

# Dys Reader

CSE-4274-Human Computer Interaction

## Submitted To:

Dr. Moinul Islam Zaber  
Associate Professor  
CSEDU

Dr. Amin Ahsan Ali  
Assistant Professor  
CSEDU

## Prepared By:

Nafis Sazid, Roll : 48  
Uchchhwas Roy, Roll : 51  
Md. Abdur Rouf, Roll : 55  
Abu Zafar Al Zahid, Roll : 58  
Md. Ariful Amin, Roll : 59  
Sajid Mahmud Kawshik, Roll : 61



Department of Computer Science & Engineering  
University of Dhaka

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# 1 Introduction

“Dyslexia” is the term used for problems of spelling, reading and writing. Many people are affected by Dyslexia to varying degrees. Often this difficulties are found in school children. Many grown people are also affected by it. Dyslexia is caused for both genetic and environmental factors. Like many countries of the world it is also found in our country. So we want to develop some solutions for the sufferers. We can’t solve the genetic problems beside it but we may go for the solution to the environmental, structural, procedural problems.

# 2 Motivation

About 20 percent of the total population is affected by dyslexia according to The Yale Center for Dyslexia and Creativity, yet many remain undiagnosed and secretly battle this ”hidden disability” without proper help.

Like other children all over the world, some children of our country struggle to learn how to read. Dyslexia is one of the major causes of reading disabilities among children. Students with dyslexia are lagging behind their classmates substantially. Childrens cognitive ability and academic failure poses a dilemma. Teachers and family members were found to display negative attitudes towards dyslexic children manifested in the form of insults, exclusion, psychological pressure, and physical violence. Besides, the people of our country don’t have a proper knowledge about dyslexia and we want to make them aware properly with this problem and provide some solutions in this regard.

# 3 How other applications have tried to solve it.

## 3.1 Google Keyboard

Its built-in word prediction and dictation technology provide spelling support for text input in any app.

### **3.2 Microsoft Immersive Reader**

This reader is friendly for dyslexics. It uses dyslexic friendly font. And different colors are used to make it comfortable to eyes.

### **3.3 OCR Instantly Pro**

For help reading hard copy (print) text, dyslexic Android users can employ the highly accurate optical character recognition of OCR Instantly. The app does an excellent job converting images of text to readable text, which can quickly be exported to a text-to-speech app for reading aloud.

### **3.4 vBookz PDF Voice Reader**

vBookz retains the original file's formatting (including images) while reading the text aloud with synchronized highlighting. There are male and female voices, and the speaking rate can be adjusted to suit individual needs.

### **3.5 Learning Ally Audio**

It provides easy navigation of recordings, and the playback speed and voice pitch can be adjusted to meet specific preferences.

## **4 What is our observations**

In the story board we saw that a boy named Rumi had "Dyslexia". Rumi represents a typical boy of our country of age 6-7. We have found these following problems observing the story board.

### **4.1 Problems in Reading Comprehension**

In the class room when Rumi was told to read a comprehension, he felt embarrassed. Because he feels difficulties in reading comprehension. He may find the words as jig-jag pattern or some thing others.

## **4.2 Problems in Reading Aloud**

He also give excuses that he can't read a comprehension aloud. If someone have problems in reading a comprehension smoothly he obviously will face problems in reading it aloud. In case of reading aloud the difficulties may increase.

## **4.3 Problems in Spelling**

Rumi also face difficulties in spelling words. He mainly confuses himself in spelling the letters of same pattern. For example 'b' becomes 'd', 'e' becomes 'c'. He also feels problems in spelling words with more than 3 or more than 3 syllables.

## **4.4 Frustration**

Rumi feels frustrated that he think himself a dumb and he becomes so sad thinking thus. This problem makes a child lonely. He may have no friends. Every other boy may mock on him.

## **4.5 Ignorance about Dyslexia**

We observed that Rumi's mother had no idea about "Dyslexia". She also had no idea about the difficulties he faces. A good number of mothers in our country don't care about their child's problems.

# **5 How your intervention may change it**

There are several android and web applications for measuring and reducing "Dyslexia" as we have gone though them in section 3. But many of them are based on situation of other countries of the world. To the best of our knowledge there are no convincing application to measure and solve in an extent to the context of Bangladesh. So we are going to keep the problems caused by "Dyslexia" in mind and try to solve the problem to an extent. We will develop applications for the problems which are solvable by an application and for which are not solvable by application we are going to develop a framework. We want to make sure that none of us will lag behind because of "Dyslexia".

In the story board we saw that feeling concerned about problems of Rumi his mother took him to a doctor to consult. She told doctor the problems in details and the doctor found that Rumi had “Dyslexia”. In response the doctor suggested to use the app “DysReader” advised some crucial factors.

Doctor suggested Rumi to use a special reader named “Dyslexia” for reading purposes. In the following section the features are described.

- **Sweep Reading** : In the app the text can be read by sweeping. This functionality will increase their visual power. This will help a user to focus the words he reads.
- **Different types of fonts and colors** : The user can use different types of fonts. The dyslexic font is the easiest and not confusing.
- **Background colors** : The back ground of the word may change as the user wants

All the difficulties of “Dyslexic” person can’t be solved by an app. So the doctor also suggested to raise awareness. He assures Rumi to not worry.

- **Encouragement** : We have to encourage the “Dyslexic” not mock their lacking. There are so many examples of renowned person who had “Dyslexia”.
- **Awareness** : We have to aware of the difficulties faced by the children. We must not scold them when they make mistakes.
- **Help to reveal their latent talent** : All “Dyslexic” person has an imaginative mind. He can imagine such things which we normal people can’t imagine.

After using the app Rumi feels better to read and spell. As a result of social awareness and care of his family he is getting better.

## 6 What is the questionnaire for user feed back

We have made the survey question in such a way that it serves two purposes. One is to get idea which person have dyslexia problem and another is to get idea how we can design the app.

To identify whether a person has dyslexia , we have asked the following five questions.

- Q.1: Do you feel difficulties reading text?  
A.YES  
B.NO
- Q.2: Do you mix up digits, letters like ‘b’ and ‘d’, telephone numbers and multiplication table?  
A.YES  
B.NO
- Q.3:Do you re-read paragraphs to understand them?  
A.YES  
B.NO
- Q.4:How easy do you find it to sound out words such as e-le-phant?  
A.EASY  
B.HARD  
C.VERY HARD
- Q.5:How hard do you find it to read aloud?  
A.EASY  
B.HARD  
C.VERY HARD

To get idea how we can design the app we have asked the following five questions

- Q.6: Which of the following fonts you can read easily?  
A. This is Arial  
B. This is OpenDyslexic  
C. This is Courier New  
D. This is Times New Roman  
E. This is Verdana
- Q.7: Which of the following fonts size you can read easily?  
A.This is written in font size 10  
B.This is written in font size 12  
C.This is written in font size 14  
D.This is written in font size 16  
E.This is written in font size 18

- Q.8: Which of the following lines you can read easily?  
A. **This is written in Bold**  
B. *This is written in Italic*  
C. This is written in underline
- Q.9: Which color' text you can read easily?  
A. Black Color  
B. Blue Color  
C. Any Dark Color
- Q.10: In Which background you can read easily?  
A. White Background  
B. Light Background  
C. Dark Background

## 7 Your observation of how the users respond

We have surveyed on 25 students of class 2 of Azimpur Model Government Primary School. They are around 8-9 years old. Here is the feedback of surveyed question.

- **Feedback of Question 1:** YES:16% NO:84%
- **Feedback of Question 2:** YES:8% NO:92%
- **Feedback of Question 3:** YES:32% NO:68%
- **Feedback of Question 4:** EASY:80% HARD:16% VERY HARD: 4%
- **Feedback of Question 5:** EASY: 20% HARD:44% VERY HARD: 36%
- **Feedback of Question 6:** Arial:36% OpenDyslexic:24% Courier:12% New Times New Roman:12% Verdana:12%
- **Feedback of Question 7:** Size 10:12% Size 12:20% Size 14 :40% Size 16:% Size 18:12%
- **Feedback of Question 8:** Bold:40% Italic:24% Underline:36%



- **Feedback of Question 9:** Black Color:36% Blue Color:20% Any Dark Color:44%
- **Feedback of Question 10:** White Background: 32% Light Background:44% Dark Background:24%

## 8 Application Testing and User Feedback

After developing the app, we tested our app with a dyslexic children X. She was 9 years old and suffered from dyslexia. Though she could understand most of the words, when it comes to reading a passage from a book, she faced major difficulties. She stated to us that the words seem to be "floating". And she mix up the words most of the time. To her it was really stressful to read. So most of the time she just covers the other words so that her focus is not interfered and read the words one by one. But this was so much troublesome.

We introduced our application to X. She could use it quite efficiently. She stated that the app quite does the work what she does with her hands while reading from the book. But the app was more efficient. It was easier to use and saves a lot of trouble. X also said that the the font seemed less stressful to her eyes. And it was less crowded. She wished all of her books were like this.

X liked the app and told us that she would use it. When asked for suggestions, she advised us to improve the user interface of the app.

## References

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