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Academic Series of Universiti Teknologi MARA Kedah

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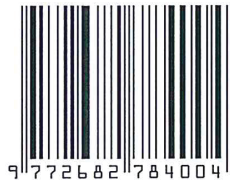
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DEVELOPMENT OF CONCEPTUAL FRAMEWORK FOR DYSLEXIA LEARNING AIDS

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ARTICLE INFO

ABSTRACT

In recent years, concern about dyslexia in child development has become an issue in Malaysia due to significant increase in numbers of children associated with this disability. It starts with an awareness on how important reading, writing and calculating are for our daily life. The skills mentioned are basic necessity to access and obtain knowledge. In addition, Malaysia has a long history of providing education for children with various categories of disabilities, especially in terms of primary and secondary education. This study intends to develop learning aids product in terms of providing better design for overcoming learning challenges and create learning effectiveness for this special group. Based on literature study and observation, this conceptual paper will discuss about the current product for dyslexia education and learning. The method for this research will use comparison data based on literature and existing product as analysis. As a result, this research has identified the development of conceptual framework for developing learning aids for dyslexia children.

1.0 INTRODUCTION

Reading, writing and calculating are important in our daily life. These are skills required to access and gain knowledge. In local context, the Department of Statistics Malaysia has released a children statistics which stated that in 2017, the composition of children who are less than 18 years is 29.4 per cent, which makes 9.4 million are children, out of 32.0 million of total population. In terms of sex, the number of male children (4.9 million) is more than female (4.6 million). Under normal circumstances, children who are suspected with dyslexia will be referred to either a paediatrician or child psychiatrist for proper diagnosis which is subsequently confirmed by a clinical psychologist through further testing.

According to the International Dyslexia Association, dyslexia has affected 10% to 15% of the world population. In Malaysia, 10% to 15% of primary school children were reported by the Harmonic Social Association (PSHM) for having symptoms of dyslexia. Based on statistics of the Department of Special Education, Ministry of Education Malaysia, approximately 314,000 children in Malaysia are suffering from dyslexia. Ministry of Education Malaysia reported that there is one dyslexic case identified in every 20 students. 11 Sin Chew Daily reported that nearly 10% of students in the primary

and secondary schools are affected with the disorder. Dyslexic children require an effective education strategy in order to gain knowledge because most of them face challenges in mastering reading and spelling skills.

According to the International Dyslexia Association, the learning disability is neurobiological in origin and is characterized by difficulties with accurate and or fluent word recognition and by poor spelling as well as decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge. (Anny Sivilay, Oct 23, 2018)

Product design is a process which uses analytical and problem statement for any designer to approach as a means to problem solving to provide a better quality of life to the end user which will result improved interaction with others. It is about visualizing, solving problem and providing a solution for the needs of users. According to Elsbach (2018), Design thinking comprises of an approach to problem solving that uses tools traditionally utilized by designers. Design thinking as an approach used for solving problems faced by consumers in their daily life.

In this research, the early phase is to understand and study issues or problem statements that Dyslexia children face during their learning in reading and writing tasks. From those statements, research questions were developed and the objectives of this research also serves as a focus for the researcher to come out with product or teaching aids that will be a validation tool at the end of this research. This research will involve the understanding of the conceptual framework and analysing design among designers, educators and dyslexic children. Furthermore, this study will form an understanding based on interaction and experience of a dyslexic child's thinking through data collection to obtain new knowledge as references on design process in making a product or learning aids for dyslexia children.

2. KJ METHOD

The KJ method was developed by Kawakita Jiro, a Japanese anthropologist in 1960s which is also known as the affinity diagram. The KJ method was popular as a method for the set up and to organize a huge number of data in an orderly system for disorganization and numerous raw data. All the data and generating of ideas are collected and placed in group so that any similarity will be selected and brought up in brainstorming session. KJ method was earliest developed to represent anthropological fieldwork to extract the relation which leads to findings from the cluster and stored information. This method is relevant to technical innovations and is most systematic for brainstorming and it is focused. The features of the KJ method are involved combined works gearing towards innovation. This study are conducted through understanding and search for keyword which was developed prior to brainstorming. By brainstorming, keywords are collected from reading materials and ideas from student design. (Omar WNF et al. 2015)

2.1 Organizing Keywords According To Group

Next is to organize the keywords in order to gather right and preferred keywords to form a conceptual framework. The analysis conducted based on three groups of main keyword. From the entire three groups, smaller groups of keywords are derived at to produce the word that can form the conceptual framework. This is a very important part of this study as it shows on how to select the right keyword to be placed in the conceptual framework. Keyword were given and suggested by the design student which will then be consulted with a supervisor. Table 1, Table 2 and Table 3 below show the list of keywords obtained from design students.

Education				
Spelling	Reading	Learning	Classroom	Writing class
Alphabet song	Reading test	Student	Handwriting	Spelling class
Observation	Adapt	Test	Kindergarten	Special class
Skills	Question	Copying	Teachers	Vocabulary
School	Neurological	Knowledge	Neighborhood	Spelling bee
Psychological test	Home	College	Speech therapist	Writing test
Intensive reading	Language	Training	Practice	

Table 1: List Tables of Keyword

Dys(x)				
Reading disorder	Memory	Problem copying	Reading	Difficulty understanding
Slow learner	Sound	Reading	Anxiety	Inconsistency
Poor handwriting	Visual problem	Visual disturbances	Typo	Slow learner
Decoding skill	Hearing	Slow writing	Dyslexics'	Boys & girls
Spelling	Disorder	Vision problem	Struggle	Avoiding reading
Action	Interpret words	Reading Fluency	7 to 12 years old	Writing
Short term memory	Spelling	Slow learner	Children	Spelling
Word reading	Confused	Cannot reading well	Alphabet	Learning disability

Table 3: List Tables of Keyword

Affecting	Developmental	Read aloud
Central dyslexia's	Learning	Memory skill
Comprehending	Teaching	Phonics
Difficulty	Special	Various built-in features
Eye movement	Orton-Gillingham methods	Accent
Literacy	Anxiety	Recognize various letter sound
Memory	Pre reading	Verity of tool
Peripheral dyslexia's	Spelling	Sequencing
Reading	Various educational element	Screen reading
Reading & listening	Stress	Game-like activity
Spelling different word	Treatment plan	Reading
Text	Barcode technology	Struggle reading
Typing/reading text	Ability to read	Processing speed
Word recognition	Cognitive basis	Assistance tool/software/app

Table 4: List Tables of Keyword from Reading Material

Figure 1: KJ Method (workshop with design student)

Figure 2: Dyslexia workshop (at UUM)

3. UNDERSTANDING RESEARCH AREA

Area of the study is focused on product and people in these research areas. The purpose in this research is aimed at the dyslexic children community in order to ensure the research fits into the aim and objective of this research. This study aims to develop products for dyslexic children to assist them in managing their disabilities at the end of this research. Dyslexia has been categorised as learning disorders or disabilities. This is three main conceptual frameworks on the study which comprises of people, product and process. Furthermore this paper mainly aims for people and product in terms of life trend or style. The research area aims to develop design knowledge for product development or any tool for a specific target users. Although students with dyslexia are often associated with difficulties in learning and using academic skills by an appropriate age, their abilities can be developed through different ways of learning and overcome challenges of their condition. The finding of this study will benefit dyslexic students as they would be able to learn more effectively into their level of understanding. The study shall contribute to our children better in development to better overcome their disability. This shall also assist them to find an effective way to achieve their academic goal and better life in future.
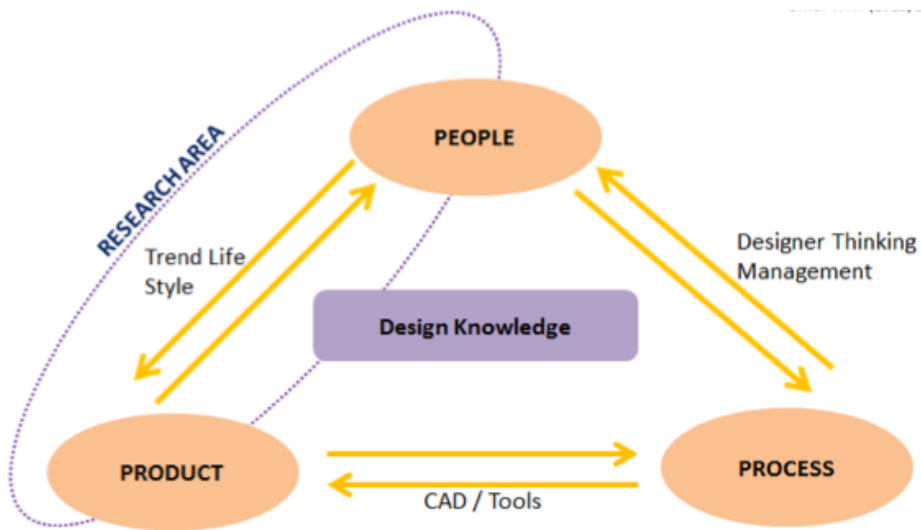
Figure 1: Research Area

4. CONCEPTUAL FRAMEWORK

Conceptual frameworks in this study is developed from brainstorming keyword in previous thinking study. These conceptual framework is build on a collection of keywords and reading sources to extract the needed process in developing the design for learning aids. It will lead the research area in this study and contribute to selected knowledge to keep this research on the right track. The existing related product may help dyslexic children to write and read. Furthermore the conceptual framework will explain the focus of this study. The study is narrowed down on education and learning aids product for dyslexic children in the primary school age between 7 to 12 years old. The aim of this study is to produce product by the end of this research through 3D or prototype model on learning disability specifically in reading and writing. The attribute from the conceptual framework will assist our research on developing a questionnaire for pilot study.

Here are three main part of the conceptual framework of this study. There are:

Education – product

Firstly, education is the main purpose of this research. The research will develop or enhance learning aids for a target user. From brainstorming and organizing keyword, education was the most selected keyword for the development of a product.

Learning disabilities – read and write

Recently, learning disabilities or the dyslexia condition has become a main concern on children in Malaysia with increasing number of dyslexic children in schools. Most children with dyslexia face difficulties in reading, writing and counting. These research will focus on reading and writing in order to decrease the number of children who are unable to read or write because of dyslexia.

Child – activity

This research will focus on specifically children between 7 to 12 years old at the primary school level. Children in schools usually are involved with a lot activities prepared by their teacher or school. Children tend to be attracted to activity involving them to play and learn.
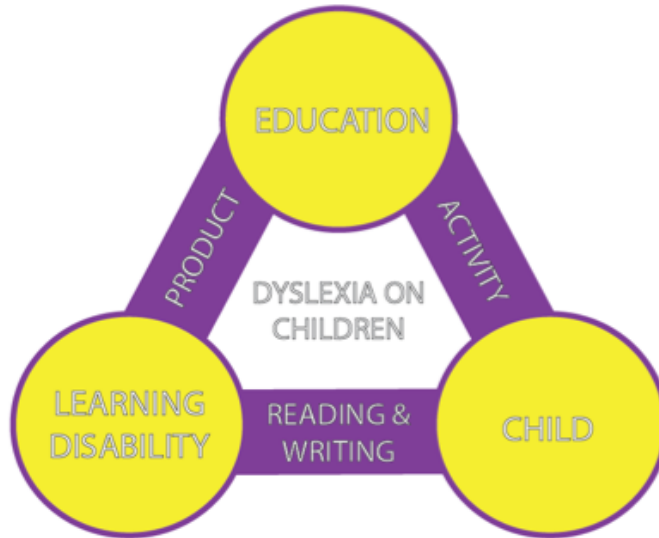

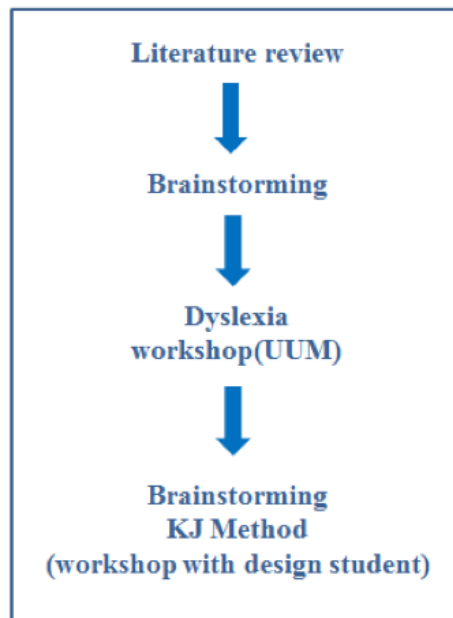*Figure 2: Conceptual Framework*

ORGANIZING KEYWORD

Figure 3: Step of Organizing Keyword

**Voice of
Academia**
e-ISSN: 2682-7840

Solehah et al. /Voice of Academia 16(1) 2020, 118 - 125

Voice of
Academia
Academic Series of Universiti Teknologi MARA Kedah
Available online at http://voa.uitm.edu.my

5. QUESTIONNAIRE BUILD FROM CONCEPTUAL FRAMEWORK

The questionnaire is divided into four sections. The first section is for general information or background of the respondent. The next three sections are questions about main keyword in conceptual framework. The other three sections were developed in earlier part of this study from the conceptual framework. Therefore questionnaires in this study are divided into one to five. All the parameters are of the Likert scale to identify responses on : hardly important, less important, neither important nor important, important and very important.

6. CONCLUSION

Based this research using the KJ method, it is hope that the method will help to generate ideas of keyword and widen perspectives in developing a conceptual framework. In other words, the KJ method is applied to determine the preferred keyword for a few groups in this study. This research shall give way to increase different forms of effort and can be a guide for further study in the future. Hopefully, by understanding the KJ method and how to edit it will produce more research and studies using thinking application. (OmarWNF et al. 2015).

Dyslexia predominantly affects reading but also writing and reading. Indeed these researches tend to help them cope with their disability. In future, this study can be useful for further study into developing design for learning aids.

7. RECOMMENDATION

Upon completion of this observation studies done as field work on selected Dyslexia children, the entire picture, data, responses, solutions and etc. were captured and recorded; analysis is based on the product Mock Up / 3D Model. The table / mind mapping will be used on this analysis to find out how the selected Dyslexia children respond to the product and comparison between them will be made and analyzed by researcher. The interview session will start with the teacher of selected Dyslexia children. The questions will be asked to them for all data to be recorded and analyzed. Then, the interview session will continue with selected Dyslexia children for more study on their response and answers. All the data from this method will be recorded and their answers during the interview will be analyzed. All the data from the related research or book on Dyslexic children will be recorded and analyzed and tally with the other two methods. These methods shall then be analysed together to find out the main aims for this research. Finally, all the data from the survey distributed to the users will be analyzed using Likert scale, interview, SPSS and NVIVO.

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