A Multi-Sensory Teaching Aid Of Malay Language For Dyslexic Children

Norarifah Ali[1]
{norarifah@uitm.edu.my}

Faculty of Art & Design
UiTM Cawangan Kedah, Malaysia

Abstract. Children with early learning difficulties need to be detected as early as possible to be given serious attention especially in the ability to recognize letters, spell and read. Learning problems that involve literacy skills, especially weaknesses in the reading process, are known as Dyslexic, which can be detected early if children aged 5 years and below are sent to preschool to receive their early education. This research is meant for dyslexic children and applicable in the learning process established and supported by theory of Orton-Gillingham in the dyslexic domain. An initial tangible product of a teaching aid named Smart Board will be used as intervention in learning strategy for children with dyslexia in the beginner level. The results supported the effectiveness of learning activities using teaching aid to construct the simple Malay syllables using the lowercase alphabets that focus on dyslexic children at the beginner level and the class observation was conducted among dyslexic children at the DAM Centre Penang and SK Bukit Kiara Kedah. The result exposed the way to assist the dyslexic children to build simple Malay syllables through multi-sensory approach as the main elements that are: kinesthetic, auditory, visual and tactile sense.

Keywords: Dyslexic Children, Teaching Aid, Intervention, Multi-sensory, Kinesthetic, Auditory, Visual and Tactile

1 Introduction

This paper integrates research on dyslexic intervention, which is broadly from the use of English language, and the researcher focuses on the recognition of alphabets to construct simple Malay Language in designing the teaching aids for children with dyslexia in beginner level. Disorders of the brain functioning and interpreting information during learning by dyslexic children cause them to be severely impaired in their ability to focus and concentrate while learning or reading.

Dyslexic children are those who are very talented and have good communication skills but they also impose problems in very poor reading and writing skills and, if a special attention is not given in the early stage, they will feel depressed. Dyslexic children have conflict in recognizing letters and describe the shape and form of the letters that make burden to their learning activities (1) and they are having the puzzle in their mind but found difficulty to describe problems and even just to complete simple tasks.

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Normally, dyslexic children always face learning disabilities where they usually having problems in recognizing letters, which could defer their performance in read skills (2). They are not able to give long -term focus on something they are doing alone. Therefore, dyslexic children will have difficulty to read well, spell words and write words (3). Dyslexic is categorized as a common learning difficulty and it also causes visual confusion (4) , language and literacy problems (5), memory function (6), reading disability (7) as well as motor skills (8).

Even though this learning disability that primarily changes the aptitude in reading skills, written and problems through oral, there is a good opportunity of research, which looks on the development of teaching aids with the aim of helping children with dyslexia. Therefore, it is important to encourage and provide something fun, interesting and enjoyable in the learning process of dyslexic children. Hence, dyslexic children need special support (9) as to improve skills and learning development of their reading (2).

The teaching aid is named as Smart Board as it consists of "SMART" which shows the focus on recognising the alphabets that divided by vowels and consonants with the 3D embossed letter shapes with a touchable surface. It uses different colours for each alphabets and the word "Board" functions to rewrite the letters that have been arranged where these dyslexic children have practiced the method of direct repetition. This teaching aid study is designed for beginner students in Grades 1-3 (age ranges of 7 - 9 years) which struggle with a small letter recognition and construction simple syllable in Malay Language. In brief, teaching aid can be recognized as a tool that can help to improve learning strategies and skills among students as well as in teaching process among teachers.

2 Problem Statement

Clearly that children with dyslexia are diagnosed with difficulties in their learning especially those involving lowercase letter recognition, syllable spelling, reading correctly and difficulty in writing skills (10). Due the fact that, Bahasa Melayu or the Malay language is the mother tongue of the main population of Malaysia and works as an intermediate language to be learned and mastered from the early stages of childhood. In addition, all the public and private schools registered under the Ministry of Education are required to use Bahasa Malaysia as the medium of instruction with over 80% of curriculum time are in Bahasa Malaysia (11). It is also stated in Malaysia Education Blueprint in which "To Uphold Bahasa Malaysia and Strengthen the English Language" policy or Memartabatkan Bahasa Malaysia Memperkukuhkan Bahasa Inggeris (MBMMBI), Malay language will remain the medium of instruction in National schools, including for Science and Mathematics. The problem to tackle new readers especially the dyslexic children in beginner level that may have critical errors with alphabets recognition and may not have built propensity to recognize new words (12).

More importantly, children with learning difficulties are among who are at risk in terms of comprehension and storage of information due to their ability to focus during learning is very weak (13). This has caused the factors of students' readiness level of learning turns to be very

limited and on the other hand, the multisensory approach as a necessary component of special education learning that can enhance children's sensory capabilities of vision (visual), auditory (hearing), kinesthetic (movement) and textile (touch) are needed to make the children focus more during the learning process (14).

Yuzaidey et al., (2018) stated that interventions or any teaching aids for dyslexic children in Malaysia are limited and this should be emphasized on the cognitive skills among dyslexic children for a quality early learning process especially the use of the brain to listen, think, learn, understand, question, and observe. The teachers will only use products that they feel useful and beneficial to the students, and this leads to contribute on the potential to make an effective teaching aid. Furthermore, teaching aids are those materials that help teachers to explain better knowledge as well as assisting students to understand more (16).

3 Significance of Study

(1). This study provides opportunities to be used as teaching and learning materials in improving literacy skills of special dyslexic children at beginner level in the recognition of letters, syllable words, re-spelling, re-read syllables and rewriting the syllables well. It also contributes to the teachers, parents and those who seek to help dyslexic children in their learning problems to get more focus on the use of the Malay language using the multi-sensory approach. It also emphasizes on the process of teaching and learning to be extra fun and interactive to the dyslexic children.

(2). The rationale of the study can be adapted as a useful practice in the efforts of Ministry of Education, therapy centres and other related organisations for the development in achieving quality improvement targeted for specially designed learning and teaching method to the dyslexic children.

4 Research Questions

(1). How to make learning effective especially in constructing simple Malay syllables using lowercase alphabets after they are exposed to use the teaching aid?

(2). How the elements of multi-sensory can be applied to build simple Malay syllables for dyslexic children at the beginner level?

5 Objectives

This study aims:

(1). To determine the effectiveness of learning activities using teaching aid in constructing the simple Malay syllables using the lowercase alphabets that focuses on dyslexic children at the beginner level.

(2). To assist the dyslexic children to build simple Malay syllables through the multi-sensory approach.

6 Literature Review

The term 'Dyslexic' comes from the Greek and it means difficulty with words (17). Interpretation of dyslexia also varies on the initial engagement criteria, and they include considerable with the difficulty in recognizing letters, read the words and spelling fluently indicates a low level of fluency and accuracy (18). In fact, the limitations can appear in many aspects range from difficulty with oral and written language, coordination, self-control or attention. Their difficulties also include the schoolwork activities and this will complicate the process of learning to read, writing skills or mathematical calculations. The signs and symptom below indicated that a child with dyslexia:

6.1 Directional Confusion

Directional confusion in dyslexic children can take several forms, as from not being sure which is left and right, to not being able to read a map correctly. (19).

Then, this directional confusion also makes an excuse to reverse letters, whole sentences or numbers. Among the following symptoms, indicate confusion of direction:

(1). Dyslexic children will indeed experience letter reversals such as p and q, or m and w, either while reading or writing.

(2). They are confused about the characters of the letters and are able to reverse the letters when reading or writing example: [n] as [u], [m] as [w], [p] as [d] or [b].

6.2 Sequencing Difficulties

Dyslexic children face difficulty with the sequence of alphabets, for example in understanding things in sequence, as well as remembering the sequence. This will distress their ability to read and spell fluently.

6.3 Difficulties in Handwriting

There are some hidden weaknesses that interfere with handwriting performance which are [1] poor motor skills, [2] faulty visual perception of letters and words, and [3] difficulty in retaining visual impressions (20).

In reality, learning process of dyslexic children is not similar with a normal child. So they need an additional guidance, clear instruction and a well face-to-face tutoring as the best teaching approach.

Furthermore, referring to the Dyslexia Association of Malaysia (DAM), there are three levels of learning, which are beginner, intermediate, and advanced. At the beginning stage of 7 to 9 years old, dyslexic children are usually unable to remember, barely recognize letters or numbers as well as the following flaws:

(1). Recognition of letter and number shapes
(2). Memorizing all the letters and numbers
(3). Spell and sound out each letter
(4). Count and say the number
(5). Build two simple syllables
(6). Rewriting the letters and numbers

The next stage of learning for dyslexic children that is the intermediate stage where they are the age of 10 - 12 years old. The method of teaching and learning is better in this phase where the improvement of skills build is more on the challenging syllables and they need to construct complete sentences. Then, the advanced stage of dyslexic children are those aged between 13 years and above, and the learning process is continued through monitoring and observation to see the competence of sentence builders and more complex vocabulary. Next, the student is able to read the entire paragraph or book.

Surely, diversity of teaching aid is needed by teachers as to create a medium of systematic and effective support for the teaching process to dyslexic children. The play while learning method is a practical and suitable approach to be applied to dyslexic children because they are not able to concentrate for a long time and the repetitive teaching technique is a very effective method for them. The benefits of the intervention in multisensory method based on Orton Gillingham's theory assist parents and teachers in letter recognition and sentence construction activities at an early stage of children (21). Furthermore. this makes an increase of reading comprehension to the dyslexic children (22). However, teaching aid-based interventions have good advantages in helping dyslexic children to recognize letters, spell and read because the method is able to appeal to most children without getting bored. For this reason, the method of learning while playing is the main impetus to attract dyslexic children to learn without feeling burdened and difficult. Previous project such as Madrigale (2014) aimed to design and implement educational action games oriented in a way to promote engagement and motivation forms of interaction, phonological training and visuospatial attention in dyslexic subjects for kids aged of 7 to 9 years (23). Another project that tackles in reading comprehension is Bijak Membaca which is designed to visualize letters, words, sentences, and pronunciations in the Malay language for dyslexics, aged of 7 – 8 years. Furthermore, other project such as MyLexics that deals the ability to read and write in Malay language (24) is among the first courseware in Malaysia for dyslexic children.

The Orton-Gillingham Approach is explored in this research to gain a prescriptive way to teach literacy using direct, explicit, multisensory, structured, and sequential as reading writing and spelling are not easy to be mastered by the individual with dyslexia. Dr. Samuel Orton and Anne Gillingham (25) who derived the basic philosophy of Orton-Gillingham believe that students with severe dyslexia require a multisensory approach, especially the use of auditory, visual, tactile and kinesthetic channels, in their literacy teaching. In addition, by using a multi-sensory teaching method, it means to help more dyslexic children to learn and understand more than one sense of taste. They need the Orton-Gillingham Approach which is an effective guide to provide reading instruction for struggling dyslexic children. This approach involves all the senses to respond to each other and assist to stimulate the brain to receive and interpret information. The most importantly, this teaching approach can be more skillful in learning process activities and effective when the dyslexic children can apply all their senses, as it is known that every sense is a path or bridge in their brain (3).

7 Methodology

The qualitative research and procedure are the based methodology applied in this study. The qualitative method is the best to be used as an effort to understand the role of participants' engagement and intensive with interested participants from the perspective of participants rather than researchers (26). In this research, class observations are used ad as the main research tools.

7.1 Sampling

Using a purposive sampling technique, 11 dyslexic children were selected for this research. The purposive sampling technique is a deliberate approach for the selection of participants who have the qualities required for the research and most importantly, this is a non-random technique that occurs and does not require a basic theory or a number of participants (27). The participants were consisted of dyslexic children from the government schools that run the Dyslexic programme and few from the Dyslexia Association Malaysia (DAM Penang). The age of the participants is between 7-11 years old. The main factor in the selection of these children is that they are dyslexic children who meet the criteria of the study where the ability to recognize letters and build syllables is still weak.

7.2 Method of Data Collection

Involvement of dyslexic children at the beginner level through class observation together with their teachers, who act as instructors to describe the role of interventions implemented, through the use of Smart Board. This tool is a useful teaching aid for coaching alphabets recognition, recognition letters consonants and vowels through color, and syllable construction in Malay language. Dyslexic children will be given syllables that is written first on the board by the teacher. The teacher will spell the syllable and the dyslexic child will have to do the word recognition and word comprehension tasks given. After that, they have to rediscover the letters as displayed on the board where each new letter searched is a 3D letter that has 21 consonants and 5 vowels which can be touched and held for the letter recognition process. Then, each of

the letters must be arranged in the correct space and the child must rewrite the spelling of the syllable. A picture and phone recording in this class observation are used by the researcher.

8 Findings and Discussion

Findings are discussed based on two research questions;

RQ1: How to make learning effective especially in constructing simple Malay syllables using lowercase alphabets after they are exposed to use the teaching aid?

The class observation was conducted to determine the effectiveness of learning activities using teaching aid to construct simple Malay syllables using the lowercase alphabets that focus on dyslexic children at the beginner level. A class observation was conducted among 11 dyslexic children to verify the readiness of the teaching aid. The researcher has chosen DAM center of Penang branch with a total of 3 students and one government school that running dyslexic programme with total of 8 students involved in the class observation. The activities were done in pairs as this Smart Board teaching aid can be used in both parts at the same time. The teachers gave instruction for the activities using Smart Board teaching aid through multi-sensory approach for these dyslexic children to build syllable in Malay language. The results of the activities are displayed in the table below:

Table 1. Findings of The Use of Smart Board Teaching Aid on Dyslexic Children at the beginner level on learning activity in constructing simple Malay syllables using the lowercase alphabets

		Recognize Letter		Construct Syllables		Rewrite The Syllables		Spell The Syllables	
		Can	Can't	Can	Can't	Can	Can't	Can	Can't
Class Group of Participants	Government School	8	0	8	0	8	0	8	0
	Dyslexia Association Malaysia	3	0	3	0	3	0	2	1
Total Participants		11	0	11	0	11	0	10	1

These results indicate that even the participants are from different institutions, they can give a good rating after using Smart Board which was specially designed according to their learning problems especially in getting to know the letters and the construction of a syllable in Malay language. However, there was only one dyslexic child who had difficulty in spelling the syllables. This condition can be classified as a disorder of information received and processed in his brain as a result of dyslexic problems that he is facing. Through an intervention, this Smart Board teaching aid is effective and helps dyslexic children to build simple words again and again without consciously doing so. Children will learn to identify vowel letters (AEIOU)

and 21 consonant letters that have different color roles to attract the eye and the idea of floating letters gets them to be more focused during the learning process. Examples of Malay syllables are as follows: *"atap", "baju", "obor", "bola", "kaki", "tiru", "emas", "muka", "hati", "daun"* and etc.

This board game helps children to learn the diversity of multi-sensory methods for the construction process of simple syllables in the Malay language using the repetition technique. They will listen to the pronunciation and see the words syllable selected by teacher or parent, then recognize the letters, find the right letter among of the 54 letters. The two sets of alphabet letters are meant to help the process of letter repetition in constructing the syllables, touching the 3D letter shape and its rough surface for the process of remembering and translating it in visual form, then arranging the letters that have been correctly selected in the special compartment slots, re-spelling the syllables that have been formed and lasty, rewriting through observation of construction the 3D letters that form the syllables in the writing space on the Smart Board. In addition, this process will be done repeatedly by the children and they will be extra excited because this Smart Board can be played by 2 students at a time with the minimum supervision of teacher or parent.

RQ2: How the elements of multi-sensory can be applied to build simple Malay syllables for dyslexic children at the beginner level?

In response to the second research question, the data was gained through the class observation sessions that were conducted at SK Bukit Kiara, Kedah and Dyslexia Association of Malaysia (DAM), Penang. As for this purpose, class observation has helped the researcher to learn a great deal, not only about the effect of teaching on the learner, but also related to the child's perspective and the influence that individual and groups of children have on the lesson (28). Researchers can choose several methods such as video recording, taking notes, using a camera or cassette recorder or marking a checklist on the observation form (29). For this reason, the researcher has chosen video recording, taking notes, and using a camera to record each activity during the observation process in the classroom and the results of these findings were analyzed using Atlas.ti.

Validation in qualitative research, as it is trying to value the "accuracy" of the finding, is best depicted by the researcher, the participants, and the readers (26). Thus, the validity of the elements in multi-sensory was done by using the views of three panel of external evaluators who have more than five years of experience and knowledge in the field of study, they were appointed as expert panel to validate the elements in multi-sensory that can be used to build simple Malay syllables for dyslexic children at the beginner level. The expert panels were asked to review, provide views and recommendations on the format, the appropriateness of arrangement of the components in the measurement and the meaning of the items in the question. The results are displayed in the figure below:

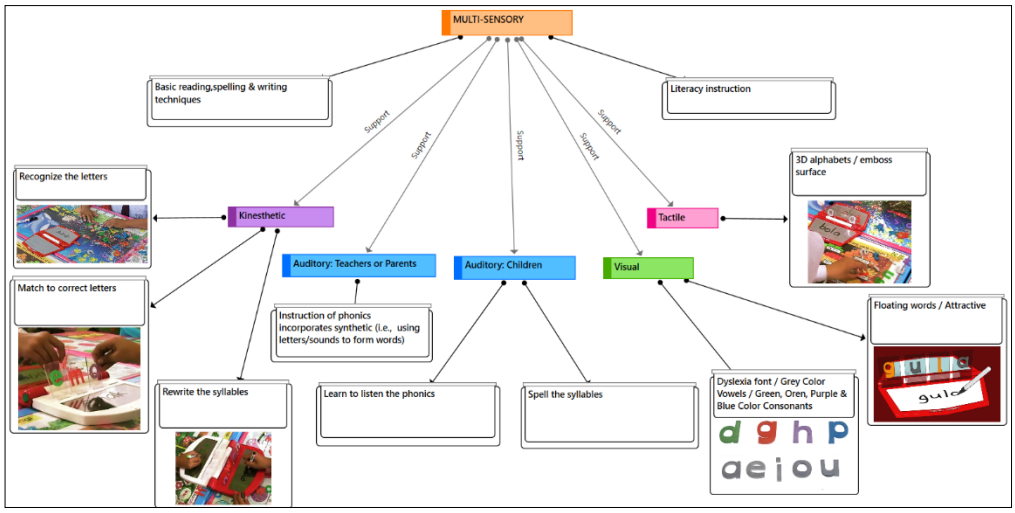

Fig. 1. Elements of domains that can assist the dyslexic children to build simple Malay syllables through multi-sensory approach.

Figure 1 describes in detail all the elements in multi-sensory approach based on Orton-Gillingham's theory as well as the improvements after going through validation from the experts. The multi-sensory approach in the finding is divided into the role of literacy instruction and the role in learning basic reading, spelling and writing. In response to the use of Smart Board as a teaching aid for dyslexic children, the objective is to assist the children to build simple Malay syllables and some of the main elements that are focusing on the effectiveness of the teaching aid such as, [1] Kinesthetic, [2] a. Auditory: teachers or parents, b. Auditory: children, [3] Visual and [4] Tactile.

The role of kinesthetic **(move)** is mainly on making the dyslexic children to respond during the intervention process by using the Smart Board teaching aid. They need to identify the required letters for syllable construction, after which the letters need to be arranged correctly in the slot squares provided and, after entering the four square slots, they need to rewrite the syllable using a marker pen on the writing space of the Smart Board. Secondly, the auditory point to **hear** is helping teachers and parents to play major role as they need to give prior instructions to dyslexic children in a systematic and orderly manner as they tend to be confused if instructions are not conveyed clearly and accurately. Teachers and parents need to pronounce the instructions in synthetic phonics and directly uttering the letters and sounds to form word. While for the auditory element of the dyslexic children, they need to be alert and focus with the instructions given especially to understand and learn to listen to the pronunciation of syllables that need to be constructed as well as spell the syllables and sound correctly. Thirdly, the visual element serves to **see** something interesting and catch the attention of dyslexic children, using *Open Dyslexic* is a typeface/font designed to reduce some of the common reading errors caused by dyslexic children. Moreover, the group of letters is prepared separately according to color where the group of vowels is in gray and the consonants have 4 different colors namely green,

orange, purple and blue. The main function of applying color is to attract interest and encourage the development of their learning. In addition, the use of 3D-embossed lowercase letters on a clear acrylic surface gives an imagination and realistic appeal for dyslexic children to focus on the shape of the letters that are floating. This indirectly deals with the repetition of learning methods to them as this process demands them to recognize the letters, visualize the shape of letter, remember, recall it and translate it through rewriting in the writing space. Lastly, tactile element brings dyslexic children to feel their sense of **touch** through tracing the rough surface of 3D letters where it takes influence from the learning process using touch on the sand. They can also touch the 3D letter shapes that appear along with the touch on the rough surface of the letters. Indirectly here, there is another repetition of learning and this has made them directly in wake. The designs of Smart Board as teaching and learning aid of a Malay language for dyslexic children at the beginner level are illustrated in the figure 2 below:

Fig. 2. Smart Board for Dyslexic Children at beginner level

9 Conclusion

The most crucial factor to stimulate and motivate researchers to produce teaching aids for dyslexic children is because there are no teaching aids available specifically for dyslexic children that focuses on the construction Malay syllables and the use of multi-sensory approach to tackle the attention of the dyslexic children. Some teachers of dyslexic children claimed they found difficulty in finding an effective teaching aid to assist their teaching and learning processes, and especially the Malay language based teaching aid. Mostly found on the market are imported products and more to game interface. In fact, the availabe products in schools as well as at the dyslexia centres are similar to the one used by normal kids. The existing products are also seen too complicated and gone beyond the ability of the dyslexic children. Through the study, researcher found that all the educators of these dyslexic kids are committed and aware of their role to help the kids in their learning process.

In the search of previous literature, the researchers found a limited number of studies focussing on teaching aids for intermediate level especially in reading activities for dyslexic children. In addition, the use of appropriate and relevant teaching aid with the right level of needs of the kids is indeed an impactful effort to help them. Further research is needed to develop the potential of research among dyslexic children at intermediate and advanced levels especially

those that scrutinize the aspects of learning in literacy skills. Emphasis should also go to the cognitive domains by adding up more sample sizes, manipulating control training programs, adding general character reading tests and involving more experts in the field, etc.

The application of Smart Board is objected to be fully utilized by all the DAM centres, schools and therapy centres that run on the remedial approach for the dyslexic kids. It is a great hope that Smart Board will help to create enthusiaism to all the educators to teach and guide the dyslexic children. Above all, it is a wish to see more kids are able to encounter their learning difficulties especially in the introduction of form of letters, spelling and writing process as well as creating extra excitement during the learning process.

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