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Study of an 8-year-old child with dyslexic tendencies and the C-Pen Reader for every day classroom based work

Assistive technology and dyslexic primary aged children

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ABSTRACT

Achieving a Level 4 in reading was, until recently, the expected result Year 6 pupils were required to reach to establish if they had the requisite understanding of the national curriculum. A Level 4 indicated an achievement of basic level reading skills which is required to access the next stage of education. One in 10 children (2012) did not reach the expected national level by the time they finished primary school (National Curriculum KS2), cited in Dyslexia Action, (2017)⁶. The current national curriculum focuses on age-related learning. To date there is no measurement of outcomes available, however, we may assume the new levels of testing will display results with significant differentiation of scores between non-dyslexic and dyslexic students.

The purpose of this study is to evaluate the use of assistive technology to encourage the dyslexic primary child to gain confidence and improve their independent learning from a young age. Consequently, the dyslexic child can develop habitual learning styles which enable them to overcome anxieties and worries associated with reading difficulties; anxieties can create a block to learning. Feedback and interviews were conducted with an 8-year-old dyslexic and her teachers which resulted in a clear indication of improved independence, confidence and reading abilities.

INTRODUCTION

Supporting young children with dyslexic tendencies is not only a worry for parents, but also for teachers as cited in an article from Dyslexia Action (2017)². 74% of those teaching dyslexic children feel dissatisfied with their initial teacher training, questioning whether it provides them with the skills to identify and teach children with dyslexia. Often dyslexic children are incredibly skilled and intelligent; therefore, it is imperative early identification of dyslexic tendencies are recognised to enable the implementation of the right teaching/learning style for that child (as recommended by educational psychologist Dr. Gavin Reid (2017))⁷. However, reading problems can occur due to other issues such as medical and learning difficulties. Early identification of dyslexia can prove to be challenging.

When a clear identification has been achieved, teachers require a bag of strategies and knowledge such as access to supportive guides; for example, the Dyslexic Screener (available online)³; awareness and instruction on the use of up- to-date available assistive technology; which in turn will enable them to support the dyslexic child; and confidence to explore the child's learning styles to help the child reach their full

potential. Finally, the teacher will need to understand the individual child's emotional well-being, Rosie Bissett, (Dyslexia Ireland chief executive cited in Irish Examiner, 2017)⁸ recently stated "It is crucial that teachers understand dyslexia while at the same time having expectations for the child...".

There are several research papers relating to assistive technology and students with learning disabilities; livescribe pen, (Harper et al. 2016)⁴ android software platforms, (Tariq et al. 2016)⁹ mobile learning (Alghabban et al. 2016)¹. However, many of these devices are aimed at the older student. Studies involving primary aged children focus on computer-based training programmes rather than smaller hand-held devices which may encourage independence.

This study evaluated existing dyslexic teaching strategies; sounding out, phonics, learning words from sight, multi-sensory activities and aligning these tried and tested approaches with a device which promotes independent learning; the C-Pen Reader.

A further focus for this study was to gain understanding of how a primary aged child could develop independent skills and habitual behaviours which would support their future educational journey. The dyslexic child requires continual feedback to confirm their success, they require extra time; to enable others to listen to them read; and they need to be motivated.

Extra time to practice reading and sounding out text is of great import to the dyslexic child, followed by confirmation from the adult (who often will have 20-30 other children in the classroom), before continuing with their work. Obviously, this impacts on the dyslexic child's chance of achieving all the work set in each lesson due to the extra minutes they require to ensure they are confident with their learning. The C-Pen Reader was deemed the perfect device to promote such efficiency, with confirmation coming from the pen rather than an adult.

The research question: "How effective would the early introduction of assistive technology be to the primary aged child, to encourage emotional development, independent learning and lead to positive reading outcomes?"

METHOD

Let us introduce you to Hester**, an 8-year-old dyslexic student. At the end of Year 2 Hester undertook the DST-J (2004) dyslexic screening test due to significant difficulties with reading and spelling. Her result placed her ‘at risk’: she was categorized as Spikey, recording below average performance, she showed weaknesses in phonological and dexterity measures and relative strengths in balance. These results indicated a strong link to the six signs of dyslexia. Strategies were put in place to support Hester alongside her family’s request that she had use of a C-Pen Reader, which they provided.

History:

- At 4years and 4months Hester was unwell; her nursery felt there was a potential issue regarding her speech development and queried a hearing difficulty.
- In Reception, she failed a routine hearing test; the school nurse referred her to the hearing clinic. However, at the same time her parents had also identified a hearing difficulty and requested a hearing test via their GP. Hester was diagnosed with hearing loss in one ear and partial hearing in her other.
- Hester was monitored during Reception and Year 1 with regular hearing tests and referred to a speech therapist. Her Reception and Year 1 reports indicated the hearing loss had impacted on her progress in Literacy and Mathematics.
- In Year 2 Hester’s hearing was given the “all clear”. It had been assumed Hester’s hearing loss was the reason for the previous year’s learning difficulties therefore with the marked improvement in hearing and an increase of ability in Mathematics, her class teacher, who was also the school’s Sendco, decided to re-evaluate the continued issues Hester was experiencing with Literacy.
- Hester undertook the dyslexic screening test, the outcome indicated clear dyslexic difficulties.

This example supports the problems often seen in determining a diagnosis of dyslexia; hearing loss is a viable reason for a child showing little progress with reading and writing (NHS, 2017)⁵.

**Name changed to protect the identity of the participant.

Hester's school use a variety of techniques when working with dyslexic children, including:

- Toe by Toe – decoding and fluency.
- Phonics – Bug Club, Letters and Sounds.
- Sight learning words, including use of multi-sensory activities
- Personalised spellings
- Accelerated reading programme
- Coloured reading guides, page covers, reading rulers
- Dragon software

Hester's parents provided the school with a C-Pen Reader. However, the pen was seen as an option for Hester to decide when and if to use; with no clear definition of how to affiliate this with other strategies.

The study team requested a meeting with the teachers to work together to ensure the teaching strategies of the school were not compromised and the C-Pen Reader had a definite focus of use. The following strategies were agreed for Hester:

- She would be initially encouraged to make use of the pen frequently, to enable this to become a habitual behaviour.
- She would attempt to identify words within a sentence she knew by sight.
- She would attempt to read a sentence unaided.
- She would use the C-Pen on words she did not recognise or unable to sound out, then attempt to read the sentence unaided.
- She would use the C-Pen to confirm she had read the sentence correctly.
- She would be encouraged to recognise a growth in her own confidence in learning and reading.

RESULTS

Hester, like many children of her age, is one of the current cohort who will be affected by the change in curriculum testing; the move from achieving set levels (Level 4) to age related expectations. Hester's score for her Year 2 SATs showed she was below the national average for reading, spelling and grammar, 100 is the average mark and she scored 88 for reading and 90 for spelling and grammar. Her Mathematics outcome was 101. She was below expected standard for phonic decoding in Year 1 and re-tested at the end of Year 2, scoring 19 out of 40 (a result of 32 and over is required).

In her first school report from Year 3, the teacher noted that Hester required support with reading and writing,

“.. has continued to show enthusiasm for her learning despite the fact that her dyslexic tendencies hold her back. She is really enjoying the use of the C Pen reader and it has certainly improved her eagerness to read.”

“Although we have been trying to get her to recall sight words using a word grid on a daily basis, she still finds this challenging...”

Hester had a change of teacher soon after this first term report. The new teacher was aware of the C Pen Reader but had not received any training or instruction in the use of the pen. *It is imperative those supporting students with assistive technology receive full training and understanding of the effectiveness of these tools.*

At the beginning of the study Hester required a prompt from her class teacher to use the pen for tasks set in the classroom. Motivation is a very strong factor when teaching dyslexic students, a lack of motivation may be due to a myriad of reasons, including self-esteem. From commencing school, the dyslexic child will soon discover the basic requirements to access learning; reading, spelling and writing, are incredibly challenging, potentially leading to feelings of frustration and/or non-engagement. Therefore, encouragement and support will be required to promote independent learning.

Hester showed no hesitation in using the pen effectively at the commencement of the study. The only issue she encountered was soon rectified; when using a new book, the pages needed to be pushed flat to enable the C-Pen Reader to flow across the page, adult support was required to overcome this problem.

Originally Hester was attempting to use the C-Pen to read a whole sentence, her teacher supported Hester to believe in her abilities; the books she was reading were aimed at her correct reading ability and therefore she would be able to read many of the words in these books without the support of the C-Pen! The teacher and teaching assistant encouraged Hester to attempt sounding out first, before using the pen, to not use the pen for reading entire sentences. Towards the end of the study Hester used the pen only when she came across ‘tricky words’. She would use all other strategies first and did not require prompts or reminders from an adult.

Primarily Hester felt more comfortable when her reading text was cut into strips as this alleviated the feeling of being overwhelmed. Using her range of strategies, including the C-Pen, was helping to promote self-belief in her abilities, she no longer required her work to be cut into strips when reading larger amounts of text.

Hester is a social child and well-liked by all her peers, she would often turn to peers with good reading skills, to assist her. The use of the head phones in conjunction with the C-Pen proved to be a helpful strategy for Hester, it helped her to avoid distraction and to attempt the work by herself.

Hester used her C-Pen often during the DEAR (Drop Everything And Read) sessions at the commencement of term, however, her teacher reported by end June 2017 she was no longer using the pen during these sessions and was confident in choosing a book to suit her abilities.

Finally, Hester's end of year report stated:

"Hester has showed great enthusiasm for her reading.... She has become proficient in using a range of techniques to help her with her reading from the use of coloured overlays to the C Pen reader, which with initial support, she is now using appropriately".

"... all this (sic. a variety of strategies) has contributed to making progress with her reading... shows good comprehension skills.... making relevant predictions".

English: below age expectations, effort is noted as excellent

Mathematics: reaching age expectations with an excellent effort.

DISCUSSION

We previously mentioned the work of Dr. Gavin Reid. Reid, an independent international educational psychologist, actively encourages professionals to look at a variety of learning styles to accommodate the individual dyslexic. He feels it is imperative for the child:

- to use creativity,
- to take small steps,
- to receive frequent feedback,
- for the student to believe in their own abilities (Reid, 2017)⁷.

Hester's parents felt encouraged and supported by her primary school, but also understood the transition to secondary school and the expectations in this environment required Hester to have confidence and habits which encompassed independence and self-belief. They wished to help her face her anxieties and to utilise a variety of strategies which suited her individual learning style. When approaching the primary

school, they found actively supportive teachers and a willingness to try other approaches to encourage Hester's exploration of reading, writing and spelling. The school also felt while the timing was right for Hester to use assistive technology, the C-Pen Reader may not be suitable for younger children and each child's individual abilities would need to be assessed.

The C-Pen Reader requires boundaries for the younger student which will not detract from the continuation of learning to read, to ensure the student experiences enjoyment in reading. However, Hester's school also understood frustration and lack of ability can create a barrier, therefore finding the right learning style is imperative. For Hester, the C-Pen Reader suited her individual learning style and improved her confidence, independence and understanding of what she can achieve.

Future studies should consider the individual learning styles of participants. Other assistive technology or creative learning resources should be compared with the C-Pen Reader; pairing the right learning aid with the preferred learning styles of the student would require an initial assessment to ensure compatible pairing. However, this study has shown how cathartic and empowering the C-Pen Reader has been for this young dyslexic.

A further recommendation is to return to this student in Year 6 to inquire if her independence and confidence has continued and to check her final age-related outcomes before commencing secondary education. We feel, as the new curriculum is based on age-related learning, Hester's emotional well-being, confidence and belief in herself will enable her to continue to access the curriculum fully.

Finally, we feel the research question has been answered positively. Hester shows increasing confidence and independence and although her attainment is still low she has been seen to show an increase in reading abilities and self-belief in her reading.

REFERENCES

1. Alghabban, W. G., Salama, R. M., Abdulrahman, H. A. (2016) Mobile cloud computing: An effective multimodal interface tool for students with dyslexia [Online] Available at: <http://www.sciencedirect.com/science/article/pii/S0747563217303266> (Accessed 9th September 2017).
2. Dyslexia the Facts & Figures; Driver Youth Trust (2013) in Dyslexia Action, Training and Professional Development 'Facts and figures about dyslexia' (2017) [Online] Available at: http://www.dyslexiaaction.org.uk/page/facts-and-figures-about-dyslexia-0#_edn11 (Accessed 10th September 2017).
3. GL Assessment, Dyslexia Screener: Dyslexia Screener, Portfolio and Guidance, 'Helping you identify pupils with dyslexic tendencies' (2017) [Online] Available at: <https://www.gl-assessment.co.uk/products/dyslexia-screener-portfolio-and-guidance/> (Accessed 8th September 2017).
4. Harper, K. A., Kurtzworth-Keen, K. and Marable, M. A (2016) Assistive technology for students with learning disabilities: A glimpse of the livescribe pen and its impact on homework completion [Online] Available at: <https://link.springer.com/article/10.1007/s10639-016-9555-0> (Accessed 9th September 2017).
5. NHS Choices: Dyslexia – Diagnosis (2015) [Online] Available at: <http://www.nhs.uk/Conditions/Dyslexia/Pages/Diagnosis.aspx> (Accessed 6th September 2017).
6. Office for National Statistics (ONS), 2012; Mid-year Population Estimates for England and Wales, 2012 in Dyslexia Action, Training and Professional Development 'Facts and figures about dyslexia' (2017) [Online] Available at: <http://www.dyslexiaaction.org.uk/page/facts-and-figures-about-dyslexia-0> (Accessed 10th September 2017).
7. Reid, G. Dr. Dr. Gavin Reid Education Consultants 'Effective Learning and Motivation – Ideas and Strategies for Independent Learning' (2017) [Online] Available at: <http://www.drgavinreid.com/free-resources/motivation-ideas/> (Accessed 6th September 2017).
8. Shanahan, C (2017) 'Boy, 12, says dyslexia gives him his own superpowers', Irish Examiner [Online] Available at: <http://www.irishexaminer.com/ireland/boy-12-says-dyslexia-gives-him-his-own-superpowers-459309.html> (Accessed 28th September 2017).
9. Tariq, R. and Latif, S. (2016) A Mobile Application to Improve Learning Performance of Dyslexic Children with Writing Difficulties [Online] Available at: <http://www.jstor.org/stable/pdf/jeductechsoci.19.4.151.pdf> (Accessed 9th September 2017).

APPENDICES

REPORT FORM - <i>Please complete weekly</i>	
Details	Comment/yes/no
<i>Has EF used the scanning pen during this week? (Comments such as: how often in the week? In specific lessons?)</i>	
<i>EF ability to use the scanning pen independently?</i>	
<i>EF displaying any independent learning? (Comments: any signs of dependency on pen, or alternatively has confidence increase enabled other strategies to emerge?)</i>	
<i>Teacher's comments:</i>	

<i>INTERVIEW QUESTIONS FOR TEACHER</i>	<i>INTERVIEW QUESTIONS FOR CHILD</i>
Teacher: EF has a specific reading difficulty? Can you describe this and how this has impacted on her learning?	Can you tell me/show me how to use the reader pen?
Teacher: EF has been using the reader pen for a while, but can you share with us her first experiences with the pen? What are the specific ways in which she uses the pen now, if they are different?	Do you like using the reader pen and can you tell us why?
Teacher: Have you had to introduce different strategies to accommodate how you would like the reader pen to be used? Why do you want the reader pen used in the way you have specified?	When do you use the reader pen? When is it most helpful?
Teacher: Are you using the reader pen only or have you found it supports other reading strategies? If so can you describe how the reader pen supports these.	Are you able to read all by yourself, with no help, when you use the reader pen?
Teacher: Would you suggest the reader pen is useful to those students with similar learning needs as EF, or do you see its use for other students? If so can you describe what their needs are and how you envisage the pen would help?	

The replies of the teacher and child to the interview questions can be view at https://drive.google.com/open?id=0B68__lIRA_SGRHdZX3A4dUtSNnM

INTERVIEW QUESTIONS FOR SENDCO and HEAD TEACHER

SENDCO: How were you introduced to the reader/exam reader pens?

In what capacity did you try out the pen?

Having then chosen to purchase a number of reader pens do you have a specific use in mind for them and would you like to share that with us?

How do you envisage the school using the pens in the future?

At what point do you feel you will introduce the pen to a student from a primary SENDCO view?

Head Teacher: Expense is of great concern to schools when looking at assistive technology, what promoted you to choose the reader/exam reader pens?

In what capacity do you envisage the pens supporting learning for your pupils?

What do you think your pupils will get out of using the reader/exam reader pens in their day to day learning?

The interview question replies can be viewed at https://drive.google.com/open?id=oB68__lIRA_SGRHdZX3A4dUtSNnM