Gamification in Learning Management System: A study on Arabic e-learning

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Abstract. Arabic has a vital role in the development of Islamic science, and it is used in the Al-Quran, Hadith, and books of Islamic Scholars. The Islamic Boarding School called Pesma Thaybah provides both education and Arabic learning. Design thinking-based e-learning design is an innovative approach to learning Arabic. The main problem of this research is how to design effective e-learning and add gamification to the learning management system. Then usability testing is applied, resulting in 100% effectiveness, meaning all students improved their learning outcomes. Testing for pre-test and post-test scores also increased by an average of 45%, indicating a significant improvement in learning. So, we can conclude that gamification can enhance the learning outcome at Pesma Thaybah.

1 Introduction

E-learning systems have been developed to facilitate the process of online learning, and user personas, which are fictional characters created to represent the different user types that might use a site, are used to help get specific needs from the problem of the Learning Management System (LMS) [1]. LMS stores lesson materials, learning resources, assessments, and evaluations in some schools. Students can access materials and monitor the teacher's assessments [2]. Nowadays, many people are interested in Islamic study, so Islamic Institutions must adapt to the rapid development of technology. A study shows that implementing Islamic education in the digitalization era can increase the effectiveness of student learning [3]. One of the Islamic learnings is studying Arabic. The Arabic language has a vital role in the development of science and Islamic civilization because Arabic is used in the Al Quran, Hadith, and books of Islamic scholars [4]. A study on online Arabic learning activities shows that tutors' activities are characterized by their personalities, teaching materials, media, methods, and motivation. In contrast, students' activities involve online learning procedures and attempts to advance their Arabic language proficiency [5].

In recent years, much focus has been placed on integrating gaming elements into non-gaming spaces. Gamification is used in education for the benefit of social effects and user interaction [6]. A common suggestion for a viable upgrade to the current e-learning platform is gamification, which adds game features and mechanics to increase the student's enthusiasm, involvement, and learning and also shows that learning through the gamified e-learning platform resulted in improved short-term and medium-term learning ability [7].

The current research will develop a website Learning Management System for student boarding schools (Pesma Thaybah) using the design thinking approach and incorporate gamification in its assessment process. Design Thinking is used as a method because it supports innovation based on the user.

2 Research Methods

2.1 Design Thinking

The method applied to this research is design thinking, which has the following stages :

2.1.1 Empathizing

Empathizing is the stage where the taste begins to understand a problem. This phase will accumulate a large amount of information to use for the next stage. The main objective of the empathize stage is to develop the best understanding of users, their needs, and the underlying issues of the product or service development that is intended to be created [8][9].

2.1.2 Defining

The defining stage is a follow-up data collection phase to understand the existing problems. This phase also involves sorting out the obtained data. This sorting is carried out by understanding the core mapping and is carried out from the user's point of view [10]. In the define stage, the user persona represents each user and their problems, frustrations, and needs. It came from each user who was involved in the scaffolding material management. Human-centered design can be implemented because the insight gathered is at a deeper personnel level [11][12].

2.1.3 Ideating

The ideating stage is a design process that concentrates on generating ideas. This stage provides materials and material sources to create prototypes and get innovative solutions for users. It will usually produce a mood board, wireframe, sitemap, and additional solutions at this stage. It involves generating ideas or solutions to the identified problems. The solutions developed during this phase will be the foundation for creating the system. This stage is characterized by brainstorming and documenting all generated ideas [13][14].

2.1.4 Prototyping

The prototyping stage is the process of repeating the final solution to answer the problem. The form of this prototype can be anything that can be interacted with with the user, such as sticky notes, app interface design, or even the finished product directly. Prototype is an essential step in planning because it helps reduce the risk of errors or dissatisfaction at the next stage. Using the prototype, the researchers can clarify and test their ideas before proceeding to the subsequent implementation stage [15][16].

2.1.5 Testing

In this stage, researchers evaluated the user experience from the prototype stage with Usability Testing [17] and analize the data obtained to evaluate the success of the application prototype that have been set at the define stage[18][19].

2.2 Gamification

Gamification intentionally uses game elements to provide a complete, playful experience of the task's non-game context. In education, gamification has been used with gamified design on a supportive learning system. Non-game activities increase student engagement and motivation to learn in a fun atmosphere. Since computer games began to be utilized in learning conditions, a couple of frameworks have been proposed to be utilized and arranged. Propose four sorts of learning results: intellectual, ability, emotional, and open learning results [20].

3 Result and Discussion

3.1 Empathizing

This emphasizing stage is the process of understanding and empathizing with the user. It uses the foundational user research method with data collection techniques, namely in-depth interviews. Researchers conducted in-depth interviews with students and teachers to get to the problem and needs of Pesma Thaybah in learning Arabic [21].

3.2 Defining

The second step is defining the user [22]. After collecting data from the empathize process, the next stage is to define the process. It aims to establish and explain the problems in learning Arabic in Pesma Thaybah. The target of the defining process is to create problem statements that are meaningful and actionable. Results of in-depth interviews were grouped based on questions and made into an affinity diagram. Then, make a user persona that contains a profile, bio, core needs, and frustration representing user groups.

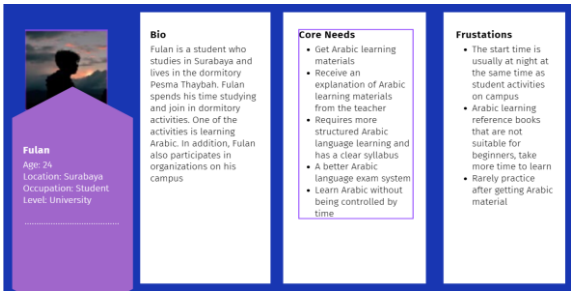

Fig. 1. User Persona

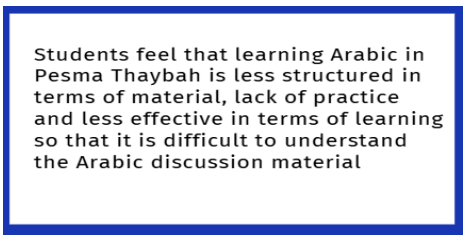

Fig. 2. Problem Statement

The user persona of this website is shown in Fig. 1. From the results of the user persona, we can get a point of view that contains users, needs, and insights. The next step is to make a problem statement containing the main problems in learning Arabic in Pesma Thaybah, as shown in Fig. 2.

3.3 Ideating

The next step is the ideating process, it is a stage for the creation of solution ideas from the problems that exist [23]. This process will generate mood boards and wireframes to create prototypes and get innovative solutions to LMS users. Moodboard in this research consists of typography and color palette, as shown in Fig. 3 and Fig. 4.

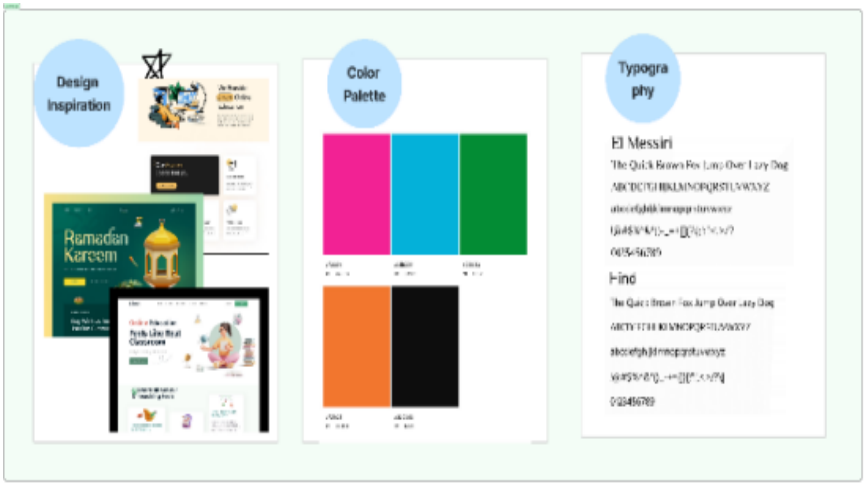

Fig. 3. Moodboard of website LMS Pesma Thaybah

Fig. 4. Color palette taken from the color of Pesma Thaybah logo

This website uses a gamification method to provide a different learning experience. Students' learning begins with viewing the video or reading the material on the website. Then, students can complete quizzes that are gamified into the system. The embedded gamification system in quizzes aims to increase enthusiasm and participation in learning by giving points. Students will later collect these points to open the following material or level up on the website. Fig. 5 shows a game flow on the website.

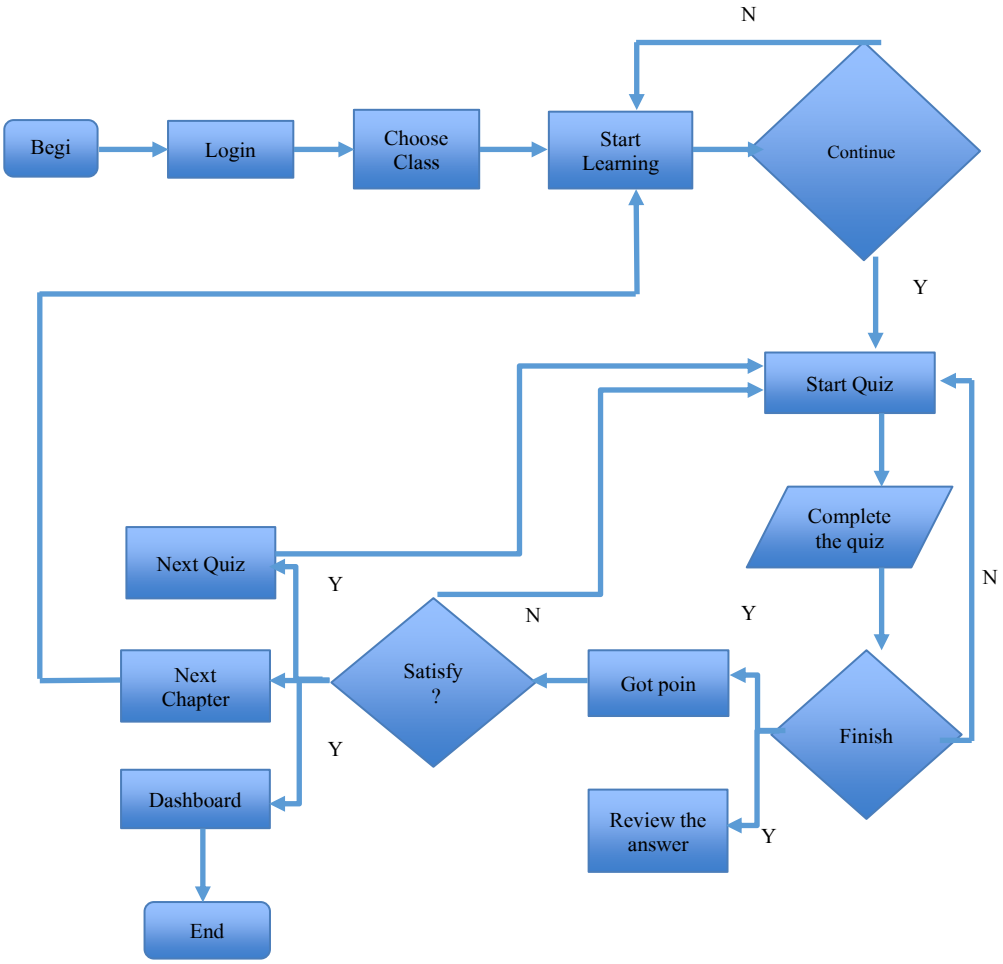

Fig. 5. The game flow on the website LMS

3.4 Prototyping

After gathering ideas in an ideating process, the next step is applying them in the desired form [24]. LSM Pesma will be in the form of a website. Fig. 6 shows the website's homepage after user login, and Fig. 7 shows the class details. If tutors have filled the lesson materials, students can start learning Arabic. It contains textbooks and learning videos.

Fig. 6. Homepage of the website

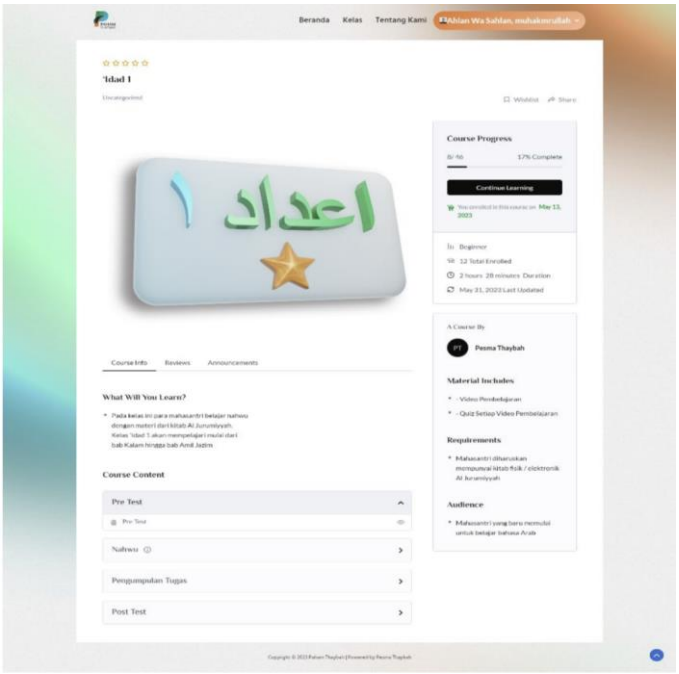

Fig. 7. Detail of the class

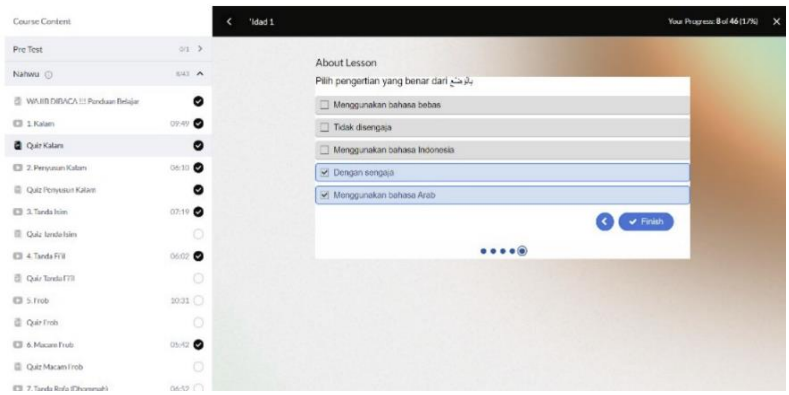

Fig. 8. Quiz page

Fig. 8 shows samples of the quiz in this LMS, and students can make multiple tries on quizzes. At the end of the quiz, students can see the achievement page in Fig. 9.

Fig. 9. Achievement page

3.5 Testing

The last stage of design thinking is a test; this stage is carried out to measure the success achieved on the website [25]. There are ten participants involved in this study who were the students of Pesma Thaybah. The first test was usability testing, shown in Table 1.

Table 1. The result of usability testing

No	Name	Number of task	The task was successfully done	Effectiveness Percentage
1	Ahmad	13	13	100%
2	Andika	13	13	100%
3	Indzar	13	13	100%
4	Daryza	13	13	100%
5	Iqbal	13	13	100%
6	Akbar	13	13	100%
7	Adiputra	13	13	100%
8	Zaid	13	13	100%
9	Ferry	13	13	100%
10	Fachri	13	13	100%

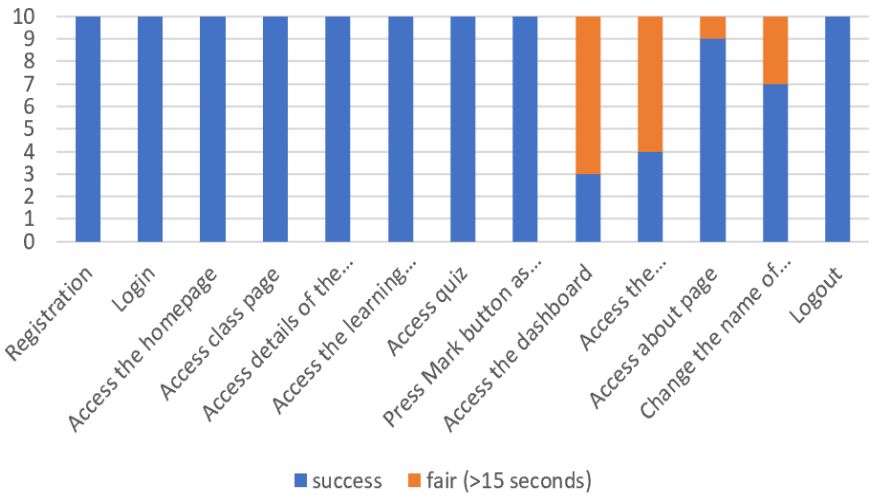

Fig. 10. Usability testing result

Fig. 10 shows the result of usability testing on Table 1 elaborated in more depth and detail, considering how long the students take to complete the task.

Pre-test and post-test are applied in this stage to measure the score. Students are given a pre-test before watching the video material and a post-test after watching the video material. The results of the pre-test and post-test are shown in Table 2.

Table 2. The results of the pre-test and post-test

No	Name	Pre-test score	Post-test score	Score Increase (percentage)
1	Ahmad	19	100	426%
2	Iqbal	86	86	0%
3	Zaid	76	95	25%
4	Ferry	23	33	43%
5	Daryza	76	90	18%
Average		56	81	45%

4 Conclusion

This gamified e-learning system integrated multiple game elements such as points, time pressure, levels, badges, and rewards. The LMS website succeeded in structuring Arabic language learning at Pesma Thaybah. It also succeeded in making students flexible in carrying out Arabic language learning. The result of usability testing was 100%, with details: 69% completed the usability testing task in under 15 seconds, and 31% completed the task in more than 15 seconds.

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