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A New Adaptive Personalized E-learning System for Students with Dyslexia

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Abstract: *E-learning plays an important role in providing a well-formed knowledge to a learner. The need for enhancing e-learning leads to the retrieval and adaptability of the learning curriculum. The medium of e-learning has achieved advancement in various fields. Since there has been no research on the different types of dyslexia as they affect application design. In this paper, reports an extensive study conducted on the existing frameworks. This framework has been developed with respect to four different dimensions.*

Keywords: *E-learning, dyslexia students, hypermediality, accessibility, user experience.*

I. INTRODUCTION

Dyslexia is a term that involve difficulty in learning to read or interpret words, letters and other symbols. Dyslexic students struggle to read fluently, spell words correctly. Dyslexia is very common, affecting 20 percent of the population. Dyslexia can't be "cured", but with the right support, dyslexia students can become highly successful.

E-learning plays very important role in providing required and well formed knowledge to a learner. Adaptive e-learning refers to a set of techniques which offer students a personal and unique experience. The goal of maximizing their performance is based on the principle, that every student is unique and has a different background, educational needs, learning style, etc.

II. LITERATURE SURVEY

A. Development of a Multimedia Courseware as a Teaching aid for Children with dyslexia [1].

Mohd Hafiz Zakaria, Umawathy Techanamurthy, Anusuriya Devaraju are constantly searching for remediation for the mostly undiagnosed and misunderstood dyslexic children and adults. This paper discusses the preliminary design and development of a multimedia courseware to be used as a teaching aid to teach children having dyslexia and pre-schoolers aged five to seven. The development of this courseware involves converting the traditional content of printed books from passive prints and illustrations into interactive multimedia content. It is aimed to create an interactive multimedia environment that will enable dyslexic children to be emergent readers. The series consists of a Master Book and seven other books ranging from Level one to Level seven. The level number does not equate to grade level. It simply indicates the sequence in which the material must be taught.

B. A Conceptual Framework For Designing a Computer-based Dyslexia Screening Test [2].

Nik Siti Fatima Nik Mat, Wan Malini Wan Isa, Rohaya bt Husain specified that a Computer-based Screening Test should be designed in such a way that is more attractive, efficient, fun and interesting so as to motivate and promote positive feeling of the user. Moreover, Information and Computer Technology (ICT) are being used in almost all levels of education in the areas of diagnostic, testing, teaching, remedial teaching, psychological testing, evaluation, development of virtual laboratory, instructional material development, development of reasoning & thinking, and online tutoring. There are various advantages of computer-based assessments over conventional assessments including being reportedly more efficient and cost effective to administer.

C. DAEL Framework: A New Adaptive E-learning Framework for students with Dyslexia [3].

Aisha Yaquob Alsobhi, Nawaz Khan and Harjinder Rahanu shows that Educational software enables an extended segment of users to access learning resources and also supports their learning process; but it is clear that now the developers of educational software should be taking into account the fact that students learn in different ways. In order to achieve this, there should be harmony between a learner's interactions with the software and the learning process. In the literature, some argue scholars have not put enough consideration into the effects of the usability features of an educational application on its achieving its educational goals. Accessibility is an important aspect in the modern world of computing. Its importance can be realised from various examples of legal implementation around the world. The importance and motivation of these standards and guidelines are discussed in this paper with respect to four dimensions: presentation; hypermediality; acceptability including accessibility; and user experience.

D. Dyslexia Adaptive e-learning System based on multi-layer Architecture [4].

Aisha Alsobhi, Nawaz Khan, Harjinder Rahanu proposes an e-learning system for students with dyslexia based on five adaptive learning approaches. The developed system is base on multi-layer architecture. The five system layers are : presentation, adaption, learning management system, application server and database layer.

E. Data Preparation Strategy in E-Learning System using Association Rule Algorithm [5].

Sunita B Aher, Lobo L.M.R.J specified that Data Mining can be used to extract knowledge from elearning systems such as Moodle, through the analysis of the information available in the form of data generated by their users. The main objective is finding the patterns of system usage by teachers and students and, perhaps most importantly, discovering the students’ learning behavior patterns. The Course Recommendation System in E-Learning suggests the best combination of courses in which the students are interested.

III. SYSTEM DESIGN

It is obvious that there is no single method to teach dyslexic children to read. Thus a combination of techniques and a varieties of technology will be integrated into a range of instructional methods. Hence, this courseware will be designed to teach the dyslexics in the way they can learn and extend their abilities. The Main Menu module will have all the navigation icons which are linked to every other screen in the courseware.

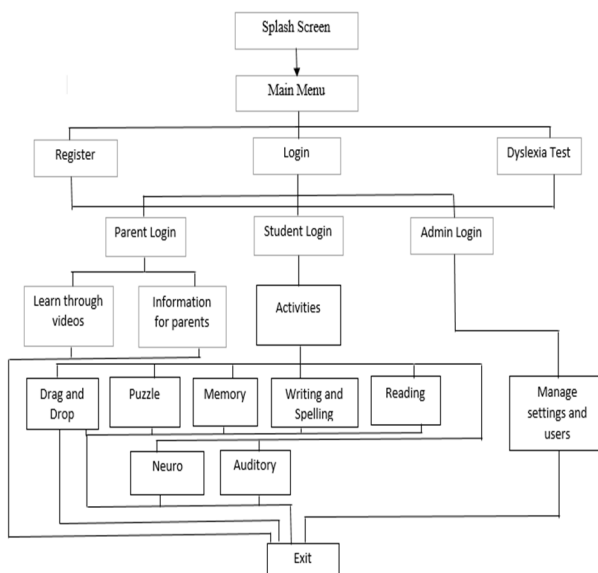


Fig 1: Proposed System Architecture

IV. IMPLEMENTATION DETAILS

A. GUI

This is the UI of the application. User will interact with the part of this application only, which is present in the website on the Home page. User has the option to pick Dyslexia test to check whether the student is normal or has dyslexia. In the Main Menu, the user has to fill registration form. Once the registration form is filled, user can login as a parent, as a student or as an admin.

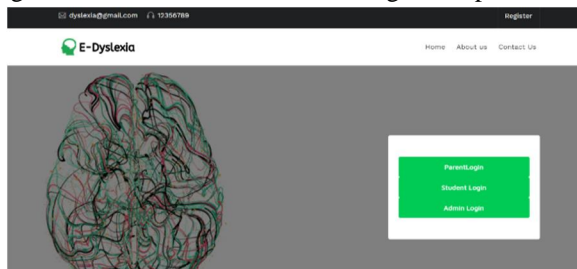


Fig 2 : Home Page

B. Parent Login

User with parent login will get two learning terminals for their children. One is “Learn through videos” and other is “Information for parents” which contains some tricks to teach their children.

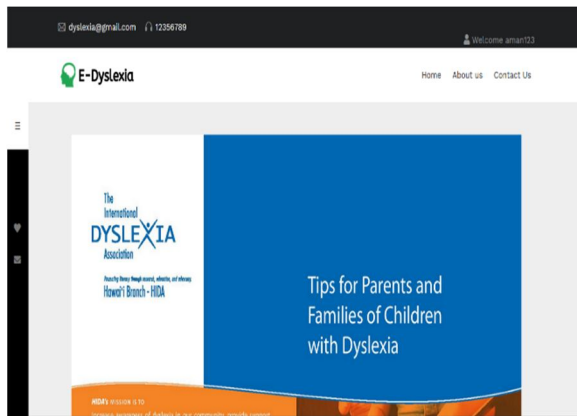


Fig 3 : Parent Login

C. Student Login

From the beginning, student with the result of dyslexia test (failure) can only log in to the website. There are some learning terminals available for the students to enhance their knowledge and easy learning.

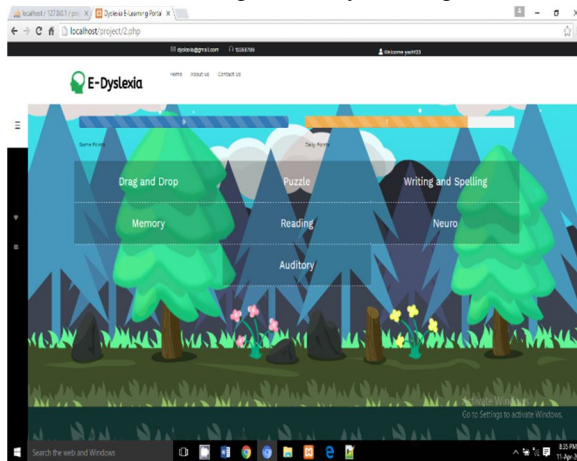


Fig 4 : Student Login

D. Admin Login

User with admin login can handle all the functionalities of the website. Admin can add expert, manage users and also add new admin. Admin can see all the information related to the users.

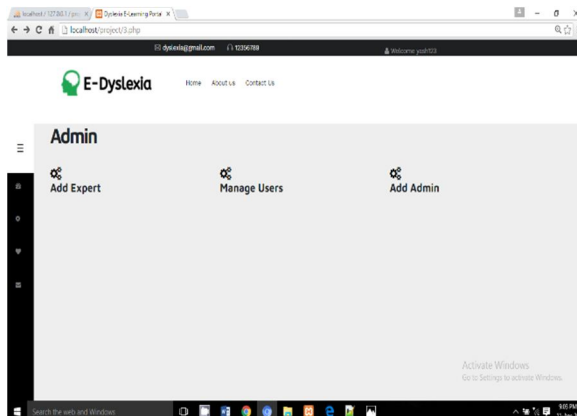


Fig 5: Admin Login

V. PROJECT INPUTS AND OUTPUTS

A. Drag and Drop the Numbers

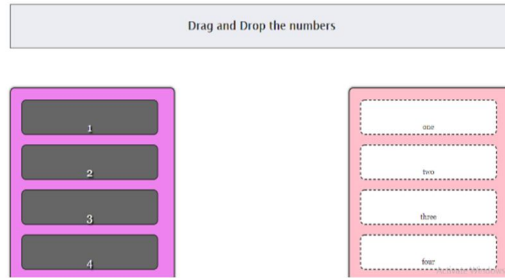


Fig 6 : Drag and Drop the numbers (input)

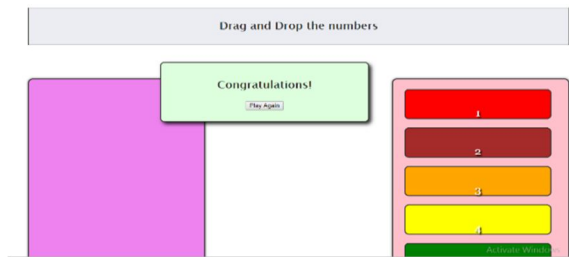


Fig 7 : Drag and Drop the numbers (output)

B. Drag and Drop the fruits

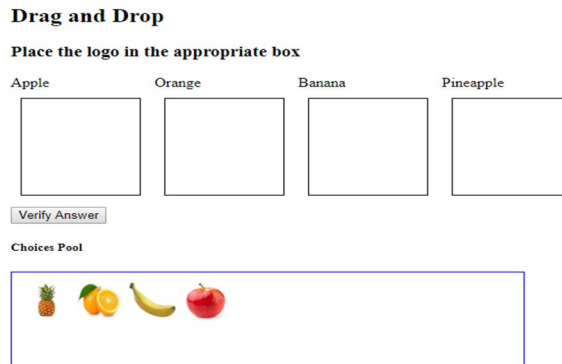


Fig 8 : Drag and Drop the fruits (input)

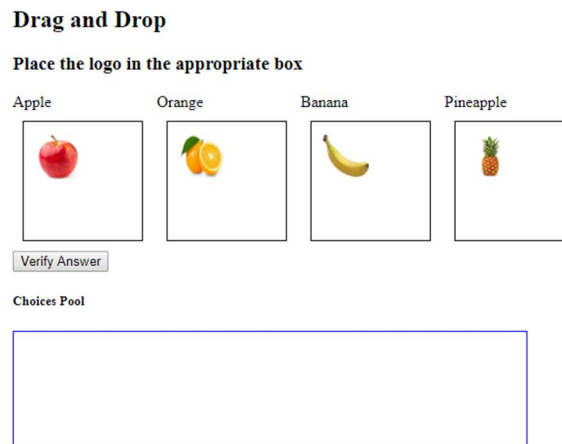


Fig 9 : Drag and Drop the fruits (output)

C. Puzzle

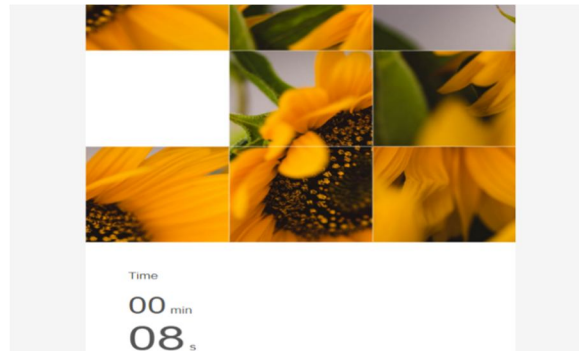


Fig 10 : Puzzle (input)

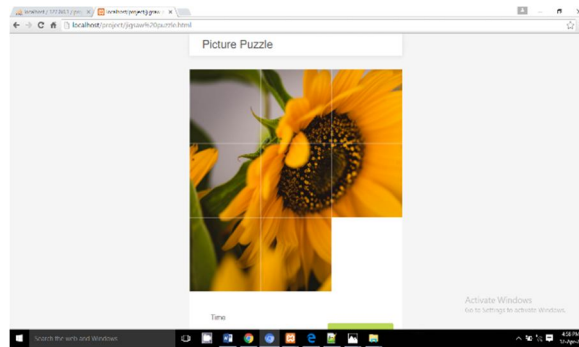


Fig 11 : Puzzle (output)

D. English Grammar

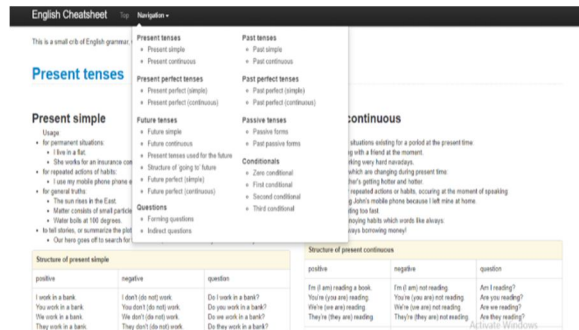


Fig 12 : English Grammar

E. Memory

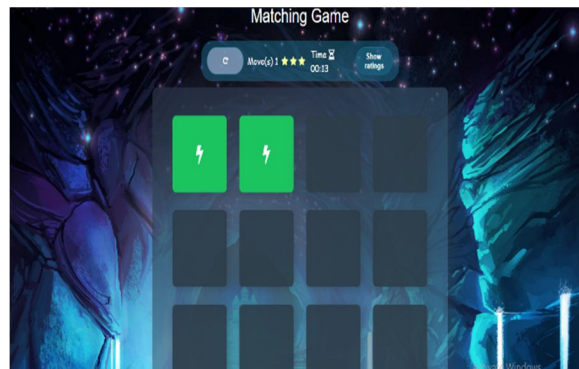


Fig 13 : Matching Game

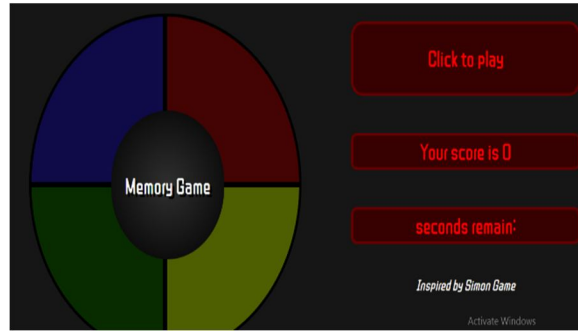


Fig 14 : Memory Game

F. Reading

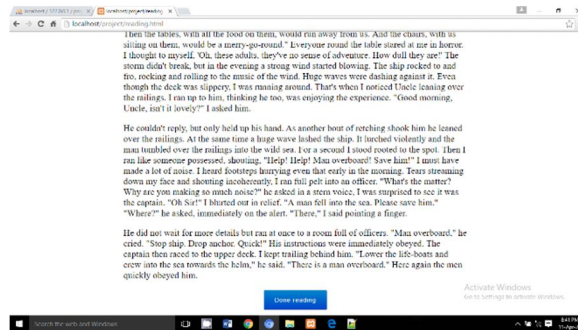


Fig 15 : Story Reading

G. Neuro

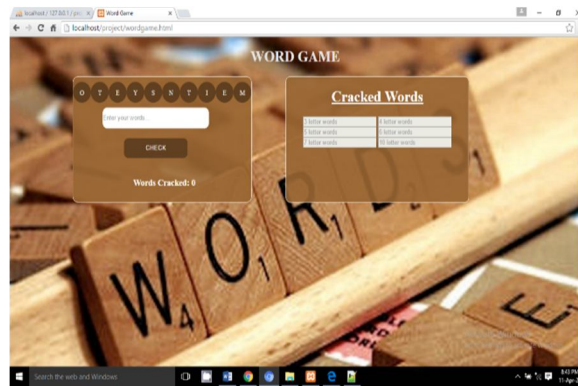


Fig 16 : Word Game

H. Auditory



The Hare With Many Friends



Fig 17 : Listening and Reading

I. Results

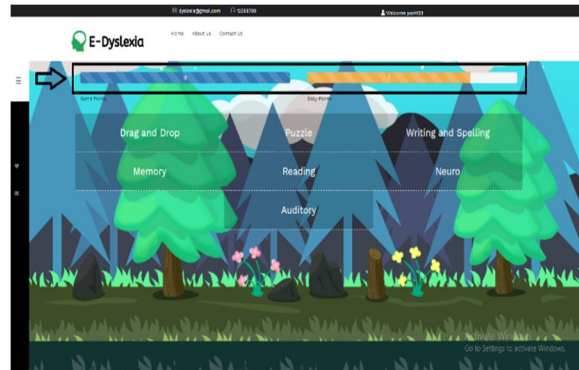


Fig 18 : Progress Bar

VI. FUTURE SCOPE

Future Scope includes preparation of learning objects which are in digital form of learning contents and development of software agents to make the system personalized.

VII. VI.CONCLUSIONS

This paper takes the first step in the direction by laying out the rationale for developing a courseware to teach Dyslexics to read in a ways that the dyslexic can learn by incorporating picture thinking model and multisensory teaching.

VIII. VII.ACKNOWLEDGEMENT

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