DESIGN OF THE EDUCATIONAL GAME "SINYAL SERU" LEARNING SIGN LANGUAGE WITH THE MDA FRAMEWORK APPROACH

Mochamad Dwi PUTRA[1], Ricky Widyananda PUTRA[2*], Ahmad Thabathaba'i SAEFUDIN[3], Fatma MISKY[4]
[1,2,3,4] ***Universitas Budi Luhur, Jakarta, INDONESIA***
[*] ***rickywidyanandaputra@budiluhur.ac.id***

ABSTRACT

The lack of understanding of sign language among teenagers often creates communication barriers and social isolation for people with hearing impairments. The design of this work aims to design an educational game as an alternative media for learning Indonesian Sign Language (BISINDO) that is interactive and interesting for the general public (non-disabled) to be able to understand and communicate with people with hearing impairments. The design method used is the MDA Framework from Leblanc, which focuses on mechanics, dynamics, and aesthetics to create an interactive experience. The result of this design is a prototype of a 2D mobile game entitled "Sinyal Seru" which combines the platformer genre with a mini-game of guessing words in sign language. This game is expected to be an innovative solution to bridge the communication gap, increase social interaction, and foster empathy between non-disabled teenagers and the deaf community through a game medium that is relevant to the younger generation.

Keywords: Communication, Deafness, Games, MDA Framework, Sign Language.

1. INTRODUCTION

People with disabilities have rights, obligations, and equal status with the general public (non-disabled). Due to their differences, people with disabilities sometimes feel less accepted in society, leading to feelings of isolation and separation. This group of people with disabilities has distinct limitations, with varying personalities, attitudes, and behaviours (Tae et al., 2024). One such disability is the deaf, who experience partial or complete hearing loss. This condition impairs their ability to understand and use language for communication (Putra & Misky, 2023).

People with disabilities often face various communication challenges that can hinder their productivity and social integration (Azzahra et al., 2022). Sign language is key for deaf people. It enables them to communicate effectively and fully participate in society (Khairat, 2022). Therefore, deaf people need support from non-disabled people to understand their limitations and enhance their social relationships by learning sign language, enabling them to fully participate in society.

Deaf adolescents sometimes experience difficulties in social interactions. They need friends and guidance, related to self-acceptance and social values (Rodhiyah & Wulandari, 2024). This transition period is a crucial stage in an individual's life, marked by various significant changes, both physical, psychological, social, and emotional. One of these changes is exploring new things. This behaviour is closely related to social, emotional, and behavioural development that generally emerges during this transitional stage. The urge to seek new things is a natural human trait aimed at enriching self-understanding and knowledge (Saragosa-Harris et al., 2022).

However, the general public's (non-disabled) lack of understanding of sign language often hinders their communication. Effective communication between the public and people with disabilities is hampered by a lack of knowledge about proper interaction methods, which often leads to various problems (Adam Nurmansyah et al., 2023). Observations and interviews conducted by the author at Difabis Coffee, South Jakarta, revealed significant communication barriers in the initial stages of interaction between the general public (non-disabled) and deaf friends. Based on this case, the author designed a project that can help the general public communicate with deaf friends. The lack of understanding of sign language in the community limits interaction between deaf friends. Therefore, alternative media such as game applications are needed to bridge communication between the general public and deaf friends.

Based on the background explanation that the author explained, the author has a basic idea to design an educational game as a learning to recognize sign language, for the general public. The aim is to enable the public to understand and communicate with deaf friends. The problem formulation in this research is how to design an effective educational game for learning language as a means of communication from the general public to deaf friends. In designing this game, the author uses the mechanical, dynamic, and aesthetic framework from Leblanc, which discusses the game design process seen from two sides: the game designer and the user (Putra, 2025).

2. METHOD

This study uses a qualitative descriptive approach with a practice-based research model that focuses on the design process of visual communication design-based works (Gilbert et al., 2022). This approach was chosen based on the

research objective, which was not only to uncover the phenomenon but also to produce an educational game prototype that could be tested for effectiveness. In this context, the game "Sinyal Seru" was chosen as the research object, while the research subjects involved the general public (non-disabled) as the primary target users.

The conceptual framework used is the MDA Framework (Mechanics, Dynamics, Aesthetics) developed by LeBlanc (Widyananda Putra & Anissa, 2023). This framework was chosen because it is able to integrate the designer and user perspectives in the game design process. The mechanics stage includes the formulation of rules, systems, gameplay features, and visual asset design (Thabathaba'i et al., 2025). The dynamics stage focuses on observing player interactions with game mechanics, including play patterns, difficulty levels, and experience flow (Misky & Putra, 2022). Meanwhile, the aesthetics stage evaluates aspects of the emotional experience felt by players, such as engagement and enjoyment (Putra et al., 2024).

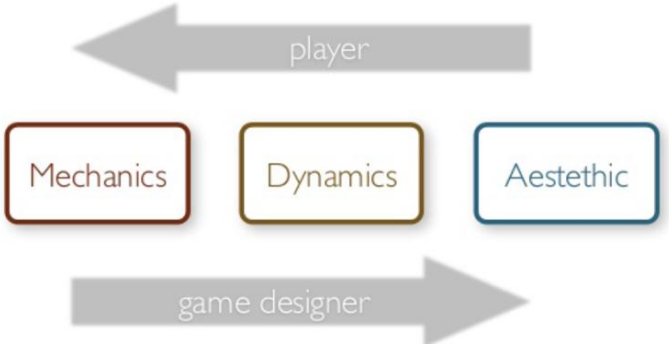

Figure 1. MDA Conceptual Framework

Broadly speaking, the stages of this research consist of problem identification through observation, interviews, formulation of a game concept based on the MDA Framework, development of the "Sinyal Seru" prototype, implementation of prototype trials on research subjects, and analysis and evaluation to refine the design. With these steps, this research is expected to produce an educational game design that is not only visually appealing and interactive, but also has a social impact in improving the understanding of sign language and strengthening interactions between the general public and people with hearing impairments.

3. RESULTS AND DISCUSSION

The game "Sinyal Seru," designed as a sign language learning medium, was analyzed using the MDA Framework (Mechanics, Dynamics, and Aesthetics). This framework was developed by LeBlanc and is often used in game design studies to understand the relationship between game structure, player interaction, and the emotional experience created. By using MDA, this game is not only viewed as a visual product, but also as a living learning system through interactions between users and digital media. The following discussion will outline the design results based on three core aspects: mechanics, dynamics, and aesthetics. The results of the discussion in this study are as follows:

Mechanics: Game Rules and Structure

The mechanics in "Sinyal Seru" refer to all the rules, features, and systems that form the framework of the game. This game combines the platformer genre with an educational mini-game in the form of sign language word guessing. Players must overcome obstacles in a chapter, then face the challenge of identifying the letters or words of the BISINDO alphabet within a certain time limit. This structure teaches vocabulary gradually, from basic to complex levels, allowing players to learn progressively.

In addition to the level system, User Interface (UI) elements also form part of the mechanics. The main menu layout is kept simple with three core options: Start Game, Instructions, and About. The level lock feature (the lock icon) ensures that players can only access the next chapter after completing the previous one, creating a gradual learning pattern. This mechanic strengthens the educational aspect by systematically streamlining the learning process.

Table 1. In-Game Mechanics of "Sinyal Seru"

Game Name	Mechanic
"Sinyal Seru"	*Game Egine Construct 3*

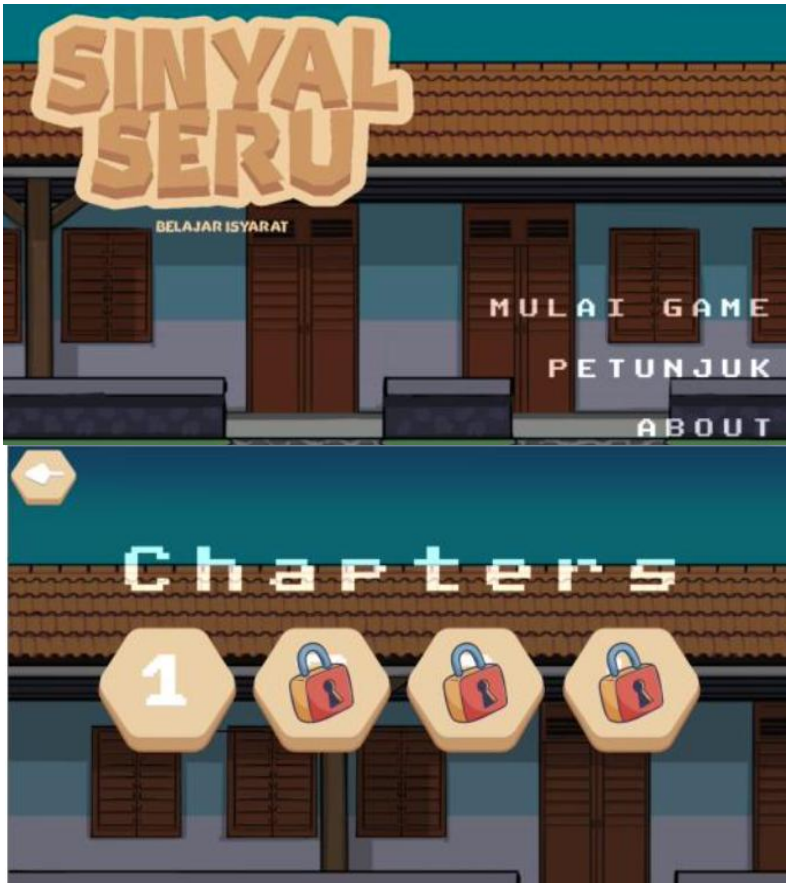

Figure 2. Main Menu Screen and Level Selection Display
Illustrate the Game Mechanics Structure.

Dynamics: Interaction and Game Flow

Dynamics emerge when players begin to interact with the existing mechanics. In "Sinyal Seru," dynamics are characterized by an active and challenging learning experience. Players are not only asked to guess BISINDO vocabulary, but they are also required to do so quickly thanks to a timer and scoring system. This creates a sense of urgency and competitive motivation. The dynamics become even more engaging when players have to repeat if they fail, thus establishing a cycle of learning from mistakes.

Furthermore, the game's dynamics also foster emotional and social engagement. Non-disabled adolescents, for example, can experience simulated communication with deaf individuals. This fosters an understanding that learning sign language is not just about memorizing symbols, but also about establishing meaningful interactions. Furthermore, the dynamic progression system, through tiered chapters, encourages players to remain motivated to reach the next level. Thus, the dynamics not only create excitement but also instill values of inclusivity.

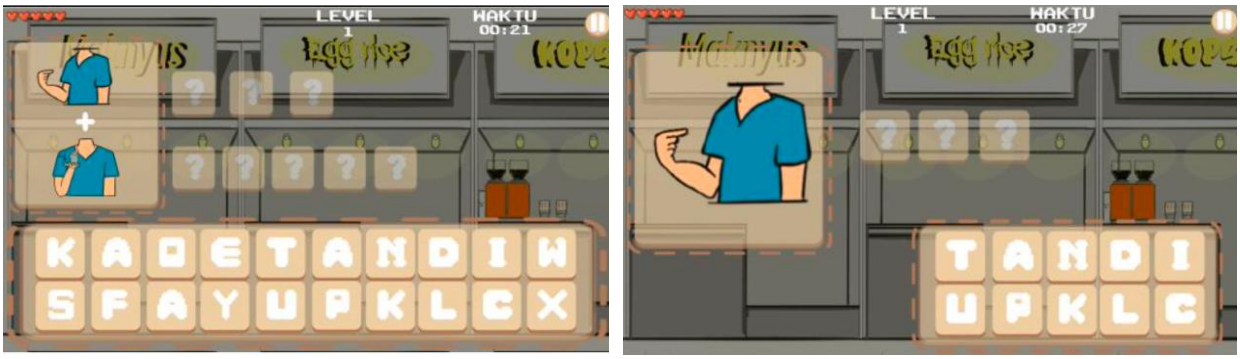

Figure 3. A Time-Limited Word Guessing Mini-Game Gameplay Display, including a Score Indicator and Timer, to Demonstrate How Dynamics Are Created Through Interaction.

Aesthetics: Experience and Feeling

The final aspect is aesthetics, which relates to the emotional experience players experience when interacting with the game. "Signal Seru" offers a fun, friendly, and empathetic learning experience. The choice of warm colours like brown

and beige, combined with chibi-style character illustrations, creates a welcoming atmosphere for teenagers. This presentation conveys an inclusive impression that sign language can be learned in a light and entertaining way.

Figure 4. Chibi Character Illustrations with Friendly Expressions and Level Background Examples To Enhance the Aesthetic Feel

The aesthetic is also reflected in the sense of accomplishment players gain when successfully completing a challenge. The feeling of satisfaction arises not only from answering the question correctly, but also from a new awareness that sign language is an essential part of everyday communication. Thus, the aesthetics of "Sinyal Seru" go beyond mere visuals; they create an emotional resonance that connects players to the social reality of deaf people.

Figure 5. Participants Conducting a Trial of the "Sinyal Seru" Game

Through analysis using the MDA Framework, "Sinyal Seru" was holistically designed as an educational game. Mechanics provide a systematic learning structure, Dynamics deliver challenging yet meaningful interactions, and Aesthetics create an inclusive and enjoyable emotional experience. All of these aspects demonstrate that this game is not just an entertainment tool, but also a strategic tool for building social awareness, improving communication skills, and bridging the relationship between non-disabled youth and the deaf community. With this approach, "Sinyal Seru" successfully presents a combination of game design, interactive learning, and a social mission that is relevant to today's youth.

4. CONCLUSION

This research confirms that the lack of understanding of sign language among the general public (non-disabled) remains a serious barrier to social interaction with deaf friends. By designing the educational game "Sinyal Seru" based on the MDA Framework (Mechanics, Dynamics, Aesthetics), this research successfully produced a game prototype that functions not only as digital entertainment, but also as a meaningful learning tool. In terms of mechanics, the game structure that combines the platformer genre with a sign language word guessing mini-game presents a systematic and gradual learning flow. In terms of dynamics, player interaction with the game mechanics creates an active, challenging learning experience, while also fostering social awareness. Meanwhile, in terms of aesthetics, the use of easy-to-understand visual design and an inclusive game atmosphere can build emotional resonance, create a sense of empathy, and provide enjoyment in learning sign language.

The results of this design demonstrate that educational games can be an effective alternative medium for bridging communication gaps, strengthening social interactions, and fostering a sense of caring between the general public (non-disabled) and the deaf community. Thus, "Sinyal Seru" not only presents innovation in visual communication design but also makes a tangible contribution to efforts to create a more inclusive and empathetic society.

This research is still limited to the design and initial testing stages within a limited scope. Therefore, further research is recommended to develop the "Sinyal Seru" game to a broader implementation stage by involving participants from various age groups and regions, so that its effectiveness can be measured more comprehensively. Furthermore, it is necessary to develop additional interactive features, such as a multiplayer mode or integration with augmented reality (AR) technology, to make the learning experience more immersive. Collaboration with deaf peers is also important to ensure the accuracy of the sign language material and the social relevance of the game. Future research can also expand the focus on long-term evaluation aspects, such as the game's impact on improving communication skills and changing players' social attitudes towards people with disabilities. With continued development, "Sinyal Seru" has the potential to become an innovative model in digital technology-based inclusive education.

REFERENCES

Adam Nurmansyah, *et al*., (2023). Permasalahan Komunikasi Yang Kerap Terjadi Pada Penyandang Disabilitas. *Jurnal Pendidikan, Bahasa Dan Budaya*, *2*(2), 200–210. https://doi.org/10.55606/jpbb.v2i2.1515

Azzahra, S., *et al*., (2022). Pengaruh Penilaian Kinerja dan Kompensasi Terhadap Motivasi Kerja dan Produktivitas Kerja Karyawan Pada PT. Datascrip Cikarang. *JMPIS*, *3*(1), 2022. https://doi.org/10.38035/jmpis.v3i1

Gilbert, G. H., *et al*., (2022). Structure, function, and productivity from the National Dental Practice-Based Research Network. *Journal of Clinical and Translational Science*, 6(1). https://doi.org/10.1017/cts.2022.421

Khairat, M. (2022). Efikasi Diri pada Remaja Tunarungu Berprestasi (Studi Kasus Efikasi Remaja Berkebutuhan Khusus). *Al-Qalb*, *13*(1).

Misky, F., & Putra, R. W. (2022). Estetika Virtual Dalam Game 3D "Dreadeye VR" (Pendekatan MDA Framework). *Kartala Visual Studies*, *2*. https://journal.budiluhur.ac.id/index.php/kartala

Putra, R. W. (2025). Estetika Interaksi Permainan Real Drum dalam Pendekatan MDA Framework. *Sasak*, 7(1). https://doi.org/10.30812/sasak.v7i1.4383

Putra, R. W., & Misky, F. (2023). *Inclusive in Online Games Brings Confidence for Players with Deaf Friends with Disabilities*. 30–31.

Putra, R. W., Misky, F., & Thabathaba'i, A. (2024). *Implementation of Educational Game "Fire Mitigation" Audio Based for Blind Persons Disabilities with MDA Framework Method*.

Rodhiyah, I., & Wulandari, S. (2024). Aplikasi Berbasis Mobile Sebagai Sarana Pembelajaran Dasar Bahasa Isyarat. *Journal of Information Technology and Computer Science (INTECOMS)*, 7(1).

Saragosa-Harris, *et al*. (2022). Real-World Exploration Increases Across Adolescence and Relates to Affect, Risk Taking, and Social Connectivity. *Psychological Science*, 33(10), 1664–1679. https://doi.org/10.1177/09567976221102070

Tae, M. I. W., Mas'amah, & Nara, M. Y. (2024). Pola Komunikasi Pengasuh dan Anak-Anak Penyandang Disabilitas. *Deliberatio: Jurnal Mahasiswa Komunikasi*, *4*(2).

Thabathaba'i, A., Putra, R. W., Misky, F., & Rinaldi, R. S. (2025). *Earthquake Disaster Mitigation Game Design Using MDA Framework Approach*. 1, 49.

Widyananda Putra, R., & Anissa, J. (2023). Analisis MDA Framework Pada Game Pokemon GO. *Kartala Visual Studies*, 2(1).