Q - PUZZLE GAME FOR MEMORIZING THE RECITATION OF QUR'AN SURAH

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ABSTRACT

This study was aimed to support the memorizing of Qur'an surah by deploying the q-puzzle game. The game is established from the sections of surah that have already been erased intentionally. The surah are derived from the 30th*juz* where each surah has 3 different levels. The higher the level is, the more the eliminated sections are.

Keyword : *Q - Puzzle Game, Level, Sections Of Surah*

1. INTRODUCTION

In the Indonesian Dictionary, the definition of memorizing is to attempt absorbing something in mind in order to always remember [1]. According to Zuhairini and Ghofir as cited by Kamilhakimin Ridwal Kamil in his book entitled *"How we memorize (tahfizh) Al-Qur'an",* the term 'memorizing' is a method used to correctly recall something that has already been read as it is. The method is frequently used as an attempt to memorize the Qur'an and Hadith. [2]

Several surah in the Qur'an and Hadith mention the importance of reading and memorizing the Qur'an. This has triggered various researches on the use of reading and memorizing the Qur'an from various aspects. A research conducted by a psychology professor of the University of Al-Imam bin Saud Al-Islamiyyah Riyadh, Al-Imam bin Saud Al-Islamiyyah, figured out the positive correlation between the increase of the surah memorizing rate and the level of mental health, and the students who are excellent at memorizing the Qur'an have different level of mental health [3] [4].

There are many methods used in the process of memorizing, such as *Bin Nazhar, Tahfizh, Talaqqi, Takrir, and Tasmi'* [5]. They are free to be selected and also adaptable to the candidate of the *hafiz* (memorizer). If the recitation is over, the The *hafiz* repeat the process in order to avoid forgetting. Sometimes the process can be more fun through the game.

The Game is a form of application that is most used and enjoyed by the electronic media users. A game can be combined with an Islamic content. It is useful to delightfully memorize and study a discipline.[6]

The objective of this research is to create a game that is capable to examine the result of memorizing the surah and also is capable to make the memorization better than before.

2. METHODOLOGY

The application is a puzzle game played by a single player. It is a mobile application that runs on the Android OS platform. In the game, the player will face surah with missing sections (words) and has to complete the surah by completely arranging the provided pieces of word.
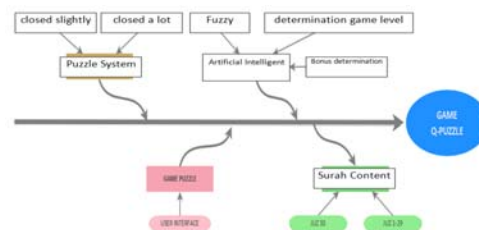

Figure 1. Research Method

The puzzle design uses the display of a jigsaw puzzle with the principle of homogenous cut. Each piece of the puzzle represents each word of the surah. The basis of the determination of the word pieces is the Quranic Arabic Corpus - Word by Word Grammar, Syntax and Morphology of the Holy Quran. The jigsaw puzzle can shown in Figure 2.

Figure 2. Puzzles Pieces

There are two phases of the surah. The first phase comprises all surah in the 30th juz. The second one comprises all surah from the 29th juz to the 1st juz. This research used the first phase. The research method shown in Figure 1.

3. THE ALGORITHM IMPLEMENTATION

This research deployed the Sugeno's Fuzzy method for the configuration of the level determination. [7][8][9]

3.1 The Fuzzy Variables

The input variable used 3 variables, they are:

1. The average time off per-piece finishing (Time)
2. The proportion of piece misplacement (Misplacement)
3. The proportion of using help (Help)

The output variable is the level determination of the game, comprising easy, normal, and difficult.

3.2 The Set of Fuzzy Variables

1. The time variable represents how fast the player finishes the game.

$$\mu TimeFast[\bar{a}] = \begin{cases} 1; & \bar{a} \leq 1,5 \\ \dfrac{4,5 - \bar{a}}{4,5 - 1,5}; & 1,5 < \bar{a} < 4,5 \\ 0; & \bar{a} \geq 4,5 \end{cases}$$

$$\mu TimeNormal[\bar{a}] = \begin{cases} 0; & 3 \geq \bar{a} \geq 6 \\ \dfrac{\bar{a} - 3}{4,5 - 3}; & 3 < \bar{a} \leq 4,5 \\ \dfrac{6 - \bar{a}}{6 - 4,5}; & 4,5 < \bar{a} < 6 \end{cases}$$

$$\mu TimeLow[\bar{a}] = \begin{cases} 0; & \bar{a} \leq 4,5 \\ \dfrac{\bar{a} - 4,5}{7,5 - 4,5}; & 4,5 < \bar{a} < 7,5 \\ 1; & \bar{a} \geq 7,5 \end{cases}$$

Figure 3. The Variable of Time Input

2. The time variable represents how fast the player finishes the game.

$$\mu FaultLow[p_b] = \begin{cases} \dfrac{0,2 - p_b}{0,2 - 0}; & 0 \leq p_b < 0,2 \\ 0; & p_b \geq 0,2 \end{cases}$$

$\mu FaultMiddle[p_b]$

$$= \begin{cases} 0; & 0,1 \geq p_b \geq 0,3 \\ \dfrac{p_b - 0,1}{0,2 - 0,1}; & 0,1 < p_b \leq 0,2 \\ \dfrac{0,3 - p_b}{0,3 - 0,2}; & 0,2 < p_b < 0,3 \end{cases}$$

$\mu FaultHigh[p_b]$

$$= \begin{cases} 0; & p_b \leq 0,2 \\ \dfrac{p_b - 0,2}{0,4 - 0,2}; & 0,2 < p_b < 0,4 \\ 1; & p_b \geq 0,4 \end{cases}$$
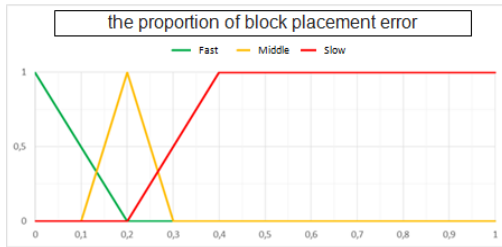
Figure 4. The Variable of Misplacement Input

3. The Misplacement Variable represents how many misplacement done by the player during the game.

$$\mu HelpLow[p_c] = \begin{cases} \dfrac{0,2 - p_c}{0,2 - 0}; & 0 \le p_c < 0,2 \\ 0; & p_c \ge 0,2 \end{cases}$$

$$\mu HelpMiddle[p_c]$$
$$= \begin{cases} 0; & 0,1 \ge p_c \ge 0,3 \\ \dfrac{p_c - 0,1}{0,2 - 0,1}; & 0,1 < p_c \le 0,2 \\ \dfrac{0,3 - p_c}{0,3 - 0,2}; & 0,2 < p_c < 0,3 \end{cases}$$

$$\mu HelpHigh[p_c] = \begin{cases} 0; & p_c \le 0,2 \\ \dfrac{p_c - 0,2}{0,4 - 0,2}; & 0,2 < p_c < 0,4 \\ 1; & p_c \ge 0,4 \end{cases}$$
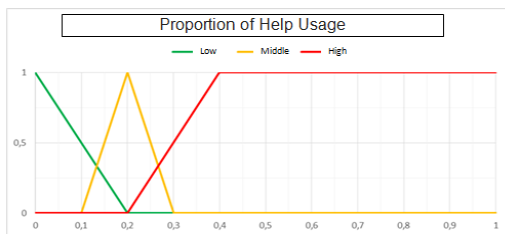

Figure 5. The Variable of Help Input

3.3 The Fuzzy Rules

[R1]   IF Time is FAST and Fault is LOW and Help is LOW THEN Level is SULIT

[R2]   IF Time is FAST and Fault is LOW and Help is MIDDLE THEN Level is NORMAL

[R3]   IF Time is FAST and Fault is LOW and Help is HIGH THEN Level is EASY

[R4]   IF Time is FAST and Fault is MIDDLE and Help is LOW THEN Level is NORMAL

[R5]   IF Time is FAST and Fault is MIDDLE and Help is MIDDLE THEN Level is NORMAL

[R6]   IF Time is FAST and Fault is MIDDLE and Help is HIGH THEN Level is EASY

[R7]   IF Time is FAST and Fault is HIGH and Help is LOW THEN Level is EASY

[R8]   IF Time is FAST and Fault is HIGH and Help is MIDDLE THEN Level is EASY

[R9]   IF Time is FAST and Fault is HIGH and Help is HIGH THEN Level is EASY

[R10]   IF Time is NORMAL and Fault is LOW and Help is LOW THEN Level is NORMAL

[R11]   IF Time is NORMAL and Fault is LOW and Help is MIDDLE THEN Level is NORMAL

[R12]   IF Time is NORMAL and Fault is LOW and Help is HIGH THEN Level is EASY

[R13]   IF Time is NORMAL and Fault is MIDDLE and Help is LOW THEN Level is NORMAL

[R14]   IF Time is NORMAL and Fault is MIDDLE and Help is MIDDLE THEN Level is NORMAL

[R15]   IF Time is NORMAL and Fault is MIDDLE and Help is HIGH THEN Level is EASY

[R16]   IF Time is NORMAL and Fault is HIGH and Help is LOW THEN Level is EASY

[R17]   IF Time is NORMAL and Fault is HIGH and Help is MIDDLE THEN Level is EASY

[R18]   IF Time is NORMAL and Fault is HIGH and Help is HIGH THEN Level is EASY

[R19]   IF Time is SLOW and Fault is LOW and Help is LOW THEN Level is EASY

[R20]   IF Time is SLOW and Fault is LOW and Help is MIDDLE THEN Level is EASY

[R21]   IF Time is SLOW and Fault is LOW and Help is HIGH THEN Level is EASY

[R22]   IF Time is SLOW and Fault is MIDDLE and Help is LOW THEN Level is EASY

[R23]   IF Time is SLOW and Fault is MIDDLE and Help is MIDDLE THEN Level is EASY

[R24]   IF Time is SLOW and Fault is MIDDLE and Help is HIGH THEN Level is EASY

[R25]   IF Time is SLOW and Fault is HIGH and Help is LOW THEN Level is EASY

[R26]   IF Time is SLOW and Fault is HIGH and Help is MIDDLE THEN Level is EASY

[R27]   IF Time is SLOW and Fault is HIGH and Help is HIGH THEN Level is EASY

3.4 Defuzzyfication

The defuzzy process of the Sugeno's Method is finding the average value of the implication function result of the determined rules composition. As the result, the output is a weighted average. Generally, the process is formulated as follows:

where:

$$z = \frac{\sum_{i=1}^{n} \alpha\text{-}predicate_i z_i}{\sum_{i=1}^{n} \alpha\text{-}predicate_i}$$

z =   the final output

n =   the amount of rules

$\alpha\text{-}predikat_i$ = the fire strength of the implication function of the rule (i)

z_i =   the output of the rule (i)

4. RESULT

The result of the game's user interface
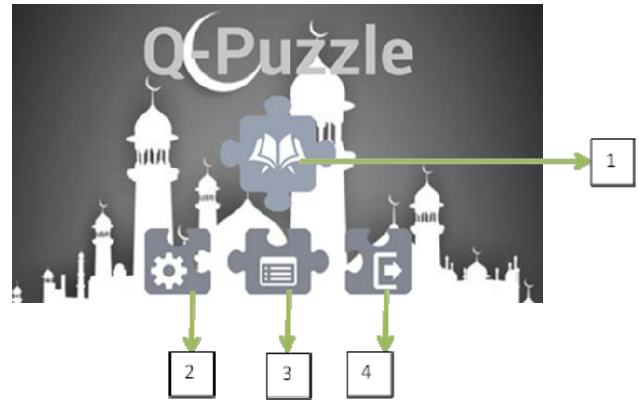
4.1 Main Menu

Figure 6 Menu option

There are four options in this segment, they are:

1. Main Menu (a button to enter the game)

2. Settings (a button to configure the game)

3. Score Board (a button used to display the score of the game) Exit (a button used to exit the application)

4.2 Loading Screen

The loading screen is used as the initial display before entering the main game.
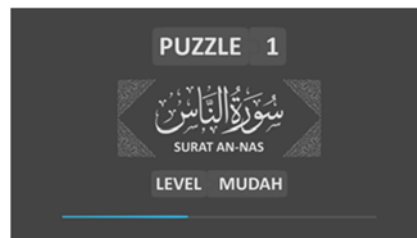

Figure 7. Loading Screen

4.3 Display Game

The sreen of the puzzle game

Figure 8. The Display of Puzzle Board Section
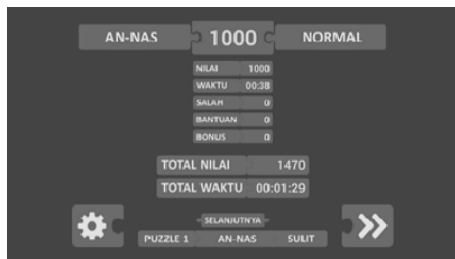
4.4 The Display of Score Board

Figure 9. The Display of Game Score Section

4.5 The Result of Fuzzy Sugeno Examination

Figure 10. The Result of Fuzzy Sugeno

Examination

On the first examination with time = 56 seconds, misplacement = 0, and help = 3, the acquired level was normal. As the result, the player could directly play the normal level without having to finish the easy one in the first place.

5. CONCLUSION

Fuzzy Sugeno can be used to control the increase of level based on the input result of time, misplacement, and help. The level of the game indicates the speed of the player in memorizing

the verses of the surah. Test results show that the use of Fuzzy Sugeno can determine the level of the game in accordance with player statistics in solving the puzzle. The better the player stats in solving the puzzle, the higher the level you get. Conversely, the less good the player stats in solving the puzzle, the lower the level obtained.

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