Hangman – A Voice-Over Game

Ayesha Anees Zaveri
University of Kuala Lumpur
Kuala Lumpur, Malaysia
zaveri.ayesha@s.unikl.edu.my

Saba Imtiaz
Bahria University
Karachi, Pakistan
sabaimtiaz.bukc@bahria.edu.pk

Mobeen Nazar
University of Kuala Lumpur
Kuala Lumpur, Malaysia
mobeen.nazar@s.unikl.edu.my

Sarama Shehmir
Ryerson University
Ontario, Canada
sarama.shehmir@ryerson.ca

Nabiha Faisal
Bahria University
Karachi, Pakistan
nabihafaisal.bukc@bahria.edu.pk

Ramsha Mashood
Bahria University
Karachi, Pakistan
Ramshamashood.bukc@bahria.edu.pk

***Abstract*— This initiative aims to make games that relax, improve cognition, and provide entertainment. Mobile gamers have made the gaming sector the top category. Gaming applications generally accompany new technologies, and this trend has increased tenfold in the past year. People try games first on modern platforms. The program aims to provide workers with a break after a long day. The unpredictable future challenges software engineering and development, especially in the growing game development business. This game features voice recognition and attractive graphics. It is a multi-level strategy game. Age-specific tiers are available. Video games are more than just programming. Factual information makes stuff enjoyable. The game's atmosphere, storyline, characters, gaming mechanics, and artwork must be evaluated alongside the program. The Hangman Voice Over advanced technology. This game can improve cognition in disabled people. This may help kids learn.**

Keywords—Hangman, Game development, Gaming, Voiceover, Android Application, Animation, Unity

I. INTRODUCTION

The integration of computer games into contemporary culture has become increasingly prevalent. Nonetheless, specific groups of individuals are precluded from partaking in this type of amusement and communal engagement due to their inability to operate the games' interface. Possible academic rewrite: The etiology of this phenomenon may involve impairments in sensorimotor integration, visual processing, or auditory perception. The utilization of automatic speech recognition (ASR) systems enables the implementation of voice-activated commands for game control, thereby expanding the potential for individuals with motor system impairments to participate in gaming communities. [1]

Games serve as a medium through which the computer transforms, both presently and in the future, within the context of society. In what ways does society influence the evolution of games? It is anticipated that two distinct processes will impact games, namely the proliferation of the mass market and the emergence of heterogeneity. There are specific ways in which these processes oppose one another. The global proliferation of gaming has led to a notable expansion in its user base, indicating that games are no longer solely a form of entertainment for juveniles or adolescents. Instead, games have the potential to fulfill a variety of functions for individuals across all segments of society. Individuals with a strong affinity for technology in contemporary times will inevitably age with time. It is reasonable to assume that such individuals would prefer not to be excluded from future services, such as games, due to design issues that may arise.

Moreover, individuals of any age may experience transient or enduring disabilities, and it would be regrettable to preclude them from utilizing games. Furthermore, it is observed that the mortality and fertility rates of the human population are declining, leading to a demographic shift towards a higher proportion of elderly individuals, regardless of their physical abilities, within the societal framework in the foreseeable future. The gaming industry must address these concerns to effectively cater to these demographics and provide them with appropriately tailored services. [2]

Utilizing automatic speech recognition systems is a concept that has been introduced previously in contemporary computing. The utilization of automated speech recognition systems as a means of game control presents a potential avenue for promoting inclusivity within game design. Individuals with restricted motor control capabilities can potentially derive advantages from the prospect of utilizing their vocal faculties to operate the game's instructions. The present study introduces a speech recognition system designed for gaming purposes, which constitutes a significant step towards attaining universal design in computer gaming. [1]

Games are a form of competition where participants engage in interactive play, adhering to established regulations, to attain specific objectives. The game serves as an activity that facilitates holistic development in children, encompassing physical, intellectual, social, moral, and emotional domains. The utilization of game-based learning can offer numerous benefits. The acquisition of knowledge by the learner encompasses not only cognitive abilities but also experiential learning. Such learning is deeply ingrained and enduring, as the lessons imparted are enjoyable and engaging, often linked to the entertaining and pleasurable aspects of the activity. Therefore, reducing the probability of students rejecting the material being taught is possible. Because the game is fun, playing simultaneously arouses tremendous interest in learners of a particular topic. A game that has been thoughtfully designed has the potential to enhance learners' abilities in specific manners, as learners favor it. [24]

Educational games are specifically developed to facilitate learning in individuals by imparting knowledge on particular subjects, enhancing their cognitive abilities, reinforcing their developmental processes, comprehending historical events or

cultures, or aiding them in acquiring new skills through interactive play. [3]

The medium of video games can capture the focus of both minors and young adults significantly. The utilization of educational games as a pedagogical tool has gained recognition among educators, governments, and parents due to their perceived advantages in facilitating learning. Games have the potential to impart knowledge to children on various aspects, such as objectives, regulations, adjustment, troubleshooting, and social engagement, all of which are presented in the form of a narrative. According to research, educational games offer various benefits such as enjoyment, passionate involvement, structure, motivation, ego gratification, adrenaline, creativity, social interaction, and emotional engagement during gameplay [3,4].

Voice recognition is an AI-based technique that converts human-spoken words, noises, or phrases into a machine-understandable format, resulting in an output generated by these machines. First, the voice signals are first converted into electric signals, and then the application analyses the resulting codes. Voice recognition app development ensures an interactive and user-friendly search and simplifies other tasks for users, such as listening to music, viewing movies, and making phone calls.

With satisfied customers come increased revenues, profits, and brand value in the marketplace. Not to mention, the advantages of free advertising combined with an excellent user experience contribute to the growth of the business. Therefore, businesses worldwide have begun to invest in voice-recognition app development. [23]

Speech recognition refers to recognizing the auditory signals produced by spoken language [25]. Put differently, the user communicates with devices that employ speech recognition software to identify spoken words. Converting spoken language into a digital signal involves the transformation of sound waves into numerical values, which are subsequently encoded to identify the specific word being spoken. The speech recognition outcomes can be presented in written format or interpreted by the system as a directive to execute a task, such as automatically launching or terminating an application on a mobile device through voice commands. The speech recognition process necessitates obtaining a specimen of the precise verbal utterances articulated by the user. The process involves the conversion of physical samples into a digital format, which is subsequently stored within a database. Voice matching refers to the procedure of comparing the sound produced by a spoken voice with a pre-existing stored sample for identification or verification—the process of voice-matching audio exhibits resemblances to the methodology of fingerprinting. The procedure ought to be able to identify the audio signal by specific attributes. The Artificial Neural Network (ANN) was first developed in 1943 by Warren McCulloch, a neurophysiologist, and Walter Pitts, a logician. It consists of a combination of basic processing units that can significantly enhance the strengths and capabilities of computing, as documented in reference [26]. It is feasible to develop technologies and make advancements in innovation to cater to the needs of individuals with visual impairments. Several developers have suggested an application that can transform a voice message into a text format during message transmission and a text message into a voice format upon message reception. In the initial stages, voice-based input and input mechanisms for web browsing were implemented to cater to the needs of individuals with visual impairments. The tool for generating synthetic speech is a speech synthesizer, which can be executed through either software or hardware. A speech synthesis system is designed to transform natural language text into audible speech. [27]

Nonetheless, a drawback of this approach is that the developer must create a sophisticated, novel interface to browse the intricate graphical application. Google Play features a voice guide that provides auditory feedback to users regarding various device activities, such as incoming phone calls and line calls. This feature is handy for individuals with visual impairments. However, it is not currently accessible for outgoing calls or for performing actions through voice commands.

The "HANGMAN VOICE OVER" application is a voice-activated game designed for the Android operating system. In contemporary times, it is commonplace for individuals to engage in gaming activities utilizing a keypad. However, we present a novel gaming approach that can be operated through vocal commands. The game of Hangman is widely recognized and enjoyed.

The game presents the player with a series of blank spaces, and the objective is to correctly guess the word within a limited number of attempts, typically denoted as K. Hangman is a simplistic game that necessitates only the aptitude to spell or conjecture. Typically, this game requires a minimum of two participants. In this game, a participant designated as "the host" selects a confidential term while the other participant endeavors to deduce the term.

The game involves an automated word generation system that prompts the player to guess a word with minimal incorrect attempts. Each incorrect guess brings the individual one step closer to losing. At the game's onset, the user will be presented with the choice of utilizing either a keypad or a voice command to engage in gameplay. The variability of an individual's preferences is contingent upon their surrounding environment and personal inclinations.

Distinct tiers will be established to correspond to varying age cohorts. The lower difficulty levels are designed for younger individuals and feature a distinct vocabulary that is simpler. The medium proficiency level is intended for adolescent learners. It incorporates a diverse range of vocabulary, whereas the high proficiency level is designed for adult learners and encompasses a more challenging lexicon.

Maintaining a comprehensive user profile that includes the user's score is imperative. The higher the words the user correctly guesses, the greater their score and the number of stars earned. The score above has the potential to be disseminated on a global scale. The system employs a mechanism to enhance player convenience by generating a single alphabet of the word randomly.

II. BACKGROUND AND LITERATURE REVIEW

According to Bhardwaj et al., recognizing speech in children poses a significant challenge due to the considerable differences in the articulatory, acoustic, physical, and linguistic features of children's speech compared to that of adults. [7] The extant literature on Arabic automatic speech recognition (ASR) was examined by Dhouib et al. [8, 9]. In their publication, Ali et al. presented a highly accurate speech recognition system designed to address the challenges posed by variations in accents and dialects that can impede the performance of automated speech recognition (ASR) systems during speech signal analysis. Kłosowski et al. [10] introduced a grapheme-to-phoneme conversion approach and algorithm for the Polish language based on rules. In their study, Song and colleagues [11] presented a convolutional neural network entirely based on recursive recurrent convolution to enhance monaural speech in the time domain. The authors Chen et al. [12] introduced a novel approach for training a speech emotion recognition (SER) model based solely on the fundamental frequency extracted from electroglottograph (EGG) signals. [12] This approach involves using the cross-modal emotion distillation (CMED) technique. Hossain et al. [13] generated a dataset comprising 30 hours of Bangla speech encompassing seven regional Bangla dialects. The primary objective of this dataset was to identify synthesized Bangla speech and classify it accordingly. Dua et al. [14] devised a convolutional neural network (CNN) based speech-to-text recognition system to identify tonal speech signals in Gurbani hymns. The method proposed by Chen et al. [15] involves extracting features from the electrogastrogram (EGG) of specific speakers. This enables the separation of target speakers from a mixture of different speakers in a noisy environment, even without clean speech.

The prevalence of home voice assistants has significantly increased in recent years, with this technology becoming increasingly integrated into daily routines [16]. Voice interaction technology is being utilized for various purposes, from information retrieval to personal organization. According to Helft's [17] findings, approximately 20% of all Google searches are conducted through voice interactions. Additionally, Canalys [18] reports a significant increase in global smart speaker shipments, with a growth rate of 187% during the second quarter of 2018. Even with the data mentioned above indicating a rise in the utilization of voice interactions, there has been a dearth of empirical research concerning human-computer interaction (HCI) concerning their application in routine scenarios.

According to GlobalWebIndex's 2019 report, 40% of individuals express an interest in gaming, while 86% of internet users engage in gaming activities on a console at least once a month. The utilization of speech recognition in video games has been lauded for its innovative nature. However, it has yet to transcend beyond the realm of novelty. Over the past decade, there has been a surge in the development of voice recognition technology in consumer products such as Microsoft Kinect, as reported by Globalme in 2018. Using player-to-player voice interactions has garnered significant attention in the realm of Human-Computer Interaction (HCI). However, voice interactions in gaming scenarios where the voice serves as an input mechanism have yet to be closely scrutinized. The study by Carter, Allison, Downs, and Gibbs in 2015 is referenced. [19]

Open-world video games are distinguished by their non-linear gameplay and the liberty to explore. According to Invision Game Community [20], this genre has gained significant popularity and is now considered one of the most widely enjoyed genres in the gaming industry. In addition, the platform presents many menus that users must navigate through in conjunction with their primary gaming activity. Kulshreshth and LaViola [21] assert that menus must be efficient and unobtrusive to the user while engaged in gameplay.

Voice recognition technology in a gaming context enables users to exercise control over their in-game character and engage in interactive communication with other players via spoken commands. The concept of enhancing accessibility for visually impaired and disabled individuals in the gaming industry is actively promoted by innovative gaming companies. Additionally, it allows players to further engage themselves in the gameplay experience through an additional layer of integration. Voice control has the added benefit of reducing the learning curve for novice users, as it diminishes the need for extensive familiarization with control mechanisms. [28]

The Hangman game is a word-based game that is visually represented by a sequential arrangement of dashes. The game is typically engaged in by a minimum of two individuals. In this activity, an individual is designated as the word selector who chooses a concealed word, while the remaining participants engage in the task of deducing the word by making sequential letter guesses. The games offer various hints, such as indicating whether the given word is an adjective or a noun, as well as providing antonyms or synonyms for the word. According to Ward [30], Hangman is considered an effective method for children to enhance their spelling, pronunciation, vocabulary, and enjoyment simultaneously. [29]

In the study conducted by Ward [30], it was found that Hangman can serve as an effective tool for children to enhance their spelling abilities, refine their pronunciation skills, expand their vocabulary, and simultaneously engage in an enjoyable activity. The Hangman game is a word-based game that is visually represented by a series of dashes arranged in a linear fashion.

Moreover, according to Coles in Wirawan's [32] study, the game of Hangman is regarded as an enjoyable activity that can be implemented within the classroom setting to enhance students' vocabulary acquisition. This game can be played using various platforms such as the blackboard, individual desks, or even the smart board. Furthermore, according to Parkin [31], the Hangman game is characterized by players being provided with a concealed word and a predetermined limit of attempts. According to Wirawan [32], a game similar to hangman can be employed to provide players with clues to solve a hidden word. This facilitates a more efficient process of arriving at the correct answer. However, if the guesser fails to include the letter "Suriani," the hangman process will commence.

Hangman is a simplistic and expeditious game requiring at least two individuals who possess writing materials and the proficiency to spell. In this game, a participant will assume the role of a "word maker" and be tasked with generating a covert term. Meanwhile, the other participant will endeavor to deduce the term by making successive attempts to identify individual letters. Incorrectly guessing the letters in the word brings the players closer to defeat. Hangman games can be customized to varying levels of difficulty and educational value, and many online applications and websites offer opportunities to engage in this activity. [24]

Voice recognition apps are a growing market that benefits customers and businesses. Customers can multi-task and engage with machines more smoothly by saying their requests instead of typing them. AI-based voice recognition apps. An advanced AI engine translates user speech commands into machine-understandable form. Then the machine processes the commands and reports the results. [23]

There are two primary modes of voice recognition in gaming: the ability to recognize any auditory input received through the microphone and the capacity to interpret players' speech patterns to execute specific commands or actions within the game. The gameplay experience can be characterized by intense exhilaration or fear, such as issuing commands to troops during combat or maintaining complete silence to evade monsters in a horror game such as Alien: Isolation. [5]

Automatic speech recognition technology is experiencing renewed vigor due to the swift advancements in artificial intelligence and deep learning technology. Notwithstanding, technological impediments hinder the implementation of adaptable solutions and the attainment of user contentment within this domain. This phenomenon can be attributed to multiple factors, including heightened susceptibility to environmental stimuli, such as ambient noise, and inadequate grammatical and semantic comprehension proficiency. Numerous factors impact speech realization, including regional, sociolinguistic, environmental, and personal factors. As mentioned earlier, those generate a diverse array of speech patterns that could be inaccurately identified and represented. [6]

The process of transforming oral language into written text is called Automatic Speech Recognition (ASR). The technology is intended to facilitate the conversion of oral language into written text instantaneously, enabling individuals to interact with computers, mobile devices, and other technological devices through their voice. The primary objective of Automatic Speech Recognition (ASR) is to precisely transcribe spoken language while considering the nuances of accent, pronunciation, and speaking mannerisms, in addition to extraneous factors such as ambient noise that can impact speech clarity. [6]

III. EXISTING APPLICATIONS

Several games incorporating voice recognition technology have been suggested, such as PAH! BIG MOUTH, and CHICKEN SCREAM. The games were evaluated comprehensively to determine their existing and absent functionalities. What factors contributed to the gaming industry's lack of progress and positive reception from consumers? What were the challenges or obstacles that required resolution? The underperformance of voice-enabled games and their reception by the audience could have been better. What metrics can mitigate the risk of failure and enhance audience engagement? Numerous factors necessitate analysis to enhance future work.

*A. **PAH!***

The initial voice-activated game on the iPhone has now been made available on the Android platform. Pah! is a game that utilizes voice recognition technology, whereby the user vocalizes the command 'Pah!' to manipulate a spaceship that emits blips on the display screen of their iPhone or Android device. The propulsion of the spacecraft is initiated by a prolonged exhalation of air, commonly represented as 'Paaaaahhhh.' At the same time, the activation of the weapon system is achieved through a brief and forceful exhalation, typically denoted as 'Pah!'. The concept in question is undoubtedly unconventional, yet it has become popular. Following a tepid reception, some uncertainties arose regarding the game's potential popularity. The concept is intellectually stimulating.

However, the practical execution of the gameplay could be better. In order to achieve functionality, it is necessary to vocalize with a high degree of volume, almost to the point of exertion. Despite one's best efforts, executing tasks effectively may still take work. The game proved to be intriguing, provided that the functionality of the controls was optimal. PAH! could not establish a positive impact on users, resulting in a negative response and a decline in the scope of the voice-based game. The individuals exhibited enthusiasm before engaging in the activity; however, after participation, their level of satisfaction could have been more substantial. While some users expressed positive feedback, the majority of responses were negative. The user ratings and feedback on the Google Play Store could have been better. The degree of enthusiasm experienced by individuals diminished over some time.

*B. **MAGIC TOUCH***

Contemporary youth need help comprehending and mastering fundamental mathematical procedures due to a lack of engagement and motivation toward the subject matter. The present study outlines a pedagogical game, Magic Touch Math, designed to enhance children's proficiency in fundamental mathematical operations. The game is intended for children aged three to five years and employs gesture recognition technology to facilitate interaction with the game. The development of Magic Touch Math adhered to the Game Development Life Cycle (GDLC) methodology. The prototype that was created has facilitated children's acquisition of fundamental mathematical skills through instinctive gestures. It is hoped that the application can get the children motivated and interested in mathematics.

C. *BIG MOUTH*

Moreover, BIG MOUTH is a funny voice-controlled game that gained significant popularity in early 2017. The charming, animated character and amusing controls elicit a attractive, novel gaming encounter. The game's players are tasked with controlling a monster known as Big Mouth through the utilization of vocal commands in order to navigate and surmount various obstacles successfully. Players are not required to perform tactile maneuvers except for the retry and revive buttons.

The challenge lies in requiring a noise-free environment to fully appreciate the game, as any external auditory stimuli may impede one's enjoyment of the experience. The game is amusing but encounters difficulties when detecting external vocalizations. The software is experiencing frequent crashes. The experience was enjoyable during its limited duration.

However, it was short-lived and ultimately terminated after only a few rounds. Due to the unavailability of sufficiently quiet locations to engage in gameplay, fewer users have had the opportunity to interact with the game. The game's efficacy is compromised in environments with high levels of ambient noise, as the software may experience difficulty in accurately detecting and interpreting user input, thereby hindering its ability to provide optimal responses.

As a result of these constraints, a relatively small number of users attempted to utilize it, which may account for its limited notoriety within the gaming sector. A small proportion of individuals possess adequate knowledge and awareness regarding the subject matter. Given that the game is voice-based, it is pertinent to examine its merits to ascertain the factors contributing to its effectiveness and appeal among users.

D. *CHICKEN SCREAM*

The game in question is an interactive and engaging, highly habit-forming experience. The objective of the game is to manipulate the movements of a chicken through the use of vocal commands. This game exhibits certain limitations whereby excessive noise is required to prompt the chicken to jump and run, or the chicken can be controlled through slow movements. However, it is imperative to refrain from making any noise to prevent the chicken from stopping, and instead, utilize a gentle tone to facilitate the chicken's movement—the issues encountered by users. Advertisements are pervasive and lengthy. Assessing audio sensitivity presents a challenge. The absence of a mute function for the game's auditory output hinders the user's ability to execute movements effectively, as the sounds serve as a source of interference. Even in a low-noise environment with the microphone set to its least sensitive mode and the speaker holding their breath and refraining from touching their phone, the chicken object under observation exhibited autonomous movement.

E. *SCREAM GO HERO*

Scream Go Hero is similar to Stick Hero, but the user screams to jump instead of creating stick bridges to reach the next platform. Loudness determines height and distance. Small jumps demand mild groans, but longer lengths require a Grammy-worthy note. [5]

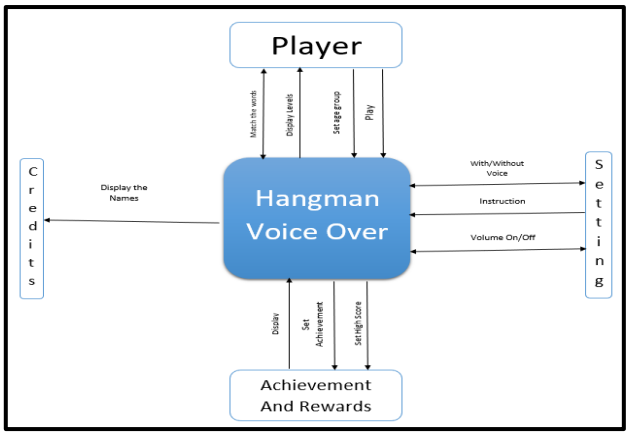

Figure 1: Context Diagram - Hangman Voice Over

F. *BOT COLONY*

The game's functionality is solely reliant on voice-activated and typed-in directives. In order to advance the storyline, engaging with the robots by posing appropriate inquiries is imperative. In the event of an erroneous inquiry, one must persist in their attempts until a satisfactory response is obtained. The Bot Colony video game immerses the player in the role of a detective tasked with unraveling the enigma surrounding the robotic inhabitants of Agrihan. [5]

Seaman represents an initial endeavor to establish an interactive encounter utilizing vocal directives. The game's objective was to oversee the development of a digital companion to facilitate its transition from an aquatic to a terrestrial environment. The development of console hardware has significantly influenced the incorporation of voice interactions in video games [19]. Nintendo introduced a voice interaction-enabled unit for its Nintendo 64 console. Merely two games were launched, one of them being Hey You, Pikachu! which facilitated uncomplicated vocal instructions to govern the protagonist in the game. The advent of the early 2000s console generation ushered in a new era of online functionality, enabling player-to-player interactions. Numerous tactical combat games have incorporated player communication. However, Rainbow Six stands out as one of the pioneers in enabling players to issue voice commands to AI teammates. [22]

IV. METHODOLOGY

The "Hangman Voice Over" game enhances users' vocabulary more engagingly. The software component of the project is not the only one, and all other components must also be considered: the game's environment, narrative, characters, gameplay, and artwork. It is a voice-based Android game. Those who wish to play games can readily engage in voice-based games to amuse themselves. In the swiftly expanding fields of software engineering and

development as well as game development, the future is still being determined.

Methodology followed for the completion of this application after extensive research and analysis is as follows.

HANGMAN VOICE OVER is a voice-based game. Flow of the game is as follows:

1. User opens the game.
2. Main menu screen appears with buttons (a) settings & (b) play.
3. In settings user can select whether he want to play with voice or without voice.
4. When clicks on play button level screen will appear.
5. Initially only 1st level is unlocked while the other 11 levels are kept locked.
6. When the user selects the 1st level automatically blanks will appear to guess a word if he guesses correctly, the user will be awarded otherwise on wrong guess nothing will be awarded.
7. After playing a game once, he can either quit the game or select the play again option.
8. After completing 1st level if he achieves the certain stars, he can unlock further levels according to the condition of each level or he can buy the stars to unlock next level.

A. ***Screen 01: Splash Screen***

This is the first interface of the game, the main menu; it will open after the Unity splash screen. It contains buttons for Play, How to Play, Settings, Leaderboard, and Achievements.

Figure 3: Screen 01 - Splash Screen

B. ***Screen 02: How to Play***

This interface opens after the user taps on the button "?" (How to play) on the main menu, from where the user learns how to play this game either by voice or keyboard.

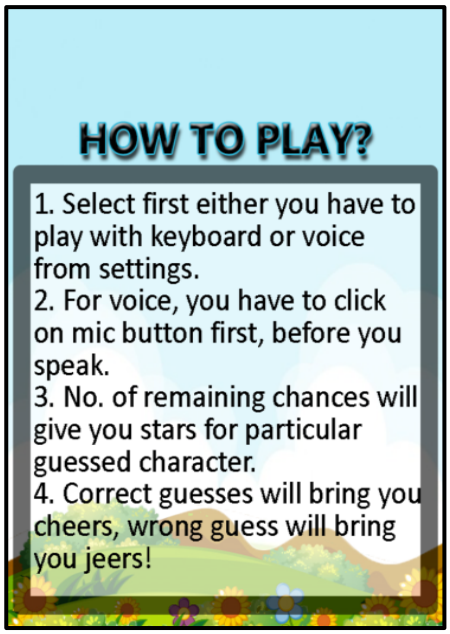

Figure 2: Screen 02 – How to Play?

C. ***Screen 03 (a & b): Settings***

This interface opens when the user taps on the button "Setting" on the main menu; this interface contains options in which the user decides how they want to play, either by voice or keyboard, with music or without music. Most users get annoyed by watching ads repeatedly, so for user satisfaction, we placed a button where he or she could turn off the ads option.

Figure 4: Screen 03 - Settings

Another exciting option is if they want to share their score with their friends, or they can share their score by tapping the share button. Last, tapping on the "Rate Us" button will allow users to rate this game on the Play Store. It will help the developers improve the game in the future by knowing the user's reviews.

D. *Screen 04: Levels*

This is the level screen that appears after tapping on the play button on the main menu. These are 12 different difficulty levels, each requiring several stars to unlock. Now it is up to the user to either buy the stars to unlock the levels or play the game and earn stars by giving the correct answers.

Figure 5: Screen 04: Levels

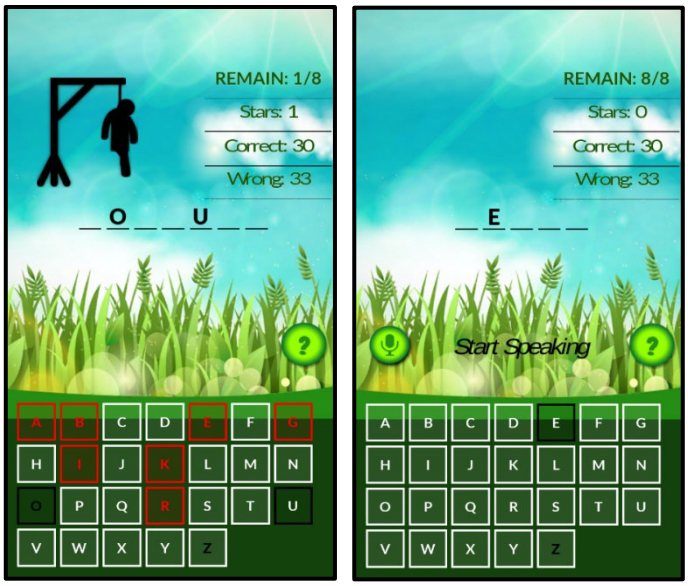

Figure 6: Screens 05 – Hangman Game

E. *Screen 05 (a & b): Game*

Two screens below; the right screen denotes that the user is playing a game with voice, and the left screen denotes that the user is playing the game with the keyboard, but the objective of both screens is the same, i.e., to guess the right word.

F. *Screen 06 : ? Synonym*

This screen appears when the user taps the "?" button to know the synonym, and he/she starts guessing the letters. Users have only eight options for wrong guesses. If the user guesses eight letters wrong, the game will be over, and the user will earn nothing. If the user guesses the correct letter, it will appear on the screen, and if the user guesses the wrong letter, it will appear on the screen keyboard with a red border.

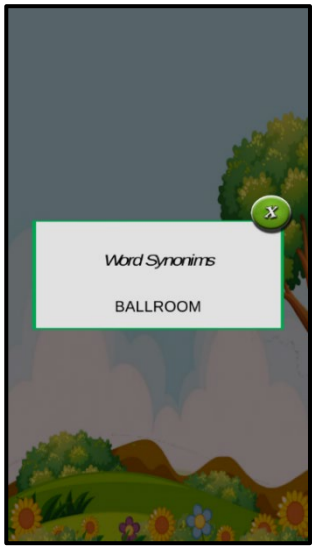

Figure 7: Screen 06 – Synonym

G. *Screen 07*

This screen will appear when the user taps the back button on his mobile. It confirms that the user wants to quit the game or accidentally taps the back button.

Figure 8: Screen 07 - Quit

CONCLUSION

People gain a sense of purpose from playing, and victory makes them feel heroic. There is a transference of our confidence, creativity, and ambition from playing video games to our actual lives. Games allow us to access positive emotions such as curiosity, optimism, and affection. Since computers are commonplace in homes and schools, incorporating word games into a child's study regimen is simple. It is an excellent method for relieving tension and relaxing the mind without becoming completely mindless. Encourage the student to engage in word games before dinner or after completing assignments. Playing word games increases a child's vocabulary and prepares him or her to recognize word patterns and spelling idiosyncrasies that cannot always be taught outside of context.

Hangman is a quick and simple game that only requires the ability to spell and predict. A minimum of two individuals typically plays this game. One player, "the host," creates a secret word, while the other attempts to guess it by inquiring what letters it contains. In our game, however, the first player is the system, which will give a word, and the second player, the user, must correctly identify that word. However, every incorrect guess draws them closer to defeat.

Unique due to its voice-controlling capabilities, its novel feature Voice! Now, gamers can play hangman not only with the keyboard but also with Voice. Hangman Voice-Over, the game has engaging visuals, and gameplay will keep gamers playing for hours.

There remains a contingent of individuals who continue to prefer the traditional combination of a joystick/button and keyboard/mouse as the preferred means of communication and control for interacting with characters displayed on a screen. Despite receiving praise for their innovative nature, games incorporating speech recognition technology have yet to achieve their goals. They have yet to transcend the novelty aspect of the situation entirely.

One of the primary obstacles lies in the substantial quantity of speech data required for its successful implementation. Gathering large-scale speech data is a multifaceted undertaking, requiring collaboration between video game developers and established third-party providers with extensive experience in streamlining workflows and implementing advanced technology.

As these collaborations materialize, the potential for enhanced precision, localization, and widespread integration of speech recognition technology in video games can be anticipated.

ACKNOWLEDGMENT

We express our profound gratitude to all individuals who supported in facilitating the development of these concepts, elevating them from a state of simplicity to one that aligns with reality. We want to take this opportunity to express our sincere gratitude to the administrations of our respective universities for their invaluable support in facilitating and overseeing our research endeavors with utmost dedication. The assistance and comprehension provided by our family and friends are indispensable in completing our endeavors, irrespective of their difficulty level, as they contribute to our overall contentment. We want to express our appreciation to the support personnel who assisted us in compiling this article by facilitating the collection of materials and data and conducting research. In conclusion, the study's authors express their appreciation and admiration for their fellow authors for their generous support and timely communication, despite their geographical distance. This collaborative effort significantly contributed to the uniqueness and novelty of the research.

REFERENCES

[1] Moyen Mustaquim, “Automatic speech recognition- an approach for designing inclusive games,” Springer, Multimedia Tools and Applications 66(1):1-16, September 2011.

[2] Chris Crawford, “The Art of Computer Game Design”, Washington State University, 1997.

[3] Neo Wen Kye, Aida Mustapha, Noor Azah Samsudin, “Gesture Recognition for Educational Games: Magic Touch Math”, International Research and Innovation Summit, IRIS2017.

[4] Jan L. Plass, Paul A. O’Keefe, Bruce D. Homer, Jennifer Case, Elizabeth O. Hayward, Murphy Stein, Ken Perlin. The impact of individual, competitive, and collaborative mathematics game play on learning, performance, and motivation.. Journal of Educational Psychology, 2013.

[5] 19 Games That Use Voice Recognition, Kirsten Howarth, Charlene Maria Teressa, Sachi Go, https://www.thegamer.com/games-with-voice-commands-speech-recognition/#lurking, Updated Feb 15, 2023.

[6] Lijiang Chen, Special Issue on Automatic Speech Recognition, MDPI Appl. Sci. 2023, 13(9), 5389;

[7] Bhardwaj, V.; Ben Othman, M.T.; Kukreja, V.; Belkhier, Y.; Bajaj, M.; Goud, B.S.; Rehman, A.U.; Shafiq, M.; Hamam, H. Automatic Speech Recognition (ASR) Systems for Children: A Systematic Literature Review. Appl. Sci. 2022, 12, 4419.

[8] Dhouib, A.; Othman, A.; El Ghoul, O.; Khribi, M.K.; Al Sinani, A. Arabic Automatic Speech Recognition: A Systematic Literature Review. Appl. Sci. 2022, 12, 8898.

[9] Ali, M.H.; Jaber, M.M.; Abd, S.K.; Rehman, A.; Awan, M.J.; Vitkutė-Adžgauskienė, D.; Damaševičius, R.; Bahaj, S.A. Harris Hawks Sparse Auto-Encoder Networks for Automatic Speech Recognition System. Appl. Sci. 2022, 12, 1091.

[10] Kłosowski, P. A Rule-Based Grapheme-to-Phoneme Conversion System. Appl. Sci. 2022, 12, 2758.

[11] Song, Z.; Ma, Y.; Tan, F.; Feng, X. Hybrid Dilated and Recursive Recurrent Convolution Network for Time-Domain Speech Enhancement. Appl. Sci. 2022, 12, 3461.

[12] Chen, L.; Ren, J.; Mao, X.; Zhao, Q. Electroglottograph-Based Speech Emotion Recognition via Cross-Modal Distillation. Appl. Sci. 2022, 12, 4338.

[13] Hossain, P.S.; Chakrabarty, A.; Kim, K.; Piran, M.J. Multi-Label Extreme Learning Machine (MLELMs) for Bangla Regional Speech Recognition. Appl. Sci. 2022, 12, 5463.

[14] Dua, S.; Kumar, S.S.; Albagory, Y.; Ramalingam, R.; Dumka, A.; Singh, R.; Rashid, M.; Gehlot, A.; Alshamrani, S.S.; AlGhamdi, A.S. Developing a Speech Recognition System for Recognizing Tonal Speech Signals Using a Convolutional Neural Network. Appl. Sci. 2022, 12, 6223.

[15] Chen, L.; Mo, Z.; Ren, J.; Cui, C.; Zhao, Q. An Electroglottograph Auxiliary Neural Network for Target Speaker Extraction. Appl. Sci. 2023, 13, 469.

[16] Myers, C., Furqan, A., Nebolsky, J., Caro, K., & Zhu, J. (2018). Patterns for How Users Overcome Obstacles in Voice User Interfaces. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (pp. 1-6). ACM.

[17] Helft, M. (2016). Inside Sundar Pichai's Plan to Put AI Everywhere. https://www.forbes.com/sites/miguelhelft/2016/05/18/inside-sundarpichais-plan-to-put-ai-everywhere/#66a674574a2e, April 2019.

[18] Canalys., Global Smart Speaker Shipments Grew 187% Year on Year in Q2 2018, With China the Fastest-growing Market. Retrieved April 2019, https://www.canalys.com/newsroom/global-smart-speakershipments-grew-187-year-on-year-in-q2-2018-with-china-the-fastestgrowing-market.

[19] Carter, M., Allison, F., Downs, J., & Gibbs, M. (2015). Player Identity Dissonance and Voice Interaction in Games. In Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play (pp. 265- 269). ACM.

[20] Invision Game Community. (2019). The Most Popular Video Game Genres in 2019. Retrieved 2019 May 11 from https://invisioncommunity.co.uk/themost-popular-video-game-genres-in-2019/

[21] Kulshreshth, A., & LaViola Jr, J. J. (2014). Exploring the Usefulness of Finger-based 3D Gesture Menu Selection. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1093-1102). ACM.

[22] Robin Harnesk, Exploring voice interactions in an open world video game environment, Malmo University, Spring 2019.

[23] How to Develop a Voice Recognition App, Artificial Intelligence (https://www.matellio.com/blog/category/artificial-intelligence/), Sep 8th, 2022.

[24] Ananda Esa Fitri, Hangman Games As Warming – Up Activities For Young Learners In Classroom English Course, English Department Muhammadiyah University Of Jakarta, June 2018.

[25] T.Shabana, A.Anam, A.Rafiya, K.Aisha, Voice based email system for blinds, International Journal of Advanced Research in Computer and Communication Engineering, Vol. 4, Issue 1, January 2015.

[26] J.A.Larson (2003,Oct),VoiceXML:Introduction to Developing Speech Applications.

[27] Pandapotan Siagian, Sindak Hutauruk, Voice controller mobile android application, 2nd Nommensen International Conference on Technology and Engineering IOP Publishing, IOP Conf. Series: Materials Science and Engineering 420 (2018).

[28] Voice Controlled Games: The Rise of Speech Technology in Gaming, https://summalinguae.com/language-technology/voice-controlled-games/, August 2021.

[29] Srimaharani Tanjung, Habib Rahmansyah, Suci Ramadani Siregar, "The Effect Of Hangman Game On Students' Vocabulary Mastery", Jurnal Liner, Institut Pendidikan Tapanuli Selatan, Vol. 2. No.3 September, ISSN. 2620-5599, 2019.

[30] Evi, Ashartini.,Susilawati Endang., Salam, Urai. 2015. Teaching Vocabulary by Using Hangman Game to Eighth Grade Students SMP DDI SSA, Pontianak. Artikel IlmiahMahasiswa. Vol.1. No. 1, 2017.

[31] Swick, Ed. 2005. English Grammar for ESL Learners. Mc.Growhill

[32] New York. Wirawan, Bramantyo Shandi. "The Effectiveness of Hangman Game in Teaching English Vocabulary". Skripsi,

,