Approaching Dyslexia in the Classroom

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1.0 Introduction :

Much research has been conducted in the past on what are known to be *learning disabilities*. However, in recent years, many prestigious and important health bodies in different advanced countries and the leading universities in the world have undertaken extensive research into such learning disabilities. Moreover, Dyslexia is regarded as the most common learning disability. Reportedly, it accounts for 85% of all learning disabilities. This paper has arisen out of the understanding that dyslexia is the learning disability that is more apparent at the university level. It is mainly intended to highlight and understand this syndrome that is often referred to as a 'hidden' disability. It provides *an overview of the syndrome, its types, accompanying conditions, theories of dyslexia, the difficulties experienced by university students with dyslexia* and *appropriate solutions to assist them to achieve success*.

1.1 Definition:

Many definitions exist to describe dyslexia. Some may even appear to be contradictory. This can be best explained by the fact that some people look at it from a medical point of view and others from an educational point a view. From the educational point of view, there are also different manifestations of the difficulties depending on the age, the grade level or the work environment of dyslexic persons. It is not surprising that the lay public is often confused by all the definitions. However, all the definitions really reveal different aspects of dyslexia. While dyslexia results from a biological difference in the brain, its outward manifestations, or symptoms, can be different depending on the type of dyslexia

and/or tasks at hand. The following are the most common definitions :

1.**From The International Dyslexia Association (IDA):**

Dyslexia is one of several distinct learning disabilities. It is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment. Dyslexia is manifested by variable difficulty with different forms of language, often including, in addition to problems of reading, a conspicuous problem with acquiring proficiency in writing and spelling (Malmkjaer, 1995:153-154).

2. From The British Dyslexia Association :

Dyslexia is best described as a combination of abilities and difficulties which affect the learning process in one or more of reading, spelling, writing and sometimes numeracy/language. Accompanying weaknesses may be identified in areas of speed of processing, short-term memory, sequencing, auditory and/or visual perception, spoken language and motor skills. Some dyslexics have outstanding creative skills. Others have strong oral skills. Whilst others have no outstanding talents, they all have strengths. Dyslexia occurs despite normal intellectual ability and conventional teaching. It is independent of socio-economic or language background (ibid: 154).

3. **The Canadian Dyslexia Association definition :**

Dyslexia results from a different brain organization, which may cause a problem with reading, writing, spelling and/or speaking, despite average or superior intelligence, traditional reading

instruction and socio-cultural opportunity. It is genetically inherited and its cause is biological (ibid: 154).

1.2 Types of Dyslexia :

According to the Field (2004:98-100), dyslexia is conventionally divided into **peripheral dyslexias**, where there is impairment of the system which permits visual analysis, and **central dyslexias**, where the processing of the signal is affected. The **peripheral dyslexias** are :

1. Attentional dyslexia, where the reader is distracted by adjoining words (or sometimes adjoining letters). GLOVE and SPADE seen together might produce the response glade. There is apparent damage to the reader's attentional filter, so that they are no longer able to focus on one piece of visual evidence at a time.

2. Neglect dyslexia, involving a failure to attend to the onsets of words: a reader might interpret GROSS as cross.

3. Letter-by-letter reading, where words are decoded letter by letter but the letters are given their alphabetic names: BED= Bee-Eee-Dee.

The **central dyslexias** are :

1.**Orthographic Dyslexia:** According to Roberts and Mather (1997: 237), Orthographic dyslexia refers to "a problem with the acquisition of decoding or encoding skills that is caused by difficulty with rapid and accurate formation of word images in memory." Orthographic dyslexics have difficulty in storing mental representations of words, especially phonetically irregular words. The problems underlying this type of dyslexia are related directly to memory and coding skills that allow representation of printed letters and words and not to poor phonological processing.

This type of dyslexia is also called *Surface Dyslexia* and is defined as an inability "to recognize written words on a purely visual basis. They have trouble reading aloud words that are irregularly spelled. Rather than recognizing words visually, the patients apparently sound out the words on the basis of correspondences between letters and sounds" (Caplan 1987:225).

Given these definitions of dyslexia, the affected person would have trouble distinguishing between the hard and soft pronunciations of 'c':

Hard: C = [k] cat

Soft: C = [s] ice

Most often, the dyslexic will use the most common pronunciation of the grapheme, which inevitably leads to errors in reading and writing. For example, an orthographic dyslexic might read "cat" as [kFt] correctly, but misread "ice" as [Ik]. In this example, the dyslexic has identified /k/ as the phoneme corresponding to the grapheme 'c' and will produce [k] all or most of the time.

2. Phonological Dyslexia :

phonological dyslexia means that the individual's dyslexia is rooted in their difficulty manipulating and integrating the sounds of a language effectively. Strong language-sound processing skills are needed to learn to read and write successfully and a deficit in this phonological skill is the most common characteristic of individuals with dyslexia. The phonological dyslexic is unable to segment, analyze, and synthesize speech sounds and is identifiable by their phonetically inaccurate misspellings.

Snowling (1981:225) defines phonological dyslexia similarly as an inability to produce novel words due to poor grapheme-

phoneme knowledge; the patient exhibits poor performance on phonological awareness tasks and deficits in verbal working memory. Phonological dyslexics are frequently unable to segment words into individual sounds most likely because of an impaired representation and use of phonology.

Based on these definitions of phonological dyslexia, the affected person would have difficulty distinguishing between similar-sounding phonemes, for example b/p or d/t. Given the word "bat", for example, the dyslexic might read or write "pat." Likewise, given the word "till" the dyslexic might read or write "dill."

It is important to note that in the example provided for the misreading of "ice" the orthographic dyslexic can hear, or perceive, the difference between the phoneme [k] and the phoneme [s]. Their difficulty lies in identifying the correct grapheme, in this case 'c,' so that they can read or spell the given words. In the examples provided for the phonological dyslexic, this person would be unable to perceive the difference between [t] and [d] or between [p] and [b], therefore their chances of reading or spelling correctly are compromised as well as their ability to discern the proper semantics of spoken language.

3. **Deep dyslexia :**

where there is disruption not just to the processing of *form* but also to the processing of *meaning*. Like phonological dyslexics, deep dyslexics find non-words impossible to read aloud. But they also make semantic errors where the word produced is different in form from the target but similar in meaning (APE read as monkey, ARTIST read as picture). They substitute function words (HIS read as in) and suffixes (BUILDER read as building). They also have a greater success rate with concrete than with abstract nouns. This condition may provide valuable information about the distribution of information in the lexicon. On the other hand, it may represent a

loss of reading processes from the left hemisphere and their transfer to the right, which is less adapted to language processing.

4. **Non-semantic reading:**

where the processing of meaning seems to be affected but not that of form. A patient can read aloud words and nonwords but has difficulty in attaching meanings to them.

1.3 Concomitant Conditions with Dyslexia:

The following conditions are often found concomitantly with dyslexia in the same individual. It is unclear whether these conditions share underlying neurological causes with dyslexia:

- Dysgraphia is a disorder which expresses itself primarily during writing or typing, although in some cases it may also affect eye-hand coordination in such direction or sequence oriented processes as tying knots or carrying out a repetitive task. Dysgraphia is distinct from Dyspraxia in that the person may have the word to be written or the proper order of steps in mind clearly, but carries the sequence out in the wrong order.

- Dyscalculia is a neurological condition characterized by a problem with learning fundamentals and one or more of the basic numerical skills. Often people with this condition can understand very complex mathematical concepts and principles but have difficulty processing formulas and even basic addition and subtraction.

- Developmental Dyspraxia is a neurological condition characterized by a marked difficulty in carrying out routine

tasks involving balance, fine- motor control, kinesthetic coordination, difficulty in the use of speech sounds; problems with short term memory and organization are typical of dyspraxics.

- Specific Language Impairment (SLI) is a developmental language disorder that can affect both expressive and receptive language. SLI is defined as “pure" language impairment, meaning that is not related to or caused by other developmental disorders, hearing loss or acquired brain injury. A study by the Universities of *Maastricht* and *Utrecht* examined *speech perception* and *speech production* in 3-year-old Dutch children at familial risk of developing dyslexia. Their performance in speech sound categorization and their production of words was compared to that of age-matched children with **Specific Language Impairment** (SLI) and typically developing controls. The results of the at-risk and SLI-group were highly similar. Analysis of the individual data revealed that both groups contained subgroups with good and poorly performing children. Their impaired expressive phonology seemed to be related to a deficit in *speech perception*. The findings indicate that both dyslexia and SLI can be explained by a multi-risk model which includes cognitive processes as well as genetic factors (Pennington, 2001, 816–33).

- Cluttering is a speech fluency disorder involving both the rate and rhythm of speech, and resulting in impaired speech intelligibility. Speech is erratic and dysrhythmic, consisting of rapid and jerky spurts that usually involve faulty phrasing. The personality of the clutterer bears striking resemblance to

the personalities of those with learning disabilities (Ruth, 1980, 3–14).

1.4 Theories of Dyslexia:

The following theories should not be viewed as competing, but viewed as theories trying to explain the underlying causes of a similar set of symptoms from a variety of research perspectives and background:

1. Cerebellar theory :

Another view is represented by the automaticity/cerebellar theory of dyslexia. Here the biological claim is that the *cerebellum* of people with dyslexia is mildly dysfunctional and that a number of *cognitive* difficulties ensue. First, the cerebellum plays a role in motor control and therefore in speech articulation. It is postulated that retarded or dysfunctional articulation would lead to deficient phonological representations. Secondly, the cerebellum plays a role in the automatization of overlearned tasks, such as driving, typing and reading. A weak capacity to automatize would affect, among other things, the learning of grapheme-phoneme correspondences. Support for the cerebellar theory comes from evidence of poor performance of dyslexics in a large number of motor tasks, in dual tasks demonstrating impaired automatization of balance, and in time estimation, a non-motor cerebellar task. Brain imaging studies have also shown anatomical, metabolic and activation differences in the cerebellum of dyslexics (Ramus et al, 2003, 841–65).

2. Evolutionary hypothesis :

This theory posits that reading is an unnatural act, and carried out by humans for an exceedingly brief period in our evolutionary history (Dalby, 1986). It has been less than a hundred years that most western societies promoted reading by the mass population

and therefore the forces that shape our behavior have been weak. Many areas of the world still do not have access to reading for the majority of the population. There is no evidence that "pathology" underlies dyslexia but much evidence for cerebral variation or differences. It is these essential differences that are taxed with the artificial task of reading (Dalby, 1986, 227–30).

3. Magnocellular theory :

There is a unifying theory that attempts to integrate all the findings mentioned above. A generalization of the visual theory, the magnocellular theory postulates that the *magnocellular* dysfunction is not restricted to the visual pathways but is generalized to all *modalities* (visual and auditory as well as tactile) (Ramus et al, 2003, 841–65).

4. Naming speed deficit and double deficit theories:

The speed with which an individual can name familiar objects or letters is a strong predictor of dyslexia. Slow naming speed can be identified as early as kindergarten; slow naming speed persists in adults with dyslexia.

A deficit in naming speed is hypothesized to represent a deficit that is separate from phonological processing deficit. Wolf identified four types of readers: readers with no deficits, readers with phonological processing deficit, readers with naming speed deficit, and readers with double deficit, that is, problems both with phonological processing and naming speed. Students with double deficits are most likely to have severe reading impairments.

Distinguishing among these deficits has important implications for instructional intervention. If students with double deficits receive instruction only in phonological processing, they are only receiving part of what they need (Birsh, 2005, 119).

5. Perceptual visual-noise exclusion hypothesis:

The concept of a *perceptual noise exclusion* (Impaired filtering of behaviourally irrelevant visual information in dyslexia or Visual-Noise) deficit is an emerging hypothesis, supported by research showing that subjects with dyslexia experience difficulty in performing visual tasks such as motion detection in the presence of perceptual distractions, but do not show the same impairment when the distracting factors are removed in an experimental setting (Sperling et al, 2006, 1047–53), (Roach et al, 2007, 771–85). The researchers have analogized their findings concerning visual discrimination tasks to findings in other research related to auditory discrimination tasks. They assert that dyslexic symptoms arise because of an impaired ability to filter out both visual and auditory distractions, and to categorize information so as to distinguish the important sensory data from the irrelevant (Sperling et al, 2005, 862–3).

6. Phonological deficit theory :

The *phonological deficit* theory postulates that people with dyslexia have a specific impairment in the representation, storage and/or retrieval of speech sounds. It explains the reading impairment of people with dyslexia on the basis that learning to read an *alphabetic* system requires learning the **grapheme/phoneme** correspondence, i.e. the correspondence between letters and constituent sounds of speech (Ramus et al, 2003, 841–65).

7. Rapid auditory processing theory:

The rapid auditory processing theory is an alternative to the phonological deficit theory, which specifies that the primary deficit lies in the perception of short or rapidly varying sounds. Support for this theory arises from evidence that people with dyslexia show poor performance on a number of auditory tasks, including

frequency discrimination and *temporal* order judgment (Ramus et al, 2003, 841–65).

8. Visual theory :

The visual theory reflects another long standing tradition in the study of dyslexia, that of considering it as a visual impairment giving rise to difficulties with the processing of letters and words on a page of text. This may take the form of unstable *binocular* fixations, poor *vergence*, or increased visual crowding. The visual theory does not exclude a phonological deficit (Ramus et al, 2003, 841–65).

1.5 Characterization and Practical Examples:

Here we come to the practical side of our study, and try to deal with dyslexia as it occurs to the student in the lecture rooms of our universities. In general, we can refer to seven kinds of difficulties (though other scholars refer to more) encountered by dyslexic students which have been partly observed through our teaching career in the local universities, and partly form general aspects of dyslexic students:

1. Difficulties with Reading:

This kind of difficulty is characterized by the following:

a. extremely slow rate of reading

b. Blurring and distortion of words. This can be clarified by the example paragraph below:

-"*Evidence suggests that one preferred interpretation is chosen and later revised if necessary*".
This will most often take the form of a distorted paragraph such as:

-"Evi *dencesug gest sth atone pref erredinterp retation is chosenan drevisedla terinne cessary*".

c. Misreading of words which are visually similar:
kind-dink, was-saw, rite-tire, speak-break

d. Misreading of multisyllabic words:
photographic, catastrophic, intervention, controllable

e. Omitting connecting words:
at, is, where, who, why, what, below, against

f. Understanding complex sentences:
-Mary could easily have won the game had she been a little more courageous.
This can be rendered into an easier form:
-With a little more courage, it was possible for Mary to win the game.

g. Understanding negative sentences:
-Did John not send the email?
-Was Jack not running the firm?

h. Reading small print below 12 to 13 font size.

i. Reading poor quality photocopies.

j. Reading on white paper.

k. Confusion with math symbols.

2. Difficulties with Spelling:

a. Misspelling visually similar words that are not picked up by a spellchecker:

Importance- impotence, brown-drown, cursing-cruising, cake-bake

b. Writing the same words differently in the same passage:

Letergy, leiturgy, leatregy, letourgy, leitorgy

c. Having numerous erasures/or cross-outs which make written very messy.
d. Mixing up and/or omitting letters or words

3. Difficulties with Note-taking:

Difficulties in note-taking may consist in failure in the following areas:

a. Ability to read own writing
b. Taking notes while listening
c. Writing legible notes
d. Writing fast enough to copy from the board

4. Difficulties with Writing:

Difficulties in writing may consist in the following weaknesses:

a. Expressing ideas clearly in writing
b. Immature writing
c. Poor sentence structure
d. Inadequate or missing punctuation
e. Mixing up sounds in multisyllabic words
f. Reversal of letters and/or numbers

5. Difficulties with Speaking :

a. Failure to expressing ideas clearly orally
b. Fast and sometimes cluttered speech
c. Failure to speak clearly during interviews or oral examinations
d. Failure to speak on a specific subject within a time limit or interview
e. Omitting words (believed to have been said)
f. Repeating sentences (believed not to have been said)
g. Difficulties with the pronunciation of multisyllabic words (aluminium, visualization, etc.)
h. Finding the right word when speaking
i. Substituting words

6. Difficulties with Listening:

Difficulties with listening occur most often in the following cases:

a. While the lecturer has his/her back to students
b. In a noisy room
c. When lecturer uses unfamiliar words without visual support
d. Misunderstanding instructions
e. Misunderstanding long complex sentences
f. Screening out important information

7. Difficulties with Organization Skills:

a. Forgetting assignments and/or appointments
b. Forgetting books at home
c. Losing papers
d. Miscalculating time needed for tasks
e. Getting lost in an unfamiliar building(sometimes in a familiar building as well)
f. Getting mixed up between left-right, west-east, up-down

g. Telling the time (clock with hands)

1.6 Dealing with Dyslexia in the Class:

Students with dyslexia have to develop alternative approaches to learning. By the time a student reaches university level they will have built strategies, probably without even realising it. However, planning, and writing essays, note taking and effectively reading the volume of information required may be difficult and time consuming. Exams and constant revision may be daunting and extra stressful.

Virtually, dozens of solutions can be suggested for the exclusive treatment of dyslexic students in the class depending on the settings where the dyslexic person is. Here we outline a number of solutions to deal with them in accordance with the difficulties listed in the preceding section and in the context of university classes. These solutions are of two types: the first seven points deal with particular difficulties mentioned in the preceding section, and the second seven are general solutions:

1. Pre-reading and giving notes should be encouraged and hand-outs should be given to dyslexic students in advance.

2. Notes and hand-outs should be made available in large print with a clear font on coloured paper (if possible).

3. Colour headings and bullet points should be used as far as possible.

4. Colour should also be used to distinguish important points.

5. Short and frequent review sessions should be emphasised.

6. The teacher should not hasten an answer; (s) he has to give them time to recognise and find the right word.

7. The teacher should try to find relevant points for praise.

General Solutions:

1. Dyslexic students may be granted extra time in examinations. The amount of extra time granted (5, 10, 15 or 20 minutes per hour) will depend on the impact of their dyslexia on their speed and accuracy in both reading and writing, and will be established through assessment at Dyslexia Centres when established in the university.

2. Some dyslexic students may be granted permission to use a portable (Laptop) computer in examinations.

3. Students who are seriously affected by dyslexia may be granted an amanuensis (an assistant to help them copy what they say) or reader for their examinations.

4. The faculty staff in a university may also opt for separating the dyslexic students by putting them in a separate class although this procedure may encounter difficulty especially at the early stages since it takes some time to diagnose properly the dyslexic students. Some may be diagnosed at later stages of study.

5. Any adjustments for clinical, practical or viva voce examinations should be made on an individual basis following assessment, through discussion with the Dyslexia Coordinator, course coordinators and the Examinations Section.

6. Undoubtedly, there is no reason why a dyslexic learner ought to be taught different lexical items and grammatical structures than the rest of students. Certainly, the only changes the teacher is to introduce are in the strategy of teaching not the content. The basic rule for teachers is to bear

in mind that gradual progress is the key to successful teaching. Presented material ought to be dealt with step by step, and the level of difficulty of the next lesson should not be higher than the previous one. Teachers ought to take into consideration the fact that while working with dyslexics, certainly more time ought to be spent on revising material already familiar to students rather than introducing new one.

7. At least a miniature centre for dealing with dyslexic students should be established in every university in Iraq. It is better for the centre to be located at the Department of Psychology and Education and to be run in coordination with the Department of English Language since specialists from both fields need to work closely in the centre.

1.7 <u>Conclusions</u>:

Dyslexia means a "difficulty with words" and is often considered in connection with difficulties affecting writing, reading, speaking, listening, spelling, reasoning and mathematical abilities. However, a more complex range of difficulties confronts the average dyslexic student at university. Major difficulties may include:

a. A marked difficulty reading aloud
b. Slow reading speed, no technical strategies
c. Poor comprehension- a text needs to be read multiple times
d. Essay writing- structure, spelling, grammar and punctuation
e. Poor memory and ineffective organization of work and life
f. Poor visual perception, lack of spatial awareness
g. Poor concentration, easily distracted- often slow to complete a task through daydreaming or trying to do too much
h. Difficulty organising the content and sequence of spoken language

To many experts, dyslexia seems to be a very elusive condition. Some are still arguing over its nature, origin and symptoms, since dyslexia has many faces. In this paper, we

have delimited the most common types of this common learning disability and outlined its characteristics with practical examples from classroom contexts. Finally, we have made a number of suggestions to deal with this disability by establishing a special centre for dyslexia research in the Iraqi universities to cope with this rapidly developing field of psycholinguistic studies.

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المستخلص

يشير عسر التعلم إلى "مشاكل في الكلام" وغالبا ما يتم التطرق إليه بالتزامن مع صعوبات تؤثر على الكتابة والقراءة والتحدث والاستماع والإملاء والمنطق والقدرات الحسابية. ومع ذلك هناك مجموعة أكثر تعقيدا من الصعوبات التي تواجه الطالب الجامعي العادي المصاب بعسر التعلم. قد تشمل الصعوبات الرئيسية ما يلي :

أ. صعوبة ملحوظة في القراءة بصوت عال.

ب. بطء سرعة القراءة ، والافتقار إلى استراتيجيات تقنية.

ج. ضعف في الاستيعاب—عليه قراءة النص عدة مرات.

د.الصعوبة في كتابة مقال والتراكيب والهجاء، وقواعد اللغة وعلامات الترقيم.

ه. ضعف الذاكرة، وتنظيم غير فعال بين العمل والحياة

و. ضعف الإدراك البصري ، والافتقار إلى الوعي المكاني

ز. ضعف التركيز، سهولة التشتت، بطيء في كثير من الأحيان في إكمال مهمة ما من خلال الاستغراق في أحلام اليقظة أو محاولة القيام بأكثر من المطلوب.

ح. صعوبة تنظيم محتوى وتسلسل اللغة المحكية.

ويبدو للعديد من الخبراء أن عسر التعلم حالة محيرة، حيث لازال بعضهم في جدل حول طبيعة هذه الحالة ومصدرها والأعراض المصاحبة لها، حيث أن لعسر التعلم أوجه عديدة. في هذا البحث تم تحديد الأنواع الأكثر شيوعا من هذا العجز الشائع في التعلم وتحديد خصائصه مع أمثلة عملية مستقاة من الفصول الدراسية. وأخيرا، تم وضع عدد من الاقتراحات لمعالجة هذا العجز عن طريق إنشاء مركز خاص ببحوث عسر التعلم في الجامعات العراقية للتعامل مع هذا التطور السريع في مجال الدراسات المتعلق بعلم اللغة النفسي.