Designing e-Learning Applications Using the Octalysis Gamification Framework

Shaifany Fatriana Kadir[1], Mochammad Augustiar Mahendra[2], Khoirul Muhtadin[3], Daffa Yauzan Tusianto[4], Nanda Badrussalam[5], Imam Auwal Salisu[6]
[1]Department of Digital Business, University of Widyagama Malang, Indonesia
[2,3,4,5]Department of Informatics Engineering, University of Widyagama Malang, Indonesia
[6]Department of Economy Management, Centre for Management Development, Nigeria

Article Info

ABSTRACT

In the digital era, information technology has penetrated various aspects of life, including education, with e-learning and gamification becoming increasingly popular approaches. Gamification in e-learning utilizes game mechanics to increase user motivation and participation in digital learning. The Hedonic-Motivation System Adoption Model (HMSAM) is an important evaluation model for assessing the effectiveness of gamification with a focus on hedonic motivations such as satisfaction and engagement. This study aims to explore the application of HMSAM in evaluating gamification-based e-learning applications, as well as understanding the influence of elements such as Epic Meaning, Accomplishment, and Social Influence on user motivation. This evaluation is expected to produce effective strategies to improve the learning experience and maximize the use of e-learning applications. The research methods include a literature study on Design Principles and the Octalysis framework, the development of Android-based mobile applications using Android Studio and Firebase, and application evaluation using HMSAM. The results of the study are expected to provide important contributions to the design of more effective and enjoyable e-learning applications.

Corresponding Author:

Shaifany Fatriana Kadir
Department of Digital Business
Faculty of Economics & Business, University of Widyagama Malang
Jl. Borobudur No. 35 Malang, Jawa Timur
Email: shaifanyfk@widyagama.ac.id

1. INTRODUCTION

In the continuously evolving digital era, information technology has permeated various aspects of life, including education and learning [1]. One increasingly popular approach is the use of e-learning applications that integrate gamification elements. This approach not only transforms how we view the teaching and learning process but also enhances user interaction and engagement within digital learning environments [2].

Gamification in e-learning refers to the use of game mechanics in the design of learning applications to motivate and increase user participation [3]. The Hedonic-Motivation System Adoption Model (HMSAM) has become an important evaluation model for measuring the effectiveness of gamification implementation in achieving learning objectives [4]. HMSAM emphasizes hedonic motivation such as satisfaction, pleasure, and engagement in using applications [5].

This research aims to explore and delve into the application of HMSAM in evaluating e-learning applications that use gamification. Through this approach, it is hoped to better understand how elements such as Epic Meaning, Accomplishment, and Social Influence affect user motivation in digital learning [6]. The goal

is to develop more effective strategies for enhancing the learning experience and maximizing the use of e-learning applications in various educational contexts.

Given the importance of technology in supporting distance and self-directed learning, evaluation using HMSAM can provide in-depth insights into the adoption of gamified learning technologies and identify factors that influence the success of their implementation [7][8].

The findings from this research are expected to contribute significantly to understanding how gamification can be effectively applied to improve learning through e-learning applications. The implications of these findings are anticipated to impact the design of future e-learning applications, enabling users to experience more enjoyable, meaningful, and effective learning in achieving modern educational goals.

2. METHOD

The research process begins with a literature review on the concept of Design Principles and the Octalysis gamification framework. Following this, an Android-based mobile application is designed by applying the eight core values of Octalysis. The application is developed using Android Studio and Firebase for data storage. After the gamified learning application is completed, the next stage involves evaluating the application using the Hedonic-Motivation System Adoption Model (HMSAM). The final stage includes documenting the research results and writing the manuscript for publication.
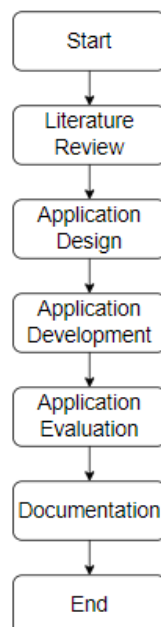

Figure 1. Research Methodology

2.1. Literature Review

The literature review is conducted by examining various sources such as books, scientific articles, journals, conferences, and digital publications. This stage aims to obtain a theoretical foundation covering User Experience (UX), the application of gamification, the Octalysis framework, Human-Centered Design, and application evaluation using the Hedonic-Motivation System Adoption Model (HMSAM).

2.2. Needs Analysis

The initial step in designing an e-learning application is to identify the target users. The users of this application include students, lecturers, and administrative staff. Students require a platform that enhances their engagement in the learning process, motivates them to study harder, and recognizes their achievements. Lecturers need tools that can increase student participation and interaction, as well as the ability to track their progress. Meanwhile, administrative staff require a system that is easy to integrate and manage in daily operations [9].

The primary goal of this e-learning application is to enhance active student engagement in the learning process, encourage their learning motivation, and improve their achievement and understanding of concepts through a more engaging and interactive approach. To achieve this goal, the application must provide an interactive and engaging learning system, integrate gamification elements such as points, leaderboards, and rewards, and offer immediate feedback to students on the tasks they complete [10].

2.3. Application Design

The Octalysis Framework will be applied to ensure that this e-learning application incorporates the eight core drives of motivation. Epic Meaning & Calling will be realized by creating missions or challenges that provide students with epic meaning. Development & Accomplishment will be implemented through a points system, levels, and leaderboards to showcase student achievements. Empowerment of Creativity & Feedback will enable students to be creative and receive instant feedback. Ownership & Possession will provide rewards in the form of avatars or virtual items that students can collect [11].

The process of determining gamification profiles using the Octalysis Framework, developed by Yu-Kai Chou in 2015, is considered the most effective framework for developing gamification projects in an educational context [12]. The results of the motivation analysis or core drives of users with the Octalysis Framework can be seen in the illustration provided in Figure 2.

Figure 2. User Core Drive

3.   RESULTS AND DISCUSSION (10 PT)
3.1. Gamification Elements

The results of the motivation analysis or core drives of users using the Octalysis Framework can be seen in the illustration provided in Figure 3.

Figure 3. Gamification Elements

The gamification design elements based on the analysis of user core drives can be seen in Figure 3. The applied gamification elements include: Epic Meaning, Accomplishment, Ownership, Scarcity, Avoidance, Unpredictability, Social Influence, and Empowerment.

3.2. Implementation Results

The "DailyTask" application is designed to help users manage their tasks effectively. A simple and intuitive login page allows users to access their accounts easily, either by using email and password login or through Google account integration. For users who do not have an account, a clear registration feature is available, where they can create a new account by filling out a simple form or continue using their Google account. This can be seen in Figure 4.
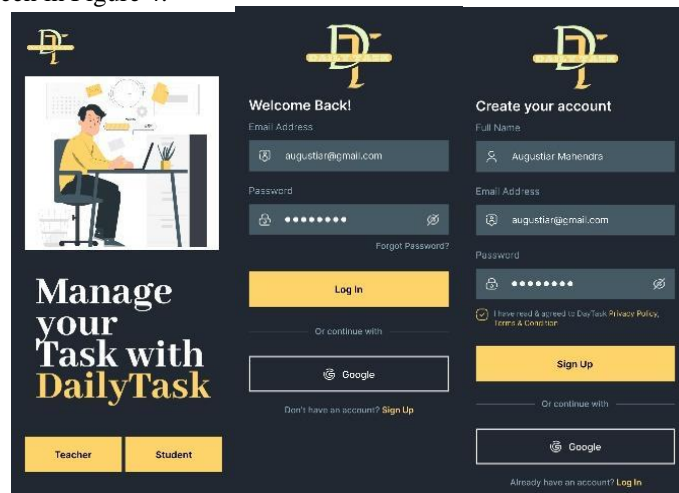
Figure 4. Login Page UI

After logging in, users will be directed to a clean and organized dashboard. Here, users can quickly view tasks that have been completed, are in progress, and are upcoming. The search feature allows users to easily find specific tasks. When viewing task details, users can see comprehensive information such as deadlines, team members involved, and progress. They can also add comments. This can be seen in Figure 5.
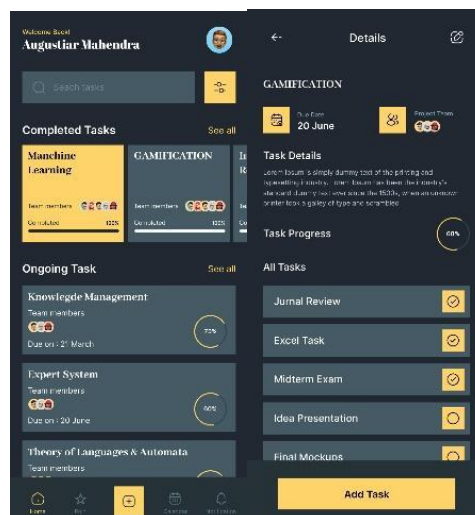

Figure 5. Main Page UI

To manage their profile, users can access the profile page, which provides the option to change their password. A calendar feature is also available to help users view their task scheduling. This can be seen in Figure 6.
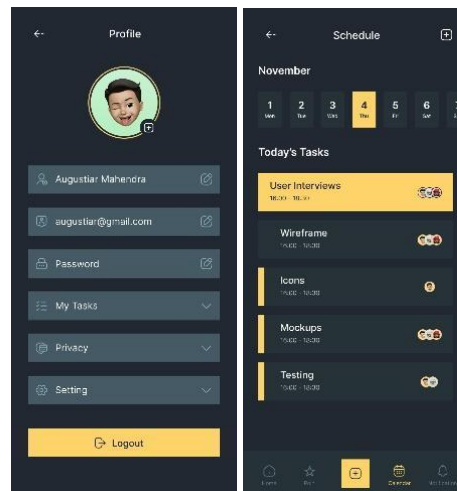
Figure 6. Profile and Schedule UI

The "Points" feature in the "DailyTask" application allows users to track and collect points based on their activities within the app. This feature is designed to increase user engagement and reward achievements or task completions. The "DailyTask" application also includes a Notification feature, which enables users to receive updates and reminders about their tasks. This feature is crucial for ensuring that users stay connected with their tasks and do not miss deadlines or important changes. This can be seen in Figure 7.
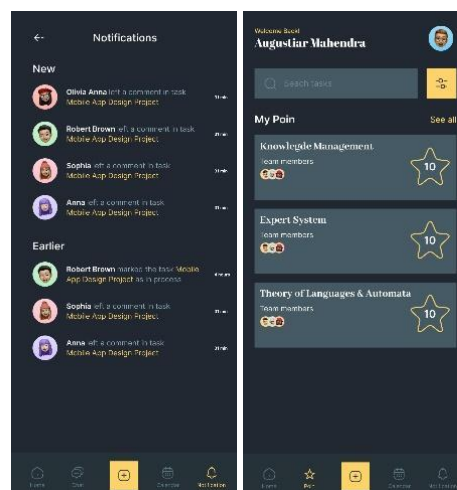

Figure 7. Notification and Point UI

3.3. Evaluation

The evaluation of the DailyTask e-learning application was conducted using a questionnaire that included a link to download the application. The sampling method used was convenience sampling, which is commonly employed in research with an unknown population size. A total of 30 respondents completed the survey based on the provided application link. The survey results were evaluated based on the Hedonic Motivation System Adoption Model (HMSAM) questions using a Likert scale. The survey results yielded the following values:

1. Perceived ease of use with an average of 83.3%.
2. Perceived usefulness with an average of 93.3%.
3. Curiosity with an average of 73.3%.
4. Control with an average of 80%.
5. Joy with an average of 80%.
6. Behavioral intention to use with an average of 90%.
7. Focused immersion with an average of 86.7%.

The evaluation data of the Android-based DailyTask e-learning application, which uses gamification methods, shows positive results across various aspects. For the Perceived Ease of Use aspect, the average score reached 83.3%, indicating that the majority of users find the application easy to use. The intuitive interface and simple navigation facilitate user interaction with the application.

The Perceived Usefulness aspect received the highest average score of 93.3%. This indicates that users find the application very helpful in achieving their learning goals. This score suggests that the features implemented in the application are effective in supporting the learning process.

Curiosity, reflecting the level of user interest and curiosity, achieved an average score of 73.3%. Although relatively high, this aspect still has room for improvement to make the application more engaging for users.

For the Control aspect, users gave an average score of 80%. This indicates that users feel they have adequate control when using the application, allowing them to navigate and use the features easily. Additionally, the Joy aspect also received an average score of 80%, indicating that users enjoy and find pleasure in their experience using the application.

Behavioral Intention to Use received a very high average score of 90%. This suggests that users have a strong intention to continue using the application in the future, reflecting the application's success in attracting and retaining users.

Finally, the Focused Immersion aspect achieved an average score of 86.7%. This indicates that users feel highly engaged and focused while using the application, creating a deep and interactive learning experience.

Compared to related studies, such as those conducted by Misbah et al. [13] and Pratama & Susanto [4], this application demonstrates better results in almost all aspects. The evaluation results indicate that the application of gamification using the Octalysis framework in this learning application has successfully enhanced various aspects of user motivation and engagement, thereby creating a more effective and enjoyable learning experience.

4. CONCLUSION

The Android-based e-learning application DailyTask, developed with a gamification approach using the Octalysis framework, has been successfully developed and implemented. The gamification elements incorporated include achievement, leaderboard, border, and points. The evaluation of the application involved 30 respondents, showing that the application achieved 90% for Behavioral Intention to Use and 86.7% for Focused Immersion. These results indicate that respondents strongly agree that the gamification methods in the learning application enhance users' desire to continue using the application. Respondents also agreed that users find it easy to engage with and remain focused while using this educational application.

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