

Online Reading Assessment for Malaysian Young Adults with Dyslexia

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Abstract- The study presented in this paper aims to provide some insight about the feasibility of reading assessment as a screening method for potentially young adults with Dyslexia in Malaysia. The motivation of this study arises based on the fact that there is lack of awareness about the impacts of Dyslexia among young adults in Malay. The current screening method for young adults is mainly using online or offline questionnaire in investigating the young adults learning difficulties history and Dyslexia symptoms. However, the assessment conclusion derived based solely on the questionnaire input might be inaccurate as learning difficulties history may also associated with other factors which are not dyslexia symptoms such as emotional disturbance, physical handicaps, environmental and economic disadvantages. Therefore, through this study an online dyslexia-screening application comprises localized questionnaire and reading assessment in Bahasa Malaysia was developed targeting young adults in Malaysia. Preliminary results from this work-in-progress indicate that reading assessment method presented in this study is feasible to be used as a Dyslexia-screening tools for young adult in Malaysia. Future work from this study also aims to assist young adults with dyslexia in Malaysia to overcome their difficulties in life by providing them with relevant programs and supports.

Keywords - *dyslexia, reading assessment, online dyslexia screening test, young adults*

I. INTRODUCTION

Awareness about learning difficulties among children has gained more attention recently all over the world particularly in Asia region. This has significantly increased the number of intervention programs and supports for children with learning in difficulties. However, this is not the case for the young adults despite the fact that they play important roles in developing the nation for the near future [1].

Dyslexia is not a disease thus it is not curable. It is neurological origin and it is characterized by difficulties with accurate and / or fluent word recognition and poor spelling and decoding abilities. Secondary sequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge [2]. Therefore, people with Dyslexia are struggling with their

learning difficulties for lifetime. Many young adults in Malaysian who have not been tested during childhood can be potentially diagnosed with Dyslexia.

Students with Dyslexia face difficulties in writing; spelling and reading are often seen as problematic due to their low academic performance. Famous people with Dyslexia such as Albeit Einstein and Walt Disney had proved that their learning difficulties were not barriers but instead helped them to achieve their highest potentials. Learning difficulties associated with Dyslexia can be described as below [5]:

- Difficulties in recognizing direction eg: left and right
- Difficulties in remembering written or oral instruction
- Problem in handwriting where would be slow and difficult to read

Technology presents potential supports for people with special needs although a study [3] reported that the increase use of technology could cause unfair disadvantages to a certain group of students especially young adults. Therefore this study is exploring the feasibility of online screening for Dyslexia among young adults in Malaysia. This idea is supported by a study that indicates that young adults need different types of screening tests [4]. Some tests may suitable for only one age group, while others have different versions or different tests for different age groups. In order to diagnose young adults, an appropriate screening test with suitable criteria needs to be considered as well.

The main focus of this paper is to discuss about the online reading assessment for Malaysian young adults aged 16 to 25 years old. Many of the current online Dyslexia screening tests were developed in English speaking countries that may deemed as unsuitable in Malaysian context due to different culture and psychological factors [19]. Although there is an online Dyslexia- screening tool in Bahasa Melayu known as Smart Lexic but it is targeted for children [8].

User-interface design guideline was referred to in developing online Dyslexia-screening tool for Malaysian young adults presented in this paper [6]. This includes:

- Present the text in narrow columns, average sentences length is 15-20 words, format the paragraph as left aligned.
- Use plain non-plain background, allow the user to customize their color scheme
- Use sans-serif fonts, minimum size 12pt
- Text boxes or bubbles are used to highlight important points, bullet points are used to highlight key items
- Use graphic, images and picture texts to break up the text.

User interface design of the online Dyslexia-screening tool presented in this paper is focusing on user's experience and interaction. It aims to enhance the visual, usability and technological qualities of an interface.

II. DYSLEXIA-SCREENING FOR YOUNG ADULTS

Young adults with Dyslexia in Malaysia face more challenges due to the fact that they have to master more than one language. Textual information are difficult to comprehend by young adults with Dyslexia even some of them may have survived secondary and tertiary education [7]. There is urgent need to have research evidences on the prevalence of Dyslexia among young adults in Malaysia.

Online Dyslexia-screening is deemed as potential instrument to identify students with Dyslexia at schools [8]. This is partly due to fact that many young adults were not screened during their childhood. This is supported by a study that reported many teachers had to go through the experience in teaching retarded readers [9]. It is observed that the screening for young adults usually require a higher scale of guidance [10].

The reading ability is dependent on the age of the child and their reading level. Nowadays, it is can be considered important to use a test of single isolated word reading like Woodcock-Johnson Word Identification subtest or the Wide Range Achievement Test. Studies have proved that in both these tests, user need to read words that increase in difficulty level from simple to complex words. The results then will be compared with result from other user of the same age level to see the differences [11]. Similar study also reported that using difficulties word level is the best way to identify potentially people with Dyslexia regardless of age groups.

Reading comprehension tests are usually timed, where researcher will record the time taken for the user to read a comprehension passage. Although people with Dyslexia can read and see the words, they may have difficulty in reading comprehension as they may read slowly compared to others.

Screening tests are designed to be used on very large numbers of individuals, to narrow down the group of individuals who might need a more thorough test for possible dyslexia [12]. Screening test can therefore be implemented in the form of questionnaires pertaining to the symptoms of Dyslexia or computer games, which present challenges in, which the person with Dyslexia normally struggles [4].

Teens and adults, for example, may not enjoy the computer games type of test, while children, even without Dyslexia, may do poorly in written tests [4]. Moreover, individuals that screened through this method could be having problems with their learning for other factors such as emotional problems, confusion caused by a change of school, Attention Deficit Hyperactivity Disorder (ADHD), delayed learning, autism, dyspraxia and also possible Dyslexia [12]. The goal of the screening is to choose the fewest independent measures needed to give a great prediction of reading outcome where each measure conclude that a substantial and independent proportion of the changeability in reading outcome [13].

In order for a screening test to be used, the efficiency should be well-established by means of a prospective validation study, which should be carried out in the absence of intervention. However, all the principles that had been discussed before had not been applied. Computer based screening test as said by Singleton, are more accurate in measurement, and especially in complex skills like reading comprehension are being assessed.

Comprehensive tests on the other hand look at the whole person and examine the root cause of any learning difficulties in the light of research into Dyslexia and its causes. The word 'comprehensive' means 'thorough', and these tests examine which brain functions are interfering with a person's acquisition of normal learning [12].

Likewise, tests of reading, spelling, comprehension, and intelligence are given, as well as visual tests, laterality tests, visual scanning tests, sequencing, reversals and other tests. The results are then assembled into a complete report on the person, which outlines the evidence for the conclusions reached. Typically, screening by questions consists of a short list of questionnaires. These questions will usually be in the form of a checklist of the signs of Dyslexia and ask if the prospective individual with Dyslexia is exhibiting any of the signs. If enough of the signs are present, the particular individual might turn out has Dyslexia. This type of test is used by Davis Dyslexia Correction Centre, Being Dyslexic and British Dyslexia Association.

Here in Malaysia, there are still no online Dyslexia screening, whereby communities have to attend the Dyslexia center to run-through the manual screening test which is done by the experts that can be timely and expensive. Yet, [9] argues that there could be some difficulties of screening in

conditions that are hard to put it in right way and do not much impairment.

III. MaDIST: MALAYSIAN DYSLEXIA SCREENING TOOL

According to The International Dyslexia Association (IDA, 2008), evaluation gives a meaning, a process of collecting all the important information to recognize the factors that contribute to an individual's difficulty with learning to read and spell. All the information is gathered from parents and teachers to understand the development and educational chances that have been provided. Then, the screening will be preceded with test that leads to a diagnosis. Evaluation is important for three reasons as below [14]:

- Diagnosis
- Intervention planning
- Documentation

As the dyslexia is been suspected, preventive intervention and assessment should be carry out shortly either in schools and in institutions of higher education. The assessment usually included a thorough measurement of reading, spelling and arithmetic skills [11]. In some literatures, some of them require an IQ test but, some says that IQ test is not necessary as it takes long time for testing and quite expensive. According to [15], most individuals with Dyslexia put so much effort on decoding the written word or decode the meaning from what they have just read from the passage in comprehension. When using reading comprehension assessment, it is conferring on considerable efficiency of time.

It is not an easy to assess from reading comprehension if a learner has a disability or if the problem is caused by the something else. According to a study regarding the identification of individual with Dyslexia is not an easy matter but it involves an analysis of individual's performance on three or four standardized measures [16].

MaDIST is an online Dyslexia-screening tool for young adults' age 16-25 years old in Malaysia. It is divided into two modules which are questionnaires and reading assessment. In this paper, the discussion will focus more on the reading assessment module. The purpose of the module is to determine the time taken for the user to complete the reading of article.

A simple article which has a medium length has been chosen for the readability test. Before user clicks the “Mula” button, the article will not appear. The article will only appear after the user click the “Mula” button. The purpose in doing this is to prevent user from start reading the article before the time is captured. This is vital in order to have accurate analysis. Below are the screenshots of MaDIST :



Figure 1: Laman Utama

Figure 1 shows medium size design of *Laman Utama* with orange colour background, black and white buttons position on middle top.



Figure 2: Arahan

Figure 2 shows medium size design of *Arahan* with separation of contents in order to ensure the user can read easily without any distraction.

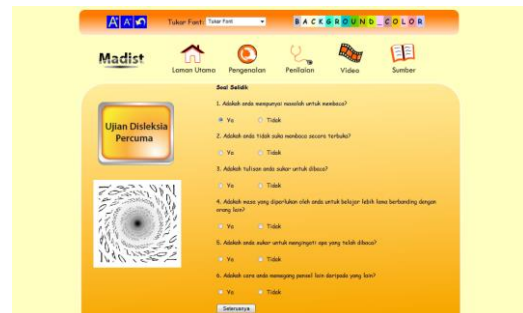


Figure 3: Penilaian

Figure 3 shows a screenshot of questionnaires module that users need to answer before proceed to reading assessment module.



Figure 4: Pembacaan

Figure 4 shows the reading assessment module. Once use clicked the “Mula” button, a short article will appear. It will record the time that the user took to read the article.

IV. DATA COLLECTION

Screening was conducted among Universiti Teknikal Malaysia Melaka (UTeM) students. Below are descriptions of the data collection procedures.

A. Participants

Fifteen students that participated in the study were selected randomly in (UTeM), aged between 16 and 25 years old.

B. Procedure

There are two modules which are questionnaires and reading assessment. Participants are allowed to customize the user interface with their preferred color scheme, font- size and font- family.

The data from both modules will be analyzed to indicate whether the participants are potentially having Dyslexia.

Before started, participants may choose to be screened either in questionnaires or reading first but in the end, participants needs to answers both of these modules.

There are 16 questions in the questionnaires. Participants ought to answer all these 16 questions by answering either “Yes” or “No” before proceeding to the next module. Participants will be asked in terms of background and history of their learning difficulties. Participants demographic are also recorded. The reading assessment is used to determine the time taken for the participants to complete reading the article.

Majority of the existing online Dyslexia-screening tool does not include reading assessment although it is proven that reading assessment plays a crucial role in Dyslexia

screening for young adults. Therefore this study chose to incorporate reading assessment with learning difficulties questionnaires as a method for online Dyslexia-screening among young adults on MaDIST.

As stated earlier, this study is also aim to capture preliminary data about dyslexia among Malaysian young adults – at present, there is no research evidence is available on the prevalence dyslexia among young adults in Malaysia. It is also aim to deliver awareness to publics especially parents and teachers to furnish these dyslexics by providing them more attention and care which may indirectly nurture their talents and reduce the percentage of juveniles.

V. RESULTS

Reading assessment

In reading assessment, participants were asked to read the article that appeared when the “Mula” button was clicked. The time taken for each participant was recorded. Figure 5 shows the analysis of reading assessment among six UTeM students who identified as potentially having Dyslexia.

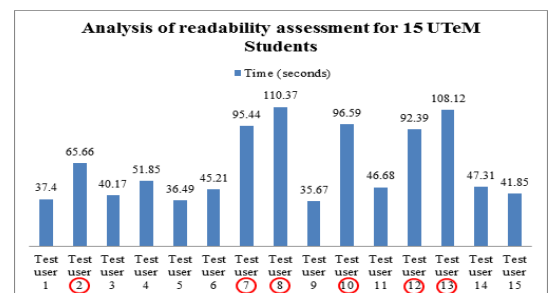


Figure 5: Test analysis of readability assessment for 15 UTeM students

Based on the analysis of six potentially participants having Dyslexia, Participant 8 took the longest time (110.37 seconds) to complete reading the article whereas Participant 2 took the shortest time (65.66 seconds) to complete reading the same article. Likewise, the analysis shows that all of the potential participants having Dyslexia took more than one minute to complete reading the article. This shows that students who are potentially having Dyslexia have difficulties in reading compared to their peers without Dyslexia who spend less than a minute to complete reading same article.

The six potential participants with Dyslexia show consistent answers related to Dyslexia symptoms in the questionnaire.

VI. CONCLUSION

Individuals having Dyslexia is increasing in percentage whereby support from family and teachers is crucial to ensure the continuity and quality of their education for a better future. With the implementation of Dyslexia-screening tool like MaDIST, it is hoped that young adults with Dyslexia could seek immediate help and support from corresponding society. The remedial programs which are available can assist young adults with Dyslexia (depending on their degree or severity) to overcome many of the difficulties they experience in reading and writing.

The attempt through this study has indicated that the online Dyslexia-screening is feasible to be used as a screening tool in Bahasa Melayu to identify potential young adults with Dyslexia in Malaysia. Hence, it is crucial to have localized screening tool that inline with Malaysian cultural and education systems.

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