CHAPTER I
INTRODUCTION

1.1 Background of the Study

E-learning is an innovative tool used to support learning activities for students and lecturers. Asynchronous learning through E-learning can help overcome the limitations between lecturers and students in terms of space and time. As a result, E-learning makes learning more practical and efficient. (Ulinuha et al., 2022). One of the universities that has implemented asynchronous learning through E-learning is Universitas Pendidikan Ganesha (Undiksha). The e-learning system that has been implemented is an open-source Learning Management System (LMS) called Moodle.

Many universities have implemented the use of E-learning LMS, but in practice, the E-learning platform is still not well utilized in asynchronous learning. LMS systems, such as Moodle, which are widely used in universities, also have weaknesses, including limited asynchronous interactions that do not support diverse student learning styles and can lead students to cheat by copying answers from their classmates. (Deliwe, 2020) From the students' perspective, a lack of motivation and boredom during learning, as well as excessive access to information through the use of other applications during the learning process, are factors that contribute to a decrease in learning motivation and negatively impact the quality of student learning. (Rabbanie et al., 2022; Rafique et al., 2021; Zulfi & Syofyan, 2021). This hurts students because motivation to learn is an essential factor in maximizing the quality of education. Learning outcomes will be optimal when there is high motivation, resulting in positive learning experiences. (Datu et al., 2022). Based on interviews with e-learning user students at Undiksha, conducted to understand their learning experience with e-learning, which has been running with questions and answers attached in attachment 1 and attachment 2, they said that:

1. Limited Material Format

   The e-learning materials currently available are only in the form of PDF documents, PowerPoint presentations, and YouTube links.

2. Interaction and Learning Discussions

   Discussion forums in e-learning are often considered less interactive than face-to-face discussions, which can facilitate a deeper understanding.

3. Understanding of the material

   Students have not yet felt focused and understood asynchronous learning materials without direct guidance from lecturers.

4. Learning Model Preferences

   Students prefer face-to-face learning because it facilitates understanding and problem solving compared to e-learning.

5. E-learning as a Platform for Assignment Submission

   E-learning is used more frequently, or only for collecting assignments, and using e-learning due to the lecturer's instructions

Based on the results of the interviews documented in Attachment 3, it was found that despite the e-learning website being operational, some students faced problems. These problems indicate opportunities for developing e-learning methods at Undiksha, especially to overcome the limitations of asynchronous learning interactions that are not in line with students' learning styles (Astiti et al., 2021; Pham et al., 2021). This interview is not intended to improve existing e-learning, but to understand user experiences and needs as key references in developing learning activities.

As one solution to address these challenges, previous studies have revealed the potential of mobile learning technology to improve the quality of learning. Mobile learning can address issues of interaction and time flexibility, facilitate distance learning, improve communication, support independent learning, and increase student motivation and learning outcomes. (Chetri, 2020; Eom, 2023; Zhampeissova et al., 2020). Therefore, this study aims to develop e-learning based on the design prototype of Undiksha mobile e-learning, as presented in Putu Dhanu Driya's research.

One approach that can be used to address this issue is gamification.

Gamification is the integration of game elements into a non-game context. (Khaldi et al., 2023). It has been proven that the concept of gamification can encourage students to learn, motivate them to progress, and increase their interest in learning, thereby enhancing engagement and positively impacting the quality of education.(Abu-Hammad & Hamtini, 2023; García-López et al., 2023; Pakinee & Puritat, 2021; Puspitasari et al., 2023; Watini & Setyowati, 2023). In the context of higher education, research conducted by (Bencsik et al., 2021) Shows that the use of Gamification in management courses at universities indicates that Gamification can be applied to almost all courses, both theoretical and practical.

According to research on the design of the mobile e-learning UI/UX at Universitas Pendidikan Ganesha conducted by Putu Dhanu Driya, there is potential for the application of gamification elements. The user interface designs for My Profile, Class Assignment, Class Exam, Class Attendance, Video Material, and Class Dashboard are designed in a way that allows for the addition of gamification elements. If gamification elements, such as points, badges, leaderboards, and quests, are implemented, they can enhance participant engagement and motivation compared to e-learning without these elements. (Chukwu, 2024).

Previous research related to gamification in LMS has been conducted extensively. Gamification-based e-learning research was conducted by Arifin et al. (2022). In his research, he employed the Design Science Research Methodology to incorporate gamification elements, including levels, Points, Leaderboards, and Badges. The study noted that e-learning with gamification elements is considered innovative and appealing by its users. Furthermore, research conducted by Atin et al. (2022) includes core drives, epic meaning, and social influence for the implementation of mathematics applications with gamification features, such as levels, challenges, points, progress bars, and badges. This study demonstrates an increase in understanding and motivation among students after they use the application. Building on this research, a study conducted by Buchem et al. (2023) employed gamification using the Octalysis framework. Researchers found that core drives that did not align with user preferences, such as CD 4 Ownership with the avatar element, and CD 5 Social Influence with the Friendship element, were ineffective among older adults aged 65 to 93 years. The research results indicate

that the application of core drives can enhance learning engagement; however, certain core drives, such as CD Ownership and Epic Meaning, have not been effectively applied, meanwhile, in the research conducted. A research study conducted by Garnisa et al. (2023) attempted to implement gamification in e-learning on the Moodle LMS using only the H5P plugin with the levelUp feature, displaying a leaderboard or scoreboard, and offering badges. The research resulted in gamification elements that have been integrated into the Moodle LMS. Similar research was conducted by Landebila et al. (2023) on applying gamification to the LMS Moodle in visual communication design courses within Industry 4.0. The method used in this research is R&D with the ADDIE model. The researcher attempted to apply the H5P gamification plugin, including interactive video and crossword puzzles. The results indicate that the implementation of gamification on the LMS is deemed highly feasible based on validation tests. Related research has also been conducted by Brian et al. (2024). This study designs a gamification-based mobile application for distance learning. The gamification elements used are levels, points, badges, and challenges. Testing of the gamification elements and usability was conducted using the UES and UEQ-SF. The researchers state that the results of the prototype application design testing indicate an increase in student motivation and engagement.

Based on the previous studies mentioned above, this study aims to incorporate gamification elements into Undiksha's mobile UI/UX, utilizing the core drive of octalysis. The Octalysis framework can provide an intuitive, engaging, and user-friendly UX design, while also delivering interactive online learning and enhancing learning motivation. (Inano, 2024; Pratama & Kusuma, 2022; Rao, 2020). The gamification elements to be implemented are elements of the Octalysis framework. The Octalysis framework is a gamification design framework designed to analyze and build gamification implementation strategies (Yu-Kai Chou, 2015a). The Octalysis framework consists of eight core drives (CD) that represent the primary motivations behind human decision-making, including CD 1 Epic meaning & Calling, CD 2 Development & Accomplishment, CD 3 Empowerment of Creativity & Feedback, CD 4 Ownership & Possession, CD 5 Social Influence, CD 6 Scarcity & Impatience, CD 7 Unpredictability & Curiosity, CD 8 Loss & Avoidance. To

enhance user engagement and motivation in e-learning, gamification elements will be designed based on the appropriate core drives. The CDs to be applied in this e-learning gamification are CD 2 Development & Accomplishment, CD 3 Empowerment of Creativity and Feedback, and CD 4 Ownership & Possession because the gamification elements in these core drives are practical Gamification elements for learning and are widely used in formal education e-learning, as the related gamification elements can enhance motivation, engagement, and a sense of ownership among students. (Afirando et al., 2023; Marisa et al., 2020; Mazarakis & Bräuer, 2023). Research by (Maukar et al., 2022) shows that the application of collaborative gamification in online learning systems can support the concept of independent learning, with eight core drives identified indicating that students' learning motivation is at a high level, one of which is the use of CD 2, CD 3, and CD 4, which play a role in increasing student engagement and motivation. Another study also shows that gamification elements, such as points, badges, leaderboards, levels, and challenges, are frequently used in higher education. This literature review, conducted by Khaldi et al. (2023), identified that these elements are the most commonly used in digital learning systems. A researcher (Afirando et al., 2023) also demonstrates that elements such as progress bars, avatars, and points are frequently associated with CD2, CD3, and CD4 in both formal and informal learning contexts. In addition, studies (Fahim et al., 2025) support the notion that Accomplishment and Empowerment are the main drivers in maintaining user motivation in e-learning. Conceptually, core drives 1 to 4 are positive motivators, or White Hats, that are more suitable for an educational context, compared to core drives 5-8, which tend to create pressure or Black Hats and are less ideal for long-term learning systems. (Yu-kai Chou, 2016).

When evaluating gamification elements, it is crucial to measure user engagement. Therefore, gamification element testing will utilize the UES-SF (User Engagement Scale – Short Form) method. The UES can measure engagement with validity in the context of games and help provide quick feedback on prototypes designed by the designers. (Brian et al., 2024; García-Jurado et al., 2021; H. O'Brien & Cairns, 2015; Wiebe et al., 2014). In application display testing, methods are used to test the designed interface. Interface usability testing will use task

scenarios. Task scenarios are actions instructed to participants to complete certain task stages in the interface design being tested. (Azhar et al., 2021; McCloskey, 2014). The usability aspects of the task scenario include learnability, efficiency, and errors. The usability evaluation will be conducted by students who have used Undiksha e-learning. The selection of students as participants is based on the fact that they are the primary users of the e-learning system. Participants are selected from five different faculties to represent the diversity of users in terms of academic background and learning styles. The selected faculties include the Faculty of Engineering and Vocational Studies, the Faculty of Science, the Faculty of Languages and Arts, the Faculty of Law and Social Sciences, and the Faculty of Economics. This approach aligns with the principle of diversity in UX evaluation, which emphasizes the importance of cross-context representation to achieve inclusive and broadly relevant results. (Goodman et al., 2013; Nielsen, 2012; UserTesting, 2023). This is also in line with previous studies that used students as target users in the context of online learning, because students are the direct users of the system. (Huber et al., 2023; Rivera & Garden, 2021). Meanwhile, the Faculty of Education, the Faculty of Medicine, and the Faculty of Sports were not involved, as their learning models tend to focus on field practice, motor skills, physical interaction, and laboratory use. Therefore, this study limits the scope of participants to five faculties deemed most suitable for testing the UI design and gamification elements within the context of digital learning. Consequently, this study will design a mobile interface incorporating gamification elements based on the Octalysis framework, as informed by previous research on mobile e-learning UI/UX design.

1.2 Problem Formulation

Based on the background described above, the formulation of the problem in this study can be summarized as follows.

1. Undiksha's e-learning has not yet provided an interactive learning experience that suits students' learning styles, as evidenced by the limited format of the material, the lack of interactive discussion forums, and the Tendency for students to find face-to-face learning easier.
2. The lack of gamification in the learning experience of students on Undiksha's mobile e-learning UI/UX, as conducted by previous

researchers.

The research questions that arise are as follows.

1. What are the results of the gamification design on the mobile e-learning UI/UX of Universitas Pendidikan Ganesha?
2. What are the results of the user engagement evaluation regarding the implementation of gamification on the mobile e-learning UI/UX of Undiksha based on UES-SF and Task Scenario testing?

1.3 Research Objectives

Based on the problems outlined above, the objectives of this study are as follows.

1. Understanding the design of gamification implementation in the UI/UX of Ganesha University of Education's mobile e-learning using the Octalysis Framework.
2. Evaluate user engagement based on the results of UES-SF and Task Scenario testing after implementing gamification in the UI/UX of Ganesha University of Education's mobile e-learning platform.

1.4 Scope and Limitations

To make this research more focused, the scope of the study is defined by the scope of the problem, which encompasses the following aspects.

1. The research will focus on the mobile e-learning prototype from previous research.
2. Usability testing using task scenarios only focuses on the aspects of learnability, efficiency, and errors.
3. Gamification testing using the short form version of the User Engagement Scale (UES).
4. Only use one sample course from an interdisciplinary course.
5. The evaluation will be conducted on Undiksha students who have used the existing e-learning website, with a total of 5 participants.
6. Usability testing and gamification will be conducted online, remotely via the Zoom platform.
7. Core Drives Octalysis used include CD 2 Development &

Accomplishment, CD 3 Empowerment of Creativity & feedback, and CD 4 Ownership & Possession.

8. The evaluation was only conducted on the design prototype and not on the existing e-learning LMS system.

1.5 Significance of the Study

Based on the study's problems and objectives, the benefits that can be obtained are as follows.

For Universitas Pendidikan Ganesha:

1. Could provide an overview of the Octalysis Framework in the design of gamification elements in e-learning.
2. Could provide suggestions for developing gamification elements in e-learning at Universitas Pendidikan Ganesha.
3. Could be used as a reference for LMS developers in designing gamification features that suit learning needs.

For Reader:

1. Can be used as a reference if similar research is conducted in the future.
2. Could expand knowledge in the field of Human Computer Interaction.