Dyslexia

PURPOSE

For years teachers and principals have recognised a small percentage of students in their schools who appear to be capable, articulate and intelligent, and should learn to read, spell and write easily but who don't despite good teaching and the use of existing early intervention programmes such as Reading Recovery.
The term Dyslexia was not able to be used in our schools, and no research or training was available for teaching staff in the New Zealand education system. Parents who were convinced that their child was dyslexic were referred to private providers such as SPLD and the Irlene Institute for diagnosis and tuition, often at considerable cost.
Has this situation changed in 2008? Are children now able to be screened for dyslexia, and are teachers and principals able to access research based intervention programmes to make a difference for these children? What robust screening tools are available for New Zealand teachers to use? What proven strategies or programmes are available for them to use?

BACKGROUND

In their paper Literature Review: An International Perspective on Dyslexia the Ministry of Education states that it has not specifically recognised the use of the term dyslexia in the school context because of the issues associated with labelling students, and instead, individual needs are identified and appropriate interventions across a range of learning difficulties are implemented – although these are for children with difficulties in reading and literacy, not for specific disorders such as dyslexia. Funding for these programmes is currently provided through the Special Needs Grant and Targeted Funding Grant within a school's Operational Grant.

In 2007, New Zealand Education Ministry Curriculum, Teaching and Learning Design manager Mary Chamberlain said the ministry, researchers, and specialists were responding to the latest international reviews of evidence about persistent difficulties with reading and writing. She says what many primary school teachers and principals have been saying for years; that New Zealand students are achieving well in literacy by international standards, but some students don't make expected progress in reading and writing in spite of good teaching and extra support.
"We're now at the beginning of the journey toward understanding how to act on this knowledge. The ministry is working with the Dyslexia Foundation and literacy experts in its work to better address dyslexia in schools.
"This is relatively new territory for education agencies internationally. We are basing our work on robust evidence and are looking at what other countries are doing."
10 October 2007 Media Release
One needs to ask…why now? What has caused this change of heart in 2007?

Behind the Rest of the Developed World

Mary Chamberlain may well be doing the international community an injustice as dyslexia, in-depth research and it's implications for schools and learning has been going on for many, many years throughout America, England the Netherlands to name just a few. In the 1960's and 1970's Australia funded identified students through its special education budget. The 1994 Code of Practice in Britain states that 'teachers are expected to identify all levels of dyslexia and other learning difficulties and put an individual education plan (IEP) into practice immediately'. England, Scotland and Nth Ireland students have introduced Dyslexic Friendly schools into their education system for some time and the Netherlands and U.S.A are also years ahead of New Zealand.

METHODOLOGY

Attending a three day international conference in Harrogate, England, gave me the opportunity to hear experts from around the world present research and provide workshops. Countries from all around the world were represented – although it was mentioned in the opening address to the conference that I was the only representative from New Zealand.
This was a missed opportunity for our Ministry.

I visited many schools who were 'Dyslexic Friendly" to see what actually is provided for children who have been identified as being Dyslexic.
I spent time researching, talking to SENCOS and Principals in England and in Nth Ireland.

Taking an extra term on leave with out pay I gave me the time to research screening tools and programmes and with the help of two RTLBs I have now put together a very robust screening tool to use and a half hour daily teaching programme that a teacher aide can administer.

Definitions

The word Dyslexia comes from the Greek 'dys – meaning difficulty with, and –lexia meaning words or language.
There are many different international definitions of dyslexia, most too wordy to be memorable or useful.

- In 1896 Pringle Morgan called it 'Word Blindness' when the first diagnosis of developmental dyslexia mentioned in any publication appeared in The British Medical Journal, 7 November 1896: "A Case of Congenital Word Blindness" by W. Pringle Morgan, M.B. Seaford, Sussex. It was an account of a 14 year old boy, Percy who "...in spite of this laborious and persistent training, he can only with difficulty spell out words of one syllable". "The schoolmaster who taught him for some years says that he would be the smartest lad in the school if the instruction were entirely oral." (*The Dyslexia Handbook 1996, p11-14).*
- The definition recommended by the Research Group of Developmental Dyslexia of the World Federation of Neurology in 1968 reads:
  "A disorder manifested by a difficulty in learning to read despite conventional instruction, adequate intelligence and socio-cultural opportunity. It is dependent upon fundamental cognitive difficulties which are frequently of a constitutional character."

Singleton (2000)1 defines the key cognitive characteristics of dyslexia as being:

- inadequate phonological processing abilities;
- a marked inefficiency in working memory;
- difficulties in automatising skills, e.g. driving a car, reading;
- problems that are related to visual processing, e.g. visual discomfort associated medical conditions.
- Dyslexia is a complex neurological condition which is constitutional in origin. The symptoms may affect many areas of learning and function and may be described as a specific disability in reading, spelling and written language. *(British Dyslexia Association 1996)*

The latter definition is also the definition adopted by the Ministry of Education in New Zealand, presumably until they can come up with their own definition.
I tend to agree with Maggie Snowling, 2008, who suggested that it was better to consider dyslexia as a dimension rather than a disorder with clear boundaries as there appears to be many different and varying degrees of dyslexia. There's no cure, but recognition of the problem and appropriate teaching methods can help a great deal. It is vital that children are diagnosed early and given the help they need.

The condition appears in all ages, races, and income levels. Dyslexia is not a disease, but describes rather a different kind of mind that learns in a different way from other people. Many people with the condition are gifted and very productive; dyslexia is not at all linked to low intelligence. In fact, intelligence has nothing to do with dyslexia.

Familial Risk

In 1896 Pringle Morgan guessed that Dyslexia has a genetic link and studies since then have proved that this is so, suggesting that a male child with a dyslexic parent has a 50% chance of being dyslexic, a female child has a 40% chance.

Knowing that a child's dyslexia has a genetic basis makes it impossible to maintain that it is 'purely psychological' or that the child is 'lazy' or 'stupid'. This can transform the child's self esteem. (*Dr Ian Smythe 2008)*

A recent research announcement from The Wellcome Trust Centre for Human Genetics at Oxford University further supports the fact that dyslexia is inherited and does run in families. This particular Oxford University study has found evidence that links a Chromosome 6 gene to reduced general reading ability without impacting on intelligence. A similar study was done through the Department of Paediatrics at Yale School of Medicine. There, researchers found that a genetic alteration in Chromosome 6 or DCDC2 causes disruption in the formation of brain circuits and this genetic alteration is transmitted within families. "The gene itself is expressed in reading centers of the brain where it modulates migration of neurons. This very architecture of the brain circuitry is necessary for normal reading." Jeffrey R. Gruen

Scientists from the Wellcome Trust Centre for Human Genetics in Oxford studied more than 200 children of families who are dyslexic and found that Chromosome 18 could be the most important gene associated with this condition.

Whether it is Chromosome 6 or 18 or a combination of chromosomes is in dispute, however there is plenty of evidence gathering now to show a strong link between chromosomes and dyslexia, and that it does undoubtedly run within families.

<u>The Cerebellum and Dyslexia</u>

Much research has been done in the past few years on the working of the brain, and the cerebellum in particular. The cerebellum is the part of the brain which allows us to do things automatically or subconsciously, such as driving a car or picking up a cup, without conscious thought. To learn a skill fluently is to make it automatic so one can do it without thinking about it. Reading with fluency and expression usually becomes automatic as a child progresses through school.

Studies have shown that dyslexic children have trouble automating even the easiest of skills and need to think their way through each task. Nicolson and Fawcett, 1990, found that while a dyslexic child could balance as well as the control group, their balance deteriorated significantly when they were asked to do something else at the same time, whereas the controls' balance was not affected at all.

There is little doubt now that researchers agree on there being definitive differences in the behaviour of the cerebellum of the dyslexic child when asked to perform certain tasks compared with that of a control child.

"*Putting together the 'cognitive neuroscience' results on the role of the cerebellum in skill automation, balance and language dexterity with our own findings with dyslexic children, it became clear that the cerebellum abnormality was a prime candidate for the cause of the difficulties suffered by dyslexic children."(Fawcett and Nicolson 2001)*

Professor Kathy Price reports on her findings of Neuroimaging Studies of Dyslexia that while there were some inconsistencies, such as confusion in the names of the regions in the brain, she did find some consistencies replicating across studies. There tended to be reduced leftward symmetry and exaggerated temporo-pariety asymmetry with less left temporal grey matter.

Fulbright et al 1999: 1925 conclude that 'the cerebellum is engaged during reading and differentially activates in response to phonologic and semantic tasks. These results indicate that the cerebellum contributes to the cognitive processes integral to reading.'
Whether the research conclusions show differences in the size of the brain or in the left and right portals or in any other abnormalities, it is clear that the brain of a dyslexic child is different to that of a poor reader or a child with low intelligence.
The brain of a Dyslexic shows abnormalities for processing of fast temporal information.

What affect does This Have on reading?

If we agree that the abnormalities in the cerebellum directly affects a child's language development and working memory these corresponding difficulties in cognitive processes such as automation and phonology will have a direct effect on the ability to read, write and spell.
A small area of the left hemisphere, the visual word form area, can aptly be named 'the letter box' in as much as it stores knowledge of shapes of letters and their relations within a given writing system. This system specialises slowly during reading acquisition, and its insufficient activation is one of the clearest markers of dyslexia. (*Stanislas Dehaene. 2008*)
The dyslexic child displays mild motor difficulties which can result in an infant being slower to sit up or walk, and can be slower to start talking. This delay in language development may lead to difficulties with rime and the phonemic structure of language. (*Snowling, Hulmes 1994*.) Poor phonological awareness has a direct impact on the ability to spell, and to learn and memorise spelling patterns. Poor handwriting, which is very common in Dyslexic children, is a result of poor finer motor skills.

Identification

Knowing that a child is dyslexic can have a great bearing on parental expectation, on a child's self-esteem, and most worryingly, on the expectations of the classroom teacher. For the child a diagnosis can be a relief as, with careful explanations and support, the child can understand why he/she is not progressing as well as his/her peers. The parents can also feel great relief and will often point out similarities in their own difficult schooling years.
A concern is that with the word dyslexia now being able to be used and with no obvious input from the Ministry to date for educating communities on what dyslexia actually is, teachers and parents may find it a convenient excuse or explanation for slow progress in literature. Much research has been done on the effect of teacher expectation on the success of children's learning, there fore it is essential to a child's learning that teachers do not lower expectations simply because a child may or may not be dyslexic.
It is therefore imperative that educators use or have access to specialists to implement a robust, reliable tool with which to diagnose children. Simply believing that a child who has difficulty reading or spelling must be dyslexic is dangerous and counter productive. Many children who are dyslexic learn to read; many children who are poor readers are not dyslexic.
Adequate and timely training and professional development must be available and it is up to our Ministry of Education to ensure this is freely available now.

It must be said that the Ministry should have had screening and support processes in place before introducing the word 'Dyslexia' into our education system.

Predictors for very young children include:

- Walking but not crawling first
- Difficulty clapping simple rhythms
- Using shorter sentences with lees syntactic complexity
- Smaller growth of vocabulary
- Persistent jumbled phrases, the inability to remember the label for known objects.
- Clumsy or slow learning to ride a bike, tie shoe laces
- Difficulty learning nursery rhymes
-

Predictors for school children include:

- family members who experienced difficulty learning to read or spell when they were at school.
- child experiencing reluctance to go to school or feelings of failure at school.
- difficulties with spelling.
- misses out words when reading.
- difficulty reading aloud.
- Letter confusion, scribing letters backwards or reorganising letters in a word.
- sometimes skips lines when reading.
- experiences difficulty copying from the board.
- gets confused about following instructions, for example when playing a game.
- unable to count backwards from 100 down to 0.
- unable to order months of the year
- difficulty retaining basic facts and times tables
- has difficulty organising and managing self.
- a noticeable difference between the pupil's ability and their actual achievement.

Co-Morbidity

Many studies have been done to prove a co-morbidity between dyslexia and ADHD. In 2000 and 2001 Wilcutt and Pennington, Smith et al and George Hynd all came to the same conclusion that up to 50% of children with Dyslexia will also display symptoms of ADHD. The Dyslexia Research Institute (U.S.A) whose director, Patricia K. Hardman, Ph.D., is a nationally known expert in the field of dyslexia and attention deficit disorders suggest that a child with both ADHD and Dyslexia will show some of the following indicators:

- Spotty performance on IQ tests: high in some areas, low in others; IQ scores decline by age 12
- Poor visual motor perception resulting in handwriting and copying problems
- Poor reading skills or poor comprehension skills
- Poor phonological awareness
- Poor ability to deal with time, which makes them have problems in organizing, setting and maintaining goals, realizing what their behaviours or choices will "cost" in the future
- Poor spatial orientation resulting in poor handwriting and problems with "reading" body language
- Impaired auditory processing problems, so that sometimes they cannot remember instructions or they "mis-hear" what they have been told
- Speech irregularities
- Variability in performance -- able to do something one time and not another time
- Literal interpretation of language with difficulty with nuances, transferring or generalization of information, and more difficulty developing morals and ethics
- Attention and concentration deficits
- High incidence of allergies, alcoholism, diabetes, learning problems, and thyroid conditions in their families or themselves

Conclusions/Recommendations

Dyslexic children need to:

- to enjoy literature and language despite their weaknesses with written text
- teaching and reinforcement of the specific skills needed for decoding and understanding
- support in all aspects of the writing process
- a reduction in the amount of writing required
- opportunities to use other ways of recording
- multisensory, structured and fun approaches to spelling
- opportunities for over learning
- opportunities for over learning
- Use coloured highlighters e.g for identifying 'gems' in writing
- **Make Learning Visual**
- Use Mind Maps® and 'key visuals' as a tool for planning, presenting and reviewing learning
- Draw pictures, diagrams and charts
- Use various colours for different areas of learning, vary screen/text colour on monitors & data shows, use black & blue markers on whiteboards
- Use visual timetables throughout the year groups
- Have days, months, numbers displayed, not just in junior rooms.
- **Make Learning Auditory**
- Use a range of speaking and listening strategies to support learning
- Make use of tapes to listen to and record ideas
- Record sound using a computer. Attach recordings to files so that pupils can hear instructions or information
- Have children teach others things they have learned, as this embeds understanding and memory
- Sing information to rhythm, as a whole-class group
- **Make Learning Tactile**
- Have children trace over words, letters and numbers
- Use whole-body movement – have children jump along floor number lines, hold cards representing stages in the life cycle and physically rearrange themselves to make the correct sequence, and so on.
- Have children cut up pieces of information, then re-sequence them
- Draw letters in the air using BIG body movements –especially for teaching b/d confusions.
- **The Advantages of ICT For Dyslexic Learners**
- Provides visual support for the teacher's explanations and key vocabulary
- Supports multisensory approaches – for example using digital image and sound to stimulate and extend writing
- Provides a variety of ways in which children can record their work
- Allows children who do not process information in linear, sequential ways to read non-linear texts
- **Allows children to:**

- Organise and arrange notes when planning writing, access on-screen word grids or predictive word processing, spell-check their work, and end up with a product of which they can feel proud
- Revisit earlier work and use the computer's feedback to amend and edit, correcting errors within an uncritical medium
- Change screen colour/text type to suit their needs

Dr Chris Singleton, June 2000 Guest Article, Understanding Dyslexia: Introductory Notes, http://www.devdis.com/guestart-jun.hmtl

Dr Ian Smythe 2008: Cross Linguistic Comparison of Reading & Writing Difficulties)

Fawcett and Nicolson 2001) Dyslexia in Context Edited by Gavin Reed & Angela Fawcett pg 29)

Education as Brain Recycling Stanislas Dehaene Paper presented at the 7th International Conference of the British Dyslexia Association, Harrogate, England pg2-3

Jeffrey R. Gruen, M.D. from Department of Pediatrics at Yale School of Medicine.

Impaired visual word processing in dyslexia revealed with magnetoencephalography R Salmalin Annals of neurology, 1996

Anatomical correlates of dyslexia: frontal and cerebellar findings Oxford Journals

Barbara Riddick Living with Dyslexia pgs 58 -77

The Dyslexia Research Institute (U.S.A) http://www.dyslexia-add.org/contact.html