**Word Wise Wonders: A Grammar and Spelling Adventure Mobile Game**

**An undergraduate Capstone Project**

**Presented to the Technical Working Group of the**

**COLLEGE OF COMPUTER STUDIES**

**EASTERN SAMAR STATE UNIVERSITY**

**Salcedo Campus**

**Salcedo Eastern Samar**

**In Partial Fulfillment of the**

**Course Requirements for the Degree of**

**BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

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**CHAPTER 1**

**INTRODUCTION**

Learning English as a Second Language (ESL) in Malaysian primary schools is not doing well, especially in terms of vocabulary. Pupils have a limited vocabulary list because they are unable to retain the vocabulary learnt and the spelling of the words. Wang & Yamat (2019)

Education continuously evolves in the age of the technology, because new technologies are changing the way that student learn. Digital Game-based learning(DGBL) was one of the particular innovation that has attracted a lot of attention due do it offer a entertaining platform and the ability to excite and engage students in a a variety of academic areas.

There are Universities that use Digital Game-based learning, the Texas A&M University develop a game called Arte:Mecenas it is a strategy game meant to improve the art history classes with specific learning objective, and the student who plays the game has increased their knowledge about art history (Weng.,W.,Ramadan., H., & Thomas, A., 2020).

This is a promising way to enhance the learning outcome of the students. As educator/teachers work hard to address the diverse needs of the today’s learners. Therefore, our study aims is to investigate the effectiveness of the mobile-based grammar and spelling game in the context of the Digital Game-based learning taking the advantage of the student frequent use of mobile devices in ESSU Salcedo to promote language proficiency in a fun and engaging way.

**Objectives:**

This project aims to develop a system that can handle and manage the grammar and spelling of individual.

Specifically, the study seeks to attain the following:

1. to design, develop and text Word Wise Wonder to assess its effectiveness improving grammar and spelling skills at ESSU Salcedo student.
2. to evaluate the acceptability of the Word Wise Wonder among student and educator using criteria such as user satisfaction survey, usability testing and focus group discussion.

**Scope and Limitations:**

The develop project Word Wise Wonders: A Grammar and Spelling Adventure Mobile Game is intended only in Android phone’s among the students at Eastern Samar State University Salcedo Campus, College of Computer Studies. Wherein, the design, development, and evaluation of Word Wise Wonder, a grammar and spelling game within the context of Digital Game-based Learning (DGBL). The game focuses on teaching spelling and grammar in an entertaining and engaging way. a grammar and spelling puzzle game where players go through levels or stages and face various grammar and spelling-related obstacles along the way. The intricacy and extent of gameplay and graphics may be impacted by the processing power and screen size constraints of mobile devices. Although the game tries to teach spelling and grammar, how effective it is as a teaching tool will rely on the individual's learning preferences and the breadth of the material presented.

**Significance of the Study**

This study holds significant benefits for various stakeholders involved in the educational process, including students, faculty, researchers, and future practitioners:

**Students:** To examining the efficacy of the grammar and spelling game on a mobile device gives students a chance to interact with cutting-edge teaching strategies that suit their affinity for digital natives. A more dynamic and engaging learning environment can be provided for pupils through the integration of gaming into language instruction. Students will probably improve their English skills in an entertaining and efficient way by playing the game more and interacting with it more.

**Faculty:** to offer insightful information about how to incorporate technology-enhanced teaching methods into the curriculum. Teachers can modify their curricula to better suit the requirements and preferences of today's students by knowing how digital game-based learning affects language proficiency. Furthermore, faculty development programs that seek to improve pedagogical methods and foster creativity in teaching and learning may benefit from the study's findings.

**Researchers:** to use of digital games for learning in language instruction. Through the utilization of empirical research and an assessment of the mobile game's efficacy, this study contributes to the scholarly discourse on the advantages and disadvantages of incorporating technology into language learning environments.

**Future Practitioners:** the study can be serve as their guide in developing their own mobile games like A Grammar and Spelling Adventure Mobile Game.

**Definition of Terms**

**Spelling.** The forming of words from letters according to accepted usage. (Merriam-Webster, 2024) In this study, spelling ensures accuracy, credibility, clarity, communication and reliable data analysis.

**Grammar.** The use of the rules of how words change their form and combine with other words to make sentences. (Cambridge Dictionary, n.d) In this study, grammar will help to ensure clarity and specificity of a sentence in the mobile game.

**Language Mechanics.** Encompass the proper use of spelling, capitalization, punctuation, grammar, and the like, to facilitate high-quality captioned media. For common words, dictionaries and style guides must be followed. Proper names, technical terms, and specialized language must be cross-checked with specialty references or directly from an authoritative source. (Described and Captioned Media Program, 2024) In this study, it will help improve by enhancing communication clarity and critical thinking.

**Cognitive Skills.** It refer to those functions brain uses to think, pay attention, process information, and remember things, constantly aiding thought processes and memory retention. (Coursera Inc., 2023) In this study, the development of cognitive skills in Word Wise Wonders involves problem-solving, memory, attention, processing speed, language development, spatial awareness, and executive functioning.

**Mobile Game.** Are defined as digital games played on a smartphone or other mobile devices like iPads, iPods, and tablet computers. (IGI Global, 2015). In this study, it can provide a platform of interactive learning, data collection, engagement assessment, real-time feedback as well as access to a wide audience.

**Educational Gaming.** Are often used in a teaching approach known as game-based learning this learning approach is premised on the game frame in learning to communicate and reinforce concepts while developing learners' skills across different areas. Game-based learning is used because they have many benefits, notably games and play are strongly connected to children's cognitive development and help develop many cross-curricular skills as a result. (Study.com., 2023) In this study, Word Wise Wonders mobile game can be enhanced through educational gaming because it makes learning fun and creates individualized challenges, allows social interaction and adheres to the curriculum standards.

**Interactive Learning.** Is a technique that tries to engage students in the learning process actively most times by technology use contrasting it with passive learning approaches, mostly in the form of the traditional lecture. (Echo360, 2022) In this study, Interactive learning will help the Word Wise Wonders mobile game through active participation and their feedback, which is instant, based on step-by-step tailoring, co-play experiences, educational learning, and content updating to the continuous engagement of students.

**User Interface (UI).** Isthe human-computer interaction and communication in a device. This may include display screens, keyboards, a mouse, and the appearance of a desktop. It's also the way through which a user interacts with an application or a website. (TechTarget, 2021). In this study, with a good user interface, Word Wise Wonders mobile game can be enhanced and supported with intuitive navigation, clear instructions, easy accessibility of the game features, visually pleasing design, and its seamless integration with gameplay.

**User Experience (UX).** Is made of all the interactions a user has with a product or service. It is the personal, internal experience customers go through when using a product’s interface. (UserReport, 2022). In this study, Improvements of the user experience in Word Wise Wonders mobile game can be achieved by enhancing the gameplay, and optimizing its performance for proper seamless and enjoyable experience.

**CHAPTER II**

**REVIEW OF RELATED LITERATURE AND STUDIES**

This chapter brings forth other related literature and studies that contribute to the importance of this research. It also synthesizes existing knowledge, which would provide a comprehensive understanding of the research topic.

**Related Literature**

According to (Rijt et al., 2018) Teaching grammar has always formed a major part of language education in curricula around the world, although it has also been heavily debated. Most of the debate on grammar teaching focused on the rationales for teaching it, rather than on the linguistic content that should be taught. At the same time, there appears to be renewed interest in restoring the bond between linguistic theory and grammar education. Previous research has suggested that it would be highly desirable to gain a clearer picture of this content. Results indicate most of the concepts in the literature on grammar teaching are from traditional grammar. To a limited extent, there are also concepts from modern linguistic theory that are being discussed, but mostly implicitly, most concepts are not being motivated because they are meaningful in modern theoretical linguistics, but because they reflect traditional classroom practices and policy. It can consequently be concluded that education on linguistic analysis is not up-to-date, which potentially has severe consequences: implementing insights from modern linguistics is likely to provide students with deeper insights, and teachers with a better equipped pedagogy.

Kempen (2013) notes that traditional grammar teaching has a number of problems: motivation for students and teachers is very low because it is not understood to be relevant to practical life; parsing exercises are of poor quality; there is a lack of transparent visualization of grammatical structures; there are insufficient opportunities for exploratory learning, all these together leading to dissatisfactory results from the teaching. For these reasons, the author thinks that elementary grammar education should use visual metaphors. The presented method uses fantastic creatures, given that they play the role of family members, as an indication of the lexical frames for a given sentence. These creatures indicate what word classes, phrasal categories, and grammatical functions are. This is a new, metaphorical way of presenting abstract grammar concepts and makes these concepts more tangible and interesting to young learners. This approach contributes to an effective and innovative teaching of grammar.

The study on technology-enhanced learning and teaching sustainability in teaching spelling yielded significant insights. It developed and tested a 40-item instrument based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model, hence producing robust assessment of technology-enhanced learning and teaching sustainability. The study, therefore, emphasized that content validity on 40 items was high with great agreement on the item, hence, the instrument's effectiveness in assessment. The study always emphasized that technology-enhanced learning should be integrated with the language learning process, especially for Generation Z, to enhance English language proficiency. The study always emphasized that pedagogy from the teachers would enable sustainability in the technology-enhanced teaching method of spelling. The study underlines that educators have to incorporate technology to enrich and enhance the spelling teaching method to ensure mastery of the English language skills of the student. Furthermore, the findings explain how educators have to incorporate technology to enrich and enhance the spelling teaching method and ensure mastery of the English language skills of the student. Overall, these findings explain the imperativeness of the utilization of technology to increase language education practices and mastery of outcomes by students in language learning. (Lau et al., 2023)

Accordingto (Awal et al., 2023)The study focused on the spelling skills of primary school students in India and tried to unearth subtle findings. It found that, in general, the spelling ability of the elementary students is very much dependent on school management. It is observed that the students in the government schools possess a relatively low spelling ability. On the other hand, the school students in the non-governmental schools were more proficient in spelling ability. Gender and medium of instruction in either Hindi or Bengali did not have a firm grip on spelling ability. The type of medium of instruction, on its own, did not seem to make any difference. However, the type of school management has emerged to be an important factor. In comparison, the non-government management students were found to be superior in their spelling ability in English compared with those under the government-managed schools. It is therefore prudent that when dealing with the spelling ability among elementary school students in the Indian context, one considers the type of school management because it suggests possible avenues for intervention in education and policy to meet the educational needs.

Games have been believed to be good media in assisting teaching for years. Games are believed can promote learning become more interesting. Many studies have been conducted on utilizing games in learning. Some have proved that games can catch students’ attention better than traditional media such as textbook. In this study, games were used in teaching students about spelling. Since spelling is the basic form of language, there are still contradicts in how to teach it better. The researchers believed that games can assist in enacting more interactive spelling course well. Thus, this research employed some spelling games to be used in teaching third grade students of English as a Foreign Language (EFL) Elementary school, Bungcala, Aceh Besar. The researchers wanted to know the students’ responses after teaching by using spelling games. Thus at the end of teaching and learning process after four meetings by applying games in teaching spelling, the researcher distributed questioners to students asking their opinion about spelling games in learning spelling. The students’ responses showed that they love to study spelling through games, games make them interested in studying spelling. Games let them work more in groups. (Qamariah et al., 2018).

According to Poposka et al. 2022, it also requires great understanding of phonology, morphological awareness, and orthographic rules. Accurate spelling requires an understanding of the work of a language and of its spelling and phonological systems. Their study measured the current level of spelling competence of 54 first-year undergraduate students at B1-B2 level, who were undergoing English for Biotechnology studies. The questionnaire used in the study is an online, anonymous questionnaire of nouns, adverbs, adjectives, and verbs that had been delivered in class, and the familiar word proved quite challenging for the competence in spelling. This has been categorized because it is of vital importance to a detailed breakdown of spelling, and this is especially noted when studying a special language such as English for Biotechnology.

The focus of the study is on the effect of the grammar element of the new statutory test for Spelling, Punctuation and Grammar in primary schools in England. The aim of this research is to find the nature and extent of changes in grammar teaching and teaching in a wider literacy since the test's introduction in 2013. The study looks at what teachers thought of new English tests and the new expectations of children's language in the primary school. This paper will use data gathered from teacher interviews and an online survey of teaching staff. Teachers talk about their knowledge, understanding, and enjoyment of grammar at their own level; and their skills in teaching pupils; they also talk about their observations of how pupils have reacted to explicit grammar teaching and the grammar test. The data here provide some insights into the processes for teachers in applying new requirements for teaching and testing grammar and how teachers try to make grammar accessible to children. The findings discussed in this paper are: The time spent teaching decontextualized and contextualized grammar has increased dramatically since the introduction of the statutory SPaG test in primary schools. Grammar is taught now explicitly and formally as a classroom literacy routine; the test format impacts grammar teaching content and approaches; teachers say pupils like learning grammar and taking the test; teachers differ in their estimations of the degree to which explicit grammar teaching and testing have positive impacts on the pupils' language and literacy; teachers feel more confident in teaching grammar. (Safford, 2016)

In an article by Menelaos et al. (2009), they describe MobiSpell, an educational mobile game that teaches spelling through entertainment. Leveraging on educational mobile games that have increased in popularity with the rapid development of technology, MobiSpell immerses players in a 3D world where they play the role of a pilot who shoots down letters and opponents to correctly spell words. There is the use of multimedia aspects such as photos and spaces for a learning guide. It is during the designing part of the game that the experience, enjoyment, and motivation of the players are highlighted. In this regard, the game incorporates features such as rewards and a competitive element to ensure its players remain engaged. In the development of this game, technologies such as the J2ME Mobile 3D Graphics library for graphics, 3DS MAX for 3D models, and Netbeans for development have been utilized.

According to (Al-Razgan & Alshaarri, 2020) the acquisition of spelling skills for young learners has a huge role to play in developing language enriching both reading and writing skills. In the case of Arabic language learning, many Arab children have very limited spelling skills, and they develop negative interest in learning the language. So, this research paper will focus on facilitating young Arab learners who face weaknesses in spelling through an interactive mobile spelling game. The mobile game has been made for upper elementary-grade Arab students that aim at improving their skill of identifying misspelled words. There are three game modes: interactive play with scoring and practice without scoring. The levels of difficulty consist of beginner, intermediate, and advanced. At different levels of difficulty, learners with different skill levels will have different levels of difficulty. During gameplay, the learner reads the text, finds the misspelled word, clicks on it, and is presented with a pop-up menu of options, which are the correct spellings. The game provides instant feedback after the learner presses the next button. So, this mobile spelling game by adaptive technology and level of adaptation is supposed to drive young Arab learners towards language learning and cure them of their spelling weaknesses in the Arabic language.

**Related Studies**

This is a cross-sectional exploratory study that aims to develop and standardize two subtests for the proposed Filipino Reading Achievement Test. The subtests that measure Pagbaybay or Spelling in Filipino and Pagkilala sa Binasa or Word Recognition were constructed. The scope of the study is based on measuring the validity and reliability of the instruments that can justify its use in assessing the reading skills of Filipino children. Reading ability is considered to be one of the important skills for an individual to develop so that he or she will be successful both in school and in the world of work. The study followed the standard scale development procedures of item analysis, reliability and validity testing. Implications of the findings are discussed. (Cayubit et al., 2018)

Vietnamese students usually feel bored in vocabulary lessons because they have not changed their learning habits, like writing words on paper, trying to learn by heart, or learning passively from the teacher's explanations. We conducted this action research to find out an answer to the question, "Do games help students learn vocabulary effectively, and if so, how?" Most academic reviews start from the assumption that games, bundled with other aspects of learning, e.g., CALL, are helpful. However we singled out the component of games to study that in isolation. After reviewing academic opinions on this specifically focussed matter, of which there are relatively few, we began action research which included applying games in our own classes, observing other teachers' classes, and interviewing both teachers and learners so as to elicit students' reactions, feelings, and the effectiveness of games in vocabulary learning. The research shows they are effective in helping students to improve their vocabulary building skills. (Huyen & Khuat, 2019)

The background of this research was based on the difficulty the students had in understanding simple past tense. To develop teaching grammar, a teacher has to have a technique in teaching grammar to help the students understand the grammar easily. In this study, this researcher used Spelling Bee Game to help students understand grammar easily. This study focused on writing skill at the eighth grade of MTs. Miftahul Khoirot Branjang-Ungaran In the academic year of 2014/2015. This research discussed about the use of spelling be game to improve students' understanding of simple past tense. The purpose of this study was To describe the students' enthusiastic in studying simple past tense through Spelling Bee game at eight grade students of MTs.MiftahulKhoirotBranjang –Ungaran in academic year of 2015/2016. To find out the improvement of students' understanding in simple past tense after being taught using Spelling Bee game at eight grade students of MTs.MiftahulKhoirotBranjang –Ungaran in academic year of 2015/2016.

The implementation of Spelling Bee Game in teaching simple past tense at MTs. Miftahul Khoirot Branjang was conducted in two cycles including cycle 1 and cycle 2. The participant of this study was 26 students in class A. In the first cycle the students' enthusiastic was 56% while in the second cycle was 80%. It means that spelling bee game could improve students' enthusiastic significantly. The result of this study showed that used spelling bee game could improve students' understanding of simple past tense. This was proved by students' comprehension test that improved in every cycle. In the first cycle, the average of students' score was 68.12. In the second cycle, the students got 79.09.The result of this research showed that the used of spelling bee game could improve students' understanding of simple past tense. (Choriana, 2016)

According to (Bocianu, 2023) The use of grammar in English for Specific Purposes is a prerequisite to the acquisition of the language learned, although it is not the focus of the course. Since ESP is usually taught at the higher level or to adults who have already graduated university but want to specialize in different fields or are students and study in specialized faculties, they often have a certain level of grammar knowledge with rare cases when adults have Al level of language according to the European Framework of Reference for Languages. Apart from the intrinsic motivation and the grammar level, students need to go through some grammar review although the main focus of the course is learning vocabulary. Ken Hyland states that ESP tends to be generally more abstract and less dependent on the immediate setting of its coherence than everyday language use. The means in which grammar aspects are introduced to the ESP students make the difference regarding the way they can internalize the theories and how logical connections can be done further on for language acquisition. For this, Rod Ellis proposes the implicit and explicit methods that work for students.

According to Mensah et al. (2022) This study sought to determine how effective and efficient the use of games are in teaching spelling so as to develop the spelling abilities of pupils in primary four of Kormanstse Methodist primary 'A'. The study sought to find the benefits of using spelling games as strategies for teaching spelling. The data collected was done using the instrument teacher made tests and an interview. The research design comprised of two pre –test, four intervention and post – tests as an action research study. The pre – test was administered to diagnose and assess the knowledge level of pupils on the topic- spelling. The intervention consisting of various spelling games was carried out so as to develop pupils' ability to spell new words without struggle. After the intervention, a post –test followed. This post –test proved that the use of spelling games had a positive impact on the pupils thereby contributing significantly to pupils' spelling abilities. Intervention applied made a great difference in the pupils' spelling ability. The study was also recommended that teachers should be encouraged to use different games and strategies to teach spelling so that it will enhance interactive and interesting spelling lessons for better performance.

The research study explores the utilization of games and activities as effective tools for enhancing English language learning, with a specific focus on vocabulary development. Emphasizing the necessity of interactive and enjoyable methods to engage students effectively, the study delves into various strategies aimed at making learning more engaging and meaningful. Through the implementation of interactive vocabulary games, reading comprehension activities, discussions, and exposure to visuals, students are provided with diverse opportunities to acquire and reinforce new words. The study underscores the significance of teaching vocabulary in context and addresses the challenges students encounter in this process, offering practical suggestions for improvement. Highlighting the role of games such as puzzles, word matching, storytelling, flashcards, memory games, and interactive object-based activities, the research underscores their effectiveness in making lessons more dynamic and promoting vocabulary acquisition. Overall, the study contributes valuable insights into the incorporation of games and activities as essential components of language instruction, fostering a stimulating and interactive learning environment conducive to vocabulary development. (Akdogan, 2017)

Raquel et al. (2008) defined game-based learning as a way where people learn knowledge and skills by playing. However, for educational games to be effective, they have to strike a balance between fun and learning. This paper presents a Pac-Man-inspired game to teach spelling and vocabulary in foreign languages. The experimental evaluation of this game is summarized in this paper, which included subjective data from students concerning their opinions on enjoyment and learning potential, as well as objective data in the form of learning improvement. The outcomes of this experiment show that the game effectively meets both entertainment and learning requirements, producing a significant level of learning improvement while retaining the entertaining gameplay.

Páez-Quinde et al. (2023) present gamification as a synergistic learning tool in technology education. The study develops new resources for the classes involving synchronous interaction and it motivates students to create content for both the synchronous and asynchronous learning through gamified activities. The study carries out experimental and analytical mixed-method study that tracks the progress of the students in the area of Programming Logic and Object-Oriented Programming. The study starts with a pretest about the students' perceptions of synchronous and asynchronous classes.Quizizz, Educaplay, and Genial.y tools have been used in the development of these gamified resources. The study has important consideration of the learning objectives. Additionally, this study focuses on student behavior, cycles of activity, resources, and mechanics of resource use. The PADDIE M+ model guides the creation of the activity. Pedagogy integrates with Learning and Knowledge Technologies (LKT) and the Technology Acceptance Model (TAM) is used to measure the acceptance of the gamified resources by students. The study reports positive results of students using synchronous and asynchronous gamified resources to propose the validity of this gamification approach. This paper also indicates that gamification is yet to be explored in technology education.

**Theoretical Framework**

The theoretical framework of this research is the Waterfall-Software Development Life Cycle (SDLC) described in Figure 1. This framework provides the distinct phases that guide the development process the Requirement Gathering, System and Software Design, Implementation and Unit Testing, Integration and System Testing, Deployment System, and Operation and Maintenance phases compose the waterfall-style software development life cycle.

**Requirements**

**Gathering**

**System**

**Design**

**Implementation**

**Testing**

**Deployment**

**Maintenance**

**Figure 1.** Waterfall Model-Software Development Life Cycle (SDLC)

**Requirements Gathering.** This stage of the initial phase involves gathering and identification of details about the inclusion in the Word Wise Wonders game. This includes defining the topics in grammar and spelling to be covered, defining the target population, and the desired gameplay features and mechanics.

**System Design.** Design According to the requirement, the design process began. This process includes creating the visual and structural elements of the game. This includes the design of UI, the creation of characters and environments, designing the levels, and the designing of where these will place their educational content. The intent of the design is to provide a cohesive and visually appealing experience for the player, without losing focus on the game's goals and objectives.

**Implementation.** This relates to the actual construction of the game based on the design designations. The developers will write the code for the game mechanisms, graphics, sound effects, and any other technical aspects. In short, it is the realization of a designed vision.

**Testing.** After developing the game, it undergoes a lot of testing for the purpose of checking functionality and quality. This has been done by testing for bugs, glitches, and other usability problems that may arise across devices and platforms. The other testing will be the educational effectiveness of the game, that is, whether it reinforces concepts of grammar and spelling while still being enjoyable for the players.

**Deployment**. Once testing has finished and all possible difficulties are resolved, the game is ready for deployment. Deployment involves organizing promotional efforts to draw players and to gain interest in the game before it hits the market.

**Maintenance.** In the after-launching of the game, the maintenance stage contains the ongoing support and update that would keep the game running and alive, over time. Updates on a frequent basis keep the players interested and set long-term success for Word Wise Wonders.

**CHAPTER III**

**PLANNING, DESIGN AND SPECIFICATION**

Materials, techniques, and procedures to be used while conducting the study are presented and discussed in this chapter.

**Gantt Chart**

This will be a Gantt chart that will reflect the schedule for the Word Wise Wonders mobile game, upon which tasks, timelines, and dependencies are mapped to help in planning and follow-up. These phases are defined as follows. Requirement Gathering and Analysis 100 days are used to set the foundation of the project on the basis of comprehensive understanding of requirements to define the needs and goals in a well-defined way, essential for research to establish clear objectives and scope. System Design 60 days is used for the conversion of gathered requirements into detailed architecture and specifications. It defines the way of implementation to cover functional and technical needs effectively. System Testing 20 days is used to make sure system reliability, usability, and performance. This may help validate the research outputs and to ensure the result is correct and functioning. System Deployment is15 days will support a smooth transition of the developed system to an operational environment, effectively implementing research in real-world scenarios. Documentation is 30 days it is used to document the processes, decisions, and results of the project that support stakeholder reference, future maintenance, and knowledge transfer. This will ensure the reproducibility and transparency of the research findings credible.

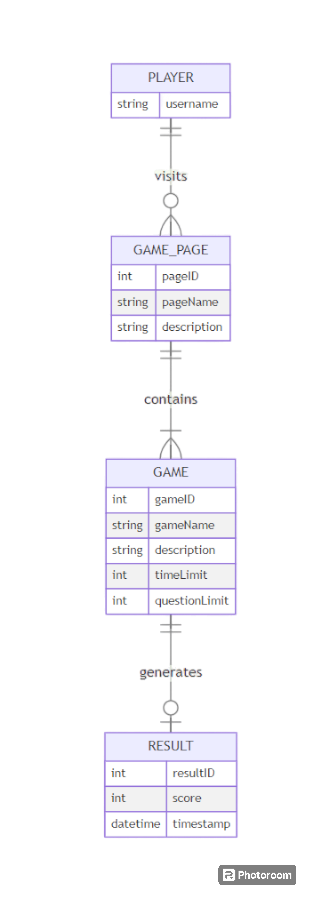
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Task Name** | **Duration Days** | | **March 2024** | **April 2024** | **May 2024** | **June2024** | **July 2024** | **August**  **2024** | **September**  **2024** | | **October 2024** | | | **November 2024** | **December2024** | **January 2025** |
| 1 | Requirement Gathering and Analysis | 100 |  | | | | | |  |  | |  | | |  |  |  |
| 2 | System Design and Android-based Development | 60 |  | |  |  |  |  |  |  | | | | | |  |  |
| 3 | System Testing | 20 |  | |  |  |  |  |  |  |  | |  | | | |  |
| 4 | System Deployment | 15 |  | |  |  |  |  |  |  |  | |  | | | | |
| 5 | Documentation | 30 |  | |  |  |  |  |  |  |  | |  |  | | | |

Task Completed

Legend:

**Entity Relationship Diagram**

Every entity has its attributes and functions to support the other entities. For instance, Figure 3 displays the ERD of the Word Wise Wonders. This will help organize and visualize relationships between data entities, aiding in understanding complex systems and improving efficiency.



**Figure 2. Entity Relationship Diagram**

**System Flowchart**

Figure 3 System flowcharts of Main Menu Page shows users have various options like Tests, Results and About. On the click of the Tests button, it changes the system to the Game Selection interface. On selecting the Results button, it transfers users to the results game section to verify their scores. On choosing the About option, it redirects the users to a separate display page that provides comprehensive information about the game.

If Choice = 1

Tests

A

Display Main Page

Interface

Yes

No

If Choice = 2

Results

B

Yes

No

If Choice = 3

About

C

Yes

No

**Figure 3. Main Menu Page**

Figure 4 of system flowchart ensures that the user have a user-friendly interface for the selection of games. Within the section, there are two sections which are Spelling Gam and Mobile Game. This type of structure will allow players to select their game type of preference.

A

Display

Game Selection

If Choice = 1

Spelling Game

G1

Yes

No

If Choice = 2

Grammar Game

G2

Yes

No

**Figure 4. System Tests Page Game**

In the system flowchart of Figure 5, when the "Spelling Game" is chosen, the game will run. As the game completes, if the task is completed successfully, a positive affirmation is displayed in the form of "Da Best!" with a thumbs-up icon. This confirms that the answer given is correct. The game helps move to the next level smoothly after the task has been completed. When the answer is incorrect, the system is seen displaying a supportive message, "Better luck next time!".

G1

Spelling Game

Playing the Game

Game Result

Correct answer

Display 'Da Best!' (Thumbs Up)

Failed answer

Display “Better Luck Next Time!”

Next Game Level

**Figure 5. System Flowchart of Spelling Game**

In Figure 6 the System flowchart of Grammar game has a time limit, if the player exceeds the limit, the result s will be considered unsuccessful, and the system shall display the message "Better luck next time!" then reset the game again to try anew. If the player completes the game within the allotted time, the result will be considered correct with the message "Da Best!" The system shall then flawlessly proceed to the next game phase.

G2

Display Grammar Game

Playing the Game

Game Result

Correct

Display 'Da Best!' (Thumbs Up)

Failed

Display “Better Luck Next Time!”

Next Game Level

Time Limit

Retry

**Figure 6. System Flowchart of Grammar Game**

In Figure 7 system flowchart is the result page, which summarizes the whole performance of the player after the game in much more detail. On the result page are relevant details of scores, indicating the number of correct and incorrect answers. It allows users to track their progress and monitor their performance objectively.

B

Display Result Game

Scores Information

Go back to Main Menu Page

Display Main Menu Page

**Figure 7. System Flowchart of Result Page**

In Figure 8 system flowchart, the About page is depicted, offering players access to comprehensive information regarding the game, including gameplay instructions and relevant details. After the player's review of the provided information, they have the option to seamlessly return to the main menu, facilitating a smooth transition to commence gameplay.

C

Display About Page

Information of the Game and How to play

Go back to Main Menu Page

Display Main Menu Page

**Figure 7. System Flowchart of About Page**

**Hardware Specification**

Table 2 presents the hardware specifications used in designing, developing, and creating the Word Wise Wonders mobile game. It also includes a description of the features and purposes of the hardware requirements that needed to run the application.

**Table 2.**

**Hardware Requirements**

|  |  |  |
| --- | --- | --- |
| **HARDWARE** | **MINIMUM REQUIREMENT** | **ACTUAL HARDWARE USED** |
| Android phone | 4 GB RAM  4GB ROM or better  Android 6.0 or any android version |  |
| Laptop | 1.10GHz 1.11 GHz  250 GB hard disk  8.00 GB RAM or better |  |
| Flash Drive | Any type of USB brands  At least 8GB or better  USB 2.0 or better | SanDisk  128GB  USB 3.0 |

**Software Requirement**

Table 3 shows the software requirements that used to create a mobile game Word Wise Wonders. Throughout the development process, two essential - were used to provide the tools and features required to create a captivating and dynamic mobile gaming experience

**Table 3.**

**Software Requirements**

|  |  |  |
| --- | --- | --- |
| **SOFTWARE** | **MINIMUM REQUIREMENT** | **ACTUAL SOFTWARE USED** |
|  |  |  |
|  |  |  |

**BIBLIOGRAPHY**

Merriam-Webster. (n.d.). Spelling. In Merriam-Webster.com dictionary. Retrieved April 23, 2024, from https://www.merriam-webster.com/dictionary/spelling

Described and Captioned Media Program. (2024) Language Mechanics https://dcmp.org/learn/600-captioning-key---language-mechanics#:~:text=Language%20mechanics%20incorporate%20the%20proper,and%20speech%2Dto%2Dtext.

Coursera Inc. (2023) Cognitive Skills https://www.coursera.org/articles/cognitive-skills  
IGI Global (2015) Mobile Game. https://www.igi-global.com/dictionary/mobile-game-based-learning/47743#:~:text=Mobile%20games%20are%20often%20defined,%2C%20iPods%2C%20and%20tablet%20computers.

Study.com (2023) Educational Gaming. https://study.com/academy/lesson/educational-games-definition-history-benefits.html

Echo360. (2022). Interactive Learning. https://echo360.com/what-is-interactivelearning/#:~:text=Interactive%20learning%20is%20a%20technique,techniques%20like%20the%20traditional%20lecture.

TechTarget. (2021) User Interface https://techtarget.com/searchapparchitecture/definition/user-interface-UI

Emily Lau, Y. Y., Hashim, H., & Yunus, M. M. (2023). Development and validation of an instrument to evaluate technology-enhanced learning and teaching sustainability in teaching spelling. Sustainability, 15(5), 4256. doi:https://doi.org/10.3390/su15054256

Awal, A., Karim, M. R., & Warda, W. U. (2023). A diagnostic study on english spelling errors among the elementary school children in india. Theory and Practice in Language Studies, 13(11), 3049-3056. doi:https://doi.org/10.17507/tpls.1311.35

van Rijt, J., de Swart, P., & Coppen, P. A. (2019). Linguistic concepts in L1 grammar education: a systematic literature review. Research Papers in Education, 34(5), 621–648. https://doi.org/10.1080/02671522.2018.1493742

Kempen, G. (2013). Visual Grammar: Multimedia for grammar and spelling instruction in primary education. In *CALL: Media, design, and applications* (pp. 223-238). Swets & Zeitlinger.

Qamariah, Hijjatul & Wahyuni, Sri. (2018). TEACHING SPELLING THROUGH GAMES. Visipena Journal. 9. 137-150. 10.46244/visipena.v9i1.447.

Cayubit, Ryan Francis & Chua, Lyka & David, Emerald & Gutierrez, Therese Monique & Tiu, Reniel. (2018). Development and validation of Pagbabaybay (Spelling) and Pagkilala sa Salita (Word Recognition) of the Filipino Reading Achievement Test. 9. 24-44.

Prodanovska-Poposka, V., Neshkovska, S., & Kitanovska-Ristoska, E. (2022). ENGLISH FOR SPECIFIC PURPOSES: A STUDY ON ENGLISH SPELLING PROFICIENCY OF UNDERGRADUATE STUDENTS – LEARNERS OF ENGLISH FOR BIOTECHNOLOGY. *PALIMPSEST / ПАЛИМПСЕСТ*, *7*(13), 41-51. <https://doi.org/10.46763/PALIM22713041pp>

Safford, K. (2016). Teaching Grammar and Testing Grammar in the English Primary School: The Impact on Teachers and their Teaching of the Grammar Element of the Statutory Test in Spelling, Punctuation and Grammar (SPaG). *Changing English*, *23*(1), 3–21. https://doi.org/10.1080/1358684X.2015.1133766

Menelaos, Bakopoulos., Sofia, Tsekeridou. (2009). MobiSpell: Educational Mobile Game Design and Development for Teaching Spelling to Young Children. 295-296. doi: 10.1007/978-3-642-04052-8\_40

Muna Al-Razgan and Safa Alshaarri. 2020. Design and Development of a Mobile Spelling Game for Elementary Students Using Genetic Algorithms. In Proceedings of the 11th International Conference on Education Technology and Computers (ICETC '19). Association for Computing Machinery, New York, NY, USA, 205–209. https://doi.org/10.1145/3369255.3369311

Huyen, N. T., & Khuat, T. N. (2019). LEARNING VOCABULARY THROUGH GAMES. The Effectiveness of Learning Vocabulary Through Games .

Choriana, D. N. (2016). THE USE OF SPELLING BEE GAME TO IMPROVE. English Language Education.

Bocianu, I. (2023). GRAMMAR TEACHING STRATEGIES FOR ESP STUDENTS A SHORT REVIEW. Euromentor Journal, 14(4), 55-61. Retrieved from https://www.proquest.com/scholarly-journals/grammar-teaching-strategies-esp-students-short/docview/2958035429/se-2

Ng, B & Suaib, Norhaida & Sihes, Ahmad & Ali, Aida & Shah, Z. (2020). Educational mobile game for learning English words. IOP Conference Series: Materials Science and Engineering. 979. 012007. 10.1088/1757-899X/979/1/012007.

Cambridge Univeristy. (n.d.) Grammar. https://dictionary.cambridge.org/us/dictionary/english/grammar