

A GAMIFICATION APPROACH TO INNOVATE THE TEACHING AND LEARNING OF MALAY SPELLING: 'EJA²BM'

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Abstract

The gamification approach is one of the game-based teaching methods in the 21st-century learning trend. Eja²BM is a digital game designed for teaching and learning based on Malay language abilities, particularly spelling. Based on past research, the spelling aspect is emphasised since students in higher education institutions continue to make frequent spelling errors. Therefore, the purpose of this research is to design a gamification application based on Malay spelling to address this issue. A random sample of 25 undergraduate students participated in a pre-test by completing a questionnaire on their background and user requirements. Earlier work included the creation of the Rakan Bahasa video kit (F.1896) and the RakanBM mobile application (UKM.IKB.800-4/1/3954). The gamification of Eja²BM is a continuation of the preceding development. Five stages from Rosset's (1987) ADDIE (Analysis, Design, Development, Implementation, and Evaluation) methodology are incorporated into the creation of Eja²BM. In order to create gamification for innovation in gadgets, the MDA (Mechanics, Dynamics, and Aesthetic) framework is employed as a design template. This application is a story-driven simulation which incorporates aspects of Malay culture, specifically traditional Terengganu Malay dwellings and folk songs. Eja²BM gamification focuses on foundational terms and individual words that are frequently misspelt, and it incorporates a number of engaging instructional features, such as animation, music, and quiz games, into the course's core material, each of which is adapted to the student's current proficiency level. Previous studies have shown that students' attitudes and actions can be influenced by digital media, making the teaching and learning process more engaging, stimulating, and entertaining. With constructive use of the gamification approach, the ease of teaching and learning the Malay language would be better improved, thus its status elevated.

Keywords: ADDIE model, gamification, innovation, Malay spelling, teaching and learning

1.0 INTRODUCTION

The Education Act of 1961 specified a uniform schooling system by establishing Malay as the primary medium of instruction in all schools, regardless of national or national-type schools. This was implemented so that students would receive consistent educational experience. A passing grade in the Malay language subject is essential to earning the Malaysian Certificate of Education (SPM), a national examination that is mandated by the Constitution of Malaysia

(2003). Consequently, the Dewan Bahasa dan Pustaka (DBP) was entrusted with planning, research, and advocating the Malay language (Asmah 2008).

DBP has adopted language corpus planning, which entails the writing system, vocabulary, and spelling system, in an attempt to strengthen and preserve the Malay language. As a component of the linguistic structure, the spelling system emphasises the harmonic pattern of Malay vowels, the spelling of loanwords, and the spelling of basic words and derivative terms. (Ministry of Education Malaysia 2018). Abdul Hamid (2004) noted that the Malay alphabet consists of 26 letters, from a to z, whereas the six main phonemes or vowel sounds are represented by the letters a, e, i, o, u and 26 consonant letters, including the five combining letters gh, kh, ng, ny, and sy. Early literacy, which in the context of learning Malay involves teaching children to recognise letters and then moving on to teaching them how to spell syllables, is the point at which development in learning Malay begins. The process of learning the spelling of individual words will help to solidify the syllables that have already been acquired. A word is considered to be single if it does not undergo any of the processes that are involved in the development of new words, such as adding, pluralising, or doubling. Even though the language system has been taught and adapted to students in a wide range of settings, both inside and outside of the classroom, mistakes in spelling and grammar are still common. The Malaysian Ministry of Education's analysis of the SPM Malay language examination for the years 2019 to 2021 demonstrates this. The challenge provides researchers with the opportunity to develop approaches that teachers and students can employ in the PdP process.

According to Deterding et al. (2011), one of the methods that is suitable for the features of learning in the 21st century is through the use of gamification. In addition, this is consistent with the transformation of PdP that was implemented by the Malaysian Ministry of Education. Gamification is described as the use of game design features to non-gaming contexts (Deterding et al. 2011). Games, according to Khairudin and Normah Dali (n.d.), are digital games designed solely for amusement, whereas gamification is a digital game that promotes game-based learning (GBL). Gamification is defined by Kapp and Cone (2012) as a concept that employs game-based mechanics, aesthetics, and thinking game to engage players in encouraging behaviours, promoting learning, and solving issues.

RESEARCH METHODOLOGY

The ADDIE paradigm, first proposed by Rosset (1987) and depicted in Figure 1, is used in the creation of this gamified innovation. This model entails five stages of creation: analysis, design, development, implementation, and evaluation. The first phase, known as the analysis phase, is divided into two distinct processes: the process of analysing library data and the study of gamification needs. Library data is analysed to determine basic word/single word spelling errors and then categorised into basic word/single word spelling error patterns, while gamification requirements are determined by establishing the level progression of the basic word/single word spelling training module, the storyboard's contents, animated objects and elements based on

traditional Malay cultural themes, and the game's educational and entertaining components. Second, the design and development phase examines the gamification storyboard, the basic word/single word spelling training module, the general knowledge module on the concept of a typical Malay dwelling, and the gamification template based on the MDA Framework. Next, throughout the development phase, storyboards, flowcharts (system behaviour), interface design, and software identification are created. The third phase, which is the implementation phase, entails coding for the Eja²BM gamification application development. The study procedure concludes with data gathering techniques for establishing the validity of language experts, gamification experts, Malay house experts, pre- and post-test evaluations, and usability and acceptance questionnaires. The developed application is evaluated to determine its degree of effectiveness. Figure 1 depicts the framework of the Eja²BM gamification application development technique.

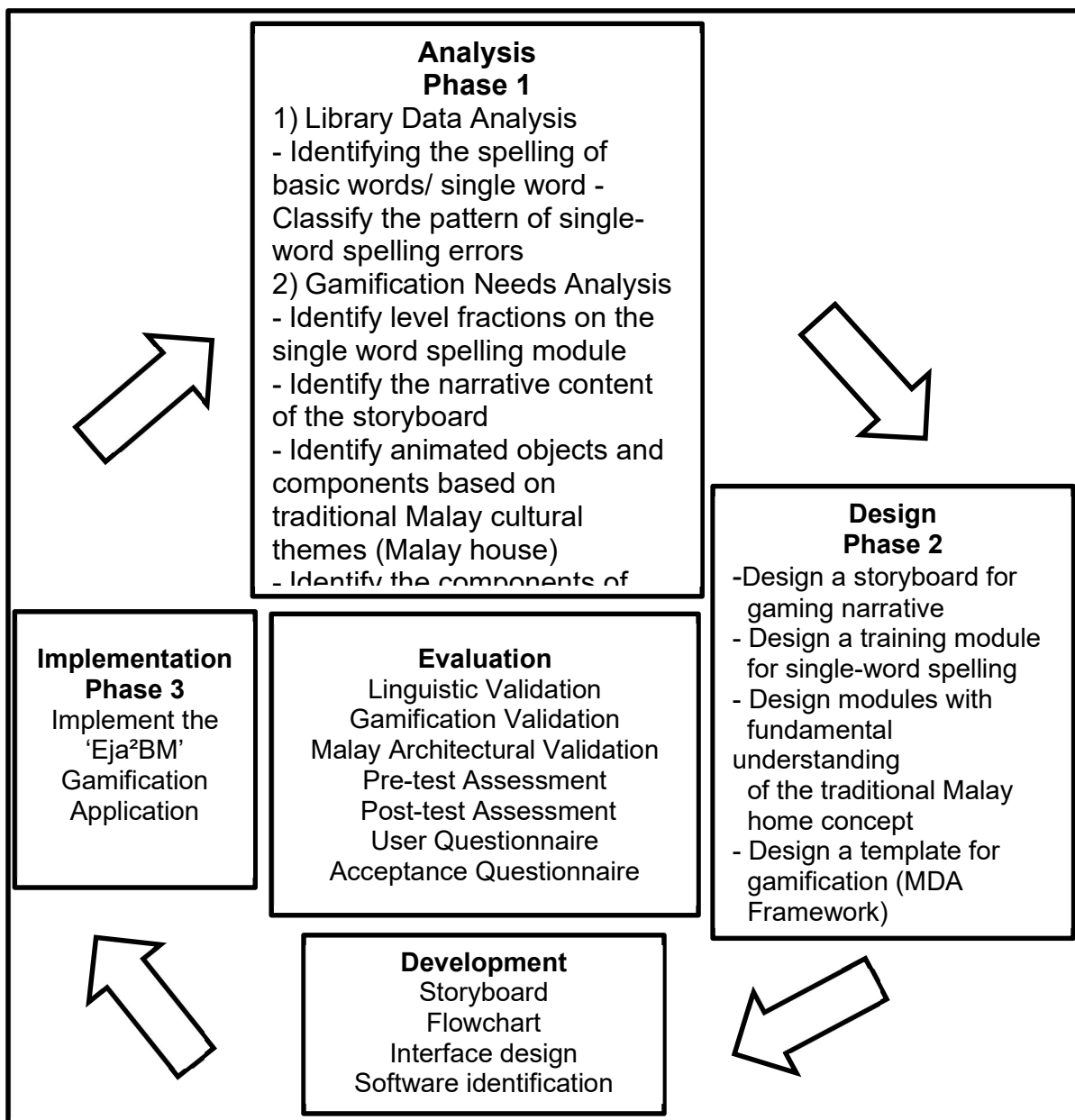


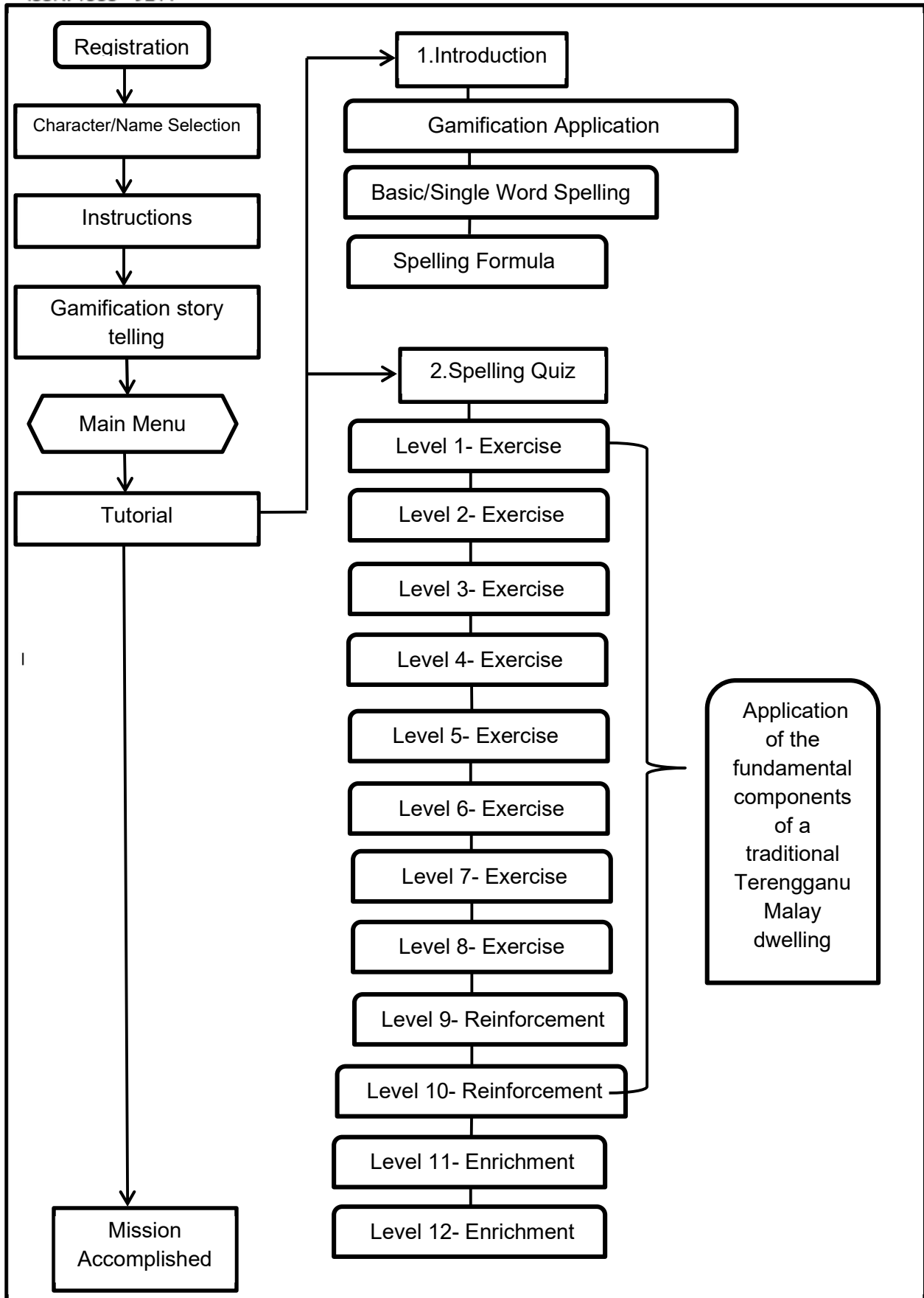
Figure 1: Eja²BM Gamification Application Development Methodology

2.1 Eja²BM Gamification Innovation Design Process

The innovative design for Eja²BM gamification is comprised of two processes: the Eja²BM gamification navigation flow chart and the Eja²BM gamification content.

2.1.1 Eja²BM Gamification Navigation Flowchart Design

The Eja²BM Gamification flowchart begins with signing in with an email address and password and submitting personal information, like name, gender, and school or institution. The next step in the gamification process involves selecting a gender and character (male or female, Mek or Awang) before giving that persona a name. The gamification's characters' subplots are then revealed. In order to continue with the gamified learning, players must select the tutorial button. In addition, players must read an introduction to the gamification programme, an overview of the three primary word/single word spelling groups (Jati Malay words, related Malay words, and foreign adaption Malay words), and spelling formulae. Once the player has followed all the steps, they will enter the basic word/single word spelling quiz phase, which includes 12 levels, and will be asked questions regarding the notion of elements in a typical Malay house in order to accomplish the gamified goal to repair and refurbish the house. Figure 2 is the flowchart used to describe the movement of Eja²BM gamification for learning the spelling of fundamental words/single words in Malay.



Application of the fundamental components of a traditional Terengganu Malay dwelling

Figure 2: Eja²BM Gamification Navigation Flowchart

2.1.2 Eja²BM Gamification Content Design

The gamification application's material is divided into two sections. First, an introduction to understanding the application of gamification, followed by three groups and spelling formulae for basic/single-word spelling in Malay. Second, respond to the 12 levels of basic word/single word spelling quizzes in Malay as well as the notion of traditional Terengganu Malay home aspects.

a. Introduction (Gamification Application, Basic Word Spelling/ Single Word and Spelling Formula)

An introduction to the concept of gamification, spelling of basic words/single words and spelling formulas will be provided and explained to students before starting the quiz so that students can understand the concepts in these three factors.

b. Basic Word / Single Word Spelling Quiz and Traditional Malay House Elements

This section serves two primary purposes in Eja²BM. The first objective is to train students to recognise the spelling of basic/single words in Malay, while the second objective is to train students to recognise and comprehend the notion of traditional Terengganu Malay house features.

i) Basic Word Spelling/ Single Word in Malay

The gamification innovation of Eja²BM was created with training exercises, reinforcement and enrichment of the spelling of frequently misspelt basic words and single words in mind. There are a total of 127 basic spelling words/single words that are frequently misspelt in the Malay language. The misspelling has been validated by six experts in the Malay language. This game divides the content of the Eja²BM gamification innovation known as quizzes into eleven stages based on the level of difficulty, namely easy, moderate, and difficult. Levels one through eight are exercises in spelling single Malay words that students frequently misspell. Levels nine and ten reinforce the collection of single spelling words, which is more challenging than levels one through eight. Furthermore, level eleven is a single word spelling enrichment level from level one to level eight that assists students in reviewing forms of understanding techniques and formulas in an easy-to-understand spelling system based on the General Guidelines for Spelling in the Malay Language (1972) and the General Guidelines for the Formation of Malay Terms (2004).

b) Elements of a Terengganu Traditional Malay House

According to the level of the game, a total of 21 Malay house elements and the spelling of basic/single words in the Malay language have been selected for inclusion. The selected features have been approved and verified by specialists in Malay traditional home construction, who assert that they are the essential physical components of a traditional Malay house. After correctly answering all of the spelling questions in a level, the player must read the notes of the

two traditional Malay house elements in order to correctly answer questions pertaining to the Malay house element, which is required for progression to the next level. From level 1 to level 10, Malay home themes are interwoven into the gamification. Level 12 will demonstrate the enrichment of the traditional Terengganu Malay home elements through the revision of element identities and a detailed understanding of their concepts.

3.0 FINDINGS AND DISCUSSION

This study aims to produce an innovative Eja²BM gamification application capable of attracting students' interests in learning basic words or single words in Malay in order to overcome the difficulty in spelling. Eja²BM is a gamification concept that uses electronics to assist students, particularly in correcting their Malay spelling errors. This game-based learning innovation was developed by considering four important factors: the analysis of the level of acceptance of the gamification approach through gadgets; the analysis of the level of mastery of spelling basic words and single words among higher education students; the rationale for selecting the ADDIE Model and the MDA Framework in the development of the gamification innovation Eja²BM; and the process of design, development, and evaluation.

3.1 Level of Acceptance of Gamification Approaches in Gadget Platforms

Eja²BM gamification innovation was created using smartphone-based gadgets because, according to a Google form questionnaire administered to 25 randomly selected higher education students, 100% of respondents enjoyed using smartphones in their daily lives and 100% of respondents stated that the use of gadgets made their daily work easier. As many as 80% of students enjoy playing digital games on gadgets during their free time. In addition, as many as 84% of students agree to study Malay using gadget applications in the PdP process, and as many as 72% of students intend to use gadgets in PdP activities. Along with the progress of technology in the present day, it is apparent that the usage of devices is incredibly important in daily life, and that Malaysian students can embrace the innovation of gamification. Indirectly, the transformation of the country's education system as outlined in the Malaysian Education Development Plan (2013-2025) can be achieved in order to raise the quality of the country's education to the global level if technology is fully utilised in the field of education.

3.2 Basic Word or Single Word Spelling Mastery Level

A Google form questionnaire was administered to 25 students as a pre-test to determine their initial level of knowledge of the spelling of basic words/single words that have been identified as frequently incorrect in the general public, with the goal of assessing the level of mastery of these words/spellings among higher education students. After completing the questionnaire, students can determine their initial level of word and single-word spelling proficiency. Based on the results of the initial stage of the pre-test that has been administered, a total of 5 students, or 20% of those with a diploma, 13 students, or 52% of those with a bachelor's degree, and 7 students, or 28% of those with a master's degree, have participated in this survey. A total of 127 basic words and single word spellings have been uploaded into the Google form questionnaire.

Upon assessing the level of spelling mastery of the students, it was determined that only 5 students, or 20%, could master more than 100 spelling words, while 20 students, or 80%, could master fewer than 100 spelling words. Students who responded accurately in the range of 90 to 99 are 2 students (8%), 80 to 89 are 4 students (16%), 70 to 79 are 8 students (32%), and 60 to 69 are 6 students (24%). Due to the multiple spelling errors, this illustrates that pupils at the higher education levels still have a low level of spelling ability. This should not occur among students in higher learning as they have studied Malay from early childhood to the completion of secondary education. This chasm must be addressed by taking the lead and devising interventions to reinforce and improve student's spelling mastery. As a result, the Eja²BM gamification innovation was developed to address this deficiency in mitigating challenges, particularly Malay spelling errors.

3.3 Selection Rationale for the ADDIE Model and MDA Framework in the Development of Eja²BM Gamification Innovation

The novelty of Eja²BM gamification is the subject of this study, which focuses on the construction of a teaching system based on gadget (smartphone) applications for Malay language acquisition. The researcher's argument for employing the ADDIE Model is that it conforms to the instructional design model's criteria. Analysis, Development, Design, Implementation, and Evaluation are the five principal components of the ADDIE Model's teaching design discipline. This paradigm employs phase-by-phase adaptation and evaluation, a straightforward development framework, and a methodical design. The ASSURE Model (Heinich et al., 1999), which introduces classroom-oriented model design, the ADDIE Model (Rosset, 1987), in product-oriented model design, and the Dick and Carey Model (1996), in system-oriented model design, are the three most prevalent teaching models employed by educators. Since the Eja²BM gamification innovation is a product production process in educational resources, the ADDIE Model, a product-oriented framework, is the most appropriate model to use as the major reference in its design.

The MDA Framework was chosen for the development of Eja²BM gamification because the adoption of gamification applications in the education system necessitates a framework that can organise game design within the gamification application to be created (Sitaresmi Wahyu Handani et al. 2016). MDA is an acronym comprised of the phrases Mechanics, Dynamics, and Aesthetics. The MDA framework is suited for usage as a design template for the Eja²BM gamification because it satisfies the requirements for the construction of a digital game in game-based learning, such as gamification. The MDA framework is outlined below:

- i. Mechanics are the components present in digital games such as the scoring system or points, levels, badges, challenges or quests, leaderboards, and on-boarding.
- ii. Dynamics is the interaction between players in the use of mechanics components to determine the behaviour that emerges in the game when the user utilises the mechanics.

iii. Aesthetics is the emotional response of a player while playing a digital game. In response to digital games, the player's emotional reactions are those of enjoyment, frustration, fantasy, and camaraderie.

The gamification innovation created by Eja²BM complies with the MDA Framework by emphasising greater motivating components that encourage players to persevere in the game without surrendering. Players will use their experience and existing knowledge to transmit the necessary information to the gamification and learn from the immediate feedback provided. Gamification applications have a promising future in the sphere of education since they can provide students the space for independent learning that is more imaginative and adaptable. As a result, game-based learning that has been invented in teaching, such as Eja²BM gamification for the 21st century teaching, can make PdP more engaging and stimulate student interest, increasing student motivation in learning.

3.4 Design, Development, and Implementation of Eja²BM Gamification Prototypes

This section details the design, development, and implementation phases of the Eja²BM gamification prototype, based on the analysis identified previously. The Eja²BM gamification design began with the creation of an engaging storyboard for the gamification narrative. Next, gamification analysis is conducted to determine the framework's suitability for gamification development. Following the study, the MDA framework serves as a template for designing and developing the gamification by adapting the MDA framework's elements. Identifying and incorporating entertaining instructional components such as animation, quiz games, and music into gamification is the next step in the content development and programming process. Appropriate software was identified in order to create a 3D animation of a traditional Terengganu Malay home. In this stage, known as "Modeling," 3D models are crafted using SketchUp Pro 2022 to represent Malay homes digitally, while Unity 2022 is used to create an interactive gaming platform. Information, instructions, and 12 spelling-quiz game levels based on a database of 127 base words/single word spellings and 21 components of the typical Malay home are all presented and refined in a flat, two-dimensional manner. Two pieces of folk music were selected as an in-game soundtrack. As part of a "gamified" approach to education, the Casio Model CTK-2100 keyboard is used to play traditional Malay music. This makes learning more fun and interesting for the students. The software Audacity 2022 was utilised in the process of uploading this musical track on the device. An animated figure was used in gamification that employs the researcher's background voice as a guide in offering directions and explanations to players in order to facilitate a two-way interaction in the game-based learning process. After that, a 3D model of a traditional Malay house from Terengganu was used to make the story and interface design. The ADDIE model is used as a guide within the MDA framework to develop the Eja²BM gamification innovation phase by phase, combining software, spelling, house elements, storyboards, 3D animation elements with the concept of a traditional Terengganu Malay house, and background music based on the ethnicity of the Terengganu Malay community, until is formed. All 12 stages must be completed in order to

complete the game by remodelling a typical Terengganu Malay house. In view of the fact that the Malaysian Ministry of Education (KPM) places an emphasis on teaching students about Malay culture, art, and aesthetics, the traditional Malay home has been selected to serve as the primary 3D animation model for the Eja²BM gamification. The gamification novelty of Eja²BM is not only to learn the Malay language, but also to immerse oneself in the heritage and culture of the increasingly extinct traditional Malays. Figures 3 through 10 depict the interface of Eja²BM throughout the gamification narrative.



Figure 3: Register/login



Figure 4: Choosing a character/name



Figure 5: Narration



Figure 6: Main menu



Figure 7: Tutorial (Quiz)



Figure 8: Example quiz

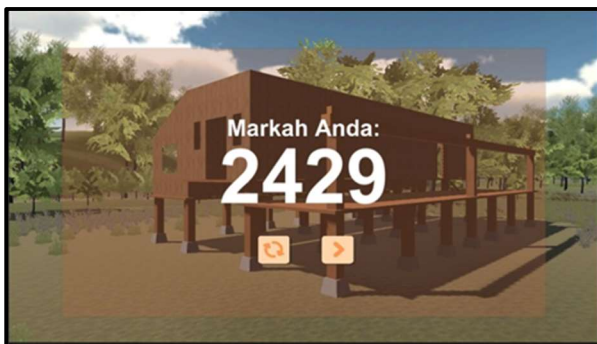


Figure 9: Score display



Figure 10: Mission completed

4.0 CONCLUSION

The gamification of Eja²BM via gadgets is an innovation in the use of technology to manage autonomous learning, as required by 21st-century learning, in order to boost student motivation to learn through more engaging approaches and indirectly benefit students' intellectual development. The development of Eja²BM gamification innovation is intended for students who do not have complete spelling mastery. Eja²BM can overcome spelling difficulties, misunderstanding, or confusion in the language. Eja²BM gamification innovation is different from existing spelling applications because it focuses on basic words and single words. Eja²BM enables students to determine their spelling mastery level and provides easy-to-understand techniques and formulas based on the General Guidelines for Spelling in Malay (1972) and

General Guidelines for the Formation of Malay Terms (2004). As the saying goes, "Killing two birds with one stone," Eja²BM uses Malay culture and history to help students learn how to spell the language and recognise traditional Malay home features. According to a previous study, gamification in learning can pique students' interest in the PdP process, hence making the PdP environment more participatory and enjoyable. It is hoped that additional studies on the innovation of spelling gamification would continue to be conducted and applied so as to boost students' incentive to correctly spell words, thus serving as a strengthening and reinforcement for language learning. Meanwhile, the gamification of Eja²BM needs to be improved so that this application may be utilised by the general public who is interested to study the Malay language and culture in order to empower and dignify the Malay language on the international arena, not just students.

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