MATHEMATICS E-LEARNINGS FOR LEARNING DISABLITY CHILDREN AND AUTISM CHILDREN

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ABSTRACT

This program's objective is instruction media for Autism children and Learning Disability children with a new style of lesson that come with 2D- animation game created by construct 2 a game engine that develops with HTML5 and JAVA Languages with ported into Android devices in order to learning and enjoy our program that can help Autism children and Learning Disability children improved mathematics skill and more understand in basic number system that use in your daily life or test your skill in exam.

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Index Terms—*E-Learning; 2D Simple Game; Mathematics Program; Autism Children; Learning Disability Children; Android Applications*

1. INTRODUCTION

In present, world of education have many ICT (Information and Communications Technology) lesson in many type and genre such as television, computer or even mobile phone but if children didn't understand how to solve mathematics question and how can help them to use in study or adapted in real life.

So we have focused to make Electronic Learning (E-Learning) for a choice that can help Autism children and Learning Disability children learn about mathematics with normal children can learn from this program too that can break the wall impeded between normal children and special children with socialize each other to make friend. The Online ICT can added effect in knowledge rose and we have to choose Mobile Applications because in mobiles device children can learn everywhere and every time with parents or teacher so we focused this application into mobile devices too..

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2. THEORY AND RESEARCHS

2.1 The Inspiration of this project

In 26 December 2016, we have interviewed one of special Education's officer at Rajanagarinda institute of child Development that responsible special student lesson and evaluation. She said "We want new program that can help children easy understand about mathematics!", so we are made decision to create mathematics program that can help special children.

Figure 1. A figure show special officer at Rajanagarinda institute of child Development .

2.2 Tools and language that develop application

2.2.1 Construct 2

Construct 2[4] is a powerful game engine that used for 2D Game with HTML5 Editor and more.

Everyone can create your own game even a beginner who didn't know about HTML5 coding. With Simple GUI system that can design your game UI and Code.

Mostly are used HTML5 to develop program but you can add plugin such as C#, C++ etc. that you want developed game.
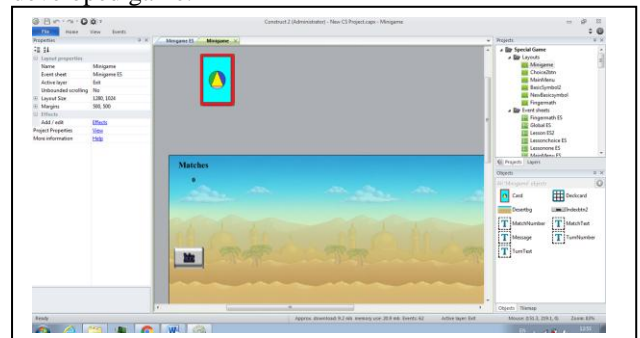

Figure 2. A figure show display of Construct 2.

2.2.2 paint.net

Paint.net [5] is a freeware graphics editor program that remastered from Microsoft Paint. With More Tool and add-on that can create effect of your art and picture.

This program can make transparent Background that allows making a picture to PNG files.

Paint.net can add more function and creative items than MS Paint. You can make more effect and linear button with this program.
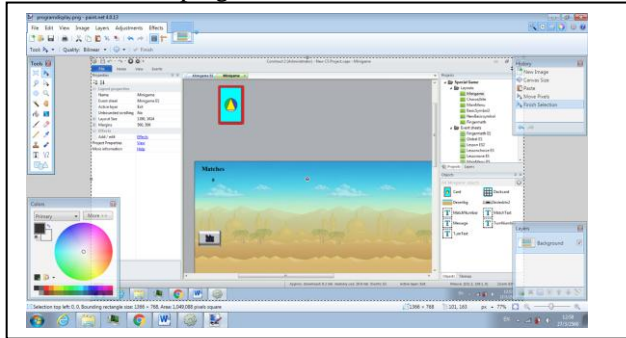

Figure 3. A figure show display of Paint.NET.

2.2.3 HTML5

HTML5 [6] stand for Hypertext Markup Language Version 5 is latest evolution of HTML that improve powerful internet websites.

Many new elements, attributes and behaviors that you can manage and create with more websites for yourself and others.

Many Editors supports HTML5 that can cooperative with JAVA and others language for publish your website.

2.2.4 XML

XML [7] stands for Extensible Markup Language is a format for storing structured data.

It used for configuration my application to settings systems and testing export to phone.

2.2.5 Android Coding

Android (Operating System) is a one of operating system that develops for mobile Hardware and Software such as Phone, Tablet ,Smart TV etc.

With Compare iOS ,a operating system tha higher performance than android but the price are very high too. So android is a best choice for who want to owner mobile phone or tablet with a few money.

2.3 Related Research

Witoon Donpondtun [1] is has researched about how to make construct 2 for basic 2D Gaming that everyone can learn this program and use many computer code HTML5 to easy understand and make create a game into browser or mobile applications.

Prisana Sankam and Team[2] have researched about behavior of autism student in upper secondary class and the result is the most behavior is not seeing other people or just play along things such as shake a wrist alone,play a object with colorful things etc.

Mskittewan[3] is youtuber who make card game tutorial in Construct 2.She teach to create a card and function to play a card match game.

3. PROCEDURE

3.1 System Requirement Analysis

3.1.1 Collect data and intel that concerned Learning Program for special children (Learning Disability & Autism Disorder) from website or mobile application etc. with inspect about learning system, how to guide for best performance.

3.1.2 Study and research about tool and resources that program requirements by Simple and easy algorithm to make this program.
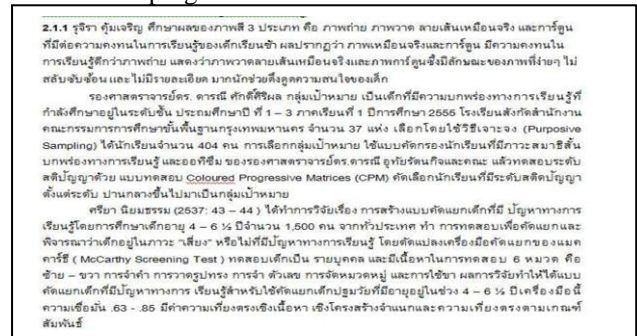

Figure 4. A figure show a example of research data

3.2 Workflow System

This program is contained with various mathematics subject and mini-game to relax for children. In Figure 5 is a requirement of programs.

Teacher or parents have teach many children to want to learning and test your children with many way with calculation and describtions.
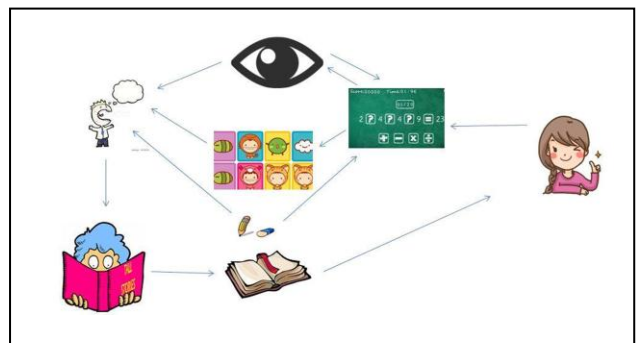

Figure 5. A figure shows system requirements.

3.3 Develop Program

In process of develop program have assigned for worked one member is programmer/encoder into application and other member is system analysis & documentary for paper management.

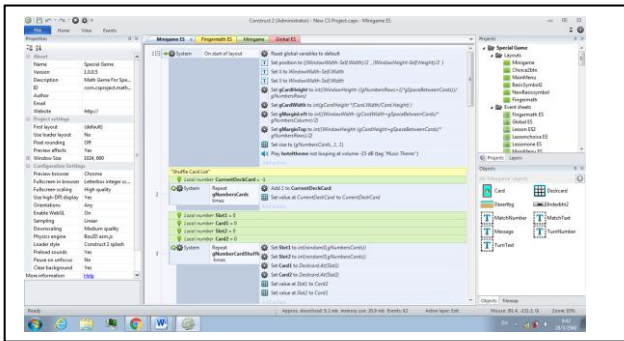Then Export HTML5 to Cordova for generate Adobe Phonegap into APK File same as in Figure 6.
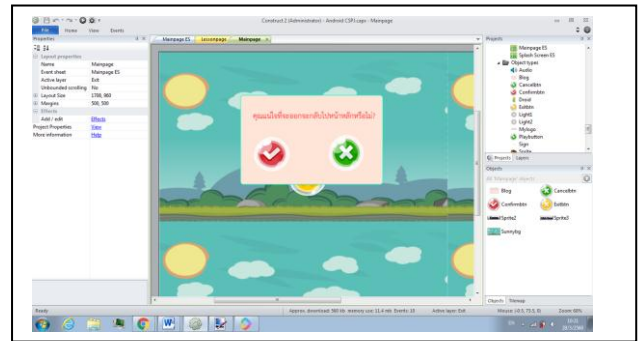
Figure 6. A figure show HTML5 coding

3.4 Testing Program

We have testing program to find debug and problem that can't solve such as no audio, missing word, animation problem etc.in the Figure7 to make completed program becaused when we export into android apk file is have to checking when the application are stopped working.
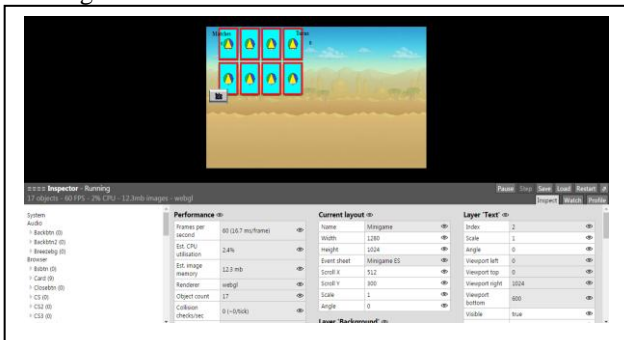

Figure 7. A figure show debugging this application.

4. OVERALL RESULT

4.1 System Result

The Main Screen of Program that user can play features are as follows.

4.1.1 The splash screen are first screen showing when application is open was show in Figure 8

Figure 8. A figure show splash screen in this application.

4.1.2 When you touch play button, you will go to index applications was show in figure 9.

Figure 9. A figure show Index screen in this application.

4.1.3 This Screen are showing lesson that you could learning such as basic symbol, Finger Math etc. that show at Figure 10.

Figure 10. A figure show the Lesson Page.

4.1.4 Next Screen are showing example of lesson that have information to describe it. In this page are explaining about Basic Math Symbol that show in Figure 11.

Figure 11: a figure that show about example lesson.

4.1.5 This screen are showed example of card match games that you learn about basic symbol that showed in Figure 12.
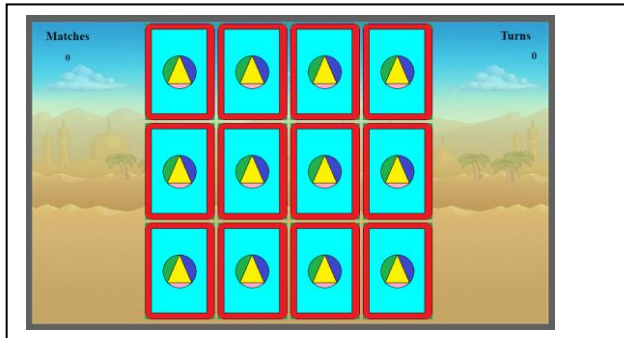

Figure 12. A figure showed the example match card games.

5. CONCLUSIONS AND RECOMMENDATIONS FROM APPLICATIONS

5.1. Conclusions of Applications

5.1.1 Conclusions Reviews from Expert Officer

As the result of officer are quite satisfied because 2D Program are not bored or disappointed, but they want more lesson and game that supported for Autism and LD children.

In the other way officer have advise us to make more game with practice for children

5.1.2. Conclusions Reviews from User(Syudents)

As the Result of user (Special Children) who have played this program are happy and trusted this program because they enjoy about 2D Games even this game are simple card games but they used the five senses to play this game and like to learn mathematics lesson.

The result test of children who have played this application 5 people and the scoring to test children is 10, 15 and 16(41 in total).

Table 1. A table show the result of mathematics skill

Children	Before Playing app	After Playing app
#1	0/0/0 = 0	2/0/0 = 2
#2	6/0/0 = 6	6/2/8 = 16
#3	6/5/8 = 19	7/5/8 = 20
#4	6/2/5 =13	6/2/8 = 16
#5	6/0/7 = 13	6/7/7 = 20
Total	51	74
Average	10.2(24.88 %)	14.8(36.10 %)

Figure 13. A figure show students do the tests

5.2 RECOMMENDATIONS

In Analysis about program, moderators have want to recommendations about program.

5.2.1We need More Lesson and practice test for expand skill of mathematics that can help children to solve math question faster and more efficient because not only calculation that solve everything but thinking with reason it a good one too.

5.2.2 Program need more design with animation and feature that can supported user and need questionnaire for comments from student and expert officer about this program that need add more function or fixing bug in common.

5.2.3 In Documents, We have to add more research data and references that belong to autism disorder and Learning Disability includes Android Encoding too.

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