Asmaul Husna Learning through Gamifications and Adaptation of Signalling Principle

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Abstract. Asmaul husna is the 99 names of attributes which is owned by Allah SWT. All names in asmaul husna must be translated with the word “Maha”, which shows the perfection in divine attribute. Unfortunately, in this modern age, the lack of knowledge about asmaul husna especially its meaning is the most common problem among muslim society. By learning asmaul husna via traditional methods such as text books and white board, muslims are getting less motivated and have no desire to learn more about asmaul husna. Due to the emerging of gamification, the traditional methods are less effective, and it has several limitations in terms of equipment for the learning process. Learning asmaul husna through gamification could increase motivation, offers challenges and trigger excitement to play, while applying multimedia principles could ease in the learning process by reducing the cognitive load and excess memory. The aim of this project is to learn on asmaul husna attributes and meanings, identify suitable gamification elements and multimedia principles to be adapted into the design and development of Asmaul husna Learning Game for students. This game consists of gamification elements in learning such as points, rewards, countdown timer, and discovery and multimedia learning principles which is the signalling principle. Heuristic evaluation has been initiated and from the test results, this game is highly recommended for students.

1. Introduction
The term Human Computer Interaction (HCI) has been founded and widespread since the 1980s and hence, has elevated since then [1]. Until today, various researchers have been trying to investigate the most appropriate HCI guidelines and principles to assist the relationship between human and machine. These principles and guidelines have been utilized in many computer applications to facilitate both party.

For this project, a multimedia learning principle and gamifications elements has been adopted as a medium to ease the use. There are 12 principles erected by Mayer after a thorough research and lab works that can be adapted into computer applications towards assisting the learning process and reducing cognitive load [2]. However, we only concentrate on one principle in this research which is the signalling principle as shown in Table 1 [3].

| Multimedia Principles | Description |
|-----------------------|-------------|
| Signalling Principle  | People learn better when signals/signs/cues that highlight the organization of the essential material are added. |
Besides the use of multimedia principles, the gamification elements are also vital to be incorporated to increase motivation, offers challenges and trigger excitement for the user in the learning process. Gamification also act as a tool for raising engagement in e-learning platforms [4], [5], [6] has introduced various types of game elements that can be used in gamification, but we have chosen only four as listed below in Table 2.

| Game Elements | Description |
|---------------|-------------|
| Points        | Points are values awarded for an action or a combination of actions. Use to encourage people to do things by collecting them. |
| Countdown     | Players are only given a certain amount of time to do something. |
| Discovery     | Players are encouraged to navigate through their learning environment and uncover pocket of knowledge. |
| Rewards       | Players get rewards for reaching specific objectives. |

2. Background of research
Asmaul husna is basically the 99 names of Allah, the names which are attributes of Allah that can be found in Holy Quran. The problem related to Asmaul husna is when nowadays Muslims are unable to memorize and understand the 99 names. This is due to the lack of knowledge in the meaning and benefits of asmaul husna. Even though, they have learned or memorized the names, they failed to apply it. For example, after “solat” Muslims are encouraged to perform dhikr but many of them ignored this practise. Usually, Muslims can read the names of Allah as they have learned and sing it since childhood, but the essence of the meaning was not embedded during the learning process. Hence, these names are later disregarded. Furthermore, gamification technique is yet to be implemented extensively in asmaul husna learning process and learning in old-fashioned ways reduced their desire to learn this essential information.

If this issue continues, students will have no intention to learn more about Islam or to be closer to their Creator via His beautiful names. This will then lead to neglect of faith and astray. Besides that, they cannot apply asmaul husna and its meanings, in their supplications (doa), as well as unable to feel and see the greatness of names of Allah SWT. To prevent these issues, we reckon to develop a game that will assist them so that they can understand the meaning and value of asmaul husna.

Thus, this project aims to develop a game for students, to give them better understanding about asmaul husna so that they can apply in their daily life such as by comprehending the meaning of asmaul husna and apply it in their supplications or use it as dhikr [7].

3. Methods
Six methodology phases were involved in this research, which were planning and analysis, design, development, testing, refinement and documentation.
3.1. Planning and Analysis

In the planning and analysis phase, the planning of completion of each phase were discussed and the project objectives and expectation were clearly stated. Analysis was done by using information gathering and data collection method. For information gathering, the information needed were about asmaul husna, multimedia principles, gamification and gamification elements. This information was obtained through books, articles, journals, and other relevant resources, as it is important to make sure that the information included in the game content are precise.

3.2. Design

Interface design is very important to attract end user’s attraction. It should be properly created as it may give an impact to the end users’ understanding about the game content. This is because there is quite a high possibility that almost 80 percent of all gamification apps failed due to poor design [8].

3.2.1. Storyboard

Storyboard is the best way to illustrate the idea before the real design and could ease the construction process. It is the sequence of drawing that used as a guideline before developing the real game interface and usually done through illustrations or sketching. There were a lot of aspects need to be considered in this phase, for example gamification elements, use of colour, and multimedia elements and principle. The interface appearance need to be design based on recognition, visual appearance, consistency and well organization.

3.3. Development

The game was produced during this phase involving hardware and software such as laptop, Adobe Photoshop CS6 and Adobe Animate CC 2017. It is essential to identify the suitable hardware and software to avoid problems such as, compatible issue.
3.4. Test
Several tests have been conducted throughout the project, but only heuristic test that will be discussed in this paper. These testing were important to gain the users feedback on the functionality and usability of the app. The participants for these tests were UiTM Perlis students and experts from Computer Science fields, this test is performed to find any flaws in the application.

3.5. Refinement
After the testing process was completed, the game was amended to resolve any problems or errors occurred based on the test results.

3.6. Documentation
The final phase was documentation process. In this phase, all data, information and activities that are related were documented.

4. Game Architecture
The game was based on the architecture as below which consists of 20 asmaul husna names related to students, gamification elements (points, rewards, countdown, discovery) and multimedia learning principle (signalling principle). It consists of three main pages which are supplications page, game instruction and controller page and game play page.

Figure 3. Game Architecture

4.1. Supplications Page
Supplications (doa) pages of the game application. Students must read, understand and memorize these types of supplications, names of Allah and their meanings along with the supplications that are provided. Each supplication is highlighted with black font as a cue so that students can understand the keyword from these supplications. Students can proceed to other supplications by pressing the “Seterusnya” button and go back to previous supplications page by pressing the “Kembali” button.

Figure 4. Supplication Page (black font is used as a cue for keyword) and Game instruction page.

4.2. Game Instruction and Controller Page
The purpose of this game instruction and controller page is to remind to the students about the rules and the controller that is used. The main objective of this game is to reach the finish line from the start line. To accomplish that, students need to answer all questions by moving their “player” to the Blue
Circle. Blue Circle is a signal that will provide a variety of questions. This game also contains countdown timer, which is 12 minutes. Therefore, students must answer all questions before the time runs out and they will receive their reward at the end of the game. Otherwise, if students are unable to finish the game according to the time given, then the game is over, and they need to restart the game. Students will get 10 points if they answer one question correctly, otherwise none. Here is the sum of points and stars (rewards) that students can obtain, 20 points - 1 star, 40 points - 2 stars, 60 points - 3 stars, 80 points - 4 stars and 100 points - 5 stars. There is also a reminder that students need to prepare their mind by reading, understanding and memorizing the lists of supplications and names of asmaul husna before they start the game. If they are ready, they can play the game by pressing the “Start Game!!!” button. If not, then they can press the “Back” button to read the lists of supplications and names of asmaul husna again. For the controller, students need to use keyboard and mouse. For the keyboard, they need to press “UP arrow” key to move up, “DOWN arrow” key to move down, “RIGHT arrow” key to move right and “LEFT arrow” key to move left. For the mouse, they only need to press and choose the correct answer from the question.

![Figure 5. Game Play (blue circle as a signal for questions) and Question Page (coloured button as a sign for answer’s options)](image)

4.3. Game Play Page

After students press the “Mulakan Game!!!” button, the maze game will appear. However, there is a reminder that works as a signal written as “Silahkan klik pada halaman game ini dengan mouse anda supaya “player” anda boleh berjalan”. The reason why there is a reminder is because after students press the “Mulakan Game!!!” button and immediately press the keyboard arrow button, the “player” cannot be moved. So, to avoid confusion, the reminder is placed at the top of the game interface. When students move their “player” to the blue circle, it will display a question. Each blue circle provides different question. If students can answer the question correctly, points will be added and a “Betul!” sign will appear. Otherwise, points will not be given, and the correct answer will pop-up. This game is also equipped with countdown timer which spare some duration to think before answering the question. There is also a variety of buildings and structures such as mosque, police station, stall food, school, an apartment and tennis court to attract students while playing the game. The number of stars will be given based on students’ points and it is placed at the right side of the game interface. Lastly, when the “player” arrived at the finish line, they will win the game and received trophy as a winning sign.

5. Test, Result and Discussion

Heuristic test was conducted to three lecturers from Computer Science department in UiTM Cawangan Perlis. This test is one of the types of usability evaluation and was performed for evaluating the user interface design or to identify any usability problem in this Asmaul husna Learning Game. In heuristic evaluation, an expert will review, or inspect a product using specific guidelines (Barnum, 2011). Through this evaluation, the developer will obtain a feedback from the users early in the designing process. For the heuristic evaluation, certain criteria were evaluated such as content, interface design, and general feedback. The scoring level is between 1 (strongly disagree) – 5 (strongly agree). From the
Heuristic Evaluation, it can be concluded that both lectures were agreed with the content provided in this game application.

Table 3: Heuristic test results

| Criteria (Content) | Mean | Criteria (Interface design) | Mean | Criteria (General Feedback) | Mean |
|--------------------|------|-----------------------------|------|-----------------------------|------|
| 1. The words used are easy to understand. | 4.0  | 1. Color used are eye-catching for students. | 4.0  | 1. Interesting | 5.0 |
| 2. The buttons in the game application are neatly arranged. | 4.5  | 2. The background image is suitable for this game application. | 4.5  | 2. User friendly | 5.0 |
| 3. The list of supplications based on Asmaul Husna are easy to read, memorize and understand. | 4.5  | 3. The font is in the appropriate size. | 4.0  | 3. Enjoyable | 5.0 |
| 4. All questions that are provided are different and require time to think before answering the question. | 4.5  | 4. Sentences and words used in this game application is understandable. | 4.0  | 4. Valuable | 5.0 |
| 5. The time that is given is enough to answer all questions. | 4.5  | 5. The reminder is displayed clearly. | 4.0  |  |  |
| 6. The sum of points that are awarded are reasonable based on the correct answer as well as the number of stars. | 4.0  | 6. Graphics in the game application is interesting. | 4.0  |  |  |
| 7. Instructions are clearly and easily understood. | 4.5  |  |  |  |  |

Therefore, based on the heuristic evaluation results, it clearly defines that the use of multimedia principles which is signalling principle and gamifications elements which are points, rewards, countdown timer, and discovery are significant in the design and development of this application. The relationship between the heuristic results towards the principles and elements are as listed below:

Figure 6. Relationship between heuristic results towards the signalling principle and gamification elements.
Furthermore, the criteria of interesting, user-friendly, enjoyable and valuable have contributed in increasing motivation, offering challenges and triggering excitement to the users.

6. Conclusion
Asmaul Husna learning game is a learning tool that has been developed for students to concurrently play and learn asmaul husna. This game was developed using Adobe Animate CC 2017 and Adobe Photoshop CS6. Several multimedia elements were used to attract students’ attention for example audio, video, animation and text. Based on the result from Heuristic test, this game had achieved its objective which is to design and developed asmaul husna learning game for students incorporating multimedia principles; signalling principle and gamifications elements; points, rewards, countdown timer, and discovery. Based on the observation that has been carried out, it can be concluded that this game has several advantages such as it can help students to learn asmaul husna supplications. Besides, students can have fun playing game while learning. In addition, students can use these supplications after praying or whenever they want. For future, it is better if a database could be implemented in this game to store score points and could be enhanced by adding voice narration that can pronounce arabic word to help students understand and pronounce it clearly.

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