

Logical Guessing Riddle Mobile Gaming Application Utilizing Fisher Yates Algorithm

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Abstract—Riddles, while perceived as a past time activity for kids, have educational features that enhances the logical thinking of a person. In this paper, the researchers aimed to develop a logical guessing riddle mobile gaming application that focuses on randomization of questions in the game by selecting the index together with the same generated number and derived from combining the words wit and wisdom. It also has educational features that enhances the logical thinking of a person, and improves the cultural awareness and linguistic aspect of a person. The algorithm can determine how many questions the riddle game has and that total number of questions will be considered as the length of an array that used for Fisher Yates algorithm. Each array has its own corresponding index. The index is always starting with zero up to the last number of array. The researchers set a random values and it always greater than or equal 0 and less than the index.

Keywords— Logical guessing riddle, Mobile game, Fisher Yates Algorithm

I. INTRODUCTION

There are two main characteristics of a person needed in intelligently answering riddles which are wit and wisdom. The researchers used riddles as the main focus of the game simply because it evokes laughter because it can be define as a humans joke. However, it also has educational features that enhances the logical thinking of a person, and improves the cultural awareness and linguistic aspect of a person. In this study, a mobile game for logical guessing was discussed with the employment of Fisher Yates algorithm specifically designed for randomization and selection of the index with the same generated number. The mobile game application composed of riddle questions that is displayed in the form of a rebus; which means that some of the words in the riddle question are represented by images which is an allusion device that uses picture as a representation of a common word. The riddle questions are grouped in different categories. The game implements a countdown timer with the inclusion of players' evaluation (scoring). It also features three power-ups; the time freeze, add time and skip. The users of this game will start at the age of 11 years old and above, during this period thoughts are more logical, flexible and organized. In the aspect of vocabulary, children begins to grasp the double meaning of words that leads to understanding of metaphor, and they are said to be more

preferable and more appropriate in understanding the logical necessity in reasoning needed for riddling according to Theory of Cognitive Development by Jean Piaget.

II. RELATED WORKS

Logical Guessing Riddle Mobile Gaming Application utilizing Fisher Yates Algorithm has been researched for years to achieve an effective alternative way related to the study. Greeks in the ancient times enjoyed riddle as to them it is a way to know who has the best brain; and the oldest recorded Greek riddle was the riddle of Sphinx of Thebes which was solved by Oedipus. One of the known Greek philosophers Aristotle was the first to actually make a real study of the cultural importance of riddles; as he wrote in his book Rhetoric that riddles are attractive in the sense that it is well-constructed for it conveys new idea and the answer to the question is actually a surprise [1].

Riddle is simply a joke that evokes wonder. It was actually studied for over a century [11] and was approximately defined during 400 A.D. [3]. Riddles are important in folk literature [12] and in this context, riddle can be defined as a cultural "orally-transmitted image-referent sequence" [4], which consists of a single riddle question, with more than one answer [10]. Riddle precedent or riddle question may be in the form of a question, command or a statement [30]; it normally requires a careful yet witty kind of analysis because of its ambiguous or indefinite question. It commonly contains compound words and employs metaphorical language, and to add spice to riddling, actually the ambiguity of the riddle can either exist on the riddle question or in the answer itself. Moreover, riddle is regarded as a past-time joke among children. To people who experience participating in an activity involving riddle can actually feel anxiousness when a riddle question was proposed, it can actually make you wonder if there is actually a possible answer to the question, because honestly, solution would not immediately come to your mind. However, once the answer was given, everything will look simple. And the reason why it looks so hard was due to the structure of the riddle, and surprisingly this riddle joke that was regarded as a past-time activity, actually improves a person's linguistic, logical and cultural aspect.

Players always want to see something new in every game that they are playing. New in the way that player(s) would be clueless what comes next in every stage or level of that particular game. Imagine how boring a particular mind game will be if the players were already known the arrangement of each questions or puzzles. The player would be easy to remember the key and answer for each level because he/she already has the pattern of how the game flows, that's the reason of applying randomization in creating a game. These will surely make the game more interesting and effective when it comes on the variety. Randomization is very important and high-priority to the purpose of the game [9]. For implementing randomization in different mobile game application, there are many algorithms available that can be used. According to [15], the Fisher Yates Shuffle Algorithm is kind of randomize algorithm where in it can produce a random permutation in a very similar way and also it was carried out using the "Generic List" data structure. The FYS is regarded by many as an unbiased and optimal method for generating a truly random permutation of finite set. This means that Fisher Yates Shuffle Algorithm can randomize the data with no repeating randomization. If the question has already been produce, then there is no need to produce it again by method of swapping the chosen indexes. Based on research the Fisher Yates Shuffle Algorithm is closely related to use for the game. This game is all about the guessing word that the answer must be guest in a given random questions without repetition. Fisher Yates Shuffle Algorithm is suit for the speed matching of the input data to display faster of the corresponding answer according to a given riddle questions on a given continues time. All functions of this algorithm appropriate to all needs for the game. [17] stated that "the popularity of video games has transcended entertainment crossing into the world of education."

According to the article of [18], "Video games have become a widely popular and highly profitable medium, with more than 40 percent of Americans now playing them regularly." A video game is an electronic game which the players controls the character in the computer. But today the technology is improved that the players can control their character by touching it on the touch screen mobile phones, tablets or touch screen laptop/computer. Video games earlier 1990's, the parents are too supported to their children to buy it. But today's generation, many parents don't want their children have it because it has waste of money that it is too expensive. Now, the younger generations tend to dominate the gaming world; however, older respondents who do play games are more avid players. The Nintendo Game Boy was the first big name in portable gaming. Prior to the release of Game Boy, companies such as Mattel (NASDAQ:MAT) tried to develop their own lines of portable games and electronics, with little success. Milton Bradley released the first swappable cartridge Microvision console in 1979, but the lack of games and the small (16x16-pixel) screen kept the Microvision from seeing widespread adoption. With Nintendo's securing court-affirmed, exclusive worldwide licenses for the production of Tetris on its near-monopoly console and handheld platforms, the Tetris property was quickly poised for world domination. The Game Boy version of Tetris alone sold 35 million copies, as the

bundled game featured with the enormously successful handheld's initial launch. The continued expansion of the influence of Tetris on every digital game platform is pretty straightforward during this period; in fact, Tetris is one of the most famous games in worldwide.

III. PROPOSED MOBILE GAME

The main objective of this study is to develop a logical guessing game riddle utilizing Fisher Yates Algorithm. The study aimed specifically to: create and develop a riddle game utilizing Fisher Yates Algorithm to generate randomized questions; create a game that increases logical thinking of the user utilizing riddle questions and develop a riddle game that will be evaluated in terms of functionality, reliability, usability, efficiency, maintainability and portability.

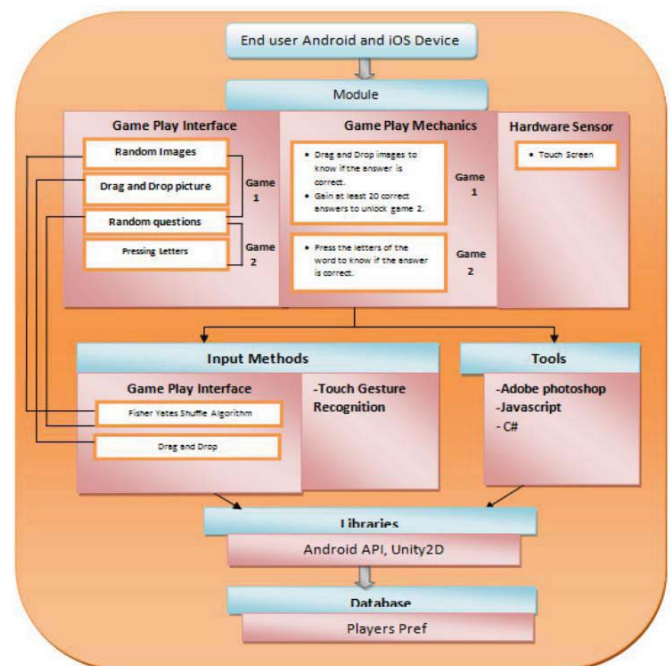


Fig. 1. Mobile Game Architecture.

The Mobile game architecture as shown in the figure 1 details the flow of the development of the game. The game has a three module. The first module is the game play interface, where in the users can view different components. In game one, there are the components such as, random questions, drag and drop picture to be able to know if the answer is correct. For the game two, it has a random question and tracing where in the user must be traced the answer. The second module is the game play mechanics, where the rules of the game are implemented. The last module is all about the hardware sensor, which consists of touch screen. To be able to functions all the modules, they have corresponding methods of each of them. First is the is the drag and drop method for the pictures, the next one is the Fisher Yates Shuffle algorithm, for the randomization of the questions and images. Touch gesture recognition is also part of method. In phase of tools, it consists of different application and graphical design that the researchers will use. Libraries, this phase implement the applications that the game made. The last phase is the database where all the coins and score of the player will stored on the players' pre function. The game have several interfaces, these different interfaces also have different uses according to its assign functionality.



Fig. 2. Presentation of the logical guessing riddle mobile game application using Fisher Yates Algorithm. Screenshots shown are the following: (A) Main screen of the logical guessing game; (B) Game levels selection; (C) Game categories per each level; (D) Game Level Interface with timer and coins counter; (E) Game Categories of Level 2 with specific numbers of letters ; (F) Gameplay interface of Level 2; and (G) Gameplay evaluation per category.

The figure 2(A) shows the main screen of the game application, there are different buttons; the “Play” button where in the users will be able to start the game, the “Instruction” button where in the users can be read how the game will play and what is the goal of the game, the “High Score” button where the users can be able to see what is the highest score, and “Exit” button where the users can closed the game if they are already finish playing it, all buttons will lead you to different pages. On the other hand, the figure 2(B) shows that there are two levels that will lead the users to two different screens. If the users will click the “1” button, it will lead them to the screen of the categories (things, animals and people) of level1. If the users will click the “2” button, it will go directly to the screen of the categories (letters from 4-5, 6-7, 8-9) of level 2. These two level has a different concept of answering the riddle. The figure 2(C) shows the three categories of level 1; things, animals and people. There will be a randomize selection on these categories. These categories have an animation for choosing one of them. The animation of these is all the categories going up and down. The figure 2(D) shows the interface of level one which has a timer in the upper left of the interface

that composed of two minutes, and the coins for every right answer of the player. Also the two power ups (time freeze and stop time) are included and it can be found in the lowest part of the interface. The interface also shows the riddle question which form has a rebus type and it also has a set of answers that can be drag and drop. The figure 2(E) shows the three categories (letter 4-5, 6-7, 8-9) of level 2 where in the letters of word in the answers of riddle is either composed of four to five letters, six to seven letters or eight to nine letters. The players can free to choose what categories he wants to play. The figure 2(F) shows the interface of game play of level 2 which has a timer in the upper left together with the coin; the three power ups (skip, freeze and stop time) that can be found in the bottom part of the interface. It also shows the riddle question similar to level 1 with different way of answering the question by means of pressing or tapping the correct letters of the answer. Lastly, the figure 2(G) shows the total evaluation (scoring) of the players form each category. The flow of this scoring is that first the system will get the score of each category: animals, people and things. After getting all the score of each category, the system will add the overall scores of the players.

IV. CONCLUSION

To conclude, this study entitled: “Logical Guessing Riddle Mobile Gaming Application utilizing Fisher Yates Algorithm” was able to attain its general and specific objective. The first specific objective of this study is “create and develop a riddle game utilizing Fisher Yates Algorithm to generate randomized questions”. This objective was attained by the researchers through applying the Fisher Yates algorithm to randomize the riddle questions. The second specific objective of this study is “Create a game that increases logical thinking of the user utilizing riddle questions.” This objective was attained by the researchers through the use of riddle questions in the game which said to be an education tool that improves a person comprehension of logic language details. The third and last specific objective of this study is “Develop a riddle game that will be evaluated in terms of functionality, reliability, usability, efficiency, maintainability and portability.” After finishing the game and have been evaluated by the respondents, the researchers were able to attain this objective by means of the result that was scored by the respondents with a total mean in every criterion that can be interpreted as “Strongly Agree”. For future works, the mobile game would be more beneficial to learners if it is integrated in an e-learning system especially that the use of learning management system is very widely adopted in the Philippines [14]. Moreover, additional game features and levels may enhance the overall game impact.

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