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Developments in effective teaching strategies for students with dyslexia: A review of literature and research

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Abstract

This article reviews the body of research on difficulties faced by dyslexic students in educational setup and different teaching methods which played an effective role in enhancing the learning skills of the students. First, we explore the assessment of comprehension and reading difficulties of these students at initial stages. Next we discuss the methodology used in reviewing the literature on different instructional methods for the students with specific focus on dyslexic students. Next we review the body of studies involving instructional methods for improving the comprehension and reading abilities of the students. This is followed by the research on techniques for improving the academic abilities. We conclude with a discussion of ongoing issues in the field with regards to identification, assessment and providing early intervention to dyslexic students, the need to include other computer assisted techniques like teach multiple strategies to students with specific focus on the "visual strategy".

Keywords: Dyslexia, Visual strategy, Reading, Peripheral vision, Learning.

Introduction

Reading disorders have been extensively researched. Dyslexia, the existence of which was once questioned, is now extensively accepted as a specific difficulty in learning to read. Research shows that dyslexia may affect more than the ability to read and write. There is an increasing volume of research on so-called 'co-occurring' factors.

Dyslexia

Dyslexia is a learning difficulty that largely affects the skills involved in precise and smooth word reading and spelling. The distinguishing features of dyslexia are difficulties in phonological awareness, verbal memory and verbal processing speed. It occurs across the range of intellectual abilities. It is considered of as a continuum, not a distinct category, and there are no clear cut-off points. Co-occurring difficulties may be seen in aspects of language, motor co-ordination, mental calculation, concentration and personal organization, but these are not, by themselves, markers of dyslexia [1].

A good indication of the severity and persistence of dyslexic difficulties can be gained by probing how the individual responds or has responded to well-founded involvement.

Beginning stages

Traits of Dyslexia start being obvious by age three and although can often be mistaken for a normal development time table that is different for all children, clusters of these issues can start to stand out from other children. As children mature and become adults their "Dyslexia" doesn't go away; they hopefully learn to work with it and accommodate themselves. Other children are not so lucky. Some are successful adapting to a left-brained world and others are plagued with their "learning differences" having no guidance to deal with them. A lot of these indicators or traits occur with other health and mental issues or personality types that are not Dyslexia [2].

Dyslexics are dominant right brain learners and thinkers in a society that reflects and respects the thinking processes of the left brain. "Righties" can have a difficult time fitting in.

This list of indicators and traits are about the particular view of the world common to righties that can create issues for them. This is not to say that being a left-brain thinker is better. They have their weaknesses and limitations with certain types of processing also [2, 3, 4].

Assessment at preschool and kindergarten stage

There are many ways to recognize a Dyslexic child at a very early age. All Dyslexic children will vary and never have exactly the same indicators. There is no authoritative test for Dyslexia. It is important to remember that Primary Dyslexia is inherited and probability of inheritance if one of the parents has Dyslexic issues is 50% [5].

Some Dyslexic children are delayed talkers and do not start speaking until as late as three or four years of age. It is not unusual for them to suddenly start talking over a short period of time and will be speaking in full sentences soon after they start. A child should get a hearing test to rule out hearing problems if they are only saying a few words and often incorrectly after three years of age or for other delayed development problems. Other Dyslexic children can start talking very early, at about one year of age, and even in full grammatically correct sentences. The high intelligence that often comes with being right-brained dominant is usually noted at this early age through their use of language and pictures, but not necessarily letters and numbers [4].

Dyslexic children sometimes lisp or stutter. Phonemic awareness problems can be one of the reasons for this or difficulty "finding their words". Dyslexics are predominantly "picture thinkers" so at times, especially when young, they will struggle to find the right words to say.

They can mix up sounds in multi-syllabic words such as "pasghetti" for spaghetti, "aminal" for animal more so than the average child.

They can have difficulty learning the names of letters or the sounds of the alphabet, numbers, days of the week, colors, shapes or how to spell and write their name. This is the beginning of them having difficulties with understanding certain types of abstract concepts versus concrete. They think primarily in images and not necessarily letters and numbers. Animals, people and objects are real but letters and numbers are abstract and mean nothing to them yet.

They have difficulty learning to say the alphabet in the correct order or counting to 10 correctly. The Dyslexic child does not understand sequences well. They see the "big picture" easily but not the individual parts.

They show confusion with directionality such as left from right, up or down, over or under, now or later. Dyslexic children think three dimensionally and 360 degrees around themselves so directionality can be bewildering because they don't know always know where they are in reference to right or left, up or down, etc. For example if you ask a Dyslexic "Can you point to my left hand?" - watch their eyes and body movements. They will generally be imagining themselves coming around the back of you to find your left hand. They do not realize it should be the hand opposite their right hand. This is why when they are told to do something in regards to direction they might ask a lot of questions to determine your left or their left, behind you or them, which "over there" because they see many "over there's".

They can have problems learning to tie their shoes or can't do it *et al.* This is a directional problem again and

difficulties with delayed fine motor skills that Dyslexics can have.

Dyslexics can have difficulties learning to rhyme words (dog and log, cat and bat) or repeat a mother goose rhyme or other rhyme accurately or say them the same each time. These are again delayed language and speech problems that can occur in Dyslexics.

They don't usually have hand dominance until about seven to nine years of age and some can use their left or right hand alternately for different tasks such as eating, printing, throwing a ball or drawing with a crayon.

They have difficulty learning to print letters or numbers or keeping them on a line or copying a word that they have an example of. Because they see the "big picture" they can see an exercise page as one image and won't know where the limits are or where to start. This requires training to help them see the lines where they are meant to print their letters and words.

They have difficulty with saying R, L, M and N properly in a word such as "wed" for "red" or "wam" for "lamb". Phonemic awareness issues.

They have difficulty with "phonemic awareness" which is the ability to hear individual sounds in a word. For example if you asked them what sounds they hear in the word "cat" they would not be able to tell you they can hear "c"- "a"- "t". They can also pronounce words like "banana" as "nana" because they don't hear the "ba".

Dyslexia symptoms in children 6 years old to adult

They often have a high IQ, but do not do well academically, especially in written schoolwork and tests.

They are generally somewhat behind in their classwork but not enough to get them noticed as having issues and needing an IEP (Individual Education Program) by the school to get them tested for Learning Disabilities. Many parents of Dyslexic students we know will tell us of their frustration with the teachers and school representatives not agreeing there is a problem. They are called "slow developers" and will catch up when they are ready. But they never catch up; they continue to fall farther and farther behind. They are told to wait and see how their children are doing in the fourth grade as many outgrow certain issues by the third grade. The problem is by that point a lot could have been done to improve their reading, spelling, writing and comprehension. By grade four it is more difficult to catch them up as much as they could have in kindergarten, grade one or two.

They are generally bright, articulate and complex thinkers but are struggling to learn how to spell, read, write and do arithmetic at the same level as their peers.

Teachers tell their parents their Dyslexic child is lazy, dumb, careless, immature, not paying attention, they ask too many questions so obviously they are not paying attention, not trying hard enough, or they are behavior problem and acting out in class.

They often feel dumb and don't understand why their class mates are able to understand the school work but they can't. They develop self esteem issues and "self limiting beliefs. If they can't spell, read and write they can't learn anything so they stop trying.

They cover up their weaknesses by compensating or adapting. Examples: -many develop their own ways of reading, spelling, writing, etc. -they look at pictures in books and figure out the written words they don't know or

by guessing from their shape or the context of the text. -they listen to someone read a story or information while they look at the pages that are being read and remembering what is read. Then when someone wants them to read the page, the Dyslexic student will repeat what they heard and use the "picture" of the text and any accompanying pictures to remember the words. -being class clowns to divert attention away from themselves. -trying to avoid writing in class as much as possible.

They are easily upset and anxious in school because of their difficulties and might even try to avoid going to school.

Talented in art, drama, music, sports, mechanics and storytelling.

They seem to lose track of time and "Zone out" [5].

They learn best with concrete, real information hands-on demonstrations, personal experience, experimentation, observation of cause and effect in the real world, visual aids and manipulatives.

They can worry about feeling or seeing non-existent movement while reading, writing, or copying.

They seem to have difficulty with their vision, yet eye exams don't reveal a problem. (Often convergence and/or tracking problems or Meares Irlen Syndrome)

Methodology

This review comprises a number of researches and studies published in peer reviewed journals, the electronic databases of Medline, PubMed Psych Info and International journal of educational research. Articles pertaining to Problems faced by dyslexics and different instructional methods used for improving the learning and reading skills were examined.

Educational Interventions

There are a number of educational interventions that can be useful in helping the dyslexic individual. Some of these are direct treatments, while others involve providing accommodations to the learning environment.

Accommodations

Educational accommodations include the use of computers, tape recorders, screen readers and speech recognition devices. Many dyslexics have illegible handwriting. The computer can be especially useful, particularly if touch typing skills are learned. Computers also have spell checking programs, which are particularly useful because dyslexics have poor spelling. Tape recorders can be useful for the child to record his or her ideas, which can then be transcribed later. Tape recorders can also be useful in classes and lectures because note taking skills can be a problem for dyslexic individuals. Screen readers are devices that read aloud what is on the computer screen and can be very helpful for dyslexics. Books on tape can also be helpful. Speech recognition devices and programs are especially useful; the individual can talk into a microphone and see his or her words appear on the screen.

Treatment

In some cases of dyslexia, the direct and systematic teaching of letters and their corresponding sounds (ie, phonological skills) is an important way to help dyslexics. Programs such as those described by Hatcher [6] and Nicolson *et al.* [7] systematically teach individuals the sounds of the letters and have been found to be successful.

Vaughn *et al.* [8] found that programs designed to enhance reading fluency or reading strategies resulted in improved reading for children with reading difficulties.

Lovett *et al.* [9-12] and Vellutino and Scanlon [13] used a detailed program that involved training in word recognition and decoding skills to improve the reading skills of dyslexic children.

Computerized programs have been helpful in some cases. In one study, Wise *et al.* [14] used computers to help dyslexic children. Children read books on computers that were linked to speech synthesizers and then obtained feedback on words that were difficult for them. As a result of this system, the children's attitudes toward reading improved. Irausquin *et al.* [15] showed that computerized exercises that train speed or automatization are helpful in improving the reading of dyslexic individuals. Lovett *et al.* [16, 17] used a computer speech-based program to train reading skills in dyslexic children.

It is also important to discover the talents of dyslexics. Many dyslexics are gifted in sports, art, music or dance [18] while others have superior visuospatial skills. These skills can be useful in careers such as architecture or engineering.

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