**CHAPTER I**

**PROJECT BACKGROUND**

This chapter presents the project context, the purpose, and the description of the study. Its general and specific objectives, scope and delimitation, and the significance of the study. In the last part of this chapter, a project dictionary defines the terms used conceptually, technically and operationally for better understanding and clarity.

**Introduction**

Education has continually evolved with advancements in technology, paving the way for innovative learning methods. While traditional learning methods are effective, they often lack engagement and motivation, particularly in complex subjects that require deep analytical thinking and problem-solving skills. The integration of gamification in educational applications has proven to be a promising approach to enhancing student engagement and knowledge retention. In recent years, mobile learning applications have gained significant traction due to their accessibility and convenience. Android-based learning applications, in particular, offer a user-friendly and cost-effective platform for students to expand their knowledge beyond traditional classroom settings. Leveraging gamification within an Android learning application can create an immersive learning experience that fosters a deeper understanding of complex subjects while making the process enjoyable and interactive. This study focuses on developing a Gamified Android Learning Application designed to assist college students in their learning. By integrating gamification elements, the application aims to enhance student engagement and promote an active learning environment that caters to various learning styles.

Globally, digital and automated learning systems are recognized for transforming education by providing interactive learning environments. Gamified learning, in particular, has been shown to reduce stress, improve comprehension, and support collaborative learning across diverse fields. This aligns with the study by Demir and Akpinar (2018) titled “The Effect of Mobile Learning Applications on Students' Academic Achievement and Attitudes Toward Mobile Learning” finds that mobile learning can positively influence academic achievement, with participants exhibiting significantly high attitude scores toward mobile learning. Furthermore, students recognize mobile learning as an effective approach to enhance their motivation. Additionally, the findings of Alsawaier (2018), who emphasizes that gamification can significantly enhance motivation and engagement among students in his study titled “The Effect of Gamification on Motivation and Engagement”. By integrating game elements into the learning process, educators can create a more engaging experience that gives deeper understanding among students. This connection highlights the potential of gamification as an effective strategy to enhance educational outcomes and adapt to the evolving needs of learners in today's digital landscape. These insights suggest that mobile learning applications can have a positive impact on students' academic performance.

In the Philippines, the educational system has increasingly focused on equipping Filipino students to compete globally. Technology has become instrumental in helping educators enhance students' conceptual understanding, enabling them to apply their skills in real-life contexts. However, motivating students remains a significant challenge for teachers, as learners' engagement varies from one generation to another. Addressing students' conceptual understanding, particularly in science education, is crucial and can be achieved through effective motivational strategies. Gamification has emerged as a promising approach to integrate technology, aiming to improve students' conceptual understanding and enhance their motivation in learning science. A study by Furio (2019) investigates the effects of gamification on Grade 7 students' conceptual understanding and motivation in a Junior High School in Valenzuela City. The research employs an experiment with two groups: one receiving conventional teaching and the other engaging in a gamified teaching approach. The findings reveal that while students in the conventional group exhibit better conceptual understanding, those in the gamified group demonstrate higher levels of motivation. The study identifies specific gamification elements, such as points and teamwork that significantly influence students' motivation to learn. The results underscore the need for collaboration among students, educators, and school administrators to implement gamification strategies effectively. Further research is encouraged to develop systematic methodologies for instructional design in gamified learning environments (Furio, 2019).

Locally developed, indigenized game-based instructional materials have shown promising results in enhancing student engagement and comprehension, especially in public school settings. A study by Lotivio and Bercasio (2022) developed the Portable Science Playhouse (PSP) as a game-based tool tailored for Grade VI Science students in Albay, Philippines. This instructional material incorporated recyclable and local resources to present lessons on mixtures through interactive and culturally relevant activities. The study found that PSP significantly improved students' understanding of different mixtures compared to conventional methods. The integration of gamified strategies within the lesson phases fostered a collaborative, learner-centered environment, demonstrating the effectiveness of game-based learning. Results suggested that the game-based approach had a greater impact on students’ proficiency than traditional techniques, supporting the value of indigenized, interactive materials in science education.

In conclusion, this study highlights the powerful potential of gamified and mobile learning in transforming educational outcomes for students. As evidenced by various studies, incorporating game-based and mobile learning strategies can improve academic achievement, motivation, and engagement across a range of educational fields, including science, technology, and social issues. This approach not only give a more dynamic and immersive learning environment but also aligns with global and local trends in educational technology by addressing the evolving learning preferences and needs of students.

**General Objective** To develop “Gamified Android Learning Application”, designed to enhance learning engagement and comprehension for college students at Osmeña Colleges. The app aims to provide a gamified approach to the subject “Advance Probability and Statistics”, making learning both interactive and effective.

**Specific Objectives**

Specifically, the study aims to:

1. Ensure user-friendly navigation and accessibility by designing an intuitive interface that accommodates students of all learning paces and technical proficiency levels.
2. Ensure academic credibility by integrating lessons and quizzes derived from valid and reputable sources, maintaining accuracy and reliability in the learning materials.
3. Integrate a reward-based system that motivates students through badges, points or progress tracking to encourage engagement and continuous learning.
4. Design the application to function exclusively offline, ensuring that all features, including lessons, quizzes, and progress tracking, are accessible without any internet connection, making it fully independent of online networks.
5. Evaluate the system using ISO 25010 of
   1. Functional Suitability
   2. Performance Efficiency
   3. Usability
   4. Reliability
   5. Maintainability
   6. Security

**Scope and Delimitations**

The study titled “Gamified Android Learning Application” focuses on developing an educational tool specifically for college students at Osmeña Colleges. The application is designed to provide an intuitive and user-friendly interface that accommodates students of all learning paces and technical proficiency levels. It incorporates interactive learning elements such as problem-solving exercises and visual aids to help students grasp complex statistical concepts effectively. To ensure academic credibility, all lessons and quizzes are sourced from valid and reputable references, maintaining accuracy and reliability. The system includes a reward-based to motivate students and encourage continuous learning. Additionally, the application is designed to function exclusively offline, ensuring that all features, including lessons, quizzes, and progress tracking, remain accessible without an internet connection, making it fully independent of online networks.

The system is limited to Android devices, excluding compatibility with other operating systems such as iOS, Windows, and Linux. It is not designed for desktop or remote use. The app supports only the subject “Advance Probability and Statistics”, excluding other subjects offered at Osmeña Colleges. Additionally, the application is restricted to single-player gameplay and does not include multiplayer interaction or online database connectivity, as all user data is stored locally within the application.

**Locale of the Study**

The study was conducted at Osmeña Colleges, located in Masbate City, Masbate, Philippines. Masbate is strategically positioned at the center of the Philippines, bridging the two major island groups of Luzon and Visayas. Administratively, it is part of Region V, and politically associated with the Luzon Island group. However, from a biogeographical and sociolinguistic perspective, Masbate has strong affiliations with the Visayas. Figure 1 shows the map of Province of Masbate, Figure 2 shows the map of Masbate City, Figure 3 shows the map of Osmeña Colleges.

Figure 1

MAP OF MASBATE PROVINCE



Figure 2

MAP OF MASBATE CITY

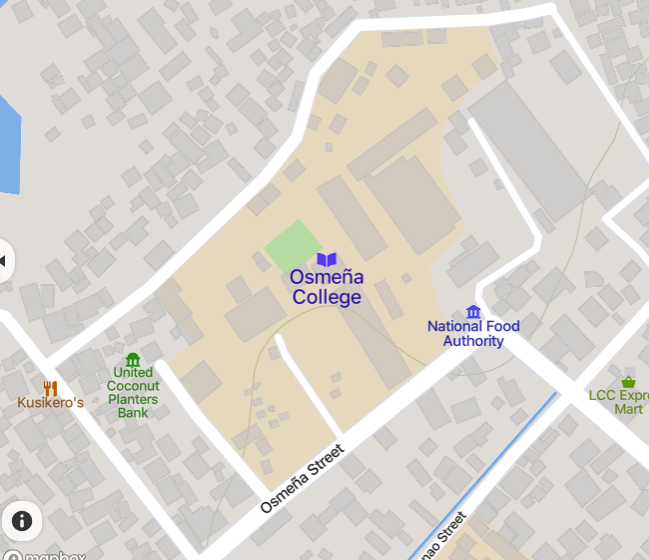


Figure 3

MAP OF OSMEÑA COLLEGES

**Significance of the study**

The study deemed significant for the following:

**Osmeña Colleges**. This project enhances the institution's educational offerings by showcasing technology-driven learning resources that align with global standards.

**Educational Institutions**. As the country strives to improve its educational standards, this study provides a model for integrating gamification in learning applications. This may encourage them to explore similar learning solutions to foster better academic outcomes.

**Researchers**. This study contributes to the expanding field of educational technology, particularly within gamified learning. Researchers can use insights from this study as a basis for further studies, potentially exploring gamification’s impact in other academic fields and educational settings.

**Project Dictionary**

The following terms related to the research are conceptually and operationally defined to enhance the reader's understanding:

**Gamified Learning**. An approach to education that applies game-design elements and principles to non-game contexts to enhance user engagement, motivation, and learning outcomes.

**In-App Database**. A database embedded within a mobile or desktop application that allows for the local storage, retrieval, and management of data directly on the user's device. This type of database enables the application to operate offline, ensuring that users can access and interact with their data without requiring a continuous internet connection.

**Educational Tool**. Any resource or tool designed to enhance the teaching and learning process, providing support for knowledge acquisition and skill development in various subjects or fields.

**Functional Suitability**. A measure of how well a system's functions and features meet the needs and requirements of users, ensuring that the intended tasks can be effectively accomplished.

**Gamification**. The integration of game mechanics, dynamics, and aesthetics into non-gaming applications to drive user participation, improve engagement, and promote specific behaviors or outcomes.

**Game-Based Instructional Materials**. Learning resources that utilize game principles, mechanics, and narratives to facilitate education, making the learning experience interactive and enjoyable.

**Operating System**. Software that manages computer hardware and software resources and provides services for computer programs. The operating system acts as an intermediary between users and the computer hardware, enabling users to perform tasks and run applications.

**Windows**. A series of operating systems developed by Microsoft, designed for personal computers, tablets, and other devices. Windows provides a graphical user interface (GUI) that allows users to interact with the system through windows, icons, and menus. It supports a wide range of software applications and hardware, making it one of the most popular operating systems worldwide. Windows is known for its user-friendly experience, extensive software compatibility, and regular updates, which enhance security and performance.

**Linux**. An open-source operating system kernel that serves as the foundation for various operating systems (distributions). Known for its stability and flexibility, Linux is widely used in server environments, embedded systems, and as a desktop operating system by enthusiasts.

**iOS**. A mobile operating system developed by Apple Inc. for its hardware, including the iPhone, iPad, and iPod Touch. iOS is known for its user-friendly interface, high security, and seamless integration with other Apple products.

**Single-Player Gameplay**. A mode of play in video games where a single player engages with the game, usually completing missions or challenges without the involvement of other players. This mode focuses on the individual player's experience and progression.

**Biogeographical**. Pertaining to the study of the distribution of species and ecosystems in geographical space and through geological time. It examines how biological diversity is distributed across different regions and how environmental factors influence this distribution.

**Sociolinguistic**. Referring to the study of how language varies and changes in social contexts. It examines the relationship between language and society, focusing on aspects such as dialects, sociolects, language attitudes, and the impact of social factors like ethnicity, class, and gender on language use.

**Maintainability**. The ease with which a system or application can be updated, modified, or repaired, ensuring that it remains functional and effective over time.

**Performance Efficiency**. The ability of a system to deliver results effectively while utilizing resources optimally, ensuring minimal delays and maximizing output quality.

**Notes**

Alsawaier, R.S. (2018), "The effect of gamification on motivation and engagement", International Journal of Information and Learning Technology, Vol. 35 No. 1, pp. 56-79. <https://doi.org/10.1108/IJILT-02-2017-0009>

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