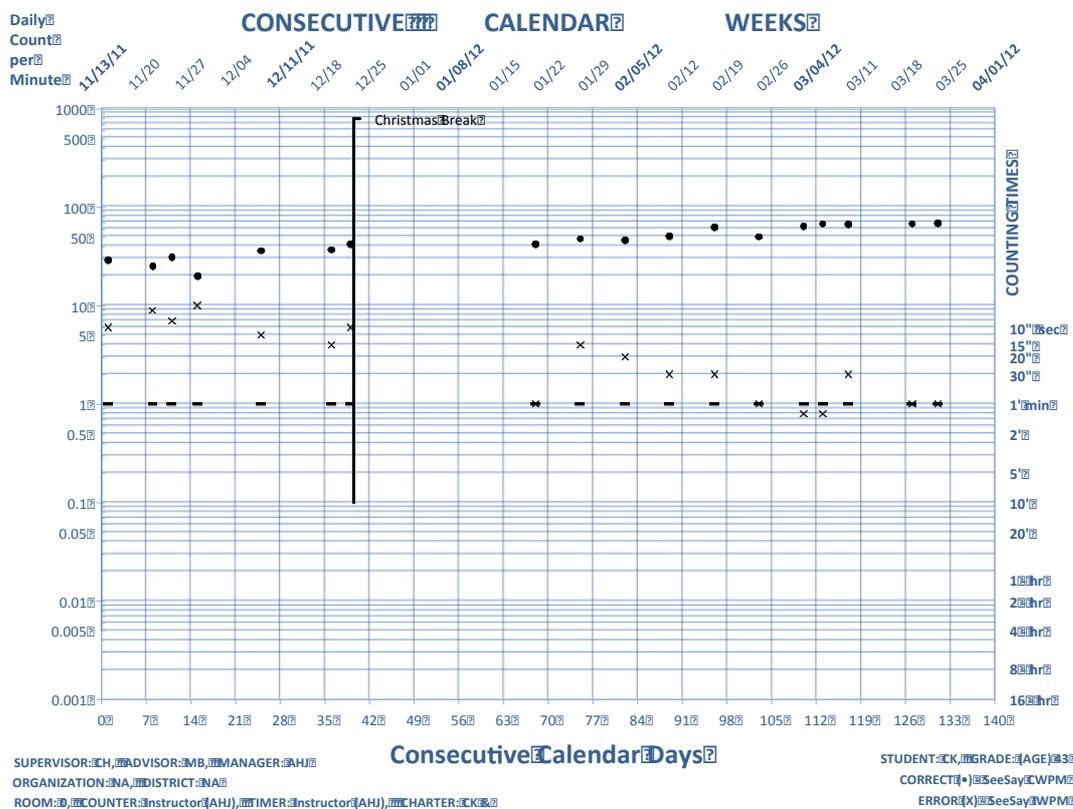


Figure 3 presents the number of correct words and incorrect words read per minute for CK. CK made a consistent increase in the number of correct words read per minute (from 29 to 69 cwpm) over a five month period. The first seven data points has greater variation (X 1.69 bounce) when compared to the final seven points in the data (X 1.10 bounce). The data demonstrates that CK managed to maintain the number of cwpm across the christmas break when intervention ceased for 3 weeks, and then further improve throughout the remainder of the intervention.

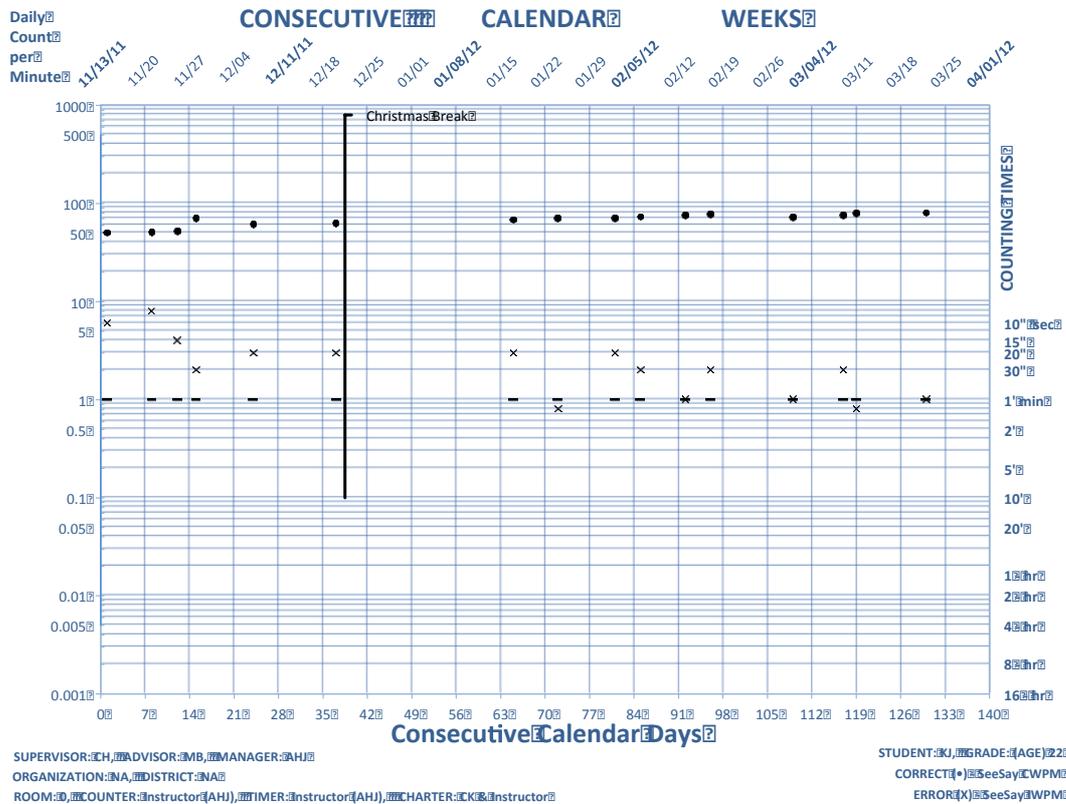


Figure 4 presents the number of correct words and incorrect words read per minute for KJ. The data demonstrates a steady increase from 50 to 91 cwpm across the intervention period (X 1.82). The first six data points displayed similar variation (X 0.70 bounce) when compared to the final six data points (X 0.79 bounce); however the trend of data supports the increase in performance from the start of the intervention to the end.

Discussion

The objective of the current case study was to examine whether the *Toolbox Series* could be used successfully with adults performing below their expected reading ability. A norm referenced Initial Assessment (IA; Niace, 2002) was taken at pre- and post-intervention and continuous progress monitoring assessments were taken in order to track progress

development. For the three participants who completed 36 hours of intervention (CK & KJ), reading ability increased by at least one level. Continuous progress monitoring assessments were taken throughout intervention as a means of tracking progress development; all three participants made improvements on each of the particular assessments on which they were measured.

The results of this study offer some preliminary evidence that the *Toolbox Series* could be beneficial as a literacy intervention for adults at risk of engaging in criminal behaviour who are also significantly behind in their literacy skills. The findings of the current study add to the body of research evidencing the efficacy of DI and PT as effective teaching reading techniques (see, for example, Adams & Engelmann, 1996; Carnine, Silbert, Kame'enui & Tarver, 2009; Kubina, Common & Heckard, 2009; National Reading Panel, 2000). This study may also help shed some light on feasibility issues with using the *Toolbox Series* to teach an adult cohort from this population. Feasibility issues have been discussed in the context of acceptability, practicality, and adaptation (Bowen et al., 2009).

Acceptability refers to how the individuals involved reacted to the intervention. During the early stages of setting up the study, it became apparent that establishing a level of commitment from participants with regard to attending meetings was proving difficult. In all cases, the time span of the intervention was extended by at least one quarter of the expected duration because participant's on average only attended 1.5 sessions per week as opposed to the pre-arranged 3. In the majority of cases, participants cancelled session in advance. However it was common for participants to fail to attend without prior warning. That said, once intervention was running and participants had turned up to a session they often expressed a desire to extend the session length. This is consistent with the research that suggests Direct Instruction and Precision Teaching methods are successful in maintaining

student attention and motivation (Binder & Watkins, 1990). However, in future research some thought needs to be given to the practicality of running multiple sessions per week with this population. It was also clear from the recruiting process that many adults who find themselves in these kinds of situations are motivated to engage in programmes because of the potential to earn money, or at least offset some of the costs of attending classes (e.g., travel costs). Future research should consider building in financial payment into the motivational system for starting, continuing, and completing the programme.

Practicality refers to the viability of the intervention with regard to time and financial constraints. The programmes' systematic instruction offers a number of advantages in the context of the population in this research. First, with the trainer following a clear structured arrangement teaching of reading material, they are better able to deliver the material without the need for extensive training, thus providing an inexpensive solution to delivering effective instruction to either an individual or a small group. This will be likely a significant issue in services where resources to employ or train educator will be severely limited. Second, the programmes based on two highly research and evidenced based approaches to teaching literacy; again, the pressure to use programmes that are backed by evidence is increasing within the context of limited resources. Third, the programme can be purchased easily and for a relatively small amount. And finally, the program provides a systematic instruction that can be used on one to one or even with a small group of learners who have similar levels of reading.

Adaptation refers to the level at which the programme needed to be adapted or modified to suit the population or context for example. During this study we found that additional tasks were introduced to increase fluency and accuracy of responding for one participant to be able to progress to further lessons. According to the instructors' manual, a

learner who is unable to correctly say 25 sounds or 30 words in a 30 second time period with less than two mistakes for each task should not progress on to further lessons. The instructor is then encouraged to review the previous four lessons with the learner and attempt the Fluency Check again. However, apart from advising that the learner should return to the four previous lessons the manual did not suggest alternative ways for the instructor to help the learner achieve a level of fluency to be able to pass the tasks. Therefore, instructors who may be unaware of techniques such as SAFMEDS may be unsure of what to do if revisiting previous lessons does not help the learner reach fluency.

The aim of this study was to evaluate the feasibility of using the *Toolbox Series* programme with adults at risk of engaging in offending behaviour, and thus offer some preliminary findings to examine the potential of up-scaling this programme and agency staff using it as one intervention to help those who they support. On the whole, we found the programme to be an effective stand-alone agent in allowing an instructor to teach and deliver the materials without having any previous experience. However, more research needs to be done to evaluate the use of the *Toolbox Series* programme with larger numbers of adults, and the potential financial impact that may result from using the programme.

Further research may wish to evaluate the use of the programme with larger numbers of a similar population and to be delivered as a group. It may have also have been interesting to explore post-intervention outcomes such as employment status and whether participants who go through the programme continue to engage with further education or training.

It is also clear that further research is needed to identify the reasons why adults do or do not engage in adult education. Further research into systematic instructional programmes such as the *Toolbox Series* may reveal further support for their effectiveness in teaching an adult population. This study has added to the limited research that looks at using manualised

reading programmes with adults and more specifically, adults at a disproportionately higher risk of offending behaviour. However, there remain a number of areas that require further investigation, such as whether this type of programme could be rolled out and delivered to larger cohorts of adult learners, and what are the key barriers to engaging in adult education. In conclusion, this represents an interesting approach to teaching basic literacy skills to underperforming adults, and in particular, those who are regarded as socially excluded due in part to their inability to read.

References

- Adams, G. L., & Englemann, S. (1996). *Research on direct instruction: 25 years beyond DISTAR*. Seattle, WA: Educational Achievement Systems.
- Andrews, D. A., Bonta, J., & Wormith, J. S. (2006). The Recent Past and Near Future of Risk and/or Need Assessment. *Crime & Delinquency*, 52 (1), 7-27.
- Becker, W. C. (1992). Direct Instruction: A twenty year review. In West, R. P., & Hamerlynck, L. A. (Eds.) *Designs for Excellence in Education: The Legacy of B. F. Skinner*. Part One, Selection II, 71 – 112. Longmont, CO: Sorpris West, Inc.
- Bereiter, C., & Englemann, S. (1966). *Teaching disadvantaged children in the preschool*. Englewood Cliffs, NJ: Prentice-Hall.
- Besser, S., Brooks, G., Burton, M., Parisella, M., Spare, Y., Stratford, S. (2004). Adult literacy learners' difficulties in reading: an exploratory study. London: NRDC.
- Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Weiner, D., Bakken, S., . . . Fernandez, M. (2009). How we design feasibility studies. *American Journal of Preventative Medicine*, 36(5), 452-7.
- Brooks, G. (2007). *What works for pupils with literacy difficulties? The effectiveness of intervention schemes*. London: DCSF Publications. Available from:
<http://www.standards.dcsf.gov.uk/phonics/downloads/gregbrooks.pdf>
- Carnine, D. W., Silbert, J., Kame'enui, E. J., & Tarver, S. G. (2009). *Direct instruction reading* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- Bynner, J., McIntosh, S., Vignoles, A., Dearden, L., Reed, H., & Van Reenen, J. (2001). *Improving Adult Basic Skills: Benefits to the Individual and to Society*. DfES Research Report 251. London: Department for Education and Skills.
- DfEE (2001). *Skills for life: the national strategy for improving adult literacy and*

- numeracy skills*. Nottingham: Department for Education and Employment.
www.dfes.gov.uk/readwriteplus/bank/ABS_Strategy_Doc_Final.pdf
- European Journal of Behaviour Analysis. (2003). Precision teaching special edition. 4(1 & 2)
- European Union (2012). Strategies for improving participation in and awareness of adult learning. Retrieved from http://ec.europa.eu/education/more-information/doc/2012/adult_en.pdf doi: 10.2766/26886
- Graf, S., & Lindsley, O. R. (2002). *Standard Celeration Charting*. Poland, Ohio: Graf Implements.
- Hughes, J. C., Beverley, M., & Whitehead, J. (2007). Using precision teaching to increase the fluency of word reading with problem readers. *European Journal of behaviour Analysis*, 8(1), 12-19.
- Kubina, R. M., Commons, M., & Heckard, B. (2009). Using precision teaching with direct instruction in a summer school program. *Journal of Direct Instruction*, 9, 1-12.
- Lochner, L., & Moretti, E. (2004). The effect of education on crime: Evidence from prison inmates, arrests, and self-reports. *The American Economic Review*, 94(1), 155-189.
- Maloney, M., Brearley, L., & Preece, J. (2002). *Toolbox for literacy: Instructor's manual*. Bellesville, ONT: Teach Your Children Well Press.
- Marrchand-Martella, N. E., Slocum, T. A., & Martella, R. C. (2004). *Introduction to Direct Instruction*. Boston, MA: Pearson.
- Moran, D. J., & Malott R. W. (2004). *Evidence-based educational methods: Advances from the behavioral sciences*. New York: Academic Press.
- National Reading Panel (NRP; 2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading*

- instruction. Washington, DC: National Institute Child Health and Human Development. (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.
- OECD. (1996). *Lifelong Learning for ALL*. Paris
- Rubenson, K., & Schuetze, H. G. (Eds.). (2000). *Transitions to the Knowledge Economy*. Vancouver, BC. University of British Columbia Press.
- Schuller, T., Preston, J., Hammond, C., Brassett-Grundy, A., & Bynner, J. (2004). *The benefits of learning: the impact of education on health, family life and social capital*. London: Routledge Falmer.
- Slocum, T. A., (2004) Direct Instruction: The Big Ideas. In D. J. Moran & R. W. Malott (Eds.). *Evidence-based educational methods: Advances from the behavioral sciences*. New York: Academic Press.
- UNESCO. (2010). *Education for all global monitoring report 2010: Reaching the marginalized*. Paris. Oxford University Press.
- Vassiliou, A. (2012). *EU High Level Group of Experts on Literacy: Final Report*. Retrieved June 15, 2013, from http://ec.europa.eu/education/literacy/what-eu/high-level-group/documents/literacy-final-report_en.pdf

**CHAPTER 3: Barriers to Adult Education as perceived by Adult learners,
Potential Learners, and Educators**

Abstract

Adulthood functional illiteracy puts substantial strain on the UK economy, and in the last few decades, increasing basic skills among adults has become an important area of investment. However, little is known about how adult learners regard adult education and even less about the perspectives of staff members who work for adult education organisations. We interviewed eight educators and ten adult learners using a semi-structured interview. Thematic Content Analysis was used to analyse the interview data. Three themes emerged: (i) The impact of low academic achievements on later life, (ii) Motivations to engage in adult education and, (iii) Barriers to adult education. There was high congruence between the learners and the educators, although they differed in the importance of particular barriers to education. For example, educators spoke of the negative attitude and low self-confidence of learners, whereas learners spoke of financial and practical issues that prevented them from engaging in adult education courses.

Adulthood functional illiteracy costs the UK economy approximately £81.3bn per annum (Cree, Kay, & Steward, 2012). ‘Functional illiteracy’ is the term used to define anyone performing below a Level 1⁷ in literacy and Level 3 in numeracy. According to the Department for Employment and Education guidelines, any person who is functionally illiterate lacks the necessary skills to function effectively within modern society (DfEE, 2001). Those who are functionally illiterate are at a higher risk of being unemployed and more likely to be marginalised from health and social aspects of life including general and mental health care, housing, and employment (Cree, Kay, & Steward, 2012; Silver, 1994). Bynner and McIntosh (2001) also suggest that illiterate adults are susceptible to greater mental and physical health problems, and other researchers have identified a relationship between low educational attainment and increased criminal behaviour (Sampson & Laub, 2003).

Survey results revealed that the UK adult literacy levels were found to be lower than 14 other member countries of the Organisation of Economic Co-operation and Development (OECD, 1997). The UK government have since made adult basic skills a priority, when this area had previously been ‘marginalised and under-resourced’ (Vorhaus, Litster, Frearson & Johnson, 2011, p10). In the last few decades, adult education has become an important area of investment (Coffield, 1997) and evidence demonstrating the positive effects of improving adult literacy has since emerged. Improved levels of education in the general population are associated with increased subjective quality of life, strengthened social relations within a wider community and broader career opportunities (Dolton & O’Neil, 1996; Feinstein, Budge, Vorhaus, & Duckworth, 2008).

⁷ Entry Level 1 is equivalent to attainment at age 5-7; Entry Level 2 equivalent to attainment at age 7-9; Entry Level 3 equivalent to attainment at age 9-11; and Level 1 equivalent to GCSE grades D-G.

To maximise participation in adult education, some higher education organisations offer financial incentives, learner-centred programmes, and flexible course schedules (Taylor, MacLeod, Houghton, Zwart, & Sachdev, 2005). However, despite educational provision being available, research suggests that a large proportion of adults who could benefit from such courses do not engage with these services and organisations that provide adult education (Cummings, Dyson, Jones, Laing, Scott, & Todd, 2010). Past research has investigated the circumstances relating to non-participation through qualitative and quantitative methods and a number of common ‘barriers’ and ‘deterrents’ have been identified. In 1990, Beder and colleagues interviewed 129 adult Iowa residents who did not complete high school or a General Education Diploma and had never attended an adult basic education course. Their main findings were that participants: 1) had a low perception of need to improve levels of education as adults, 2) felt that there was high effort involved, 3) had a previous dislike for school that meant that they had a disregard for returning to such an environment, and 4) reported situational barriers such as not having the availability of time and finances. Beder (1991) later refined the reasons for nonparticipation down to two main categories: *Structural* barriers that included external circumstances such as time restraints and lack of course availability, and *attitudinal* barriers such as the perception that education is pointless or effortful. The barriers outlined by Beder (1990; 1991) correspond closely with other research. Cross (1981) independently described structural and attitudinal barriers (although labelled them *situational* and *dispositional* barriers), and furthermore identified a third type of barrier: *institutional*. Cross (1981) described institutional barriers as any sort of policy or practice by the adult education centre that may cause barriers to potential adult learners (e.g., courses that require prior academic qualifications to be eligible to enrol).

Although there has been research about the perceptions of adult learners towards education, we could find no research investigating the perceptions of those who provide education services. Some information comes from ‘grey’ literature, in the form of a Learning and Skills Council report conducted by Bates and Aston (2004). Educators (those were responsible for the delivery of adult basic skill courses) and adult learners were interviewed. However, the authors did not draw out any differences between educator and learner responses.

The aim of the present study was to examine the perceptions of education provision and barriers to learning from two groups: 1) adult learners, and 2) education providers. Our aim was to explore similarities and discrepancies between the two groups’ perceptions. In the remainder of this paper, adult learners and potential learners will be referred to as ‘adult learners’ and the service providers as ‘educators’.

Method

Participants

Following ethical approval from the School of Psychology at Bangor University a total of 18 participants were recruited to take part in the study: ten adult learners, and eight educators. The mean age of learners was 33.5 years (range 19 to 58 years) and the mean age of educators was 36.5 years (range 23 to 47 years). Tables 1 and 2 summarise participants’ demographic details. All names have been changed to protect anonymity. Inclusion criteria for educators were as follows: 1) employees of an organisation that provided advice on or delivered adult basic education courses⁸, 2) had a direct experience of working with the

⁸ of note, one of the organisations included a crime reeducation charity of which a proportion of the learners accessed. Although this organisation provided educational courses they also provided many other services such as housing and financial advice.

adults that accessed the service, and 3) had been employed for a period of six months or longer. The inclusion criteria for learners were as follows: 1) learners accessed and received support from organisations or services that provided advice on or delivered adult basic education courses such as The Job Centre, crime reduction charities and libraries, and 2) had left compulsory schooling without achieving a qualification at GCSE level or they were currently seeking or attending a basic adult education course.

Table 1. *Participant information for the adult learner group.*

Name	Age	Gender	Currently in Education	Currently in Employment	Organisation*
Jane	34	F	Yes	No	2
Jacqueline	29	F	Yes	No	2
Alice	24	F	Yes	No	2
Abbie	29	F	Yes	No	2
Stephen	38	M	No	Yes	1
Alan	32	M	No	Yes	1
Neil	42	M	No	No	1
George	30	M	No	No	4
Glen	58	M	No	No	4
Michelle	19	F	No	No	4

* 1= crime reduction charity; 2= community-learning centre; 3= women’s centre; and 4= church run community outreach service

Table 2. *Participant information for the educator group.*

Name	Gender	Time employed by current organisation	Organisation*
William	M	15 yrs	1
Bruce	M	10 yrs	1
Sarah	F	8 yrs	3
Owain	M	6 yrs	1
Daniel	M	2 yrs	2
David	M	2 yrs	3
Sam	M	18 months	1
Adam	M	10 months	2

* 1= crime reduction charity; 2= community-learning centre; 3= women’s centre

Methodological Approach

Thematic Content Analysis (TCA: Braun & Clarke, 2006) was chosen as the method of analysis because of its suitability for exploring novel areas of research. Through using TCA and its characteristic 'bottom up' approach, we could ensure that the data were analysed without reference to previous research. We used a semi-structured interview, because this allowed for any topics introduced by participants to be explored, thus responding to the dynamics of conversational exchange and collecting information on the subject matter that may otherwise have been missed (Kvale, 2008; Seidman, 2006).

Once all of the audio recordings had been transcribed, they were divided up according to participant type (educator and adult learner), and were analysed separately. To enhance the quality of the data analysis, data were triangulated by comparing the coding with other researchers at each stage of analysis and throughout write up (Yardley, 2007).

First, the first author familiarized herself with the data, and read each transcript multiple times noting emergent 'codes' within the margin of the transcripts. 'Codes' are described by Boyatzis (1998) as "the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" (Boyatzis, 1998, p. 63). Second, the codes were extracted to form themes, such as 'school experience', 'perception of adult education', and 'barriers'. These themes were tabulated and compiled into a single document, so each transcript had a corresponding theme table. Third, the researcher extracted the tabulated themes and associated quotations from each transcript into a separate word document – a 'master-theme' document, which encompassed all identified themes for each group. At this stage there were two master theme documents, one for the learners, and one for educators. Finally, key similarities and differences between the two groups were drawn out and noted in a separate 'comparative' document, and then the write

up of data began, with close reference to the master themes document throughout the writing up process

Procedure

Following institutional ethics review and approval, nine organisations that were either advisors or providers of adult education in the North Wales area were approached. The researcher visited each of the organisations and informed the staff about the opportunity to take part in the study. Posters were distributed to the organisations detailing the study and contact details were provided so that potential participants could contact the researcher directly. All nine organisations agreed to display the posters on notice boards around the organisation. An email was also sent out to all of the organisations asking if they could forward the information on to anyone they thought might wish to take part in the study. A pdf version of the poster was attached to the email.

If a potential participant contacted the research team and expressed an interest in participating, then a face-to-face interview was arranged. Written and verbal consent was gained before the interview began. Participants did not see the interview schedule. However, they were provided with a general idea of what would be covered.

Interview questions differed slightly between educators and learners, although both had a general focus on experiences with, and perceived barriers to education; learners were asked about their personal experiences of adult education, whereas the educators were asked about how they perceived adult learners. Pilot interviews were trialled with two educators and two adult learners, whose data is not included in this study. As a result, minor alterations

were made to the interview format to facilitate the flow of conversation and exclude ambiguous questions.

For all participants, Interview times lasted between 15 and 55 minutes (Mean = 38.16 minutes). Following the interview, all participants were debriefed, thanked, and given the opportunity to be later informed about the results of the study.

Results

Three master themes were drawn from the data: 1) The impact of low academic achievements on later life, 2) Motivations to engage in adult education, and 3) Barriers to adult education (see Table 3).

Table 3. *Summary of themes and subthemes*

Themes	Subthemes
1 The impact of low academic achievements on later life	
2 Motivations to engage in adult education	
3 Barriers to adult education	
	3.1 Practical barriers
	3.2 Dispositional barriers
	3.3 Institutional barriers

Theme 1: The impact of low academic achievements on later life

All educators reported that low academic achievement impacted adversely upon the later life of the adult learners. The two areas they felt were most affected were employment prospects, and the overall self-confidence of adult learners. The majority, (n=7) of educators spoke of how low academic achievement led to either low paid jobs without much hope of

career progression, or long-term unemployment. David (educator) said: *'Not only have they got a lack of qualifications, quite often they've got a lack of skills too, so obviously they are not going to progress, they are not going to go into the highly paid job; They tend to move from job to job as well, so that they don't get the support.'*

Mirroring this opinion another educator Adam spoke of how low academic achievement was a barrier to proceeding onto the usual route of higher education:

Adam (educator): *'They feel limited by what they can apply for and what they can do if they didn't achieve results at GCSE English and maths, if they see that in a job or they see that's a stumbling block and they don't apply and it has an effect on them. They're ruled out of further education because they didn't have a good education from school.'*

Four educators reported that adults who have low academic achievement are often lacking in self-confidence, which could permeate their whole lives, and affect their ability to pro-actively seek employment. Sarah (educator) explained: *'It's affected how they see themselves, their confidence to find a job; they don't feel they are worthy to get one.'* Similarly, another educator suggested that low confidence was a contributing factor to unemployment: William: *'Yeah, it really affects them in a big way. It knocks their confidence and they feel they are unable to do anything, get a job, carry on as a normal person would.'*

Similar to educators, the group of adult learners also reported that low academic achievement lowered their job prospects, although fewer adult learners than educators spoke

of this link. Four of the ten adult learners stated that a lack of academic attainment limited them to low paid jobs, Alan (learner) said: '*[I] Probably wouldn't of ended up working as a grafter, [I would] be sat in an office making loads of money.*' Similarly, Neil stated: '*Well coming out of college I went into security work, no great prospectus [sic] type of thing.*'

In contrast to the educators, three adult learners did not feel that low academic achievements had a negative impact on their later life. Steve (learner) who said: '*I've done alright without them [qualifications]*' worked for a friend as an assistant plumber. Similarly when asked how having no GCSE's⁹ had affected her, Michelle replied: '*Affected my later life? No not really, it has not stopped me doing anything really.*' Jane (learner) had a clear goal to pursue a career in child-care and believed that she had '*Caught up*' since leaving compulsory education.

While both educators and learners on the whole believed that leaving school with low academic achievements would impact negatively on later life experiences, the reasons provided differed somewhat. Educators tended to focus on the effects on learners' self-confidence and the practical difficulties of finding work, whereas the learners just spoke of low employment prospects as the sole negative outcome, or did not regard their low academic achievement as having a negative impact on their life. Although educators talked of the low self-confidence of adult learners as a result of being a low academic achiever, this was not spoken of by adult learners themselves.

Theme 2: Motivations to engage in adult education

⁹ GCSE - General Certificate of Secondary Education, is a UK academic qualification

All educators said that adult learners were motivated to engage with education to make a positive change in their lives, and to improve the way they feel about themselves. Educators also believed that learners wanted to improve the way that others perceived them, and said that some learners wanted to improve their reading skills to be able to read to and help with the homework of children and grandchildren. Sarah (educator) noted: '*We have people you know that want to read stories to their grandkids.*'

Sam (educator) said: '*It's not just about getting a job, it's about having respect for yourself and we try and put that across to them you know that it's gaining confidence and self-esteem and being proud of something.*' Likewise William (educator) told us: '[learners want to] *Prove to others that they can do it, you know, like for so long they've felt like a failure. I think they reach a point and they feel they want to show what they're capable of doing.*'

Two educators talked about education as serving as a means to help learners who had difficulties with drugs or alcohol, in helping them in their recovery to abstain. Educators reasoned that educational courses offered a structured day-to-day focus for adult learners, especially to those who lived '*Chaotic lives*'. Bruce (educator) stated: '*A lot do it alongside their recovery, they throw themselves into education and courses and training and what not to help with their recovery, from drink or drugs or whatever.*' Similarly, Daniel (educator) reported that without the '*Structure*' of educational courses some adult learners are prone to falling back into the '*Old patterns of* [drug taking] *behaviour.*'

All of the learners regarded adult education as positive and a '*Really good idea*' in principle. Three learners referred to adult education as a second chance, and four others described the benefits of participating in an adult educational course as an '*Opportunity to*

broaden skills' and a way to '*Better yourself*'. One learner (George) stated: '*If you can get a second chance then why not. Its a chance to better yourself through proving you can work hard and achieve something in your life.*'

Alan (learner) described adult foundation education as an opportunity for himself and others like him: '*Getting the right people around them, who are encouraging them, then they'll go into higher education. That could be health and social care, it could be plumbing, it could be bricklaying.*'

Both educators and adult learners had shared views about how beneficial education could be, and all spoke of the motivation to engage with further education as a means to better oneself and to enhance future prospects. Although adult learners felt that education was a good thing in principle, when asked about how they personally might engage with education, they started to identify many barriers that prevented them personally from enrolling on or completing a course (see Theme 3).

Theme 3: Barriers to further education

There were many similarities between the learners' and educators' perceptions of barriers to accessing further education. However, the two groups had very different emphases on how pertinent particular barriers were. Adult learners spoke at length about the practical barriers they faced, whereas educators placed much more emphasis on the barriers arising from the attitude and low self-confidence of adult learners.

Sub-theme 3.1 Practical barriers

The majority of learners (n = 8) identified financial issues as the biggest barrier to accessing adult education, and spoke of both short-term costs, such as course fees, and long-term costs, such as compromising state benefits. Short-term costs such as course fees meant that one learner (Glen) had to discontinue a catering course: *'[I] Couldn't afford to keep up with the payments because I was trying to do it privately so I had to drop out as well. Basically, it's all come to nothing'*. For others, financial help with small costs made a big difference, Alice (learner) reported that she would not have been able to attend a course without getting subsidized bus tickets

Furthermore, three learners reported a fear of having their government financial support stopped if they were enrolled on an educational course. The possibility of having his financial support reduced deterred Neil (learner) from even considering enrolling on a course, he stated *'Not a chance would I even consider it like [returning to adult education] 'Cause I want to keep the money [government financial support] coming in don't I?'*

Another practical issue reported by three adult learners was the difficulty of juggling a course with the demands of parenthood, Jacqueline (learner) stated: *'My kids. It's more to do so with. I've got one with ADHD and I was always taking 'phone calls, come and get him from school and so that held me back.'* Another issue was finding suitable childcare for when adult learners were attending a course. Jacqueline said she would not have been able to attend a course without the provision of free childcare, and spoke of the additional benefits this had for her child: *'It's not only good for me but it's also good for my little one. It gives me the break I need, and it also helps with her because she probably wouldn't be going to nursery if it wasn't for them.'*

Although the majority of learners named difficulties with finance as a significant barrier to accessing basic education courses, educators saw financial issues as less of a problem, only half (n=4) of educators spoke of financial issues being a barrier, and did not elaborate on this issue as much as the adult learners did; William (educator) said: '*Finances, if they haven't got money that's a key one.*' Two educators spoke about the fear surrounding benefit losses, and the unhelpfulness of an inflexible benefit system.

Sarah (educator): '*If they attend the course, whether with it's with us or college that's deemed full time, regardless of what the contact time actually is, if it says full time, then they lose their benefits. They lose housing benefit. How on earth are they ever going to engage? How are they ever going to progress when we can't offer them that security and support? Nobody's going to engage in training when they are going to lose their income and their home*'.

Childcare was named as a barrier by two educators, one of which suggested that single mothers in particular struggled when trying to complete a course, noting the inflexibility of the course timeframes in regard to childcare responsibilities. Daniel (educator) also related the costs associated with paying childminders to financial implications stating: '*For a lot of people it's expensive and although the college will support with childcare costs, it's still expensive.*'

Other practical barriers included unstable personal circumstances of learners. Two educators spoke of homelessness, family issues, ongoing court cases, and drug abuse as factors that prevent learners from engaging in education. Sam (educator) said that '*All these things have to be addressed first*' before learners could fully engage with education. Another

educator (Sarah) stated that adult learners could sometimes be too highly medicated to focus on courses, stating: *'People on scripts (prescribed medication) are too highly medicated to remember what they're doing or remember appointments.'* Although none of the learners stated that drug or alcohol use was a current problem for them, one said it had affected her in the past, and had caused her to stop attending a higher education course, Abbie (learner) stated: *'It spiralled out of control a bit there so I left after a year to sort myself out.'*

Sub-theme 3.2: Dispositional Barriers

The majority of educators (n = 6) felt that the biggest barrier facing learners was their low self-confidence and negative attitudes towards education. Educators frequently referred to the *'low self-confidence'*, *'low self-esteem'* and *'self-worth.'* they encountered with adult learners. See examples below.

Owain (educator): *'I think a lot of it comes down to confidence. Going into a room full of people. So, I think they could come up with every excuse under the sun. Because don't forget we're working with a lot here that have had substance misuse issues, so their self esteem and confidence is at zero so I think that's the thing.'*

David (educator): *'Oh barriers. Well I think the main one would be self-belief. You know the sheer fact that they don't believe that they are worthy or good enough or you know, entitled I suppose. They have learnt to class themselves as second-class citizens.'*

William (educator): *'Doubting themselves and doubting their abilities... it can be a bit embarrassing for them.'*

Three educators also observed that learners who had previous bad experiences of education would often have a negative attitude towards adult education, and would thus be less likely to participate.

Sarah (educator): *'The most difficult thing that you come against is obviously the people away from work, probably dropped out of school, purely for the fact that they don't like classroom work they're not academically that brilliant at stuff, so it's difficult to then get them back in to that sort of environment. I would think that is the main barrier, just sort of trying to get them in a classroom environment, that's the reason they dropped out of school in the first place.'*

Adam (educator) felt that some learners had difficulties in realising that education might benefit them: *'Attitude. Thinking they don't need it because some really think that they don't need to do any learning and that to get on in life. They don't think they need basic skills.'*

Three educators suggested that some learners' attitudes differ according to age group. Two educators suggest that older adults are more difficult to engage because they have fewer skills than the younger learners and thus more likely to *'Have a barrier before they even come in and they think that it's not going to work'* (David - educator). Neil (educator) explained: *'Yes, and there's all sorts of reasons isn't there, from negative experiences to the*

stigma, to “I've done 50 years and I've never needed to so why now?” In contrast, Daniel (educator) stated that some people in their late teens/ early twenties were *‘really difficult to get hold of’* because of their *‘chaotic’* life style.

In contrast to the views of educators, adult learners very rarely identified a lack of confidence or their attitude as problematic. Only two adult learners reported that their own anxieties and lack of confidence prevented them from enrolling on an adult education course, although, unlike educators, they placed little importance on this. When asked whether he would consider enrolling on a course George (learner) replied: *‘No because I had the trouble in school with reading and that so I didn't bother. All these years down the line I didn't think about it because I haven't got any qualifications.’* Michelle (learner) reported feeling *‘nervy’* about attending a course alone. Unlike the educators, learners who did mention confidence as a barrier did so very briefly, and did not seem to feel that their own attitude toward education was in itself a barrier.

Sub-theme 3.3: Institutional barriers

Both groups identified problems with the institutions that provided educational programmes. Two adult learners did not regard the courses as easily accessible, reporting that they were either *‘unsuitable’* or *‘unavailable.’* George (learner) stated: *‘They hadn't really got anything that I wanted to do.’* Abbie (learner) expressed that she felt as though some courses were not aimed at an appropriate level for her skill set: *‘This is going to sound a bit condescending but some of it [was] very, very basic, yes.’* Additionally, Abbie reported frustration with the administration process, which was not always organised, and had led to her missing out on placements in the past.

Abbie: *'You leave your details and then they get lost and then you ring people up, they don't ring you back. And then when they do ring you back, the places have all gone. It's just ridiculous really.'*

In accord with this sub-theme, two educators recognised that their own organisations could generate barriers. Owain spoke of how the organisation he worked for could be disorganised and not work closely with learners, which led to adult learners being enrolled on courses that they have no interest in. Owain explained that learners can *'lose faith in the organisations'* if they receive what they believe to be an *'unacceptable service'*. Sam (educator) also suggested that organisations could be a barrier, for example, if they are unable to provide a particular course due to unavailability of suitable teachers.

Discussion

Our findings revealed largely congruent accounts of the perceptions of education provision and barriers to learning, albeit with distinct patterns emerging between adult learners and educators on some issues. Both groups spoke of how low academic achievement had negative impact on later life, such as lowered employment prospects (although three adult learners felt their lives were unaffected by a lack of qualifications). Educators also felt that low academic achievement had an impact on learners' feelings of self-worth, although this was not identified by any of the learners in this study.

Both groups were unanimous in regarding adult education as being a positive move for adults in principle, and many learners regarded adult education as a 'second chance'. However, while acknowledging that learning basic skills was likely to be beneficial, some

learners did not intend to enrol on education course, and said this was due to financial barriers.

The key differences between learners and educators were the importance they placed on particular barriers. Learners tended to speak of practical issues such as financial issues, childcare difficulties and availability of courses. Some learners received support for short-term costs such as bus tickets and childcare, which enabled them to engage in education. For others, the fear of losing government financial support meant that they did not consider enrolment on a course as a viable option. Conversely, the majority of educators felt that learners did not engage because of their negative attitudes toward education and their low levels of self-worth.

The discrepancy between educators and learners might be due to educators having a broader outlook than the adult learners as they are likely to see a wide variety of learners with differing ages and backgrounds, and may see how the attitudes of learners can be a barrier. Although learners did not see their own attitudes as a barrier, some claimed that a lack of basic skills has not hindered their career prospects, although given that higher academic achievement is associated with better job prospects and other life outcomes, this may not be the case.

We found that our categorisations of barriers (see Theme 3) were similar to previous research (Bates & Aston 2004; Beder, 1991; Cross 1981), which also identified dispositional barriers, situational barriers, and institutional barriers. We extended previous research by including the perceptions of educators, which also fell into similar categories.

The findings in this report are subject to two main limitations. First, these data apply only to the small number of participants, recruited from the area of North Wales. Therefore, we should be cautious in generalising the results to the greater population. Second, all of the

adult learners interviewed were already accessing support from a particular service and were therefore exposed to and / or had access to information on the adult education courses that were available. Consequently, it is possible that other adult learners / potential learners who did not have access would report different barriers.

Further research might increase the number of participants and recruit from a wider source of regions. Additionally further studies may survey what provisions and incentives organisations provide as a way of increasing adult education participation, and how effective these are. It would be interesting to investigate whether the provisions available address more internal attributes, such as increasing the self-confidence of learners, or practical assistance, such as childcare and financial support. We also found that educators also noted a difference in barriers depending on the age of the adult learner, with younger people leading more chaotic lives, whereas older people felt that they did not need education. Future research investigating differences between younger and older adult learners may help elucidate any differences and thus make more tailored interventions for different age groups.

The finding that practical issues, such as not having enough money to travel to a course or pay course fees, are so key for learners but are not seen as a priority by educators, may have implications for practice. Educators and institutions might increase the participation rates of learners by addressing the importance of practical issues of their learners, help with a simple cost such as a bus fare may mean the difference between engagement and non-engagement for some adult learners. This might be achieved by offering financial assistance in the form of travel expenses or reduced course costs, providing childcare options and offering a wider variation of course types.

A number of participants reported that they had received a negative past experience during the time they spent in compulsory education. They believed that this was one of the reasons they did not want to engage in adult education. With this in mind, it is important that research continues to investigate ways that improve the school experience for those who find it aversive. The following studies focus on secondary school children who are struggling academically and are beginning to disengage from the education system.

References

- Bates, A., & Aston, J. (2004). *Overcoming Barriers to Adult Basic Skills in Sussex. Institute for Employment Studies*. <http://www.employment-studies.co.uk>
- Beder, H. (1991). *Adult literacy: Implications for policy and practice*. Malabar, FL: Krieger Publishing Co.
- Blair, A., McPake, J. and Munn, P. (1995), A New Conceptualisation of Adult Participation in Education. *British Educational Research Journal*, 21, 629–644. doi: 10.1080/0141192950210506
- Braun, V., Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 7-101.
- Coffield, F. (1997). A national strategy for lifelong learning (Newcastle, University of Newcastle).
- Cummings, C., Dyson, A., Jones, L., Laing, K., Scott, k., & Todd, L. (2010). *Extended Services Evaluation Reaching Disadvantaged Group and Individuals: Thematic Review*. Department for Children, Schools and Families.
- DfES (2001). National Standards for Literacy and Numeracy. Nottingham DfES
- Organisation for Economic Cooperation and Development (OECD) (1997). *Literacy skills for the knowledge society* (Paris, OECD).
- Dolton, P. and O'Neil, D. (1996), “Unemployment duration and the restart effect”, *Economic Journal*, 106: 387-400.
- Domberg, S., & Winters, S. (1993). *Learning Styles and Needs of Adult Learner: The Art & Science of Entrepreneurship Education, 1*, Berea: Ohio.

- Feinstein, L., Budge, D., Vorhaus, J., & Duckworth, k. (2008). *The Social and personal benefits of learning. A summary of key research findings*. Centre for research on the wider benefits of learning.
<http://www.learningbenefits.net/publications/FlagshipPubs/Final%20WBL%20Synthesis%20Report.pdf>
- Feinstein, L. and Sabates, R. (2008). Public value in adult learning. Ad-Lib, *Journal for Continuing Liberal Adult Education*, (35), 1- 28
- Kvale S. (2008). *InterViews: learning the craft of qualitative research interviewing* (3rd ed.) London: Sage.
- Seidman I. (2006). *Interviewing as qualitative research: A guide for researchers in education and social sciences* (3rd ed.) Williston, VT: Teachers' College Press
- Silver, H. (2004). Social exclusion and social solidarity. *International Labour Review*, 133(5), 531-78.
- Vorhaus, J., Litster, J., Frearson M., & Johnson, S. (2011) Department for Business, Innovation and Skills. Review of research and evaluation on improving adult literacy and numeracy skills. BIS Research paper number 61 p10 www.BIS.gov.uk
- Yardley, L. (2007). *Demonstrating validity in qualitative psychology*. In, J. A. Smith,. (ed.). *Qualitative Psychology: A Practical Guide to Research Methods*. SAGE Ltd, (pp 235-251).

Chapter 4: A pilot evaluation of online reading programmes as a literacy teaching aid for secondary students at risk of academic failure: Practice-based evidence

Abstract

The purpose of the present study was to conduct a practice-based pilot evaluation of using MimioReading[®] *Comprehension* (MRC) (with some MimioSprout[®] *Early Reading* (MSER)) with an adolescent cohort from a mainstream school who were reading below their chronological reading age. Eight 12-13 year old students took part in the study and received the MRC programme for five months in place of their normal English lessons. One student who required additional reading instruction also received 23 episodes of MSER before beginning MRC. MRC was implemented with this cohort with only minor adaptation - an additional token economy was incorporated to supplement students' on-task behaviour. Students were assessed at pre- and post-intervention time using a standardised reading assessment (Dynamic Reading Analysis; DRA) and a self-perception scale (The Self-Perception Profile for Children; SPPC). The students made improvements in their reading abilities according to the DRA between pre- and post- intervention. In terms of self-perception, students scored lower (i.e., rated themselves more negatively) on the measure of global self-worth and behavioural conduct post-intervention, whereas there was no change in their perception of scholastic competence between pre- and post-intervention.

Children with reading difficulties who do not receive any form of intervention are at a significantly greater risk of experiencing difficulties throughout their school career (Kamil, 2003) and will quickly fall behind their peers who can read at the level expected for their chronological age with the gap widening exponentially (Juel, 1988; Stanovich, 1986). Following an investigation into offending behaviour of adolescents, Graham and Bowling (1995) also found that students who underperformed academically were more likely to truant and drop out of school, and that the average age of beginning to engage in offending behaviour is around 15 years.

An effective intervention that enables a child to learn more in a shorter amount of time is essential if they are to achieve their age-appropriate reading ability and prevent the negative effects associated with academic failure (Johnson & Layng, 1994; Johnson & Street, 2004). Remediation of reading deficiencies is most successfully achieved with an intervention that happens earlier rather than later (Cooke, Kretlow & Helf, 2010; McIntyre et al., 2005; Wanzek & Vaughn, 2007). However, it is unfortunately the case that many children do not receive intervention early on in their academic years and they subsequently fall progressively behind. Recent research conducted in the United Kingdom (UK) revealed that one in five children at the age of 11 were performing below their age appropriate reading ability (Ofsted, 2012). Studies have found that interventions that focus on basic reading instruction can benefit students who have reading deficiencies regardless of their age, suggesting that the reading difficulties of older students can be remediated effectively (Abbott & Berninger, 1999; NICHD, 2000).

The most effective intervention types rely on systematic, explicit instruction and provide maximum opportunities for students to practise the skills they have learned with immediate feedback (Swanson, 1999; Vaughn, Gersten, & Chard, 2000). The National

Reading Panel (2000) outlined five essential components (determined by empirical research) that an effective reading instructional programme should possess— phonemic awareness, phonics, vocabulary, fluency, and comprehension.

A particular type of reading intervention includes Computer Assisted Instruction (CAI), developed to teach a variety of academic skills (Fletcher-Flinn & Gravatt, 1995). CAI's have been used within the classroom setting to help children of all ages to become proficient at the basic reading skills (Hall, Hughes, & Filbert, 2000; Soe, Koki, & Chang, 2000). The effectiveness of CAI may be related to several factors: (a) individualised instruction delivered by the CAI saves the amount of time spent during teacher instruction, (b) the teacher is therefore able to facilitate learning and monitor on-task behaviour while the students continue their learning through the CAI, (c) programmes are tailored to the individual needs of each student, (d) CAI can maintain high levels of student motivation and attention and, (e) students can be provided with immediate feedback (Boone & Higgins, 1993; Carnine, Silbert and Kameenui, 1997; Lewis, 2000; Rieth & Semmel, 1991).

A CAI known as MimioSprout[®] *Early Reading* (MSER) and the sequel programme MimioReading[®] *Comprehension* (MRC) are online instructional reading programmes that function as a comprehensive package. A unique characteristic of the programmes is that they are a responsive technology, meaning that every click of the mouse made by the student is collated to comprise individual data of learner responses. Consequently, the programmes are then able to adapt instruction according to the learner's progress and performance. Repeated exposure of tasks where the student is struggling allows them to practice the skill until they become fluent within each component.

The MSER programme provides instruction for early reading skills and incorporates the five essential components outlined in the National Reading Panel report (NRP, 2000).

MRC is designed to follow on from MSER and focuses on developing the fundamental reading skills, teaching the learner how to implement the skills to aid reading comprehension. MRC expands on vocabulary and encourages the active use of multiple comprehension strategies (Leon, Layng, & Sota, 2012; NRP, 2000). Either programme can be used as a stand-alone intervention and delivered separately, or students can complete all or part of MSER before going on to MRC.

The MRC and MSER programmes have a rich evidence base advocating their effectiveness with younger children (see, for example, Layng, Twyman & Strikeleather, 2003; Layng, Twyman, & Strikeleather, 2004a; Layng, Twyman, & Strikeleather, 2004b). However, at this time no research exists on the effectiveness of MSER or MRC for older typically developing children with reading deficiencies.

The need to address the issue of underachieving readers in school is further emphasised by the research by Cunningham and Stanovich (2001) who found that struggling readers are likely to develop a negative attitude towards reading and subsequently begin to engage in a particular set of behaviours that serve to help them avoid the work assigned to them (Finn, 1995). These behaviours might include non-compliance within the classroom, such as refusing to complete class-work and may quickly graduate to more serious types of behaviour such as truancy and dropping out of school (Hibbert, 1990; Rutter, Maughan, Mortumirem Ouston, & Smith, 1979; Snow & Biancarosa, 2003). Researchers suggest that school children begin to construct an image of themselves in accordance with their abilities in the classroom and in comparison with their peers (Byrne, 1984; Gold and Mann, 1984; & Ruble, Boggiano, Feldman and Loebel, 1980). Bloom (1976) argues that children who receive continual evidence of personal academic success (i.e., continually high-grade results and a good relationship with teachers) will undoubtedly hold a high self-regard with respect to their

academic self. Alternatively, students who consistently perform poorly in the classroom are more likely to have a lowered self-perception of their academic ability (Bloom, 1976).

A perception of the self, that is an individual's view of him- or her-self, has most commonly been operationalised as self-esteem, self-concept, or self-image. The perceptions of school age children have commonly been measured using the Self-Perception Profile for Children (SPPC; Harter, 1985). The SPPC is designed to measure the perceptions of children between the ages of 8 to 15 years across six different domains: social competence, athletic competence, physical appearance, scholastic competence, behavioural conduct, and global self-worth. Encouragingly, research has demonstrated that students' self-perceptions can be improved alongside academic performance and Huffman (2000) suggests that such changes also result in positive behavioural changes within the classroom.

The present study is a pilot evaluation that sought to investigate the feasibility of using the suite of MimioSprout® *Early Reading* and MimioReading® *Comprehension* programmes with a group of 12 to 13 year old children from a mainstream school who were reading below their chronological reading age. We also explored outcomes over a school year of using primarily MRC with a group of children. Outcomes measured were reading attainment and also self-concept.

Method

Participants

Following ethical approval from the School of Psychology at Bangor University the participants (who will be referred to as students from hereon) were comprised eight students. Students included seven males, one female between the ages of 12 years 0 months and 12 years 10 months ($M = 12.5$ years) at the time of pre-test. The students were recruited from a

mainstream secondary school in North Wales, UK, and were identified by the school to take part because they were underachieving academically. According to the standardised reading assessment we conducted prior to intervention one student from the group was only two months behind their chronological reading age. However, he was included in the study because the school had identified the him as being ‘at risk’ of academic failure, evidenced by low outcomes on school test scores. In addition, all of the students were classified as being on ‘referral’, which, indicated that the students had some behavioural difficulties. The referral system was implemented by the school to monitor students’ behaviour following an initial incident that the school deemed as inappropriate. An inappropriate behaviour by a student might range from refusal of work to hitting another student. Those who were on referral were required to carry a card to every class and ask the teacher to sign it at the end of the lesson. Each teacher would report on the student’s behavioural conduct and the amount of work output during their class. At the end of each school week, the card would be assessed by the student’s Head of Year, who would then resolve to monitor the student’s behaviour further and issue the student with another card, or to recognise the student’s appropriate behaviour by taking them off the referral system. See Table 1 for the student information.

Table 1.

Student information

Student	Gender	Age pre- (Y:M)	DRA predicted reading age (at pre-test)	Discrepancy between chronological age and reading age (-/+)*
Andrew	Male	12:04	10:11	-17mths
Chris	Male	12:10	10:04	-30mths
Kate	Female	12:04	09:10	-30mths
Kevin	Male	12:05	12:03	-2mths
Harvey	Male	12:02	08:03	-47mths
Keiron	Male	12:00	10:11	-13mths
Liam	Male	12:07	08:03	-52mths
Sion	Male	12:09	09:06	-39mths

Setting

Scheduling for intervention sessions was carefully integrated into the school timetable. Normal English classes were replaced with four separate intervention sessions per week, and lessons lasted 50-minutes. Students attended the school library, which housed a total of ten computers, for each intervention session.

Materials and Apparatus

The MimioReading[®] *Comprehension* (MRC) programme composed of 50 online episodes that took approximately 20 minutes to complete per episode. Additional materials accompanying the online programmes included, (a) Progress Maps and Stickers (that were placed over each episode the students had completed), (b) Printable MimioReading[®]

Comprehension Companion Books and Worksheets), and (c) *Completion Certificates*. The MimioSprout® *Early Reading* (MSER) programme was also used in addition to MRC because one student was required to complete a certain number of episodes before he began MRC. MSER was composed of 80 online episodes that took an average of 15-20 minutes to complete, however, the student was placed at episode 57 and therefore only completed the last 23 episodes from this programme.

The apparatus comprised of either a computer, with a mouse or a laptop with a tracker pad; a web browser with a Macromedia Flash plug in and the MimioSprout® *Early Reading* and MimioReading® *Comprehension* online programmes. A tactile prompt known as a Motivaider® was used for momentary time sampling along with a scoring sheet (See Appendix A and B respectively). For the pre- and post-intervention assessments, physical copies of the DRA marking sheets and SPPC scales were printed, an audio recorder and a stopwatch were used to record and time the students reading the passages and answer questions from the DRA.

Design

The study used an educational case series design with eight children identified by the school as underachieving academically. The school uses a system of separating students into different levels or 'set groups' for each class subject. The students are assigned to set groups according to their level of academic ability that is determined by their performance on standardised tests conducted during the previous school year. The sets are not resolute and students can be moved up or down according to their performance. The students used in this study comprised of the lowest set English (of which there were four possible levels).

Measures

Diagnostic Reading Analysis

The *Diagnostic Reading Analysis* (DRA; Crumpler & McCarty, 2004) is an oral reading assessment designed for those between the ages of 7 to 16 years old. The assessment is a standardised measure of reading accuracy (total number of correct words read), fluency/reading rate (number of words read per minute) and comprehension, and provides standardised scores, percentile scores and reading ages for each participant. The DRA is made up of two parallel forms (A and B) which when used separately prevent practice effects during pre- and post- measures. Both forms are bound within one booklet that includes colour illustrations, which accompany each passage. The assessor first reads a short passage to the a child and then asks them questions immediately after; the number of correct answers the child makes determines where and at what level of difficulty the child will begin in the either form A or B. The assessor then listens to the child read a passage of text and records the number of errors the child makes on a separate recording form. The recording form is a copy of the form A or B with an additional section for the assessor to mark down the number of errors the child makes, the time it took for the child to read the passage and answer the comprehension questions and the number of questions the student answered correctly. The test is carefully structured so the child does not need to read every passage. Instead the administrator is instructed to direct the child to each passage according to their performance on the last until the child reaches a ceiling.

The Self-Perception Profile for Children

Students were also assessed using *The Self-Perception Profile for Children* (SPPC; Harter, 1985). This is a multidimensional scale that examines children's perceptions of

themselves across six separate domains: social competence, athletic competence, physical appearance, behavioural conduct, and scholastic competence. Although, for this study the decision was made not to include all six domains that comprise the SPPC and therefore only the three aforementioned domains were included. One reason for this decision included the need for efficiency in the delivery of the assessments because of the applied nature of the study. Working around the school timetabling system brought about difficulties, for example, it was not always possible to predict where the students would be and whether it was even possible to take them out of certain lessons to administer the assessments. Therefore using just three domains (18 items) reduced the administration time by half (i.e., average administration time took approximately 15 minutes as opposed to half an hour).

Each domain is separated into six items that incorporate a “structured alternative format” (Harter, 1982), this means that the student is first asked to read two different statements that reflect two different types of child. The student is then required to make a judgement on whether they are more like the child in the first statement or the child on the second. Once they have chosen one child they are asked to determine whether the statement is “sort of true” or “really true” for them. Figure 1, provides an example of one of the items from the scholastic competence domain.

Really True for me	Sort of True for me				Sort of True for me	Really True for me
<input type="checkbox"/>	<input type="checkbox"/>	Some kids often <i>forget</i> what they learn	BUT	Other kids can remember things <i>easily</i>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1. An example of an item from the scholastic competence domain of the SPPC scale.

Statements were specific to the particular domain, an example of two different statements from the Behavioural Conduct domain is “Some kids behave themselves very well BUT Other kids often find it hard to behave themselves.” An example from the Global-Self Worth domain was; “Some kids don’t like the way they are leading their life BUT Other kids do like the way they are leading their life.”

Items in the SPPC are counterbalanced, so for example, three items are worded so that the first statement reflects a positive perception of their competency or adequacy and the second reflects a negative perception and vice versa for the remaining three items. The student should only mark down one choice for each item. Administrators are provided with a marking system that scores items as 1, 2, 3, 4 for the negative or 4, 3, 2, 1 for the positive items. The total score for each domain is then divided by the number of items (i.e., six) to provide an average score, the lower the score the more negatively the student perceives their level of competency or adequacy.

Interobserver agreement (IOA)

IOA was established for 25% of the pre-intervention DRA assessments and 25% of the post-intervention DRA assessments to ensure that there was a minimum level of 80% IOA between the three researchers who were administering the assessments. IOA was calculated as follows; two assessors simultaneously recorded the results for four of the eight pre- and post-intervention assessments, marking independently from one another. The number of agreements (i.e., the total number of words that both assessors scored as accurate words) were divided by the total number of agreements plus the number of disagreements (the difference between the accuracy scores for each assessor). This coefficient was then multiplied by 100 to give a percentage of agreement. The same procedure was carried out for IOA on comprehension scores. IOA for pre-intervention was calculated to be 97.5% for the

DRA comprehension measure and 94.7% for the DRA accuracy measure. IOA at post-intervention was calculated to be 98.9% for the DRA comprehension measure and 95% for the DRA accuracy measure.

Procedure

The DRA and SPPC were taken prior to intervention and took an average of 30 minutes per student. Assessments were administered by three different researchers all of whom had received the appropriate training and an opportunity to practice administering the two tests. Students were taken out of the classroom and completed the assessment with one of the researchers in a separate room.

Once all of the pre-intervention assessments were complete the students were then required to complete the MimioSprout® *Placement Test 2* so that researchers could determine at which episode to place the student. The student is required to read the MSER story ‘What lives in the sea?’ The assessment is delivered by the instructor who records the student’s performance as the total amount of words read accurately within a two-minute timed period. See Appendix C for the MSER story and the placement criteria. If the student was able to read more than 140 words in two minutes without making more than 10% errors then they were placed in the MRC (see table 2 for placement test outcomes). If the student was unable to reach this fluency criterion they were placed at an appropriate episode in the MSER programme. Only one student did not manage to achieve above this fluency level.

Table 2

The total number of words read in two minutes and the amount of errors made and the subsequent programme the student was placed for the experimental group.

Student	Words read	Errors	Programme
Liam	236	11	MRC
Chris	190	3	MRC
Andrew	110	0	MSER (starting at episode 57)
Sion	285	7	MRC
Kevin	233	6	MRC
Harvey	165	2	MRC
Kate	193	9	MRC
Keiron	192	8	MRC

Before the students could begin intervention they were required to complete the MimioSprout® ‘Mousing around’ introductory programme, which offered brief exercises to aid familiarisation with the programme and acclimatise the students to the instructional language used within the programme. Once the researcher was satisfied that all of the students were familiar and competent at using the basics of the programme they were able to begin their first episode.

At the start of each session, the student would retrieve their folder and headphones and sit at a computer. They would then access the Internet from the school server and log on to their personal accounts. From the first episode to the last, all instructions were provided by the programme, which allowed the researchers and teaching staff to facilitate on-task behaviours, answer any student questions, and deliver stickers to students who had completed episodes. Before each session commenced the researcher checked the Class-wide Performance Reports to gain an ‘at a glance’ summary of the students’ performance for the previous session. The MimioReading® programme allocates one of three possible outcomes for a student’s individual performance for each episode, represented as three colour coded

letter: ‘E’ - Excellent means that the student answered 75% of the questions correctly on their first attempt; ‘S’ – satisfactory symbolises that the student answered between 50% and 75% of the questions correctly on their first attempt; and ‘N’—needs attention, which means that the student answered less than 50% of the questions correctly on their first attempt. Student data were monitored closely and if a student received either two consecutive Ns or three consecutive Ss then their individual episode data were examined to determine whether the student was struggling within a particular area of the episode.

The intervention continued until each student had completed all 50 of the episodes of the MRC programme. Andrew completed 23 episodes of the MSER programme before going on to complete the MRC programme. Post-tests were taken using the same measures, the DRA and the SPPC.

Procedural adaptations

A token economy system was implemented during the sixth week of intervention because the level of off-task behaviour within the group was causing students to become distracted during session time. The purpose of this observation procedure was not used for research purposes but only to facilitate the delivery of the intervention. Thus, no outcome data will be reported or analysed and no formal reliability data were gathered. At the beginning of session 16, the students were asked not to log onto the computers but to turn and listen to the researcher who then explained the new rules of each session. The students were told that their behaviours would be observed each session and particular behaviours would be rewarded with points that would later lead to a class outing if enough points were achieved. The researchers then explicitly described the types of behaviours that would be classed as ‘appropriate’ (on-task) and would earn them points and also the ‘inappropriate’ (off-task) behaviours. Appropriate (on-task) behaviours were described as the following: facing the

computer with headphones on and covering ears, listening to or executing instruction, asking teachers or researchers a question related to the programme by putting up a hand and waiting for assistance. Inappropriate (off-task) behaviours were described as: not-facing the computer, facing the computer but not listening to or executing instruction, not having the headphones on their heads or having them on their heads but not covering ears. More severe types of off-task behaviour (throwing objects, hitting (pushing, pulling) other students, being out of their seat without permission, leaving class without permission) were also described to the students to be inappropriate and would be dealt with by the teaching staff (e.g., the student might be asked to leave the classroom).

Student behaviour was recorded using a momentary time sampling method that involved the researchers checking the behaviours of all of the students every 5 minutes. One of the researchers wore a tactile prompt known as a Motivaider[®], which is a small battery-operated device that can be set to activate (vibrate) either at random time intervals or specified schedules. During intervention, the Motivaider[®] was set to activate every five minutes, beginning five minutes into the start of the lesson (to allow for folder retrieval and logging on time). This meant that during a normal session students were observed 8 times. The researcher wearing the Motivaider[®] signalled to the other researchers it was time to take a recording by either verbally saying ‘time’, or visually by holding up the recording sheet (See Appendix D). At the end of each session, the students were eager to review their scores and the researchers provided a brief summary of how they had done. Throughout each session on-task behaviour was rewarded with verbal praise.

Results

Reading assessments

All of the students were reading below their expected reading age a pre-intervention. Following intervention, post-assessments revealed that seven out of the eight students had increased their reading ages (gains ranging from 12 to 65 months over the five month period of intervention). One student did not make any change in their reading age according to the DRA; Chris had a reading age of 10 years four months at pre and post-intervention. However, because he was five months older he had and effectively 5-month decrease in reading age between pre- and post-intervention, see Table 3 for the individual data.

Table 3.

Shows the students' chronological ages (at pre- and post-test), the reading ages as derived from the DRA (at pre- and post-test), and the discrepancy in months between the two

Student	Age pre- (Y:M)	DRA reading age	Difference*	Age post- (Y:M)	DRA reading age	Difference	Overall change
Liam	12:04	08:03	-49mths	12:08	14:00	+16mths	+65mths
Chris	12:10	10:04	-30mths	13:03	10:04	-35mths	-5 mths
Andrew	12:04	10:11	-17mths	12:07	15:00	+29mths	+50 mths
Sion	12:09	09:06	-39mths	13:02	12:06	-8mths	+31 mths
Kevin	12:06	12:03	-3mths	12:10	14:06	+20mths	+23 mths
Harvey	12:02	08:03	-47mths	12:06	12:03	-3mths	+44 mths
Kate	12:04	09:03	-37mths	12:07	10:06	-25mths	+12 mths
Keiron	13:00	10:11	-25mths	13:05	15:03	+22mths	+47 mths

* -/+ depicts whether the student is above (+) or below (-) their chronological reading age.

Scores for the DRA subtests in reading accuracy, and reading fluency, comprehension questions correct and comprehension processing time are displayed in Table 4. All of the students improved their accuracy (calculated by subtracting the total number of errors from the total amount of words in the last three passages read) between pre- and post intervention.

Seven out of eight students read fewer words per minute fluency scores (calculated as the total number of words read divided by the number of time in seconds multiplied by 60) between pre- and post-intervention. Comprehension scores were calculated by taking the total number of correct answers from the last three passages the student read. Five students increased the number of correct questions answered between pre- and post-intervention (ranging between one and six), two students stayed the same and another decreased from 7 correct questions to six between pre- and post-intervention. Students were also measured on the amount of time taken in seconds to process the comprehension questions. Six students took longer at post-intervention to process the questions (ranging from two to eight seconds). Kevin and Chris processed the questions faster and overall took one and two seconds faster respectively.

Table 4

Individual scores on DRA subtests at pre- and post-intervention

Name	DRA subtest	Pre-	Post-
Andrew	Accuracy	187	260
	Fluency	102	98
	Comprehension score	13	13
	Comprehension processing time (secs)	3.8	5
Chris	Accuracy	169	173
	Fluency	77	103
	Comprehension score	9	13
	Comprehension processing time (secs)	5.11	4
Harvey	Accuracy	128	221
	Fluency	108	73
	Comprehension score	7	11
	Comprehension processing time (secs)	2.6	10
Kate	Accuracy	160	174
	Fluency	89	88
	Comprehension score	6	7
	Comprehension processing time (secs)	4.1	6.3
Keiron	Accuracy	187	269
	Fluency	59	55
	Comprehension score	7	7
	Comprehension processing time (secs)	5.6	10.9
Kevin	Accuracy	221	256
	Fluency	73	57
	Comprehension score	9	12
	Comprehension processing time (secs)	8.7	6.5
Liam	Accuracy	133	253
	Fluency	110	83
	Comprehension score	10	16
	Comprehension processing time (secs)	2.5	6.1
Sion	Accuracy	156	160
	Fluency	102	89
	Comprehension score	7	6
	Comprehension processing time (secs)	5.6	10.9

Results for student self-perceptions as measured by The Self-Perception Profile for Children (SPPC) are illustrated in Figures 2, 3 and 4 across the domains of global self-worth, behavioural conduct and scholastic competence respectively. Each chart displays the scores for each individual student and depicts the norm-referenced scores for children of the same age group (shown as horizontal dashed line).

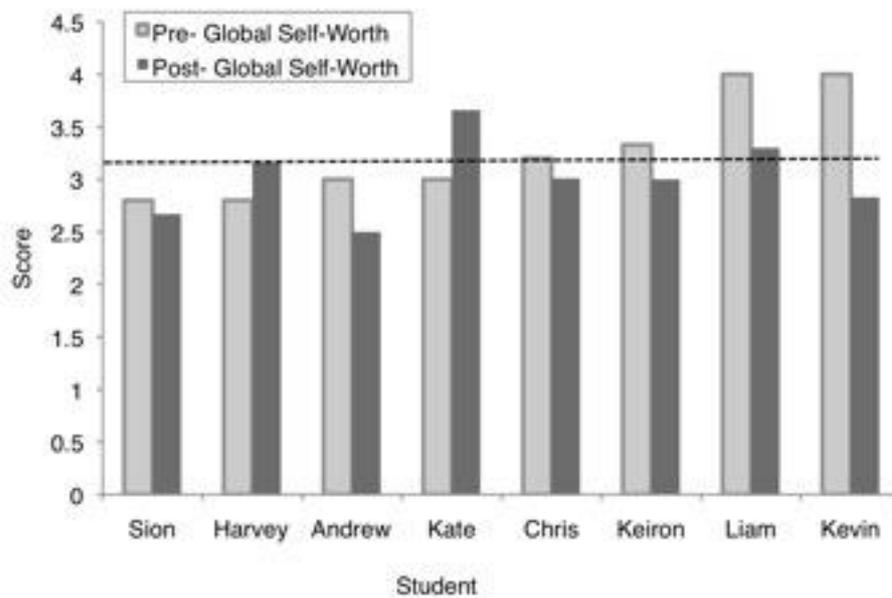


Figure 2. Illustrates the individual scores at pre- and post-intervention on the domain for global self-worth. Six out of the eight students scored more negatively for global self-worth at post-intervention. One student who scored higher at post-intervention exceeded the norm-referenced score. Half of the students scored higher than the norm-referenced scores (shown as a horizontal dashed line) at pre- intervention. However, at post-intervention all but two students scored more negatively, falling below this line.

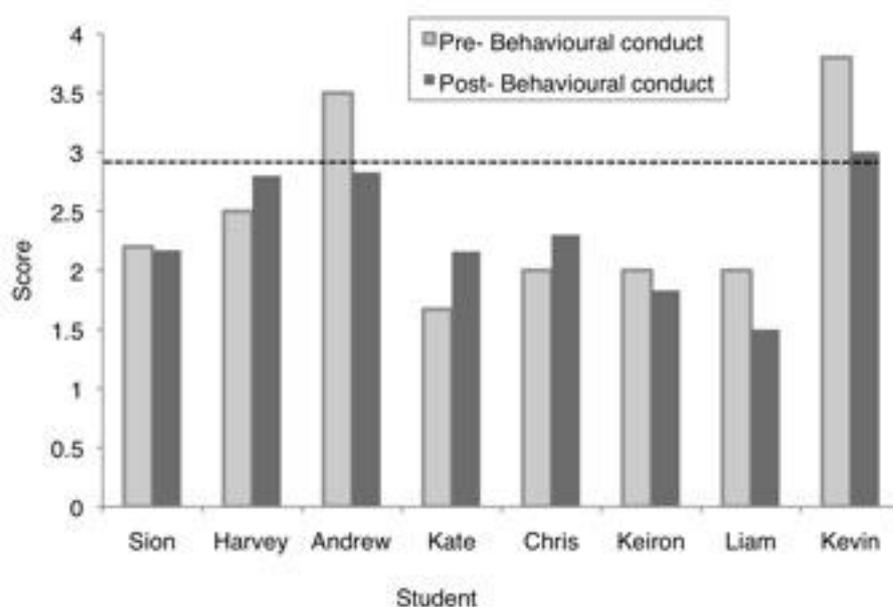


Figure 3. Shows the individual scores at pre- and post-intervention on the domain for behavioural conduct. Five students scored lower between pre- and post-intervention, rating their behavioural conduct more negatively at post-intervention. Two students scored higher than the norm referenced scores at pre-intervention and Kevin was the only student who scores above this threshold post-intervention despite scoring lower between assessments.

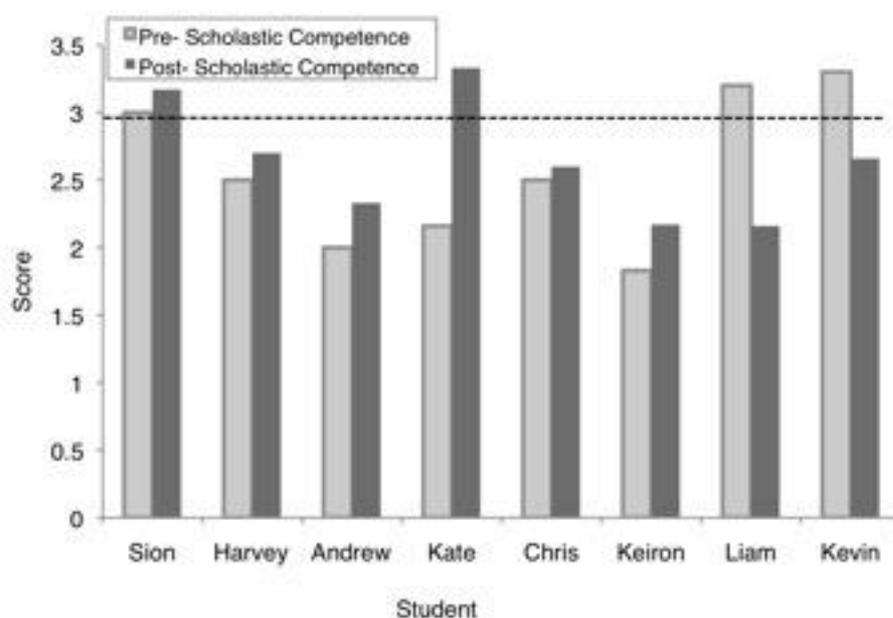


Figure 4. Illustrates the individual scores at pre- and post-intervention on the domain for scholastic competence. Six out of eight students rated themselves as being more competent or adequate post-intervention. Two students scored higher than the norm referenced scores at pre-intervention and Kevin was the only student who scores above this threshold post-intervention despite scoring lower between assessments.

Discussion

All but one of the students made improvements between pre- and post- intervention according to the Diagnostic Reading Assessment. Four of the eight students were reading at or above their chronological reading age post intervention according to the DRA. These outcomes might be regarded to be an educationally significant improvement. Students on average increased the number of correct words read per reading passage (accuracy rate), whereas the number of words read per minute (fluency rate) decreased. We might infer from these preliminary results of reading accuracy and fluency that the students were taking more time and care to process each word as they read a passage and as a consequence they were on average making fewer mistakes.

On average, the number of comprehension questions that were answered correctly increased between pre- and post-intervention and students were found to take longer to answer the comprehension questions at post-intervention. This might indicate that the students may be applying the strategies they had learned through the MRC programme.

Student self-perceptions were measured pre- and post-intervention using the Self-Perception Profile for Children (SPPC) across three different domains; Global self-worth, behavioural conduct and scholastic competence.

Six out of the eight students scored more negatively for global self-worth at post-intervention. This means that the students were associating more with the negative self-perceptions (i.e., “other kids are often not happy with themselves”) than they were with the positive (i.e., “some kids are happy with themselves as a person”). Some possible reasons for this outcome might be due to them having a more realistic idea of their academic performance in relation to their average peer which therefore may have left the student feeling less happy with themselves in general. However, this is only an assumption and more research into the area of student self-perception following improved academic performance might shed more light on this issue.

In the domain of scholastic competence six out of eight students perceived themselves to be more competent following intervention than they did pre-intervention. This trend reflected their actual academic improvements except for Kevin and Liam who had in fact improved their reading performance according to the DRA, however, they still scored contrary to this on their scholastic perceptions.

Six of the eight students scored lower on their self-perception of their behavioural conduct following intervention. Therefore, students were relating more to statements such as “some kids usually get in trouble because of things they do” as opposed to “Other kids usually don’t do things that get them in to trouble.” It may be that the students’ scores on behavioural conduct were influenced by the fact that they knew the researcher had witnessed their behaviour over the course of the last four months and therefore answered the questions more honestly. It is possible that the baseline reports in this domain were less valid.

It is also important to reflect on the feasibility of using the MSER and MRC programmes with older students reading below their average reading age who attend a mainstream school. With the students were older than the targeted age range of the programmes (3 to 7 years for MSER and 8 to 9 years for MRC) we were concerned that the students might perceive the programmes as being too childish. Secondly, the students who took part in this study were regarded as having behavioural difficulties, and thus potentially disposed to noncompliance and disengagement from the class work.

Despite some initial remarks by the students about the programme being 'babyish' we did not find that the students reacted adversely to the programme. We did, however, experience some difficulties with regard to the way the students were behaving within the classroom. For example, it was common for students to argue and even fight with one another during a session; students would often leave their chairs and sometimes even try to leave the classroom without asking for permission, or having a valid reason. By the sixth week of intervention it became apparent that the amount of off-task behaviour experienced during each session was beginning to become a problem and if students were to complete intervention in an environment that was conducive to learning then their behaviour needed modifying. The token economy system was added to the intervention to reduce student's level of off-task behaviour. When a class outing was suggested as a possible reward all of the students agreed that they were happy with this. At the end of each session, the students were eager to find out score that the class had achieved for that session and whether they were on target to achieving their reward. In the absence of observational data, anecdotally students' off-task behaviours reduced and on-task behaviours increased following the token economy.

Some methodological weaknesses were encountered during this study, namely the relatively small cohort of students used (n=8) of students, therefore we are unable to

generalise our findings to the wider population of this age group. In addition, we did not evaluate the outcomes with a comparison group.

The decision to only include three of the six domains from the Self-Perception Profile for Children limited our ability to gain more information into other areas of an individual's self perception. Furthermore, because behavioural data was not sufficiently collected during the implementation of the Token Economy we were unable to establish whether behaviour improved over time. Also it would have been interesting to compare the behavioural data with the students self reported answers on the Behavioural Conduct item of the SPPC scale.

These data suggest that further research, using a controlled design, is warranted to explore the putative effects of the combined MSER/MRC intervention for secondary school students with reading difficulties. Given the difficulties we encountered in engaging the students in the programme it might be interesting for future research to investigate the outcomes of using the programme with a younger year group. This would help to identify the age boundaries of relative acceptability for the programme.

References

- Abbott, S. P., & Berninger, V. W. (1999). It's never too late to remediate: Teaching word recognition to students with reading disabilities in grades 4–7. *Annals of Dyslexia*, 49, 223–250.
- Bloom, B. S. (1976). *Human characteristics and school learning*. New York, NY, US: McGraw-Hill.
- Boone, R., & Higgins, K. (1993). Hypermedia basal readers: Three years of school-based research. *Journal of Special Education Technology*, 12(2), 86-106.
- Byrne, B. M. (1984). The general/academic self-concept nomological network: A review of construct validation research. *Review of Educational Research*, 54, 427-456.
- Carnine, D. W., Silbert, J., & Kameenui, E. J. (1997). *Direct instruction reading* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall.
- Cook, N. L., Kretlow, A. G., & Helf, S. (2010). Supplemental reading help for kindergarten students: How early should you start? *Preventing School Failure*, 54, 137-144.
doi:10.1080/10459880903492924
- Coopersmith, S. (1981). *The antecedents of self esteem*. Palo Alto, CA: Consulting Psychologists Press.
- Ekstrom, R. B., Goertz, M. E., Pollack, J. M., & Rock, D. A. (1986). Who drops out of high school and why? Findings from a national study. *Teachers College Record*, 87, 356-373
- Elliott, D. S., & Voss, H. L. (1974). *Delinquency and dropout*. Lexington, MA: D.C. Heath and Company.

- Finn, J. D., Pannozzo, G. M., & Voelkl, K. E. (1995). Disruptive and inattentive-withdrawn behavior and achievement among fourth graders. *The Elementary School Journal*, 95, 421-434.
- Gold, M., & Mann, D. W. (1984). *Expelled to a friendlier place: A study of effective alternative schools*. Ann Arbor: University of Michigan Press.
- Grindle, C. F., Hughes, J. C., Saville, M., Huxley, K., & Hastings, R. P. (2013). Teaching early reading skills to children with autism using Mimosprout Early Reading. *Behavioral Interventions*, 28(3), 203-224.
- Hall, J. D., Hughes, C., & Filbert. (2000). Computer assisted instruction in reading for students with learning disabilities: A research synthesis. *Education and Treatment of Children*, 23, 173-193.
- Harter, S. (1985). Manual for the Self-Perception Profile for Children University of Denver, Denver.
- Huffman, L. C. (2000). Risk factors for academic and behavioral problems at the beginning of school (Doctoral dissertation, Stanford University).
- Jitendra, A. K., Edwards, L. L., Sacks, G., & Jacobson, L. A. (2004). What research says about vocabulary instruction for students with learning disabilities. *Exceptional Children*, 70, 299-322.
- Johnson, K. R., & Layng, T. V. J. (1994). The Morningside model of generative instruction. In R. Gardner, D. M. Sainato, J. O. Cooper, T. E. Heron, W. L. Heward, J. W. Eshleman & T. A. Grossi (Eds.), *Behaviour Analysis in Education: Focus on measurably superior instruction* (pp 173-197). Pacific Grove, California: Brooks/Cole Publishing Company.

- Johnson, K. R., & Street, E. M. (2004). *The Morningside model of generative instruction: What it means to leave no child behind*. Concord, MA: Cambridge Centre for Behavioural Studies.
- Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, 80(4), 347-447.
- Kamil, M. L. (2003). Adolescents and Literacy: Reading for the 21st Century. Alliance for Excellent Education. Retrieved from <http://www.all4ed.org/files/archive/publications/AdolescentsAndLiteracy.pdf>
- Klingner, J. K., & Vaughn, S. (2004). *Strategies for struggling second-language readers*. In T. L. Jetton, & J. A. Dole (Eds.), *Adolescent literacy research and practice* (pp. 183–209). New York: Guilford Press.
- Kos, R. (1991). Persistence of reading disabilities: The voices of four middle school students. *AMSErican Educational Research Journal*, 28, 785-895.
- Lewis, R. B. (2000). Musings on Technology and Learning Disabilities on the Occasion of the New Millennium. *Journal of Special Education Technology*, 15(2), 5-12.
- McIntyre, E., Jones, D., Powers, S., Newsome, F., Petrosko, J., Powell, R., & Bright, K. (2005). Supplemental instruction in early reading: Does it matter for struggling readers? *Journal of Educational Research*, 99, 99-107.
- National Institute of Child Health and Human Development (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington, DC: U.S. Government Printing Office (NIH Publication No. 00-4769).
- National Reading Panel (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading

instruction. Washington, DC: National Institute of child health and human development

- Rieth, H., & Semmel, M. I. (1991). *Use of computer-assisted instruction in the regular classroom*. In G. Stoner, M. R. Shinn, & H. M. Walker (Eds.), *Interventions for achievement and behavior problems* (pp. 215-239). Silver Spring, MD: National Association of School Psychologists.
- Ruble, D. N., Boggiano, A. K., Feldman, N. S., & Loebel, J. H. (1980). Developmental analysis of the role of social comparison in self-evaluation. *Developmental Psychology, 16*(2), 105.
- Rutter, M., Maughan, B., Mortimore, P., Ouston, J., & Smith, A. (1979). *Fifteen thousand hours: Secondary schools and their effects on children*. Cambridge, MA: Harvard University Press.
- Steinberg, L., Blinde, P. L., & Chan, K. S. (1984). Dropping out among language minority youth. *Review of Educational Research, 54*, 113-132.
- Stuart, M. (2006). Open dialogue: Authors response to peer commentary. *The Psychology of Education Review, 30*(2), 44-50.
- Snow, C. E., & Biancarosa, G. (2003). *Adolescent literacy and the achievement gap: What do we know and where do we go from here?* New York: Carnegie Corporation of New York.
- Soe, K., Koki, S., & Chang, J. (2000). Effect of computer-assisted instruction (CAI) on reading achievement: A meta-analysis. Pacific Resources for Education and Learning (PREL) ERIC Document Reproduction Service No. ED443079. Retrieved from: <http://www.prel.org/products/Products/effect-cai.htm>.

- Swanson, H. L. (1999). Reading research for students with LD: A meta-analysis in intervention outcomes. *Journal of Learning Disabilities, 32*, 504–532.
- Vaughn, S., Gersten, R., & Chard, D. (2000). The underlying message in LD intervention research: Findings from research syntheses. *Exceptional Children, 67*, 99–114.
- Wanzek, J., & Vaughn, S. (2007). Research-based implications from extensive early reading interventions. *School Psychology Review, 36*, 541-561.
- Wilder, A. A., & Williams, J. P. (2001). Students with severe learning disabilities can learn higher order comprehension skills. *Journal of Educational Psychology, 93*, 268–278.

Chapter 5: An evaluation of online reading programmes as a literacy teaching aid for secondary students at risk of academic failure: A controlled study

Abstract

The purpose of the present study was to evaluate of the use of MimioSprout® *Early Reading* (MSER) and MimioReading® *Comprehension* (MRC) with a group of 11-12 year old typically developing students who were reading below their chronological reading age. Thirty-three students took part in the study, 19 received either the MSER or the MRC programme in place of their normal English lessons, and 14 students comprised the waiting list control group and received education as usual. Pre- and post-intervention measures included a reading ability using a standardised reading assessment (Diagnostic Reading Analysis; DRA) and student self-perceptions using the Self-Perception Profile for Children (SPPC; Harter, 1985). Compared to the control group students in the experimental group made significant improvements in reading accuracy and comprehension and in self-perceptions of scholastic competence.

The ability to read and write is one of the core skills of society today, those who are ill-equipped with these skills are likely to experience difficulties in many domains of a modern information driven society (Doyle, 1983). Children who do not read at a level expected for their age range will lack the ability to access the majority of what is taught in schools and will therefore have difficulty progressing through core curriculum areas (Barber, 1997). Research by Francis, Shaywitz, Stuebing, Shaywitz, and Fletcher (1996) and Torgesen and Burgess (1998) suggests that the poor readers at the primary education level almost invariably continues to struggle with reading at the secondary education level and throughout their adult lives. Poor literacy skills seriously disadvantage young people and greatly increase their risk of underachievement and truancy at school. Further more the child is at a higher risk of experiencing social exclusion and unemployment in later life (eg. Patterson et al, 1989).

The present study is based on the findings from a pilot intervention study that investigated the feasibility of using the MimioReading[®] *Comprehension* programme with an older cohort (mean age: 12 years 5 months) of typically developing students with reading deficiencies. Other than the pilot study there is no known published research that has investigated the use of the Mimio[®] programmes in an applied mainstream secondary school setting with typically developing students. Therefore the pilot study provided pioneering foundations on which the present study is based. There were a number of methodological weaknesses found within the pilot study that the current research attempted to address. This study investigates the use of both MimioReading[®] *Comprehension* (MRC) and MimioSprout[®] *Early Reading* (MSER) programmes. The pilot study used a relatively small group (n=8) of students and did not have a comparison group. The present study used a larger

cohort of students (n=33) that were divided between an experimental group (n=19) who received intervention, and a waiting list control group who received treatment as usual (n=14) (i.e., attending English lessons as normal). The present study was a year group younger (mean age: 11 years 5 months) than those in the pilot intervention. One issue that arose during the pilot study was that the 12-13-year-old cohort were difficult to engage in the Mimio® programmes. Therefore, the reason for working with a younger cohort was to establish the feasibility of engaging a group of 11-12 year old students. Both groups comprised of students who had been allocated to the lowest performing English set groups for their year. The school operates a system that separates each academic subject into tiers, ranging from set 1 that houses the most academically proficient students to set 4, housing the least proficient. All of the students in the pilot- and present study had been allocated to the lowest set group based upon their performance outcomes on school test results from the previous year. Despite that the students involved in the present research were a year group younger than those in the pilot study, both groups shared similarities in behavioural characteristics. Both groups of students presented with ‘problem’ behaviours within the classroom, such as non-compliance (e.g. refusing to complete class work) disruptive behaviours (e.g. talking out aloud, getting out of their seat without permission, hitting or being verbally abusive to peers and/or teaching staff). Therefore, the younger cohort group could be regarded to be on a similar trajectory as the students in the pilot study that were one year group older.

The aim of the present study was to investigate the use of both MimioSprout® *Early Reading* (MSER) and the MimioReading® *Comprehension* (MRC) programmes, extending on the pilot study by employing a larger group of students and comparing outcomes with waiting list control group who received treatment as usual. Six students were placed on the

MSER programme, five of who went on to MRC and achieve an average of 18 episodes. The present study used the same standardised reading assessment (the Diagnostic Reading Analysis; DRA) and measure of students' self-perceptions (using The Self-Perception Profile for Children; SPPC) as the pilot study.

Method

Participants

Once ethical approval was granted from the School of Psychology at Bangor University, 33 participants (referred to as students from hereon in) were recruited from a mainstream secondary school in North Wales, UK. The school identified the students to be academically underachieving (based on test outcomes taken from the previous school year) and placed the students randomly into two of the lowest English set groups. The experimenter then assigned the largest group (n 19) to become the experimental group. This group comprised of five males and 14 females aged between 11 years 2 months and 12 years (Mean: 11 years 5 months) at the time of pre-test. The smaller of the two groups (n 14) was allocated to be the waiting list control group (WLC). In this group there were seven males and seven females who's ages ranged between 11 years 1 month to and 12 years 3 months (Mean: 11 years 6 months) at pre- intervention. See tables 1 and 2 for the experimental and WLC group student information.

Setting

Intervention sessions for the experimental group replaced four of their usual English classes per week. Intervention sessions lasted 50-minutes, the duration of a normal class. Intervention sessions were delivered either in the school library or the ICT (information and communications technology). The school library housed a total of ten computers and the ICT room houses 40 computers. The WLC group attended their usual English classes as normal.

Materials and Apparatus

Materials included the MimioSprout® *Early Reading* (MSER) programme and the MimioReading® *Comprehension* (MRC) programme. There were 80 online episodes in MSER, which, on average, took 15-20 minutes per episode to complete, and 50 episodes in MRC that took approximately 20 minutes to complete.

Accompanying materials to the online programmes included, (i) Progress Maps (ii) Printable stories (including MimioSprout *Readers with Me Stories* and MimioReading *Comprehension Companion Books and Worksheets*), and (iii) *Completion Certificates*. Each student had their own folder where they kept their progress maps and any other materials such as worksheets and the Companion Books and they needed to keep safe, stickers were also used to cover each completed episode on the students progress map. The apparatus comprised of headphones, a computer that had Internet access, a web browser with a Macromedia Flash plug.

Design

The study used a between subjects experimental-control group design. At the beginning of the school year students were allocated to class groups based on assessment data from standardised tests conducted the previous school year. The school where we conducted this research had two streams of classes within each year group of comparable ability levels. For the purpose of this study we worked with the lowest performing class in each stream (i.e., the lowest performing class in stream one and the lowest performing class in stream two). The largest group (n=19) was selected to receive the intervention, while the other acted as a WLC (n=14). The WLC group received the intervention in the following school year.

Measures

Diagnostic Reading Analysis

The *Diagnostic Reading Analysis* (DRA; Crumpler & McCarty, 2004) is an oral reading assessment designed for those between the ages of 7 to 16 years old. The assessment is a standardised measure of reading accuracy (total number of correct words read), fluency/reading rate (number of words read per minute) and comprehension, and provides standardised scores, percentile scores and reading ages for each participant. The DRA is made up of two parallel forms (A and B) which when used separately prevent practice effects during pre- and post- measures. Both forms are bound within one booklet that includes colour illustrations, which accompany each passage. The assessor first reads a short passage to the a child and then asks them questions immediately after; the number of correct answers the child makes determines where and at what level of difficulty the child will begin in the either form A or B. The assessor then listens to the child read a passage of text and records the number of errors the child makes on a separate recording form. The recording form is a copy of the form A or B with an additional section for the assessor to mark down the number of errors the child makes, the time it took for the child to read the passage and answer the comprehension questions and the number of questions the student answered correctly. The test is carefully structured so the child does not need to read every passage. Instead the administrator is instructed to direct the child to each passage according to their performance on the last until the child reaches a ceiling.

The Self-Perception Profile for Children

Students were also assessed using *The Self-Perception Profile for Children* (SPPC; Harter, 1985). This is a multidimensional scale that examines children's perceptions of themselves across six separate domains: social competence, athletic competence, physical

appearance, behavioural conduct, scholastic competence and global self-worth. Students in this study were evaluated on their perceived adequacy and competence across three of the six different domains: scholastic competence, behavioural conduct and global self-worth. The tool was too long to be used in its full form alongside other measures, therefore only three of the six domains were incorporated. These domains were selected because they were most relevant to the focus of the intervention, which was to improve reading skills. In accordance, behavioural conduct and global self-worth were also chosen because they were thought to be subsequently influenced by possible improvements in reading performance.

The scale was structured as follows; the student was first asked to read two different statements that reflect two different types of children. One statement reflects a child that is less competent or adequate, for example, “some kids worry about whether they can do the school work assigned to them” whereas the second statement reflects a child that is more competent or adequate (e.g. some kids feel that they are very good at their school work. Each statement is specific to the particular domain it belongs to; the given examples were taken from the scholastic competence domain. Example statements from the behavioural conduct domain include “some kids usually get in trouble because of things they do BUT other kids usually don’t do things that get them in trouble” and examples from the global self-worth domain include “Some kids are happy with themselves as a person BUT other kids are often not happy with themselves.”

The student is required to make a judgement on whether they are more like the child in the first statement or the child on the second. Once they had chosen just one statement they are then asked to determine whether the statement is “sort of true” or “really true” for them.

The six items in each domain were counterbalanced, three items presented with the competent or adequate statements first and the second half were the less competent and

adequate statements. Subsequently, when scoring the completed scale the items are either scored in ascending (i.e., 1, 2, 3, 4) or descending (i.e., 4, 3, 2, 1). The total score for each domain was then divided by the number of items (i.e., six) to provide an average score, the lower the score the more negatively the student perceives their level of competency or adequacy. The student should have only marked down one choice for each item.

Interobserver agreement (IOA)

IOA was conducted on 25% of the pre- and post-interventions tests of the DRA assessments. IOA was calculated number of agreements (i.e., when both assessors agreed on the total number of words read) were divided by the total number of agreements plus the number of disagreements. This was then multiplied by 100 to give a percentage of agreement. The same procedure was carried out for IOA on comprehension scores. IOA for pre-intervention was calculated to be 95% for the DRA comprehension measure and 96% for the DRA accuracy measure. IOA at post-intervention was calculated to be 97.9% for the DRA comprehension measure and 96% for the DRA accuracy measure.

Intervention

Each student in the experimental group was required to complete the MimioSprout[®] *Placement Test 2*, a brief reading assessment that measures the percentage of words read correctly from a passage in a two minute period. The student was required to read the MSER story ‘What lives in the sea?’ The assessment was delivered by the instructor who records the student’s performance as the total amount of words read accurately within a two-minute timed period. The student’s performance on the placement test determined which programme the student should begin, and at which episode for those placed in MSER. Students unable to read more than 140 words at or above 90% correct words within two minutes, were placed at

MRC. Six students did not achieve this criterion and were placed at the appropriate level within MSER. See Table 1 below for each student's performance scores.

Table 1.

The total number of words read in two minutes and the amount of errors made and the subsequent programme the student was placed for the experimental group.

Student	Words Read	Errors	Programme
E-3	176	6	MRC
E-4	193	6	MRC
E-6	140	8	MRC
E-7	209	5	MRC
E-8	171	5	MRC
E-9	262	4	MRC
E-10	140	13	MRC
E-11	231	8	MRC
E-12	125	0	MRC
E-15	209	6	MRC
E-17	225	9	MRC
E-18	183	19	MRC
E-19	273	3	MRC
E-14	42	26	MSER Episode 1
E-5	168	121	MSER E41
E-1	108	10	MSER E57
E-13	98	21	MSER E57
E-16	138	9	MSER E57
E-2	138	9	MSER E57

Procedure

Pre-intervention assessments

Each student from the experimental and the WLC group met with a researcher one-to-one to complete a DRA assessment. The student was removed from their classroom and the assessment was delivered at a desk in an empty classroom with another member of teaching staff present. The DRA provides two parallel forms A and B, which allows for re-testing without having practice effects. Therefore, all of the students were tested on form A during pre-intervention assessment. Each assessment began with a brief explanation to the student, informing them that they would be recorded reading aloud to the researcher and also timed.

They were reminded to read the words carefully and without rushing, and also informed that they would be asked questions relating to the passage they had read and that they were able to look back over the passage when answering the questions. Students were asked for their names and date of birth, which was recorded, on the front of the DRA form. The test begins with an initial listening comprehension question, which determines at which passage the student should begin. The test administrator is then directed by the DRA in accordance to the student's performance as to which passage they should read next. Throughout the test administration the experimenter noted the amount of time taken to read each passage, the number of errors made and the time taken to answer comprehension questions and the number of comprehension questions and the number answered correctly.

Students were also asked to complete the SPPC scale at pre-intervention, this was delivered to the whole class as opposed to a one-to-one level. The SPPCs were delivered once all of the children had completed a DRA assessment. The researcher addressed the whole class and explained that they would be answering questions about themselves and that they should answer as honestly as possible, indicating their choice by circling one of the four possible answers on the scale. The researcher then read aloud each question and waited for the students to make their choice. At least one other researcher along with the teacher was present in the classroom during this time to answer any of the student's questions and help facilitate the process.

Intervention

Before the students could commence the programme they had been allocated to they were required to complete the MimioSprout® 'Mousing around' introductory programme, which, enabled the students to become accustomed to the instructional language used within

the programme. All of the students successfully completed the brief exercises provided in the introductory programme and were therefore assumed competent to begin their first episode.

The students quickly entered a routine each session, at the beginning of each class the students retrieved their folders and headphones and sat at a computer. After accessing the Internet from the school server they would log on to either the MSER or the MRC programme using the log in details written in their folders and find their personal accounts.

The students followed the instructions provided by the programme, only putting their hands up to ask a question. The teaching staff and researchers were at hand to monitor class behaviour, answer questions and award stickers to those who had completed episodes. Prior to each session one researcher would log onto the Mimio[®] website and check the students performance from the previous session.

The Class-wide Performance Reports provide a summary of each of the students' performance as indicated by one of three colour-coded letters. An 'E' for excellent, means that the student answered 75% of the questions correctly on their first attempt, an 'S' for satisfactory meant that the student answered between 50% and 75% of the questions correctly on their first attempt, and finally an 'N' which means that the student answered less than 50% of the questions correctly on their first attempt. For those who received two consecutive N's or three consecutive S's their individual data would be examined to identify which particular area of the episode the student was struggling. The researcher would then decide whether the student would need further practice and ask the student to complete the relative exercises, or whether the student just needed to be reminded that they needed to concentrate on the instructions given to them and consider their answers carefully.

Intervention continued until two weeks before the end of the academic year, thus allowing enough time for post-intervention assessments to be taken. The intention was for all

of the children to at least complete the programme they were placed at. The students who began on MSER had the opportunity to then begin MRC however, given the relatively short time-scale of the academic year it was expected that it would be unlikely that a student would completed both programmes. All Thirteen students successfully completed MRC during this time; five of the six students placed at MSER completed the programme and began MRC; leaving only one student who did not completed 50 of the 80 episodes of the MSER programme. See table 2 for student progress through the relative programme/s.

Table 2.

The table displays the students' progression through the MER and subsequent MSER programmes.

Student	Programme	Episode achieved
E-3	MRC	50 (complete)
E-4	MRC	50 (complete)
E-6	MRC	50 (complete)
E-7	MRC	50 (complete)
E-8	MRC	50 (complete)
E-9	MRC	50 (complete)
E-10	MRC	50 (complete)
E-11	MRC	50 (complete)
E-12	MRC	50 (complete)
E-15	MRC	50 (complete)
E-17	MRC	50 (complete)
E-18	MRC	50 (complete)
E-19	MRC	50 (complete)
E-14	MSER Episode 1	MSER Episode 50
E-5	MSER E41	MRC Episode 15
E-1	MSER E57	MRC Episode 28
E-13	MSER E57	MRC Episode 1
E-16	MSER E57	MRC Episode 10
E-2	MSER E57	MRC Episode 36

Post-intervention assessments

Following intervention all of the students completed the SPPC assessments and parallel versions of the DRA assessment. The same procedures were followed at pre-intervention.

Data Analysis

A two-way mixed ANOVA was used to analyse the reading and self-perception scores generated from the DRA assessment and SPPC scale respectively. Outcomes at the individual level were also explored in addition to the group based statistical analysis, by using the Reliable Change Index (RCI; Jacobson & Traux, 1991). The RCI identifies whether an individual score has ‘significantly improved’ (at the .05 level) between pre- and post-intervention. When generating an index that can be regarded as a level that is significantly different, the RCI takes into account the group variation of scores and the stability of the measure over time. RCI was only calculated for students’ accuracy scores and was calculated by first working out the difference in students’ accuracy scores between pre- and post-intervention and then dividing it by the standard error of the difference. The decision was made not to include fluency scores because the DRA did not differentiate between correct and incorrect words when calculating fluency scores.

Results

Group Analysis

Mean scores on the Diagnostic Reading Analysis (DRA) subtests of accuracy, fluency, and comprehension pre- and post-intervention for the experimental ($n = 19$) and WLC ($n = 14$) groups are shown in Table 3.

A 2 (Group: Experimental vs. Control) * 2 (Test Time; Pre vs. Post) mixed factorial ANOVA was used to analyse the DRA assessment components and scores of self perception

using the Self-Perception Profile for Children (SPPC) across the three different domains (scholastic competence, behavioural conduct and global self-worth).

Table 3

Mean scores (M) at pre- and post-intervention for experimental and waiting list control groups.

DRA scores	Experimental Group		Waiting List Control Group	
	Pre- Intervention <i>M (SD)</i>	Post- Intervention <i>M (SD)</i>	Pre- Intervention <i>M (SD)</i>	Post- Intervention <i>M (SD)</i>
Subtest				
Accuracy	148 (58.5)	200 (72.1)	180 (47.4)	196 (52.7)
Fluency	78 (32.9)	70 (20.6)	77 (19.8)	76 (18.8)
Comprehension score	8 (3)	10 (3.3)	9 (3.1)	10 (3)
Comprehension processing time (seconds)	6.14 (4.8)	7.62 (4.2)	6.31 (2.2)	5.84 (1.6)
SPPC scores	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Scholastic competence	2.36 (.66)	2.86 (.52)	2.56 (.37)	2.59 (.67)
Behavioural conduct	2.81 (.52)	2.91 (.57)	2.93 (.47)	2.89 (.50)
Global Self Worth	2.88 (.78)	2.99 (.69)	3.05 (.36)	3.11 (.47)

These reading results mirror the outcomes that were found from the pilot intervention. On the whole, students in both the pilot intervention group and the students in the current experimental group all scored higher on accuracy and lower on fluency rate. Both groups also increased the number of comprehension questions they answered correctly post intervention and also increased the time it took them to process the questions and answer.

DRA Statistical Analysis
Accuracy

A two-way mixed ANOVA revealed that there was no significant main effect of Group, $F(1, 31) = .495, p = .487, \eta_p^2 = .016$; however there was a significant main effect of Test Time, $F(1, 31) = 21.26, p < .001, \eta_r^2 = .407$; and a significant interaction, $F(1, 31) = 6.20, p = .018, \eta_r^2 = .167$. Although overall, scores in both groups increased over time, the increase was larger in the experimental group.

Fluency

The number of words read per minute reduced for both groups between pre- and post-intervention. However, analysis revealed that there was no significant main effect of Group, $F(1, 31) = .093, p = .763, \eta_r^2 = .003$; no effect of Test time, $F(1, 31) = .769, p = .387, \eta_r^2 = .024$; and no significant interaction $F(1, 31) = .601, p = .444, \eta_r^2 = .019$.

Comprehension

The average number of comprehension questions answered correctly increased between pre- and post intervention for both groups. However, analysis showed no significant main effect of Group, $F(1, 31) < .001, p = .984, \eta_r^2 < .001$. There was a significant main effect of Test time, $F(1, 31) = 10.42, p = .003, \eta_r^2 = .251$, with participants across both groups showing higher comprehension scores at post test. The interaction was not significant, $F(1, 31) = 2.10, p = .157, \eta_r^2 = .064$.

Comprehension processing

Comprehension processing time increased for the experimental group and decreased for the control group. There was no main effect of Group, $F(1, 31) = .468, p = .499, \eta_r^2 = .015$, or Test time, $F(1, 31) = 0.940, p = .340, \eta_r^2 = .029$, and no significant interaction, $F(1, 31) = 3.381, p = .076, \eta_r^2 = .098$.

SPPC Statistical Analysis

Self-perception scores were also analyzed using a two-way mixed ANOVA for each domain, scholastic competence, behavioural conduct and global self-worth.

Scholastic competence

The experimental group increased their scores on scholastic competence between pre- and post-intervention while the control group's scores decreased. A two-way ANOVA revealed that there was no significant main effect of Group, $F(1, 31) = .040, p = .843, \eta_p^2 = .001$; and no effect of Test time, $F(1, 31) = 2.244, p = .144, \eta_r^2 = .067$. However there was a significant interaction, $F(1, 31) = 5.185, p = .030, \eta_r^2 = .143$ showing that the increase in perceptions of scholastic competence increased in the experimental group only.

Behavioural conduct

The experimental group scored higher at post-test on behavioural conduct than at pre-intervention, whereas the WLC group scores remained relatively similar. According to the analysis there was no main effect of Group; $F(1, 31) = .052, p = .820, \eta_p^2 = .002$; or Test time, $F(1, 31) = .142, p = .709, \eta_p^2 = .005$, and no significant interaction, $F(1, 31) = .138, p = .713, \eta_p^2 = .004$.

Global-self worth

Both groups' scores on global-self worth increased between pre- and post-intervention. However, analysis found no main effect of Group; $F(1, 31) = .172, p = .200, \eta_p^2 = .052$; or for Test time; $F(1, 31) = .360, p = .553, \eta_p^2 = .011$, and no significant interaction, $F(1, 31) = .020, p = .890, \eta_p^2 = .001$.

In comparison with the outcomes from the pilot study, the students' self-perception scores were not consistent with the scores from the present experimental group. The pilot study students on average scored higher on the scale for scholastic competence, mirroring the trend found in the experimental group scores. However, the pilot study students scored lower on the scale of behavioural conduct and global self-worth, whereas the experimental group student in the present study increased their scores on both scales.

Analysis of individual performance

Reading outcomes

The individual changes in reading age (post- minus pre-intervention reading age score in years and months) are presented in Figure 1.

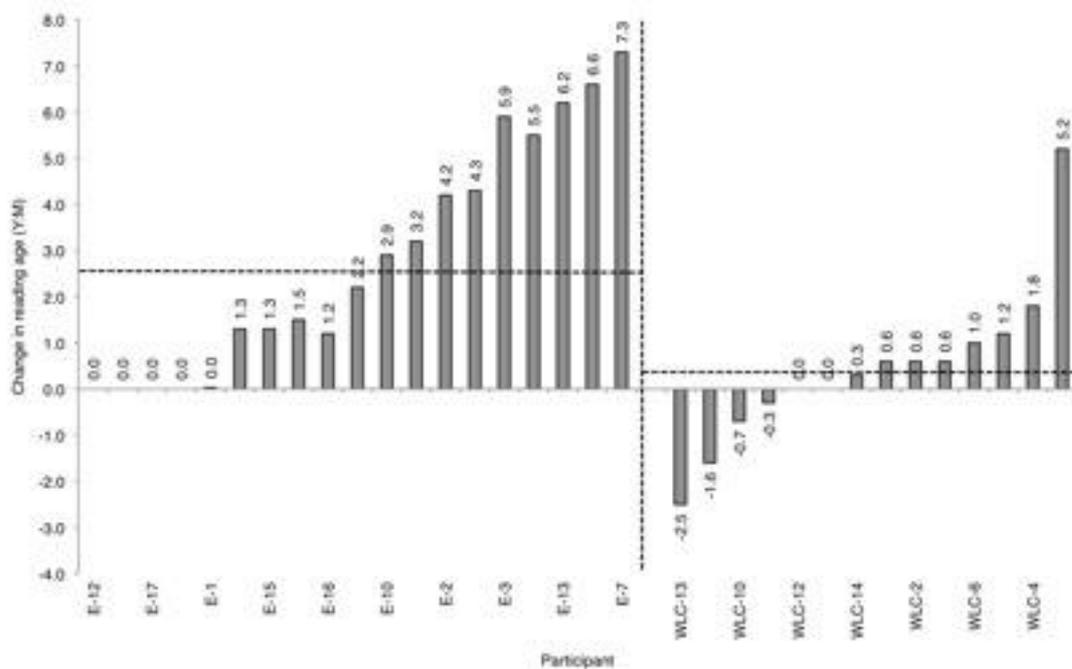


Figure 1. The scores display reading age changes in years and months along the y-axis for individual students and are organized in ascending order separately for the experimental and WLC groups. Hashed lines show the mean group change. The data demonstrate that the

students in the experimental group made larger reading age increases (average increase of 2 years 7 months – ranging from maintenance of reading age – no change - to a 7 year 3 month increase). The students in the WLC group made a 4-month mean overall improvement on their reading ages (ranging from a reduction in reading age by 2 years 5 months to improving by 5 years 2 months).

A Reliable Change Index (RCI) was also used to demonstrate the significant changes of individual accuracy scores at pre- and post-intervention between the experimental and WLC groups (see Figure 2).

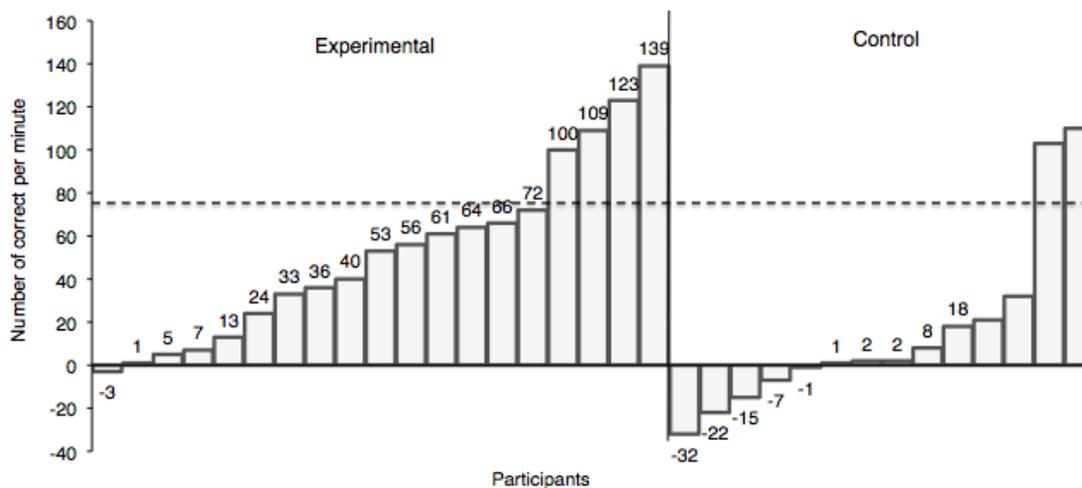


Figure 2. Displays the individual data for the change in accuracy scores between pre- and post-intervention for the experimental and WLC groups. The dashed horizontal line illustrates the level measured by the *Reliable Change Index* (RCI) regarded to be a significant level of improvement. Four students in the experimental group exceeded this threshold and were therefore considered to have made significant gains. All of the other students made gains following intervention except for one who read less accurately at post-intervention. Of

the WLC group, nine students made improvements, two of which exceeding the level of improvements indicated by the RCI. Five students from the WLC read less accurately at post-intervention.

Discussion

Following a five-month intervention period our results suggest that teaching the students using the MSER/MRC programmes led to improvements in reading in the experimental group compared to the controls. Seven students in the experimental group exceeding their age appropriate levels and were reading at least one year above their chronological ages at the end of the intervention period.

At pre-intervention the WLC group, on average scored higher on the DRA assessment for accuracy than the experimental group. When the students were tested again post-intervention the experimental group outperformed students in the WLC group and were reading more accurately.

A visual display of the accuracy scores was plotted on the *Reliable Change Index* (RCI) graph (Figure 2), which displays the difference in scores for accuracy at pre- and post-intervention for each individual student. Only one student in the experimental group did not make an improvement on reading accuracy at post-intervention. Four of the students made significant levels of improvements as measured by the RC Index. Individual scores for accuracy in the WLC group showed that five students read less accurately at post-intervention. From the statistical analysis and the RCI we might infer that intervention had a positive effect upon the ability to increase overall accuracy of reading. Although, the MRC programme did not specifically provide instruction on developing reading accuracy, the

students were given adequate opportunity to practice their reading skills when following the comprehension tasks (e.g., reading through numerous passages to derive answers to the questions). Our findings that demonstrate improved accuracy scores supports previous literature, such as Hughes, Beverley, & Whitehead, (2007) who claim that the measures of Precision Teaching that build fluency therefore increase accuracy rates. The MRC programme incorporates PT fluency building through the ongoing monitoring of student responses (i.e., number of correct/incorrect responses), and consequently adapting instruction according to the students' performance. This procedure might have taught the students in this study to re-read the passage more carefully after being informed that they had made an incorrect response and were required to make another attempt at the question.

Interestingly, both groups decreased the total number of words read per minute when tested post-intervention. The experimental group made a greater reduction in the total number of words read than the WLC group, and although not significantly different there was an interaction found within the statistical analysis. Lower fluency scores indicate that words are being read slower; according to Hasbrouck and Tindal (2006) a typically developing 11 to 12 year old child should have a fluency rate of between 98 and 127 words per minute. On this assumption, the students in this study were reading below their expected age average even following intervention. However, the reduction in reading fluency may not necessarily be a counterintuitive outcome. It may be an indication that the students are taking more time and care to decode the written text (Stahl & Kuhn, 2002), the improved accuracy scores also adds support to this case.

Another possible explanation for the reduction in fluency scores could be due to students reading more complex passages in the post-intervention assessments thus slowing

down the fluency rate. Stahl and Kuhn (2003) suggest that when text difficulty increases, fluency rate decreases. The DRA assessment directs more competent readers towards more difficult passages until they reach their ceiling, consequently with the experimental group improving on their accuracy scores they were progressing further through the assessment and therefore accessing progressively more difficult text.

The experimental group performed marginally better on the test for comprehension when compared to the WLC group over time. These results mean that the experimental group answered more comprehension questions correctly than the WLC group. We may therefore infer that the students who had received intervention and taught explicit comprehension strategies were applying these skills during the post-intervention assessment. However, not all of the students completed MRC, which focussed specifically on comprehension.

The average amount of time it took students to answer the comprehension questions increased in the experimental group and decreased in the WLC group between pre- and post-intervention. Although these differences were marginal (a couple of seconds difference) and were not statistically significant the experimental group scores were closer to the level of significance than the WLC group were. The increase in post-intervention comprehension processing times might mean that the students in the experimental group were employing the comprehension strategies and therefore taking longer to consider their responses.

Student's self-perceptions were measured using the SPPC scale prior to and following intervention to examine whether there would be any change in attitudes according to possible changes in reading performance. Results found that the experimental group scored higher at post-intervention on scholastic competence than at pre-intervention when compared to the WLC group, thus demonstrating a significant interaction. The improved self-perception on scholastic competence might have been a direct reflection of the students improved reading

abilities. These findings corroborate findings that suggest that student's self-perception is influenced by their academic achievements (Byrne, 1984; Gold and Mann, 1984; & Ruble, Boggiano, Feldman and Loebl, 1980).

Both groups' scores on global-self worth increased between pre- and post-intervention. Whereas scores on behavioural conduct decreased in the WLC group and increased in the experimental group between pre- and post-intervention. However, the differences in scores were very small and statistical analysis revealed that they were not significant.

The findings of the present study provide additional support to the existing literature on the efficacy of Mimio[®] programmes (Layng, Twyman & Strikeleather, 2003; Layng, Twyman, & Strikeleather, 2004). Extending on this research the present study provides an insight into a previously un-researched area of using these programmes with typically developing older children.

However, with a relatively small sample size and a lack of a randomised controlled trial we should view the findings with a certain amount of caution. Furthermore, running a study such as this within an applied setting generated some difficulties; we mainly encountered logistical problems associated the timetabling intervention sessions. Therefore, future research should investigate these encouraging findings with a larger sample and a randomised sample. A further study with more focus on academic self-perceptions and possibly a measure of behavioural conduct is therefore suggested.

To conclude we found that this study, which was based on an initial pilot study conducted in the same school with a smaller group (n=8) of struggling readers, reflected similar positive outcomes. We found that the students in the experimental group improved on

their reading abilities as measured by the Diagnostic Reading Analysis assessment. The students made significant improvements on their accuracy and comprehension scores and 15 of the 19 students in the experimental group made gains on their reading ages, seven of these students were reading above the level expected for their age. We did not find that students reacted adversely to working on a programme that was targeted towards a younger age group.

References

- Barber, M. (1997). *The learning game: Arguments for an educational revolution*. London: Indigo.
- Bennett, K. J., Brown, K. S., Boyle, M., Racine, Y., & Offord, D. (2003). Does low reading achievement at school entry cause conduct problems? *Social Science and Medicine*, 56(12), 2443-2448.
- Bloom, B. S. (1976). *Human Characteristics and School Learning*. New York: McGraw-Hill.
- Byrne, B. M. (1984). The general/academic self-concept nomological network: A review of construct validation research. *Review of educational research*, 54(3), 427-456.
- Crumpler, M., & McCarty, C. (2004). *Diagnostic Reading Analysis* (2nd Ed). Hodder Education.
- Doyle, W. (1983). Academic work. *Review of educational research*, 53(2), 159-199.
- Fletcher-Flinn, C. M., & Gravatt, B. (1995). The efficacy of computer assisted instruction (CAI): A meta-analysis. *Journal of Educational Computing Research*, 12, 219-233.
- Gillon, G. T., & McNeill, B. C. (2009). Effective practices in phonological awareness assessment and intervention. *ACQuiring Knowledge in Speech, Language and Hearing*, 11(2), 72-76.
- Gold, M., & Mann, D. W. (1984). *Expelled to a friendlier place: A study of effective alternative schools*. Ann Arbor: University of Michigan Press.
- Grindle, C. F., Hughes, J. C., Saville, M., Huxley, K., & Hastings, R. P. (2013). Teaching early reading skills to children with autism using Mimiosprout Early Reading. *Behavioral Interventions*, 28(3), 203-224.

- Harter, S. (1985). *Manual for the Self-Perception Profile for Children* University of Denver, Denver.
- Hasbrouck, J., & Tindal, G. A. (2006). Oral reading fluency norms: A valuable assessment tool for reading teachers. *The Reading Teacher*, 59(7), 636-644.
- Hibbert, A., Fogelman, K., & Maoner, O. (1990). Occupational outcomes of truancy. *British Journal of Educational Psychology*, 60(1), 23-36.
- Hintikka, S., Aro, M. & Lyytinen, H. (2005). Computerized training of the correspondences between phonological and orthographic units. *Written Language & Literacy*, 8, 155–178.
- Huffman, L. C. (2000). Risk factors for academic and behavioral problems at the beginning of school (Doctoral dissertation, Stanford University).
- Jacobson, N. S., & Truax, P. (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *Journal of consulting and clinical psychology*, 59(1), 12.
- Kuhn, M. R., & Stahl, S. A. (2003). Fluency: A review of developmental and remedial practices. *Journal of Educational Psychology*, 95(1), 3.
- Kulik, C. C., & Kulik, J. A. (1991). Effectiveness of Computer-Based Instruction: An Updated Analysis. *Computers in Human Behaviour*. (7), 75-94.
- Layng, J., Twyman, J., & Stikeleather, G. (2004). Selected for success: How Headsprout Reading Basics™ teaches beginning reading. In D. J. Moran, & R. W. Malott (Eds.), *Evidence-based educational methods* (pp. 171–197). San Diego: Elsevier Academic Press.

- Leon, M., Layng, T. V. J., & Sota, M. (2011). Thinking through text comprehension III: The programming of verbal and investigative repertoires. *The Behavior Analyst Today*, 12, 21–32.
- Mason, B. J., & Bruning, R. (2001). *Providing feedback in computer-based instruction: What the research tells us*. Retrieved May, 15, 2013, from <http://dwb4.unl.edu/dwb/Research/MB/MasonBruning.html>
- National Reading Panel (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction. Washington, DC: National Institute of child health and human development.
- Ruble, D. N., Boggiano, A., Feldman, N. S., & Loebel, J. H. (1980). A developmental analysis of the role of social comparison in self-evaluation. *Developmental Psychology*, 16, 105-115.
- Rutter, M., Maughan, B., Mortimore, P., & Ouston, J. (1979). *Fifteen thousand hours: secondary schools and their effects on children*. London: Open Books.
- Saine, N. L., Lerkkanen, M. K., Ahonen, T., Tolvanen, A., & Lyytinen, H. (2011). Computer-Assisted Remedial Reading Intervention for School Beginners at Risk for Reading Disability. *Child Development* 82(3), 1013–1028.
- Slavin, R. E., Lake, C., Chambers, B., Cheung, A., & Davis, S. (2009). Effective Reading Programs for the Elementary Grades: A Best-evidence Synthesis. *Review of Educational Research*, 79(4), 1391-1466.
- Snow C. E., & Biancarosa, G. (2003). *Adolescent literacy and the achievement gap: What do we know and where do we go from here?* New York: Carnegie Corporation of New York.

- Stahl, S. A., & Kuhn, M. R. (2002). Center for the Improvement of Early Reading Achievement: Making It Sound like Language: Developing Fluency. *The Reading Teacher*, 55(6), 582-584.
- Twyman, J. S., Layng, T. V. J., & Layng, Z. R. (2011). The likelihood of instructionally beneficial, trivial, or negative results for kindergarten and first grade learners who complete at least half of Headsprout® Early Reading. *Behavioral Technology Today*, 6, 1–19.
- Williams, S., & McGee, R. (1994). Reading attainment and juvenile delinquency. *Journal of Child Psychology and Psychiatry*, 35, 441-61.

Chapter 6: Discussion

Discussion

Broad Overview

Ensuring that every person within society has an equal opportunity to learn and build upon basic reading and writing skills is a sure way to maximize the positive life outcomes that the individual will experience, which, in turn has a favourable effect on the wider society. A wealth of literature exists, evidencing the relationship between low basic skills and negative associated outcomes such as unemployment, poor mental and physical health, and crime (Bynner & Parsons, 2001; Bynner, McIntosh, Vignoles, Dearden, Reed, & Van Reenen, 2001; Miech, Caspi, Moffitt, Wright, & Silva, 1999). Such factors often coincide and interrelate and contribute to disengagement from educational achievement and work activities common in conventional society.

The aim of this thesis was to contribute to our knowledge in ways we can impact educational success with populations that have typically failed and struggle to engage in education and other forms of personal development with respect to the job market. This thesis has begun to extend on finding ways to improve the basic reading skills in older children and adults by examining effective teaching methodologies and by also understanding the motivations and barriers that might exist to adult education. All of the research was carried out within applied settings using a mixed methods approach, combining qualitative and quantitative research methods.

The structure of the thesis can be separated into two parts. The two studies in part 1 focused on adults, many of who could be regarded as being socially excluded (i.e., they were either long-term unemployed, had a history of offending, a lack of or low level basic skills).

The second part of the research involved working with a group of young adolescents (aged between 11 and 14 years) who were at risk of failing in mainstream academia. Many of these adolescents were at increased risk of poor educational outcomes and the associated risk of poor life outcomes as noted previously. Although taking data specifically on offending behaviour was beyond the scope and resources of this project, all of the studies recruited participants who had either a history of offending or were at a disproportionately higher risk of doing so.

During the initial stages of research I received training and first hand experience of working at Nacro - the crime reduction charity that part funded this research. During this time I learned about partner organisations, gained an understanding of how basic skills were assessed and delivered and was able to meet many of those who used the services. Working alongside staff at Nacro and meeting service users helped to inform the conception and development of the first two research studies in particular and recruit participants through their service. From this research it became clear that educating adults was of great importance not only to those individuals, but to society as a whole; the social and financial cost of offending are incalculable, and the focus on 'dynamic' factors (Bonta, 1996), such as education, seems to be an effective approach to alleviating these issues. That said, ensuring the successful education of children is imperative as a preventative means to reduce the likelihood that they will be affected by the negative outcomes (i.e., unemployment and crime) in later life.

It was around the mid-point of the PhD I was beginning to explore alternative avenues of research that concerned conducting reading interventions with vulnerable groups before they reached adulthood. The shift in focus away from the adult population to working with a younger cohort was due to a combination of both pragmatic and academic factors. First, the

close relationship with Nacro staff was becoming more difficult to maintain simply because a number of key staff had left the company and it was proving more difficult to create new productive relationships. Second, the opportunity to conduct research with a group of adolescents who had reading difficulties in a large mainstream secondary school arose because we had a good working relationship with the local education authority and heads of schools locally. And third, during the early experience of induction and working with Nacro and the findings from the first two studies, it became clear that the problems faced by adults had clearly not started in adulthood, and a key milestone in the 'journey' to educational failure was the end of primary and the start of secondary education. Although it was clear that we would not be able to answer longitudinal questions about the outcomes of earlier interventions with those at risk, I became very interested in the possibility of possibly impacting young adolescents who came from disadvantaged catchment areas and who had already started to show clear signs of educational failure.

Chapter Analysis

Study 1 (chapter two) was an investigation into the use of the Toolbox for Literacy[®] reading programme with three adults who had a reading ability below that of a typically developing 11 year old. This study involved working one on one with three adults, one male aged 34 and two females aged 43 and 22 years old. Two of the participants had a history of offending while one was classed as long-term unemployed. The objective of the intervention was to assess the feasibility of using such a programme with adult learners, and to improve their reading skills. Combinations of continuous measures were taken throughout the intervention period along with a normative standardised reading assessment that measured

reading progress at pre- and post-intervention. The intervention lasted an accumulated 36 hours distributed between four and six months. Results yielded increases in reading performance measured using continuous progress assessments in each participant. Two of the three participants made at least one level gain between pre- and post-test on the norm referenced reading assessment.

The findings of this study added to the limited research that looks at using manualised reading programmes with adults and more specifically, adults at a disproportionately higher risk of offending behaviour. By conducting the research in an applied manner (i.e., actually running the reading programme with adults with reading difficulties) as opposed to conducting desk-based research we were able to identify the successes and difficulties encountered when applying a programme such as this.

The findings of this study offer some preliminary evidence that the Toolbox Series could be beneficial as a literacy intervention for adults. In addition the results of this study add to the body of research evidencing the efficacy of DI and PT as effective teaching reading techniques (see, for example, Adams & Engelmann, 1996; Carnine, Silbert, Kame'enui & Tarver, 2009; Kubina, Common & Heckard, 2009; National Reading Panel, 2000). Anecdotally, the participants become increasingly engaged in the programme. This I believe was due to the use of the techniques of DI and PT instruction, and having explicit targets broken down into achievable goals, achieving goal highly rewarding. Participants were at first very difficult to engage - participants often provided reasons as to why they would be unable to stay for the full session that ranged from dentist appointments to suddenly remembering that they had left the back door unlocked. However, once the session commenced and both researcher and participant were working through the programme together they usually stayed until the end. At times participants even asked to stay an extra

hour or to at least stay long enough to complete another lesson before they left. One participant, who was the mother of five children, explained how she “hated reading and writing” and had developed strategies to avoid it at all costs. At the start of the study this particular participant was the most difficult to engage. Initially it was not uncommon for her not to turn up to sessions and sometimes unexpectedly leave during the middle of a session through frustration. However, by the midpoint of the study she began to make significant progress and in her own words “get it”. At the end of intervention she wrote a letter of thanks to the researcher expressing her gratitude for the opportunity to take part in the study, explaining that it had given her a “second chance” and most importantly it had given her the skills and “confidence” that she felt she needed to help her children with their homework. Anecdotal evidence also suggested that participant’s felt better equipped and more motivated to find a job following intervention.

A limitation of this research included the small number of participants that we used. The primary reason for not recruiting any more than three participants was because there was only one researcher available to deliver the programme. Each participant received 36 hours of tuition across a 12-week period and met with the researcher between once and three times per week. Given that the researcher also needed to factor in preparation time before each session three participants was decided to be a practical amount. Although the Toolbox Series for Literacy programme can be used to teach a class of students simultaneously, instruction was delivered one-to-one during this study. The reason for this decision was primarily due to the logistical implications of getting all three participants together at the same time. The primary difficulty we encountered during this study was getting the adult participants engaged in the reading intervention. Participant attendance was low particularly during the initial stages of

intervention. It was not uncommon for participants not to show up to pre-arranged session times without prior warning. In addition all three participants lived in three separate towns and therefore it was more practical for the researcher to drive to the respective areas to deliver sessions as opposed getting all of the participants together. Consequently, we failed to investigate the feasibility of delivering the programme to a class of adult learners.

Furthermore we did not measure post-intervention outcomes, which may have included, employment status and continued education, which meant we were uncertain about whether there were long-term effects following this brief intervention.

Study 1 examined the use of the Toolbox Series for Literacy to improve the basic literacy skills for three underperforming adults. Further research may wish to evaluate the use of the programme with larger numbers of a similar population and delivered the programme to a group as opposed to on-to-one. It may also be interesting to explore post-intervention outcomes such as employment status and continued education. Further research into systematic instructional programmes such as the Toolbox Series may reveal further support for their effectiveness in teaching an adult population.

Overall the Toolbox Series for Literacy programme is based on two highly researched and evidenced based approaches (DI and PT) to teaching literacy and can be purchased easily and for a relatively small amount. A programme such as this may be of significant value to services that have limited resources and the added pressure to use programmes that are backed by evidence.

This first study highlighted some of the difficulties of engaging adults with reading difficulties, who I found to be eager to want to improve their reading skills but often found it difficult to attend sessions and commit entirely to the programme.

This informed the formation of the second study that set out to investigate the perceptions of adult learners, potential adult learners and educational service providers surrounding barriers to adult education.

Study 2 (Chapter 3) documents a qualitative research study that used a semi-structured interview design to interview eight educators and ten adult learners about their perceptions that adult learners face when trying to enrol on a course. A total of eleven hours and 40 minutes of interview data was analysed using the Thematic Content Analysis (TCA: Braun & Clarke, 2006). From the data three themes emerged: (i) The impact of low academic achievements on later life, (ii) Motivations to engage in adult education and, (iii) Barriers to adult education. There was high congruence between the learners and the educators, although they differed in the importance of particular barriers to education. For example, educators spoke of the negative attitude and low self-confidence of learners, whereas learners spoke of financial and practical issues that prevented them from engaging in adult education courses. We found that participants reported a number of barriers that were consistent with previous research (Bates & Aston 2004; Beder, 1991; Cross 1981).

One of the methodological weaknesses of this study was that only a small number of participants was recruited from a relatively limited area of North Wales. Therefore, we cannot assume that the results drawn from this study are representative of the general population. In addition the adult learners that took part in this study were already accessing

support from a service that offered financial, housing, and educational advice and information. Therefore, the participants had already been exposed to and / or had access to information on the adult education courses that were available. It is therefore possible that adult learners and potential learners who were not in contact with such services and therefore did not have access to information would report different types of barriers.

Study 2 explored the perceptions of adult learners and potential learners and educational providers using a small number of participants. The findings, therefore, should be approached with caution. However, the themes drawn from the participant responses did mirror previous findings (Bates & Aston, 2004; Beder, 1991; Cross 1981). Future research might explore similar perceptions with the same groups using a larger number of participants and recruit from a wider regional area. It may also be interesting to investigate the types of provisions and incentives that organisations provide as a means of increasing participation and attrition rates, and how effective these are. Our findings demonstrated that there was a discrepancy between what the learners and educators perceptions surrounding particular barriers. The key differences were that educators placed more importance on practical assistance, such as childcare and financial support whereas educators placed more emphasis on internal attributes, such as increasing the self-confidence of learners. It would be interesting to investigate whether the educational provisions actually reflect this perception. Therefore, future research might examine the resources educational providers make available to learners or potential learners to improve participation rates. In practical terms, research such as this might help to inform providers of educational courses policy makers on how best to focus their resources.

Study 3 (Chapter 4) was a practice-based pilot evaluation of MimioReading[®] Comprehension (MRC) and MimioSprout[®] Early Reading (MSER) with a small group (n=8) of 12-13 year old mainstream students who were reading below their chronological reading age. The intervention involved implementing the reading intervention (i.e., MER and MSER) with eight students who had been identified by the school to be failing academically and who had behavioral difficulties. The students received intervention for five months in place of their normal English lessons. Students were assessed at pre- and post-intervention time using a standardised reading assessment (Dynamic Reading Analysis, DRA). In addition students' self-perception was measured pre- and post-intervention using the Self-Perception Profile for Children (SPPC). Results found that all of the students made improvements in their reading abilities according to the DRA between pre- and post- intervention. In terms of self-perception, students scored lower (i.e., rated themselves more negatively) on the measure of global self-worth and behavioural conduct post-intervention, whereas there was no change in their perception of scholastic competence between pre- and post-intervention. Anecdotal, evidence from the teaching staff suggested that the behaviour of the students who took part in this study had improved throughout the course of the intervention. During an interview with one of the teaching staff that was most involved with the study she stated: (see appendix E for the full transcript of the interview).

“I’ve seen enormous changes in all of the individuals in the group. From when they started to when they finished . . . I think the most significant change has been behavioural changes from the way they interact with each other . . . Their behaviour was challenging in a way that I don’t usually get in a class. They found it very difficult to even sit next to one another and interact with each other . . . The MimioSprout really grew on them and they went

into the phase of being interested and then suddenly after a couple of lessons we got to the point where everybody was quiet and working.”

During this study we encountered a number of methodological limitations, namely the relatively limited group (n=8) of students used and the lack of a comparison group. Conducting research within applied settings also meant that we could not exert the same control over variables that would otherwise be possible in a laboratory environment. We were therefore met with a number of methodological weaknesses. (Further difficulties relating to the applied nature of this research are discussed in more detail in study 4 along with implications for future research).

Study 4 (Chapter 5) continued the theme from study 3 in the evaluation of the use of MimioSprout[®] Early Reading (MSER) and MimioReading[®] Comprehension (MRC). However, the group of students in this study older cohort (mean age: 12 years 5 months) of typically developing students with reading deficiencies. Thirty-three students took part in the study, 19 received either the MSER or the MRC programme in place of their normal English lessons, and 14 students comprised the waiting list control group and received education as usual. Pre- and post-intervention measures included a reading ability using the same standardised reading assessment as the pilot study (Diagnostic Reading Analysis; DRA) and similarly student self-perceptions were also measured within this study using the Self-Perception Profile for Children (SPPC). Results of this study found that the experimental group made significant improvements in reading accuracy and comprehension in comparison to the control group. In addition students in the experimental group increased their self-perception scores of scholastic competence at post-intervention.

Study 4 attempted to address some of the methodological weaknesses encountered within study three, and a larger sample size (n=33) was used however this number could still be regarded as being relatively small. The students in this study were not randomly selected into groups, with this in mind the findings should be approached with a certain amount of caution. During the course of studies 3 and 4 we encountered a number of logistical difficulties when implementing the intervention into the structure of the school timetable. The sessions for the experimental group replaced the students' normal English lessons; however, because intervention required each student to have access to a computer we needed to negotiate a fixed weekly time slot into the library timetable. Difficulties were also encountered when taking the pre- and post- assessments with the control group students because it was necessary to take the control students out of their normal lesson time. The majority of staff were happy for this to happen following a polite email that requested that we take up to three students out of their lesson for approximately 15 minutes; some members of staff however were less willing for us to do this.

Despite the issues encountered through conducting research in applied setting, a great deal of important information and experience was gained throughout this time and was therefore regarded as a worthwhile exchange.

Further research might replicate studies 3 and 4 and enhance the research we conducted by addressing the methodological weaknesses. Evaluating the use of the Mimio programme with a larger sample of a similar population may be a valuable starting point.

Although study 3 implemented an additional token-economy to keep the students on task no data was taken on this aspect of the design. Anecdotally we found that students' off-task behaviours reduced and on-task behaviours increased following the token economy, however a study with more focus on academic self-perceptions and possibly a measure of behavioural conduct might yield some interesting results with respect to students changes in perception and their actual behavioural conduct within the classroom. Future studies could also investigate the effects of the Mimio[®] programmes separately. During study 4 in particular when more students (n=5) completed a number of episodes from MimioSprout[®] Early Reading (MSER) before beginning MimioReading[®] Comprehension (MRC), we did not evaluate students reading performance after they completed the first programme.

The preliminary findings of Study 3 and 4 offered support of the use an online reading programme with adolescents at risk of academic failure. Although the Mimio[®] programmes were developed for a younger age range studies 3 and 4 demonstrated that children between the ages of 11 and 13 were happy to engage. Therefore it might be interesting for future investigations to evaluate the use of the programmes with older children to distinguish the ceiling age of acceptability for typically developing children. Rolling out the programme in a mainstream school, either as an alternative or as supplementary instruction to help students falling behind academically to catch up with their peers.

Conclusion

Those who leave compulsory education having not received the minimum level of qualifications should have multiple opportunities to revisit academia and gain an education. However, such adults must be first made aware of such opportunities, and encouraged to take

part. Similarly, the instructional teaching methods used within adult education programmes should also be based on solid research foundations to prevent this. However, these individuals should not have fallen through the academic net as children and interventions should have been put in place within compulsory education. Prevention is always better than cure. Thus early intervention for children at risk of academic failure should be implemented.

According to the National Reading Panel (NRP; 2000) children who do not gain essential reading skills (phonics, phonemic awareness, fluency, vocabulary and comprehension) before the age of seven will have a 90% probability of remaining a poor reader throughout the rest of their school career and into adulthood. Therefore, it is essential that the children who struggle academically receive immediate intervention to remediate their deficits so that they become competent readers (Biancorosa & Snow, 2004) and are therefore better able to understand the curriculum material that gets progressively more difficult through each school year (Barber, 1997).

Carnine (1991) argues that educational policy-makers who are ultimately responsible for ensuring the field of education implement the same rigorous scientifically informed methods and technologies. Unfortunately however, there is a lack of research that investigates the effective interventions that are designed to increase reading attainment of older children and adults (Brooks, Miles, Torgerson, & Torgerson, 2006). Therefore, there is an urgent need to investigate the types of teaching methods that are already in practice, the methods of teaching they use and the measurement system by which success is measured. This information will enable us to discover the most effective methods so that governments and policy makers can mandate that educational providers only implement effective teaching methods into schools and adult education provisions. Ben Goldacre recently stated that there was a desperate need to develop and cultivate evidence based teaching culture, allowing the

teaching profession to become “[. . .] free from governments, ministers and civil servants who are often overly keen on sending out edicts, insisting that their new idea is the best in town” (Goldacre, 2013, p. 7).

The investment in and implementation of effective teaching methods that are based on evidence-based research methods should ensure all learners receive the best possible chance at gaining a sufficient education that equips them with the necessary skills to enter the workplace, whether it be as a manual labourer or an office worker.

The primary focus of this research was to explore the ways in which basic reading skills can be improved in those who did not achieve them during the early years of formal education. The overarching theme of this research was to focus on the use of effective evidence-based methods of teaching basic reading skills that can be applied successfully in real life settings. Over the course of the research it was necessary that we incorporated a combination of quantitative and qualitative methods of research to insure we met our investigation aims. We initially focussed on working with adults who had not achieved the minimum level of qualifications that are necessary to function effectively in modern society. During the first study a common issue arose, whilst evaluating the use of a reading programme with three adult struggling readers, we soon found that all of the adults who took part were lacking the motivation to learn and improve their reading skills. In an attempt to explore this issue further we developed a second study, which used a qualitative research method. Using the semi-structured interview design we were able to effectively investigate the perceptions of potential adult learners and service providers surrounding motivations and barriers to adult education.

One of the barriers reported by the participants was the fact that they felt they did not want to return to education because they had had a negative past experience during their compulsory education years. This led us to turn our focus towards working with a younger cohort, in particular those at secondary school age. We wanted to establish whether it would be feasible to use an online reading programme (MimioSprout®) with secondary school children to improve their reading skills. Despite the fact that the children ranged between 11-14 years of age we still regarded these studies to be an early intervention that is relative to the adult interventions. It is therefore important to identify those children in secondary education who have already ‘fallen through the net’ and apply effective evidence-based interventions to remediate their reading deficits.

This research extended on the current research through evaluating and examining effective teaching methodologies with those who had not been previously tested. We also extended on research surrounding motivations and barriers to adult education and provided foundation research into the differences that might exist between service users and service providers.

References

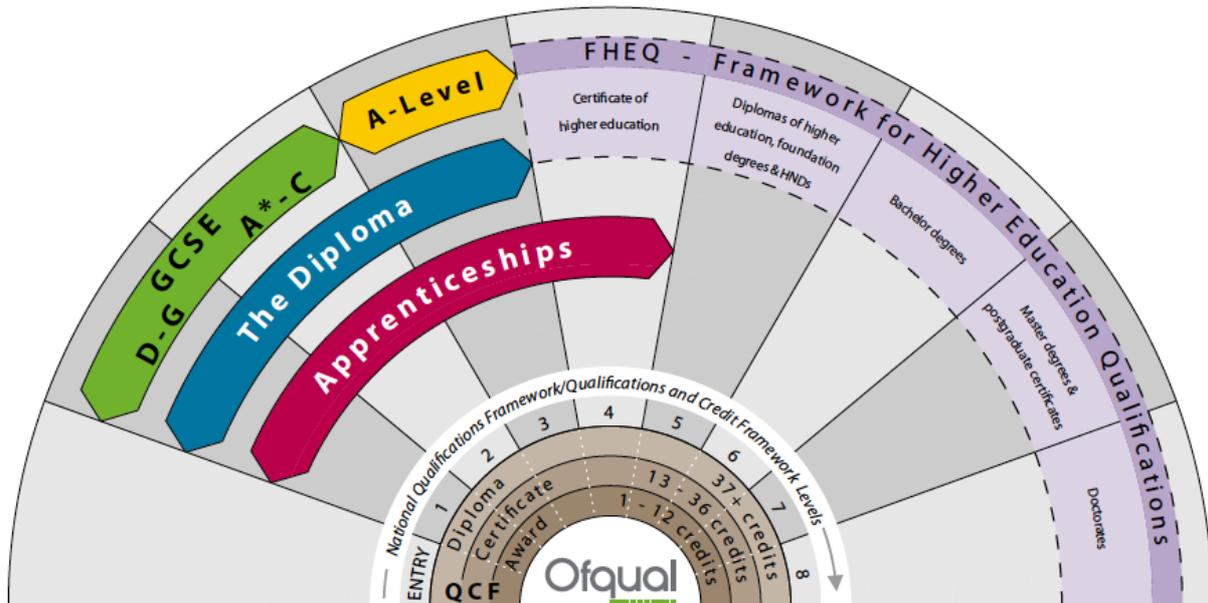
- Bates, A. & Aston, J. (2004). *Overcoming Barriers to Adult Basic Skills in Sussex. Institute for Employment Studies*. <http://www.employment-studies.co.uk>
- Beder, H. (1991). *Adult literacy: Implications for policy and practice*. Malabar, FL: Krieger Publishing Co.
- Cross, P. (1981). *Adults as learners*. San Francisco: Jossey-Bass.
- Goldacre, B. (2013). Building evidence into education (pp 7). Retrieved October 2013, from <http://media.education.gov.uk/assets/files/pdf/b/ben%20goldacre%20paper.pdf>
- Knowles, M. M. S. (1950). *Informal Adult Education*, Chicago: Association Press.
- Knowles, M. M. S. (1970). *The modern practice of adult education (Vol. 41)*. New York: Association Press.
- Kruidenier, J. R. (2002). Research based principles for adult basic education reading instruction. Washington, DC: National Institute for Literacy.
- Kruidenier, J. R., MacArthur, C.A., & Wrigley, H.S. (2010). Adult education literacy instruction: A review of the research. Washington, DC: National Institute for Literacy.
- McShane, S. (2005). *Applying research in reading instruction for adults: First steps for teachers*. Washington, DC: The Partnership for Reading, National Institute for Literacy, Washington, DC.
- Malouf, D. B. & Schiller, E. P. (1995). *Practice and research in special education. Exceptional Children*, 61, 414-424.

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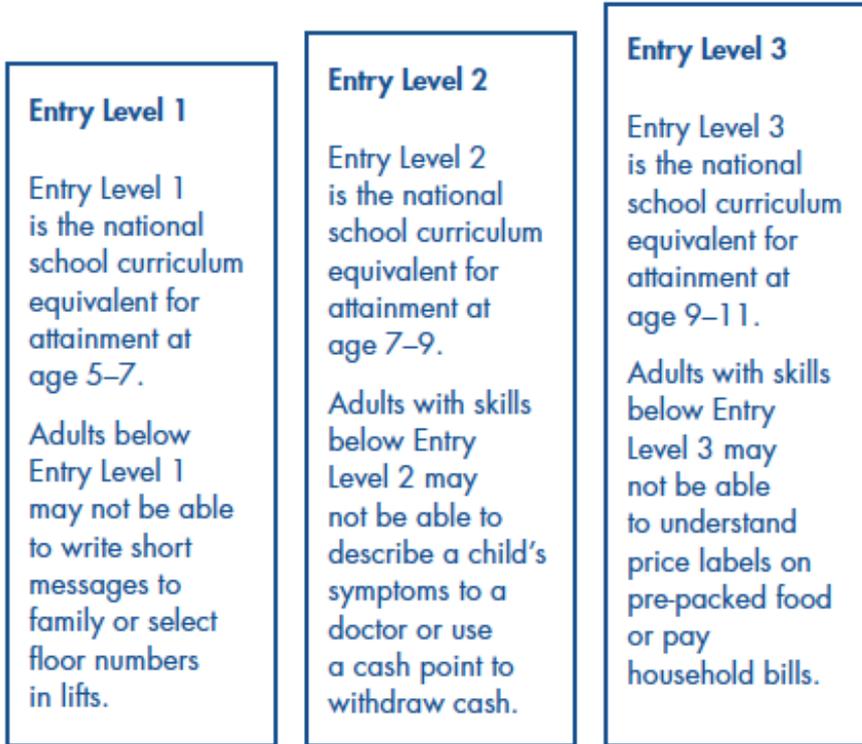
Appendix A

Diagram illustrating the different levels of accredited qualifications.
<http://ofqual.gov.uk/help-and-advice/comparing-qualifications/>



Appendix B

Diagram illustrating the levels that precede Level 1.



Appendix C

Motivaider®



Appendix D

Transcription of interview: Amy (A) and member of teaching staff (F).

12/7/2013.

A: So I just want you to give me an overview of whether you see any differences in the children before and after the Headsprout programme.

F: Erm I've seen enormous changes in all of the individuals in the group. From when they started to when they finished. I think the most significant change has been behavioural changes from the way they interact with each other and the way that they have become more confident. Like if they've got a piece of text in front of them then they would just not look at it or . . . So I taught the group last year. I had them twice on a Thursday, and I found the experience really disturbing . . . and I'd been teaching since 1984 and probably they seemed to me to be the weakest class that I have ever taught in terms of literacy. I was teaching them music where you would hit literacy every now and again. Also I taught them for my only non- for a subject outside of our own training, which was RS.

A: Right

F: So we had to do reading and writing and access the normal literacy skills you'd expect from that sort of a group. So I was given a scheme of work that I had to work with which would have been suitable for them in year 7 which included things like reading PowerPoint looking at simple pieces of text, discussing ideas, answering simple kinds of comprehension type questions. Erm. And I found initially in RS it was for a start too difficult for them. I had

to do very simplified versions of them (PowerPoint). Then when they had to write in the books they were unsure . . . because they couldn't read properly they I had to ask what to write. A lot of the time they couldn't. You had to give them alternatives to the lesson and keep them engaged with lots of different ways of working. Trying to get the same idea across. It was almost as though they were giving up. Their behaviour was challenging in a way that I don't usually get in a class. They found it very difficult to even sit next to one another and interact with each other. So it was a very basic level. Erm, what else? Oh yes and it was at that point I think that I spoke to (researchers name) because to me, if you can't read what's in front of you or write down what's in front of you then... They just seem to be struggling and crying out for help. I knew that setting up this type of project in the school would be really hard, and that we'd have to jump through so many hoops, try to make it work within the tight timetable of a school. I knew we'd also be upsetting a number of people along the way too. So I think when we first started off Headsprouts they actually had a similar sort of approach. They were of course a little bit older by this stage but it was still sort of interaction they had with one another, that they weren't able to listen to each other to respond, they talked over each other. They bickered there was this competition with each other, erm quite aggressive. They weren't even terribly excited about working at a computer because I think what had happened was probably by the time they'd got to about the end of the year 7 was that a lot of the other teachers had been finding something similar so they were looking for a lot of different ways and they probably thought that if they had stuck them in front of a computer they would engage. But in fact there was probably less interaction but I think with Headsprouts there was constant interaction. Not just with the computer, because there was yourself, (name of second researcher) and (name of third researcher). You know

lots of people asking questions and trying to get them back on task, I think having the headphones worked.

A: yeah, yeah.

F: There was. They definitely needed them . . . and they were terrible at listening. I think what was great about the group was that they didn't edit what they said. They just said what was in their heads, usually they wouldn't bottle things up. So when they were irritated we knew about it. When they were hungry we knew about it and we knew they couldn't sit still because somebody had hit them the previous lesson, and they would tell us. So there was something quite unique about their honesty. Which come across in them disclosing things that were actually quite personal, so it was actually quite helpful when you're working with them. You could see the difficulties in them when they were sitting down. But they really. The Headsprout really grew on them and they went into the phase of being interested and then suddenly after a couple of lessons we got to the point where everybody was quiet and working. They were a few real magic moments in my teaching career.. and I don't mean just because it was quiet I often get periods of great quiet, its not quiet we're after you know it is everybody engaged. And you see them of being quite excited about it.

Appendix E

Semi Structured interview Service Provider Staff

‘Warm up’ questions

- a. What is your position in the organization?
- b. How long have you been here?

Q1. What kind of qualifications do most of your service users have?

Q2. How do you think leaving with these grades affected their lives?

2a. With respect to their current employment?

Q3. Are many of the SU’s you see eager to access education?

3a. What are their reasons/incentives for doing this do you think?

Q4. What type of SU is least likely to enquire about education/learning?

4a. Why do you think this is?

Q5. What kind of barriers do you think potential learners face?

5a. What do you think can be done to overcome such barriers?

5b. Do you believe the SU can try harder to overcome learning barriers? If ‘yes’ –

5c. If ‘no’ Q6.

5c. Why do you believe they are not trying to their best ability?

5d. What do you think could be done by your organization to help SU’s overcome barriers?

Q6. If you had a hypothetical pot of money and it was up to you to spend it the way you would on encouraging adults into education how would you spend it?

Q7. What do you believe would encourage SU’s back to education?

Semi Structured interview Service User

‘Warm up’ questions

- a. Where did you go to school?
- b. When did you leave school?
- c. What qualifications did you leave with?

Q1. What Kind of learning experience did you have at school?

Q2. How do you think leaving with _____ GCSE’s affected your life?

2a. How has it affected your current employment?

Q3. What do you think about adults who want to have another go at education and retake their GCSE’s for example?

3a. Do you think it is worthwhile for an adult to get an education later in life?

Q4. Have you tried to get onto any courses such as Basic Literacy and Numeracy? **If No – Q5**

4a. Who did you do the course with?

4b. Did you get onto the course and complete it?

4c. How did you find it?

4d. Did you find it easy to get onto the course? **If 'No' - Q5**

4e. Can you give an example of how things were made easier for you to get onto a course?

Q5. What kind of things got in the way of you finding and/or getting onto a course?

5a. Did you have enough money to cover the costs of the course/child care/travel?

Q6. What things do you believe would encourage you to go back to education?