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Research Article

Types Of Letter Reversal Among Dyslexic Students

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Abstract

This study is done to examine the issue of letter reversal among dyslexic students. The study objective is to identify the type of letter reversal among dyslexic students. The theory adopted in this study is the Levinson Theory (1994). The study sample comprises 10 dyslexic students from Dyslexia Center Malaysia in Ampang, Kuala Lumpur who experience severe letter reversal issues. This work adopts observation, interview and questionnaire methods. Meanwhile, the study tools used are the questionnaire forms and field notes. Eight letters with similar forms common to be in reversal among the dyslexia students based on Levinson Theory (1994), are letters 'b', 'd', 'p', 'q', 'm', 'w', 'n' and 'u' and they are chosen and enlisted in the questionnaire form. The questionnaire is then given to the respondents, or teachers at the dyslexia center to be answered. The study data are analyzed both qualitatively and quantitatively. The study finding shows that all the subjects have a reversal issue towards the letters. Nonetheless, the types of letters being reversed are different according to individuals.

Keywords: Dyslexia, Reversal Issue, Letter Reversal, Similar Forms

Introduction

Reading is an important activity in human life and this skill is fundamental to self-development towards gaining knowledge (Yahya Othman, 2003). The act of reading is built from two processes where it interprets the written form and understands the message that is delivered in that written form (Everatt, 2008). According to Vijayaletchumy and Wan Muna Ruzanna (2012), dyslexia in the aspect of reading does exist, but a lot of teachers do not realize this as they lack the knowledge about dyslexia. With that, dyslexic students are sent to normal classes and they have to compete with normal students in all aspects of language learning. As a result,

dyslexic students get lower marks than their normal counterparts and they are thought to be weak or slow students. A Pediatric Development Consultant, Dr. Raja Juanita Raja Lope, states that there are still children of 5 years of age who still cannot read and spell easy syllables in a word. Even the parents assume that this is normal. In return, their children might experience disability or specific learning distraction known as dyslexia for children experiencing dyslexia will generally face problems and difficulties in reading (BeritaHarian, 2017).According to Soeisniwati Lidwina (2012), the reading ability for normal children can be seen as they get to 6 or 7 years. For dyslexic children, they are not able to show reading ability as early as that. Even in adulthood, they still experience problems in reading. Dyslexia sufferers face difficulty in learning due to the problems they face when they read and write. This interruption is formed from the physical disability, such as sight issue, but this is due to the discomfort in the brain that sifts through and processes the information being read.

According to Levinson (1994), dyslexia can be divided into dyslexia in reading, dyslexia in writing, and dyslexia in arithmetic. When dyslexic students are reading, there will be eye determination and detection on the letters. Their eyes cannot scan the different letters, words, or sentences. Due to this inability, they cannot understand the material that they are reading. This is because the things that they can with their eyes are seen in a scattered form. Normally dyslexic students will try to hide their weaknesses by making the shapes and forms of the letters, sounds of the letters, and the combination of words so that their weakness cannot be detected by the teachers. They will repeatedly make the forms of the letters, their sounds, and the combination of words to memorize them. This is because dyslexia sufferers easily forget as they have short-term memory. According to Levinson (1994), there are seven types of mechanisms of reading errors among the dyslexic students, and they are omission, transfer, insertion, replacement, reversal, condensation, and guessing or a wild guess. However, the most significant issue done by dyslexic students in reading is a reversal issue (Sariah Amirin, 2000). The issue of reversal happens when dyslexic students begin to read something in reverse. According to Levinson (1994), this type of error can be divided into two types, and they are letter reversal and reversed words. Letter reversal is normally done by dyslexic children when they see letters that are similar in shapes or forms, like /b/, /d/, /p/, /q/, /m/, /w/, /n/ or /u/. Meanwhile, the reversal in terms of the words happens when dyslexic children read syllables of words in reverse order, for example, /nasi/ becomes /sina/ or /batu/ becomes /tuba/.

Problem Statement

The problems of dyslexic children in their learning are on the rise. Berita Harian (2012) reports that approximately 45,000 or 50 percent from more than 90,000 children in Malaysia suffering from learning problems since they are 5 or 6 years old, stems from dyslexia. The statistics received by Dyslexia Association Malaysia from the Ministry of Education establishes that the children's ratio potential in suffering from dyslexia is 5:100 and this is alarming. A

significant issue that is evident among dyslexic students when they read is they often reverse some of the letters in the word (Sariah Amirin, 2000). Letter reversal happens when dyslexic children cannot distinguish letters that have similar shapes. Normally, they will make errors like letter /b/ becomes letter /d/, letter /p/ becomes letter /q/, letter /m/ becomes letter /w/, and letter /n/ becomes letter /u/. Other than that, for word reversal, dyslexic children will reverse the positions of the syllables in a word. For instance, the word 'tisu' becomes 'suti', word 'buka' becomes 'kabu' and the word 'buta' becomes 'tuba'. If this issue is not addressed, the special talents and skills of these dyslexic children will not be obvious. These extraordinary students will be seen as slow by the teachers who put more priority on performance and parents cannot tap into their children's extraordinary skills and talents as they see their children as being ill or unwell.

The study on the reading problems of dyslexic students focusing on the issue of letter reversal has been scarce, like the study done by Sumiyati (2009) about students' learning issues related to reversed numbers and letters. Although this study focuses on those issues, the students involved do not show any characteristics of children with the risk of dyslexia, instead, they have the characteristics of weak students in their learning alone. This is as opposed to the study done by Soesiniwati (2012), which is about the root cause of the reading and writing issues influenced by dyslexia. Her study focuses on the symptoms of dyslexia, the root cause of dyslexia, and the way of overcoming dyslexia. Also, in the work of Zaliza, Mahfuzah and Ahmad (2014), the scope is on dyslexia in terms of the spelling and reading of Bahasa Melayu. However, this study focuses on the issue of letter reversal but the scope is wider, surrounding errors in terms of an omission, insertion reversal, condensation, transfer, replacement, or guessing. Besides, other studies written by Linda (2016) give more focus on the factors of dyslexia, and the study related to the symptoms of dyslexia is done by Kavenia (2018) focuses on the symptoms of visual dyslexia among dyslexic students. Past studies have not focused on the issue of letter reversal that is increasingly serious among dyslexic students. Due to the scarcity of the studies, this opens the gap and allows for the researcher to carry out this study.

Objective

Identifying the type of letter reversal in the reading aspect of dyslexic students.

Literature Review

The study by Rajesvari Ramasamy (2008) is carried out to measure the level of existence of dyslexia problems that influence academic achievement and also the behavior of the remedial students in primary schools in general, and to identify the challenges faced teachers of remedial education and the steps that can be taken to help remedial students that have dyslexia problems. Respondents are 120 remedial students and 25 special education teachers from ten schools in Penang. In the collection of the quantitative data, the study instrument formed is based on the Dyslexia Checklist Instrument (ISD). The study finding shows that there are some dyslexia

problems among the remedial students involved. This study can give exposure to teachers and parents to know in detail about the learning difficulties faced by dyslexic children. Other than that, this study can also become the source of reference to special education teachers in identifying and understanding the dyslexia issues. Meanwhile, a study similar to the study by Rajesvari Ramasamy (2008) is also done by Sumiyati Abdul Rahman Jikem (2009) to identify the learning issues of dyslexic students.

Sumiyati Abdul Halim Jikem (2009) has conducted a study on a student who experiences a problem in the writing skill where the numbers and letters are written in reverse. To overcome this problem, six approaches have been used-deductive, play while learning, drilling, repetition, writing on air, and tracing the shapes of letters by sequence (tracing). This study finding establishes that the study subjects show some positive changes. They no longer write letters and numbers in reverse and a significant change is evident in terms of their work. This shows that individual guidance using the six approaches above can resolve the issue or reversed numbers and letters. The work by Sumiyati Abdul Halim Jikem (2009) provides a reference to the researcher to form other approaches to help address the reversal issues that occur among dyslexic children.

Also, Zaliza Zubir, Mahfuzah Md Daud and Ahmad Hifzurrahman (2014) have conducted a study to identify the background of the family of dyslexic children and to analyze the spelling errors through the Bahasa Melayu Diagnostic Test and relate the errors based on the Levinson Theory (1994). The focus is on language learning, and analyzing spelling errors that only involve dyslexic students of auditory and visual types. The result from the diagnostic test through the reading done has established that the subjects in this study have dyslexic characteristics. The finding on four subjects shows that they have dyslexia. They have made mistakes in reading the letters according to the errors contained in the Levinson Theory (1994). They include letter reversal, the addition of letters, insertion of letters, replacement of letters, condensation of letters, transfer of letters, omission. The weakness of this study is that the researcher does not shed light on the technique or solution to the dyslexia problems. This study leaves the gap open, to be filled in by the researcher in conducting a detailed study on one of the errors contained in the Levinson Theory (1994) and further planning the solution to overcome the issues. The study by Zaliza Zubir, Mahfuzah Md Daud, and Ahmad Hifzurrahman (2014) is dissimilar to that of Treiman, Gordon, Boada, Peterson, and Penington (2014) who look into the learning issues that focus on letter reversal.

Treiman, Gordon, Boada, Peterson, and Penington (2014) examine the letter reversal issues that lead to reading inability. In this study, the writing of letters of children aged 5 to 6 years old is checked to identify if there are any reversal errors. A total of 130 children are chosen as the sample and 92 from this figure have problems in pronouncing the letters. This becomes the factor that causes them to face some reading difficulties. Other than that, this study finding also establishes that the samples are more likely to perform letter reversal to the left compared to the

right. This is similar to the study by Zaliza Zubir, Mahfuzah Md Daud, and Ahmad Hifzurrahman (2014), where it also does not offer any suggestions in resolving the reversal issues occurring in children. This has given room to the researcher to conduct an intervention in resolving the letter reversal issues among dyslexic students.

In overcoming the learning issues of dyslexic children, the appropriate and effective techniques and methods must be practiced in the teaching process. In the study of Arif Widodo, Dyah Indraswati and Agam Royana (2020), the radiant picture media method has been used to improve reading ability among dyslexic students in primary schools. This study aims to analyze the use of radiant pictures as a medium in reading for dyslexic children. The subject in this study is a Grade 4 dyslexic student. The method used in this study is qualitative descriptive. Data collection was done through reading tests and observations. The data is presented in the form of diagrams, then analyzed descriptively. The main purpose of this research is to test the effectiveness of serial picture media in helping study subjects improve their reading skills. The results showed that the use of serial picture media showed a positive response to the reading of the study subject. This shows that through pictures, the memory of dyslexic students can be stimulated, as well as motivate dyslexic students to read more easily.

Similar to the study conducted by Latifah Khairiyah and Gustina Erlianti (2020), they stated that through pictures, dyslexic students are more interested in reading. Their study aimed to find out the effectiveness of picture story books on increasing the reading interest of dyslexic children. This type of research is a qualitative approach in descriptive form. The results show that dyslexic children need to be taught the concept of space before they recognize letters. The concept of space itself is the initial basis for dyslexic children to recognize letters. In addition, the use of picture books shows effectiveness in dyslexic children and is very helpful in cultivating an interest in reading among them.

However, according to Associate Professor Dr Abdul Rahim Razalli, Deputy Dean of Academic and International (UPSI), he said the application of techniques through the use of the senses makes teaching strategies more effective. In the study by Sri Utami Soraya Dewi (2015), she opines that children's capability to identify letters and words when reading is influenced by the teaching style or method adopted by the teacher. When students are taught using the technique that fits with their learning style, they will learn faster and they will be able to adhere to, and use, easier concepts in the next stages of learning. In this work, an intervention using the multi-sensory method is given to dyslexic students in a classical way in seven meetings in the duration of 60 minutes in every session. The outcome shows that there is an increase in the subjects' ability to recognizing the words although it is insignificant. Although the increase is not very remarkable, the study finding shows a positive outcome. To get a more significant finding, the researcher should not set specific time duration. This is because every dyslexic student take his or her own time to master a concept. The study by Sri Utami Soraya Dewi (2015) is similar to the study done by Ann Lee Sien Sut (2016).

In the study of Ann Lee Sien Sut (2016), a program known as MyBACA is carried out. MyBACA is a reading program that uses the inculcation of the multi-sensory technique that concentrates on the decoding process and is built to rehabilitate dyslexic children. The study result shows that there is an increase in decoding skills, reading fluency, and learning motivation among the participants. The study outcome also shows that issues related to letter-sounds are significant among dyslexic children. The use of the multi-sensory technique in the MyBACA program towards dyslexic children has shown an increase. Indeed, the multi-sensory method serves to be an appropriate in solving issues related to the learning of dyslexic students. This study benefits the researcher as it forms a new intervention based on the multi-sensory method as the therapy in solving the issues of dyslexic students. The effectiveness of the use of the multi-sensory method in the study by Ann Lee Sien Sut (2016) is also supported by Nur Syuhada Mohd Abdul Wahab and Faridah Yunus (2017).

The study by Nur Syuhada Mohd Abdul Wahab and Faridah Yunus (2017) aims to delve into the meaning behind the multi-sensory technique in the teaching and learning of letter literacy of preschool children. According to Nur Syuhada Mohamad Abdul Wahab and Faridah Yunus (2017) in their study, the implementation of the multi-sensory technique is recommended to be an alternative in the teaching and learning of childhood literacy. This is because the multi-sensory technique implemented can stimulate children's senses and makes the teaching and learning process more enjoyable. However, in this study, the researcher only explains the meaning of the multi-sensory technique and suggests the use of the method in teaching and learning in general. The explanation stated without method testing to the subject study causes the outcome to be far from convincing researchers should implement the multi-sensory method in teaching to see how far it is effective in resolving students' learning issues.

The study on the use of the multi-sensory method such as the studies by Nur Syuhada Mohd Abdul Wahab and Faridah Yunus (2017) is also done by Noor Syamilah Md Maliki and Mohd Hanafi Mohd Yasin (2017). The objective is to identify the level of letter-identification skills after the multi-sensory method is adopted in the learning of special education. This study adopts the quasi-experiment approach and the study method comprising of pre and post-tests adapted from Clay (2005). Six students with a learning disabilities are chosen as the samples and then they are divided into two groups, where group A (treatment) uses the multi-sensory learning method and group B (control) uses the traditional learning method in the class. The study finding establishes that there is increased value in the post-test for the treatment group as compared to the control group. This shows that the multi-sensory method is effective and appropriate to be used in the teaching of special, disabled children. The work by Noor Syamilah Md Maliki and Mohd Hanafi Mohd Yasin (2017) shares a similarity with the study by Majeda Al Sayyed Obaid (2013) who adopts the multi-sensory approach through the pre and post-tests done on both the treatment and control groups.

Majeda Al SayyedObaid (2013) has done a study to identify the effect of multi-sensory approach towards students who experience disability in learning. The study sample comprises of 117 Year 6 students and divided them into the treatment group that uses the multi-sensory approach in teaching and the control group who does not use that approach in teaching. To achieve the aim of the study, the pre- and post-tests are developed to measure students' achievement in Mathematics subject. The outcome of the study shows a very significant statistical difference happening between treatment group and the control group, and the result leans more to the treatment group. The study finding shows that the multisensory approach in the teaching of special students is very appropriate and effective.

Similar to the study conducted by Githa Mediana Simanjuntak, Rahma Widyana and Kamsih Astuti (2020) which aims to find the influence of multisensory learning methods in improving pre-reading ability among pre-school children. 6 pre-school students involved in this study were used as the study sample. Data was collected by using a pre-reading ability measuring tool. Data analysis used an independent sample t-test and the results of the data analysis showed a t value of 3,097 ($p < 0.05$). This indicates that there is a significant difference in pre-reading ability between the sample groups exposed to multisensory learning methods with samples using conventional learning methods in schools. In addition, data analysis using paired sample t-test also showed a t value of -3,991 ($p < 0.05$). This indicates a significant improvement before and after the study sample is exposed to multisensory learning methods. Therefore, it can be summarized that the influence of learning using multisensory methods is very significant in improving pre-reading ability among preschool students.

In addition, Fajri Basam and Sulfasyah (2018) also support that learning methods using multisensory methods have a positive influence in the reading of primary school students. The study of Fajri Basam and Sulfasyah (2018) aims to improve the ability to read fluently through multisensory methods among primary school students. This research consists of four main components, namely planning, action implementation, observation and response. The study subjects consisted of 49 Grade 2 students. Data collection in this study used test and observation methods, while data analysis used quantitative and descriptive methods. The results showed that the reading test fluently by the study sample increased from 59.32 to 77.64 from a maximum score of 100. This shows the set indicator that 80% of students have achieved the set target. Through the results of the study, this proves that learning methods using multisensory methods can improve the ability to read fluently among primary school students.

However, the study by Majeda Al Sayyed Obaid (2013) goes in a different direction with that of Sharifah Nawirah Syed Hassan (2016). She opines that the use of the traditional method like the multisensory method is not able to resolve the issues of dyslexic children as a whole. She adds that the method is not able to explain certain symptoms that enable a child to be categorized as dyslexia. She introduces the learning method using the Davis Dyslexia Rehabilitation Model

application for dyslexic children. The outcome of the study finds that the model gives a positive effect on forming the reading and spelling skills for children with dyslexia. This is because it is the focus that sets the strength of an individual to help them improve the skills required. As for the researcher's statement stating that the multisensory method cannot resolve the issues of dyslexic children fully, the statement is far from convincing. This is because their opinion is not supported by any party or other researchers. The researcher should be using both methods, namely the multi-sensory method and the Davis Dyslexia Rehabilitation Model in testing the reading and speaking skills among dyslexic children. The outcome from the use of both methods will then be compared and the method that is more significant in terms of giving positive effects will be evaluated.

Methodology

This study is done in a dyslexia center which is the Dyslexia Association Malaysia in Ampang, Kuala Lumpur. The selection of the location is because this dyslexia center is the headquarters and the main center for all branches of dyslexia centers nationwide. Other than that, students here are diagnosed through a diagnostic test and then they will be grouped according to their dyslexia level, namely beginner, intermediate and advanced levels. In this study, the researcher has chosen 10 students who are beginners in dyslexia as the subject of our study, as they are found to have severe letter reversal issues. Next, the methods used in this study are the methods of observation, interview, and questionnaire. Observation is divided into two, which is the participants' observation and non-participants' observation. In this study, the researcher adopts the participants' observation method, where the researcher gets involved as one of the members of the group that is to be observed and at the same time, makes an observation. The role of the researcher is to observe the changes in the behavior of the subject and how they interact in class, from a distance or at close range. For the interview method, the researcher uses the non-structured interview method, where there is no fixed script and the questions asked are spontaneous. The interview is done on two teachers who teach the subjects at the dyslexia center. The interview method is done to get additional data that is more detailed about the demography of the study subjects. For the questionnaire, the questionnaire form formulated is in the form of closed details to identify the type of letter reversal experienced by the subjects.

Outcomes

To identify the type of letter reversal among dyslexic students, a questionnaire form has been used as the study tool. The questionnaire form is given to two teachers and each teacher represents 5 students. This questionnaire form is divided into two sections. The first is related to the subjects' demography covering their age, gender, and type of dyslexia. Meanwhile, the second section is related to the type of letter reversal.

	←→	→	_

Legend	both letters experience the mutual reversal	Only one letter experiences reversal	Not experiencing any reversal

SUBJECT A

Table 1: The Type of Letter Reversal for Subject A

Original Letters		Reversal
b	←→	d
p	←→	b
q	→	–
m	←→	w
n	←→	u

Subject A is a male boy aged 6. The study finding establishes that the letter reversal experienced by subject A affects the letters ‘b’, ‘d’, ‘p’, ‘m’, ‘w’, ‘n’, and ‘u’. The subject does not have any reversal issue towards the letter ‘q’. Subject A cannot distinguish letters ‘b’ and ‘d’. Subject A shows letter reversal from right to left, where ‘b’ becomes ‘d’ and from left to right, where ‘d’ becomes ‘b’. Other than that, subject A also reverses the letters from the bottom to top like ‘b’ becomes ‘p’, ‘m’ becomes ‘w’ and ‘n’ becomes ‘u’. Next, the subject also reverses the letters from top to bottom like ‘p’ becomes ‘b’, ‘w’ becomes ‘m’, and ‘u’ becomes ‘n’. Through the data obtained from the questionnaire form and interview with the teachers, researcher finds that subject A has visual +auditory dyslexia. Based on the study finding, the researcher opines that subject A faces a reversal issue on the letters above following the sight and hearing issues experienced. The difficulty to detect the shapes of the letters and listens to the sounds well leads subject A to fail to detect the letters correctly.

SUBJECT B

Table 2: The Type of Letter Reversal for Subject B

Original Letters		Reversal
b	←→	d
p	←→	q
m	←→	w
n	←→	u

Subject B is a Malay boy aged 8. The study finding establishes that the letter reversal experienced by subject B affects all letters, namely ‘b’, ‘d’, ‘p’, ‘q’ ‘m’, ‘w’, ‘n’, and ‘u’. Subject B cannot distinguish letters ‘b’ and ‘d’. Subject B shows letter reversal from right to left, where ‘b’ becomes ‘d’ reverses the letter from left to right, where ‘d’ becomes ‘b’. The same happens to the letters

'p' and 'q'. The subject reverses the letter from right to left, where 'p' becomes 'q' and from left to right, where 'q' becomes 'p'. Other than that, subject B also reverses the letters from the bottom to top such as 'm' becomes 'w' and 'n' becomes 'u'. Then, he also reverses the letters from top to bottom where 'w' becomes 'm' and 'u' becomes 'n'. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject B has visual dyslexia. Since subject B experiences an issue with his sight, it is difficult for him to detect and see the forms of the letters correctly until letter reversal occurs.

SUBJECT C

Table 3: The Type of Letter Reversal for Subject C

Original Letters		Reversal
b	←→	p
d	→	–
q	→	–
m	→	–
w	→	–
n	←→	u

Subject C is a Chinese boy aged 9. Our study finding establishes that the letter reversal experienced by subject C affects letters 'b', 'p', 'n', and 'u'. The subject does not have any reversal issue towards letters 'd','q', 'm' and 'w'. Subject C cannot distinguish letter 'b' and letter 'p'. Subject C shows letter reversal from bottom to top, where 'b' becomes 'p' and reverses the letters from top to bottom, where 'p' becomes 'b'. The same is done to the letters 'n' and 'u'. Subject reverses the letter from bottom to top, where 'n becomes 'u' and he reverses the letter from top to bottom, where 'u' becomes 'n'. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject C has visual+auditory dyslexia. Through the study finding, the researcher feels that subject C has reversal issues on the letters above following the sight and hearing issues experienced. The difficulty to ascertain the forms of the letters and to listen to the sounds of the letters well has led to subject C's failure in detecting the letters properly.

SUBJECT D

Table 4: The Type of Letter Reversal for Subject D

Original Letters		Reversal
b	←→	p
d	→	–
q	→	–
m	←→	w
n	←→	u

Subject D is a Malay boy aged 7. The finding establishes that the letter reversal experienced by subject D affects letters ‘b’, ‘p’, ‘m’, ‘w’ ‘n,’ and ‘u’. The subject does not have any reversal issue towards letters ‘d’ and ’q’. Subject D cannot distinguish letters ‘b’ and ‘p’. Subject D shows letter reversal from bottom to top, where ‘b’ becomes ‘p’ and from top to bottom, where ‘p’ becomes ‘b’. subject D also reverses the letters from the bottom to top as in ‘m’ becomes ‘w’ and ‘n’ becomes ‘u’. Next, the subject also reverses the letters from top to bottom where ‘w’ becomes ‘m’ and ‘u’ becomes ‘n’. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject D has visual+auditory dyslexia. Through the study finding, the researcher opines that subject D has a reversal issue on the letters aforementioned due to the sight and hearing issues he experiences. The difficulty to make out the form of the letters and listen to the sounds of the letters well causes subject D to fail to detect the letters correctly.

SUBJECT E

Table 5: The Type of Letter Reversal for Subject E

Original Letters		Reversal
b	←→	d
p	←→	q
b	←→	p
m	←→	w
n	←→	u

Subject E is a Malay boy aged 6. Our study finding establishes that the letter reversal experienced by subject E concerns with all letters, namely ‘b’, ‘d’, ‘p’, ‘q’, ‘m’, ‘w’, ‘n’ and ‘u’. Subject E cannot distinguish letter ‘b’ and letter ‘d’. Subject E shows letter reversal from right to left, where ‘b’ becomes ‘d’ also from left to right, where ‘d’ becomes ‘b’. The same happens towards the letters ‘p’ and ‘q’. The subject reverses the letters from right to left, where ‘p’ becomes ‘q’ and from left to right, where ‘q’ becomes ‘p’. Other than that, subject E also reverses the letters from the bottom to top where ‘b’ becomes ‘p’, ‘m’ becomes ‘w’ and ‘n’ becomes ‘u’. Then, the subject also reverses the letters from top to bottom where ‘p’ becomes ‘b’, ‘w’ becomes ‘m’ and ‘u’ becomes ‘n’. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject E has visual +auditory dyslexia. Following the sight and hearing issues experienced, subject E faces some difficulties to make out the shape of the letters and listens to the sounds well, that he fails to detect the letters of similar shapes correctly.

SUBJECT F

Table 6: The Type of Letter Reversal for Subject F

Original Letters		Reversal
b	←→	d

p	←→	q
m	←→	w
n	←→	u

Subject F is a Malay boy aged 7. Study finding establishes that the letter reversal experienced by subject F concerns with all letters, namely ‘b’, ‘d’, ‘p’, ‘q’ ‘m’, ‘w’, ‘n’ and ‘u’. Subject F cannot distinguish letters ‘b’ and ‘d’. Subject F shows letter reversal from right to left, where ‘b’ becomes ‘d’ and reverses the letter from left to right, where ‘d’ becomes ‘b’, also ‘p’ and ‘q’. Subject reverses the letter from right to left, where ‘p’ becomes ‘q’ and reverses the letter from left to right, where ‘q’ becomes ‘p’. Other than that, subject F also reverses the letters from the bottom to top as in ‘m’ becoming ‘w’ also ‘n’ becoming ‘u’. Next, the subject also reverses the letters from top to bottom where ‘w’ becomes ‘m’ and ‘u’ becomes ‘n’. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject F has visual dyslexia. Due to this slight problem, it is difficult for him to detect and see the forms of the letters correctly- hence, the occurrence of letter reversal.

SUBJECT G

Table 7: The Type of Letter Reversal for Subject G

Original Letters		Reversal
b	←→	d
p	←→	q
m	←→	w
n	←→	u

Subject G is a Chinese girl aged 7. The study finds that the letter reversal faced by subject G affects all letters, namely ‘b’, ‘d’, ‘p’, ‘q’ ‘m’, ‘w’, ‘n’, and ‘u’. Subject G cannot distinguish letter ‘b’ and letter ‘d’. Subject G shows letter reversal from right to left, where ‘b’ becomes ‘d’ and she also reverses the letters from left to right, where ‘d’ becomes ‘b’, also the letter ‘p’ and ‘q’. The subject reverses the letters from right to left, where ‘p’ becomes ‘q’ and left to right, where ‘q’ becomes ‘p’. Other than that, subject G also reverses letters from the bottom to top, like ‘m’ becomes ‘w’ and ‘n’ becomes ‘u’. Next, the subject also reverses the letters from top to bottom, like ‘w’ becomes ‘m’ and ‘u’ becomes ‘n’. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject G has visual + auditory dyslexia. Following the sight and hearing issues experienced, subject G has difficulty looking at letters and listening to the sounds of the letters well, so much so that she fails to detect letters with similar shapes correctly.

SUBJECT H

Table 8: The Type of Letter Reversal for Subject H

Original Letters		Reversal
b	←→	d
p	←→	q
m	→	–
w	→	–
n	←→	u

Subject H is a Malay boy aged 12. The study finds that theletter reversal experienced by subject H affects letters ‘b’, ‘d’, ‘p’, ‘q’, ‘n’, and ‘u’. Subject does not have any reversal issues towards the letters ‘m’ and ‘w’. Subject H cannot distinguish letters ‘b’ and letters ‘d’. Subject H shows letter reversal from right to left, where ‘b’ becomes ‘d’ and he reverses letters from left to right, where ‘d’ becomes ‘b’. The subject also does that to letters ‘p’ and ‘q’. Subject reverses letters from right to left, where ‘p’ becomes ‘q’ and does the opposite, where ‘q’ becomes ‘p’. Other than that, subject H reverses the letters from the bottom to top that is where and ‘u’ becomes ‘n’and also reverses the letters from top to bottom where ‘n’ becomes ‘u’. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject H has visual dyslexia. Following the sight issue, subject H finds it difficult to see the letters well that he fails to detect the letters with similar shapes correctly.

SUBJECT I

Table 9: The Type of Letter Reversal for Subject I

Original Letters		Reversal
b	←→	d
p	←→	q
m	→	–
w	→	–
n	←→	u

Subject I is a Chinese boy aged 10. Our study finding finds that theletter reversal experienced by subject I lie in letters ‘b’, ‘d’, ‘p’, ‘q’, ‘n, and ‘u’. The subject does not have any reversal issue towards the letters ‘m’ and ‘w’. Subject I cannot differentiate between ‘b’ and ‘d’. Subject I shows letter reversal from right to left, where ‘b’ becomes ‘d’ and letters are reversed from left to right, or ‘d’ becomes ‘b’. The same thing happens to the letter ‘p’ and ‘q’. Subject reverses the letters from right to left, where ‘p’ becomes ‘q’ and reverses the letters from left to right, where ‘q’ becomes ‘p’. Other than that, the subject I also reverse the letters from the bottom to top, like ‘m’ turning into ‘w’ and ‘n’ turning into ‘u’. Next, the subject also reverses the letters from top to bottom such as ‘w’ becoming ‘m’ and ‘u’ becoming ‘n’. Through the data obtained from the questionnaire form and interview with the teachers, researcher finds that subject I has a visual type of dyslexia. Due to his sight issue, subject I experiences some difficulty in looking at the letters well that he sees the letters in reversal.

SUBJECT J

Table 10: The Type of Letter Reversal for Subject J

Original Letters		Reversal
b	←→	d
p	←→	q
b	←→	p
m	←→	w
n	←→	u

Subject J is a Malay boy aged 9. The finding reveals that the letter reversal experienced by subject J affects all letters, which are 'b', 'd', 'p', 'q', 'm', 'w', 'n' and 'u'. Subject J cannot distinguish letter 'b' and letter 'd'. Subject J demonstrates letter reversal from right to left, where 'b' becomes 'd' and reversing the letters from left to right, where 'd' becomes 'b'. The same is done by subject J towards the letter 'p' and the letter 'q'. Subject reverses the letters from right to left, where 'p' becomes 'q' and reverses the letter from left to right, where 'q' becomes 'p'. Apart from that, subject J also reverses the letters from the bottom to top such as 'b' becomes 'p', 'm' becomes 'w' and 'n' becomes 'u'. Also, the subject also reverses the letters from top to bottom like 'p' becomes 'b', 'w' becomes 'm' and 'u' becomes 'n'. Through the data obtained from the questionnaire form and interview with the teachers, the researcher finds that subject J has dyslexia type visual+auditory. The sight and hearing issues faced by subject J cause him to find it troublesome to see the forms of the letters and to hear the sounds of the letters well that he fails to detect the letters with similar sounds.

Overall Analysis

The overall analysis finds that nine out of ten subjects of the study are males and it shows that all the subjects have reversal issues towards letters that are similar in shape or form. This is because the subject comprises of the dyslexics who have the problem visually or in visual+auditory. However, the letter reversal done is different according to the individuals. The letters that most significantly have reversal issues are letters 'b', 'p', 'n' and 'u'. All the subjects have reversal issues towards these four letters. From the 10 subjects of the study, half of them have reversal issues on all letters, namely letters 'b, 'd', 'p', 'q', 'm', 'w', 'n' and 'u'. Some others make reversal errors on only certain letters. According to an expert, Puan Sariah Amirin, the issue as to why every student makes different reversal errors has an unexplainable root cause. This is due to the fact that the visual or sight of every dyslexic student when they see letters is different and their level of thinking is also different. Other than that, through interviews with teachers at the dyslexia center, they state that most of the dyslexic students are able to see the letters that have symmetrical lines such as the letters 'm' and 'w'. The symmetrical lines are one folded line on a geometrical

form or object so that the shape can correctly fall onto each other when it is folded (Harliyana, 2012). That said, according to the teachers, there are also those who are unable to see the symmetrical letters correctly as they depend on the individuals. Thus, it can be concluded that there is no difference between the subjects with visual dyslexia or those with visual+auditory dyslexia because they all make errors in reversing the letters that have similar shapes. This is because all the subjects have visual issues where they see letters in reversal so much so that they become confused in scanning the letters correctly.

Conclusion

The reality is that, today there are some parents and teachers who do not care at all about this issue due to their lack of knowledge about dyslexia. If children have problems in identifying letters and if they are not able to spell or read within their age when they are at primary school, they will be regarded as slow learners by the teachers who prioritize performance as they have been lagging in their studies and parents are also unable to tap their children's special talents because they have always assumed that their children are unwell. The exposure about letter reversal happening among dyslexic students must be given to parents and teachers at school. The study about the learning of dyslexic children must continue so that these children can master the 3M skills, namely reading, writing and spelling just like other normal children. Next, diverse effective methods of learning must also be formulated to make them the sources of reference to teachers and parents. If every member of the community is sensitive and concerned in resolving this issue, dyslexic children will have the opportunity to contribute their skills and special talents in the community, and further help improve the growth of development and education in Malaysia.

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References

1. Ann Lee SienSut. (2016). Evaluation of The Effects of a Multisensory Malay Language Reading Programme and The Decoding Skills of Children with Dyslexia.Pulau Pinang: Universiti Sains Malaysia.
2. Arif Widodo, Dyah Indraswati dan Agam Royana. (2020). Analisis Penggunaan Media Gambar Berseri Untuk Meningkatkan Kemampuan Membaca Siswa Disleksia Di Sekolah Dasar. Date of access on 6 Oktober 2020, from https://www.publikasiilmiah.unwahas.ac.id/index.php/MAGISTRA/article/view/3457

3. Everatt, J. (2008). Proses Penglihatan dan Perhatian :Membaca dan Disleksia. Kuala Lumpur: Institut Terjemahan Negara Malaysia Berhad.
4. Fajri Basam dan Sulfasyah. (2018). Metode Pembelajaran Multisensori VAKT sebagai Upaya Meningkatkan Kemampuan Membaca Lancar Siswa Kelas II. Jurnal Riset Pendidikan Dasar. Vol 1 (1) : 18-24 .\
5. Githa Mediana Simanjuntak, Rahma Widyana dan Kamsih Astuti. (2020). Pembelajaran Metode Multisensori untuk Meningkatkan Kemampuan Pra-Membaca pada Anak Usia Pra-Sekolah. Jurnal Pendidikan Anak Usia Dini. Vol 11, No1 : 51-54.
6. Halina Mohd Noor. (18 Februari 2017). Disleksia Lambatkan Proses Pembelajaran. Berita Harian Online. Date of access on 25 October 2010, from https://www.bharian.com.my/node/249663
7. Harliyana Ramli. (23 November 2012). Garis Simetri. Tarikh diakses 28 Ogos 2019, from http://harliyanarami.blospot.com/2012/11/garis-simetri.html?m=l
8. Latifah Khairiyah dan Gustina Erlianti. (2020). Efektivitas Buku Cerita Bergambar untuk Meningkatkan Minat Baca Anak Disleksia. Jurnal Stie Semarang. Vol 12, 75-83.
9. Levinson, H.N. (1994). A Solution to The Riddle Dyslexia. New York : Springer-Verlag.
10. Linda Feronika. (2016). Studi Analisis tentang Kesulitan Membaca (Dyslexia) serta Upaya Mengatasinya pada Siswa VB SD Muhammadiyah 22 Sruni, Surakarta.Surakarta : Universitas Muhammadiyah Surakarta.
11. Majeda Al Sayyed Obaid. (2013). The Impact of Using Multi-Sensory Approach for Teaching Students with Learning Disabilities. Journal of International Education Reasearch. 9, 75-82.
12. Mohd Fahmi Mohd Yusof. (24 Mac 2012). Isu Pendidikan : 45,000 Kanak-Kanak Hidap Disleksia. Berita Harian Online. Date of access on 15 January 2019, from https://www.bharian.com.my/bharian/articles/45_000budakhidapDisleksia/Article/index_html
13. Noor Syamilah Md Maliki dan Mohd Hanafi Mohd Yasin.(2017). Application of Multisensory in Learning Alphabets Identification Skills for Special Education Students. Journal of ICSAR. 1, 150-154.
14. Nur Syuhada Mohamad Abdul Wahab & Faridah Yunus. (2016). Teknik Mltisensori dalam Pengajaran dan Pembelajaran Literasi Huruf Kanak-Kanak Prasekolah. Bangi : Universiti Kebangsaan Malaysia.
15. Rajesvari Ramasamy. (2008). Masalah Dyslexia dalam Kalangan Murid-Murid Pemulihan di Sekolah Rendah, Pulau Pinang. Pulau Pinang : Universiti Sains Malaysia.
16. Sariah Amirin (2000). My LexicsTM: Edisi Bahasa Malaysia Modul 1-Modul 10. Selangor: Venton Publishing (M) Sdn. Bhd dan Persatuan Disleksia Malaysia.
17. Sharifah Nawirah Syed Hassan. (2016). Model Pemulihan Disleksia Davis dalam Pembelajaran Kanak-Kanak Disleksia. Journal of Education and Social Sciences, 4, 151-155.

18. Soeisniwati Lidwina. (2012). Disleksia Berpengaruh Pada Kemampuan Membaca dan Menulis. Jurnal Stie Semarang, 4, 9-18.
19. Sri Utami Soraya Dewi. (2015). Pengaruh Metode Multisensori dalam Meningkatkan Kemampuan Membaca Permulaan pada Anak Kelas Awal Sekolah Dasar. Jurnal Program Studi PGMI, 2, 1-11.
20. Sumiyati Abdul Halim Jikem. (2009). Nombor dan Abjad Terbalik. Buku Koleksi Kertas Kerja Seminar Researcher an IPGM KBL Years 2009, Institut Pendidikan Guru Kampus Batu Lintang, 28-29 November.
21. Treiman, Gordon, Boada, Peterson dan Penington. (2014). Statistical Learning, Letter Reversals and Reading. Scientific Studies of Reading. 18, 34-48.
22. Vijayaletchumy Subramaniam. (2008). Disleksia dalam Konteks Pembelajaran Bahasa di Malaysia. Pertanika J. Soc. Sci. & Hum. 16, 115-139.
23. Vijayaletchumy Subramaniam & Wan Muna Ruzanna Wan Mohammad. (2012). Penggunaan Bahasa Verbal dalam Kalangan Murid Disleksia. Jurnal Bahasa. 27, 153-169.
24. Yahya Othman. (2003). Mengajar Membaca : Teori dan Aplikasi. Pahang: PTS Publications Sdn. Bhd.
25. Zaliza Zubir, Mahfuzah Md Daud & Ahmad Hifzurrahman. (2014). Disleksia Dalam Aspek Ejaan Bacaan Bahasa Melayu. Perlis :Universiti Malaysia Perlis.