Can We Help Individuals with Dyslexia by Adapting their Learning?

Hadeel Mohammed Al-Dawsari (hma776@cs.bham.ac.uk) and Mr.Robert Hendley

1 Abstract

Dyslexia is a life-long reading difficulty that can be found anywhere regardless of an individual's language, culture or race. Individuals with dyslexia each face different reading problems with different levels of severity. These reading problems can be mapped to different dyslexia types. Since, individuals with dyslexia, like everybody, are different, then they have different dyslexia type(s) too. Nowadays, adapting e-learning systems based upon learner characteristics is possible and valuable. It tailors the learning towards the learner's needs. Different learner characteristics can be used for adaptation. One of the most important characteristics of learners with dyslexia is their dyslexia type. Therefore, the aim of this research is to understand the impact of adapting e-learning material to the dyslexic learner's needs. To do so, learners with dyslexia use a series of e-learning exercises - adapted to their dyslexia type. Their learning gain and satisfaction are measured to assess the effectiveness of adaptation.

2 Introduction

Reading is one of the most important basic linguistic skill that should be learned. Unfortunately, dyslexics faces difficulty and being exhausted in reading, leading them to be excluded socially and educationally especially in classrooms.

Therefore, many researchers provided different interventions to improve dyslexic's reading. But they all treat dyslexics the same while majority of researchers pointed out that dyslexics are different.

In other words, there is very little research which draws upon the theoretical understanding of dyslexia and uses this to derive adaptive learning. Therefore, this work seeks to build upon existing research into the causes and effects of dyslexia and understand whether and how this can be used to derive adaption of learning to improve the students' reading taking into consideration:
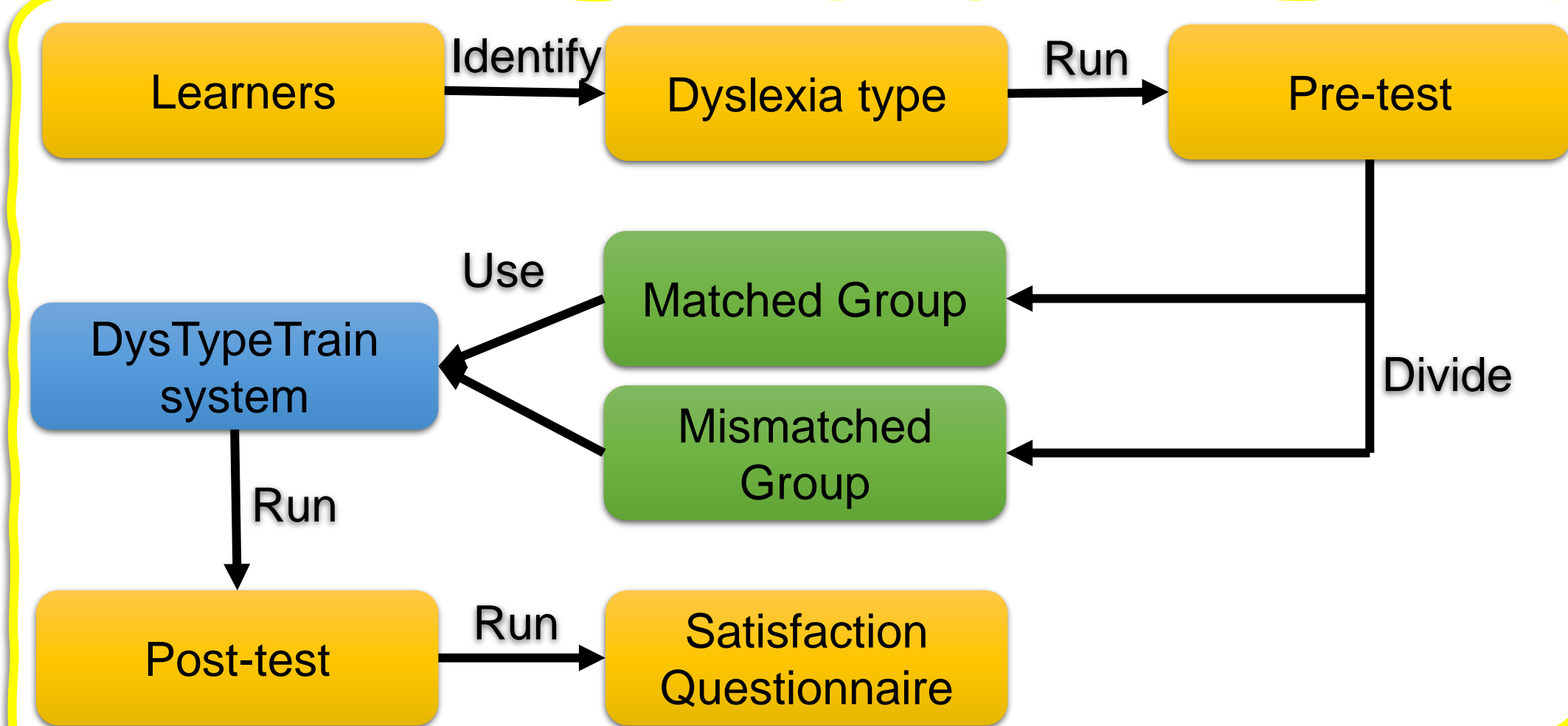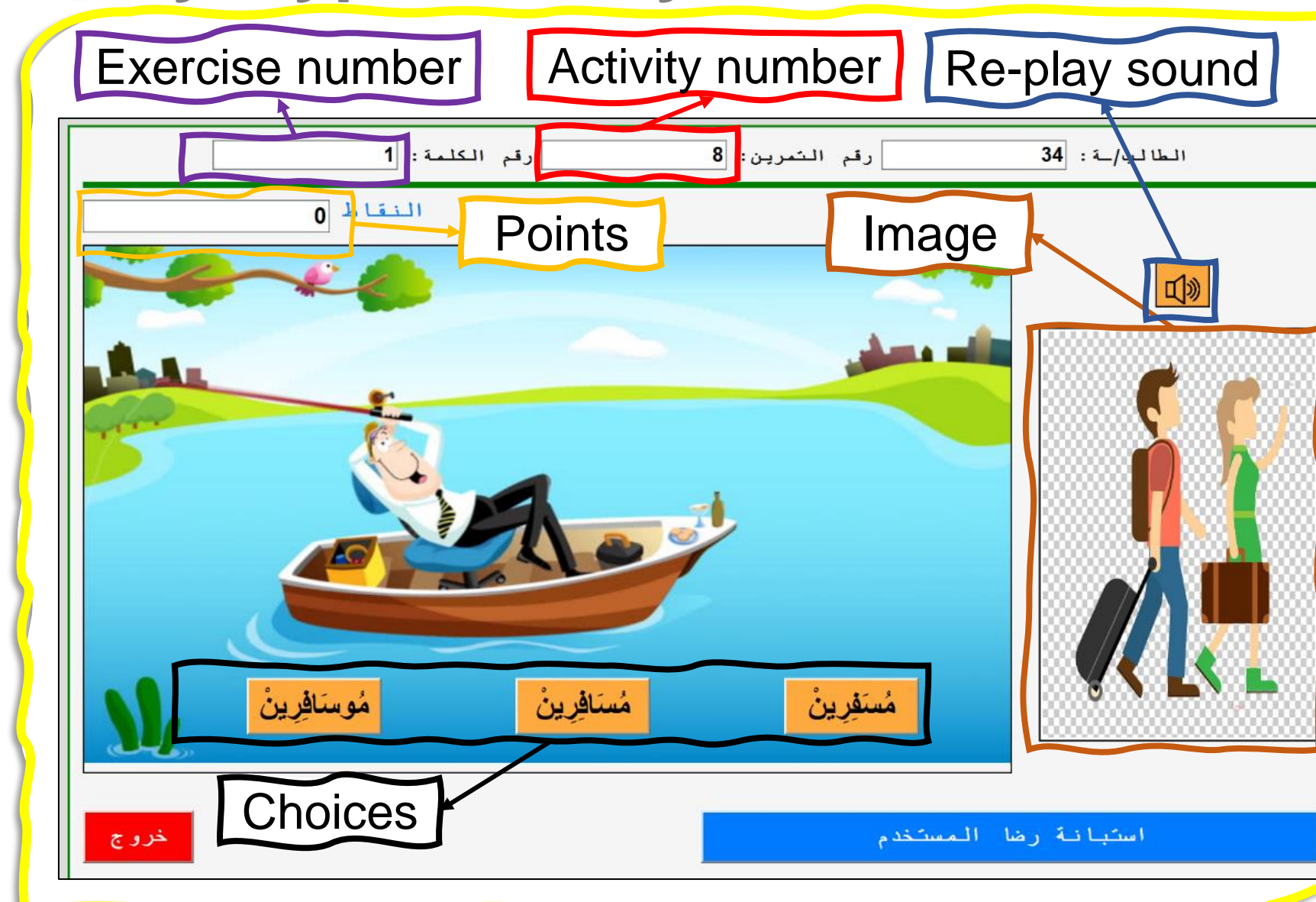
- **Language**
- **Intervention's type**
- **Age**
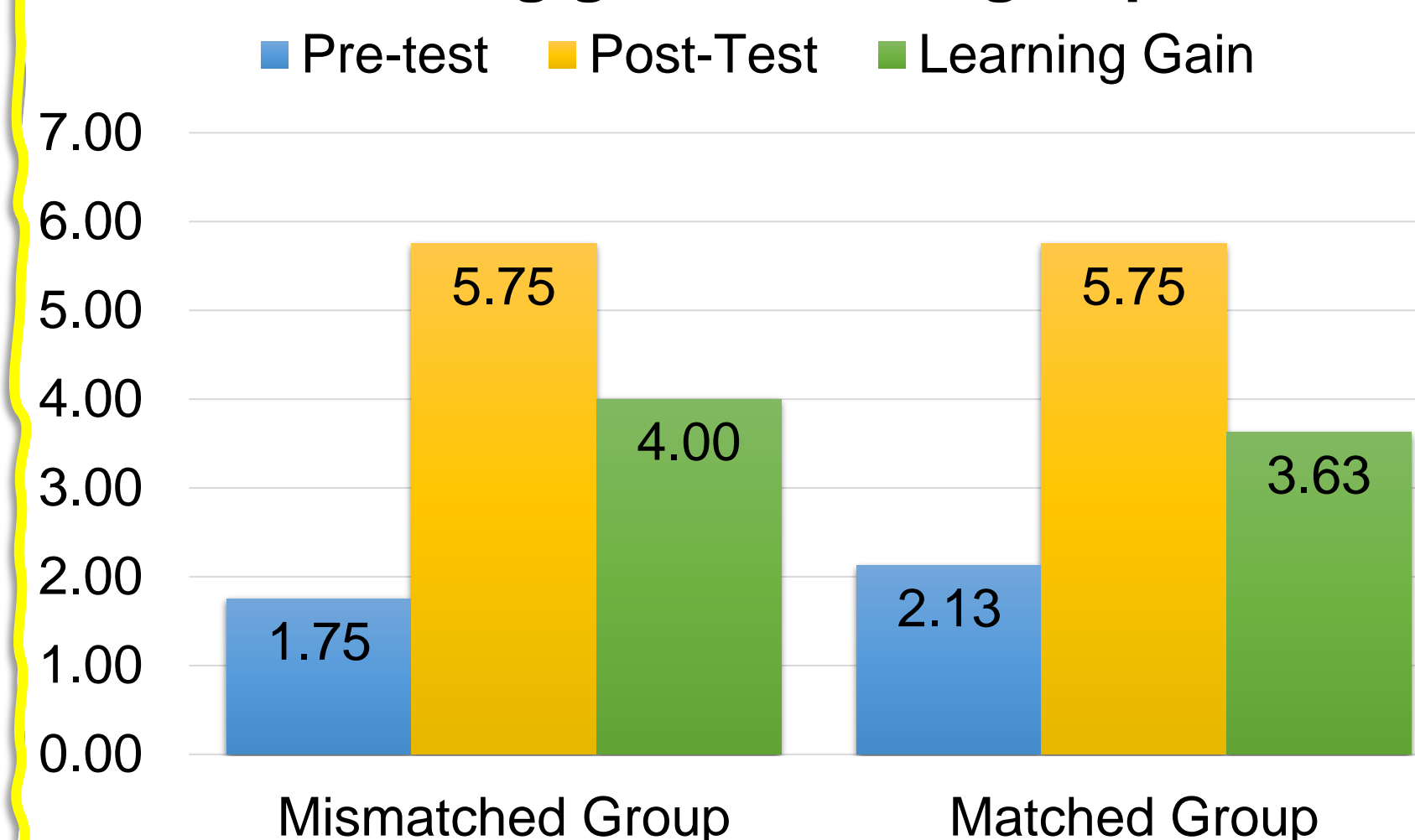- **Experiment's domain**

3 Method

4 DysTypeTrain system

5 Results

Mean of the Pre-test, post-test and learning gain for both groups

6 Discussion and Conclusions

- Most learners were engaged and motivated to learn.
- Reading of both groups (matched and mismatched) was improved.
- Both groups were satisfied with the system.

In Future

Further investigation of other metrics is required. The complex co-morbidities of many learners with dyslexia suggests that adaptation based on other factors such as learning style would be valuable.

7 References

[1] Alghabban, W.G., Hendley, R. (2020). https://doi.org/10.1145/3386392.3397596
[2] Benmarrakchi, F., Kafi, J.E., Elhore, A., Haie, S. (2017). https://doi.org/10.1007/s10639-016-9551-4