Virtual Game Learning Media to Understand the Types and Formation of High School Students Identities using the Vilamil Molina Method

Muhammad Syahrul Azhari Nasution
Department of Computer Science, Faculty of Engineering and Computers, Universitas Harapan, Medan, Indonesia
syahrulazhari2000@gmail.com

ABSTRACT

This study aims to address the challenges of conventional learning regarding the types and formation of self-identity among high school students by applying a virtual game as a learning medium. Conventional learning methods, such as lectures and textbooks, are often considered less effective in capturing students' attention on personal topics like self-identity. Therefore, this research proposes the use of a virtual game combined with the Vilamil Molina Method to create a more interactive and engaging learning experience. The Vilamil Molina Method is a structured multimedia development approach that consists of five main stages: Development, Preproduction, Production, Postproduction, and Delivery. In the Development stage, the initial concept of an educational First Person Perspective (FPP) game application was formulated, targeting high school students. During the Preproduction stage, detailed designs such as Use Case Diagrams, Activity Diagrams, and Storyboards were created. The Production stage focused on implementing these designs by integrating a virtual museum environment and 3D objects using Unity. In the Postproduction stage, system testing was conducted through the Black Box method to ensure the application's functionality. The final stage, Delivery, involved distributing the application to users for trial. The results of the study indicate that implementing a virtual game with the Vilamil Molina Method successfully created an effective learning medium. Functionality testing and user trials showed that the application worked properly, and the designed interactions functioned logically. By combining the entertainment elements of gaming with a systematic educational approach, this application is expected to improve high school students' motivation, engagement, and understanding of self-identity formation in greater depth.

This is an open-access article under the CC BY-SA license.

Corresponding Author:

Muhammad Syahrul Azhari Nasution
Universitas Harapan
Email: syahrulazhari2000@gmail.com

1. INTRODUCTION

In this rapidly developing digital age, technology has penetrated almost all aspects of human life, including the world of education. One form of technological innovation that is now increasingly popular is the use of digital games or virtual games. Games are not only seen as a means of entertainment, but also have great potential as an effective learning medium. Game-based learning can create an interactive and enjoyable experience that can increase students' motivation to learn. In the context of high school education, the use of virtual games as a means of introducing and understanding certain concepts is increasingly considered relevant.

During adolescence, especially for high school students, individuals are in a very important phase of self-identity development. Adolescence is a crucial period for individuals to search for and build a personal identity that will form the basis for their future decisions, attitudes, and behaviors. Understanding the types of identity, whether personal, social, cultural, or gender identity, is very important for high school students. Therefore, learning that can introduce and facilitate students in forming their self-identity is something that needs serious attention in education. However, conventional learning processes, such as lectures or learning methods that rely solely on textbooks, are sometimes not effective enough in attracting students' attention and building their understanding of very personal topics such as self-identity. This is evidenced in research conducted by Nur Fitria and Mohammad Darwis. The results of their research from the multiple regression analysis test T values on the conventional method variable were 0.947 > (0.05) and technology-based learning were 0.021 < (0.05). This study has also proven that the lecture method of learning is ineffective. A more creative and engaging approach is needed so that the material can be better understood [1]. One alternative that can be used is to utilize digital media, such as virtual games, which can provide a more engaging learning experience that is relevant to students' daily lives.

In this context, the Vilamil Molina Method may be the right choice. The Vilamil Molina Method is a learning approach that emphasizes the active involvement of students in the learning process. This method is designed to encourage students to become more involved in interactive learning situations by giving them the opportunity to actively participate, interact, and collaborate [2]. Through this method, students are not only passive recipients of information, but also actively involved in the process of discovering and understanding the material being studied [3]. This method is very effective for interactive products because each stage supports a structured and high-quality production process, so that the final result can meet the promotional objectives of the interactive booth [3] .

When the Vilamil Molina method is applied in virtual game-based learning, students are given the opportunity to explore various concepts of identity through simulations that are highly relevant to their life experiences [4]. Virtual games can offer various scenarios that allow students to face situations that lead to the formation of self-identity [5]. For example, games that focus on characters and social interactions can teach students to understand the importance of their social identity, while games that contain elements of decision-making or life choices can help students understand how they form their personal identity through the choices they make. Furthermore, the use of virtual games in this context also allows students to learn in an environment free from pressure and fear of failure. The interactive nature of games allows students to try out various roles and scenarios without worrying about immediate consequences, so they can more freely explore and understand themselves without psychological barriers. This is very important, considering that adolescent identity formation is a process that involves complex psychological aspects. In an effort to introduce types and formation of identity to high school students, virtual games can serve as a tool to introduce various types of identities that exist, such as cultural, social, and gender identities. Games are interactive and engaging tools with great potential for education, including the development of skills such as analysis and problem solving and their application [6]

By combining virtual games with the Vilamil Molina method, students will gain a learning experience that is not only enjoyable, but also profound and sustainable [7]. They will be able to explore more deeply who they are, what their role is in society, and how they can develop a healthy and positive identity. Overall, the application of the Vilamil Molina method in virtual game-based learning can be a very effective solution in overcoming educational challenges that focus on the development of self-identity in high school students. This interactive and experience-based learning is expected to accelerate students' understanding of relevant concepts and have a positive impact on their future personality development. Thus, the use of virtual games as a learning medium not only provides entertainment but also plays an important role in a more holistic and innovative educational process [8].

2.   METHOD

This research began with the concept stage, which involved identifying the objectives of game development, target users, and educational content needs related to dinosaurs. Literature studies and needs analyses were conducted to understand the relevant types and identities of materials as well as the characteristics of effective educational games [9]. Next, in the design phase, storyboards, game flow, interface design, and interaction scenarios in the virtual museum were created. A first-person approach was integrated into the design to create an immersive experience, including the selection of viewing angles, navigation, and exploration mechanics [10]. This study uses the Vilamil Molina approach, which consists of five stages. The following are several stages in designing an application using the Vilamil Molina method [11].

2.1. Development

At this stage, the initial idea and concept of the application or multimedia application are determined. This includes setting objectives and target audiences [12]. In this study, an application was created using a first-person perspective game to explore identity formation, with high school students as the target audience.

2.2. Preproduction

The process of detailing plans such as system workflow, system and user interactions, interface display/storyboard, and required elements. In this study, this phase includes designing Use Case Diagrams, Activity Diagrams, and Storyboards [13].

2.3. Production

This process is the execution where the things prepared in the preproduction stage are implemented in this phase. At this stage, the application begins to be designed using the Unity engine [14].

2.4. Postproduction

This stage involves internal evaluation or testing to determine whether the design is in line with the initial design. This is an important stage in identifying problems. In this study, Black Box testing is used to determine whether the application is in line with the initial design [14].
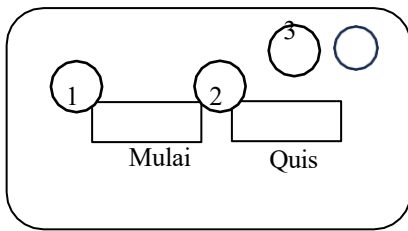
2.5. Delivery

The product is delivered or distributed to users through personal devices to try out the application, where in this study, the application will be given to high school students [15].
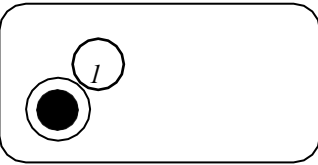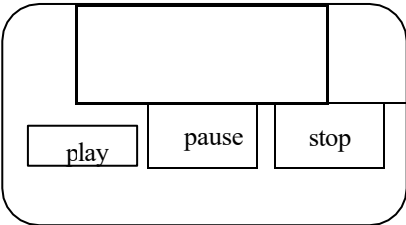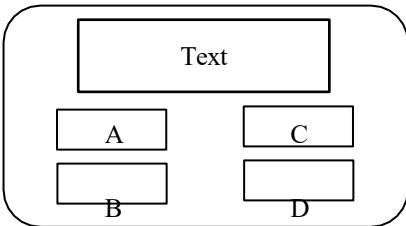
In the Villamil-Molina method, development is the initial stage that focuses on formulating the basic ideas and concepts of the multimedia project to be developed [16]. At this stage, the main objectives, target users, and scope of the product to be created are determined so that the subsequent process has a clear direction. In addition, the needs for hardware and software, the types of media to be used, and an overview of the workflow to be followed are also identified. In other words, the development stage becomes the foundation that ensures that each element of production has a reference that is in line with the vision and mission of the multimedia project. At this stage, a First Person Perspective (FPP) multimedia game application is determined to provide education on identity formation [17].

Pre-production is the preparation stage that takes place after ideas and concepts have been formulated in the development phase. At this stage, all technical and non-technical details are prepared so that the production process can run smoothly. Activities carried out include storyboards as visual guides for multimedia flow, as well as interactions between users and the system. In other words, pre-production is a detailed planning stage that ensures all requirements are in place before entering the production process.

A storyboard is a tool used in media production, particularly in the production of films, videos, animations, games, and other multimedia projects. A storyboard represents illustrations used to plan a visual sequence that helps show how a story or design will unfold from beginning to end, for example, box illustrations, descriptions, frame by frame, and additional notes. Storyboards help create more user-friendly and efficient applications and ensure that everyone's vision is aligned. This stage serves as a guideline for designing the appearance of an application, showing how the application will be designed in the future.

Table 1. Storyboard

Scenario	Display	Description
Scenario 1		This screen is the main screen, where there are three buttons. The first button is the start button, which is used to move to the FPP game page. The second button is the quiz button, which is used to run the quiz game. Finally, the exit button is used to exit the application.

Scenario 2		First Person Game where there is an analog stick inside to control the character's movement.
Scenario 3		The display when the character watches the material explanation, where there are 3 buttons that are useful as a video player, video pause, and video stop.
Scenario 4		Contains 10 questions related to the types and formation of identity in high school students with multiple choice questions.

3.   RESULTS AND DISCUSSION

After completing the design, the results of the design can be seen, where this research produced an Android video game application with a first-person perspective. This game discusses the formation of human identity, both as a group and as individuals, with the theme of being in a museum room where objects interact when brought close together. Not only that, users can also see further explanations about identity formation by watching a video in the game. Finally, the feature presented is a multiple-choice quiz game where users are asked to answer questions correctly from several choices. The questions given are still themed around the formation of human identity. This application follows the material in high school lessons, while also targeting high school students as the main users of the application.

Once the testing process is complete, the results can be viewed immediately. There are two types of testing conducted: functionality testing and respondent testing. The results of these tests will determine whether the research is successful and in line with the expected objectives.

Figure 1. Respondents

After users were given the application, they were required to fill out a questionnaire. The questionnaire contained 10 questions and there were 31 respondents who filled it out.

Table 2. Respondent Results

Questions	Diagram	Description
This application is easy to understand when used for the first time.	Aplikasi ini mudah dipahami saat pertama kali digunakan. jawaban — Setuju / Tidak Setuju — 22,6% / 77,4%	A total of 77.4% of students agreed and 22.6% disagreed.
The app's interface is attractive and makes me feel comfortable learning.	Tampilan aplikasi menarik dan membuat saya nyaman belajar. jawaban — Setuju / Tidak Setuju — 25,8% / 74,2%	A total of 74.2% of students agreed and 25.8% disagreed.
The application runs smoothly without any significant technical issues.	Aplikasi berjalan dengan lancar tanpa kendala teknis yang berarti. jawaban — Setuju / Tidak Setuju — 96,8%	A total of 96.8% of students agreed and 3.2% disagreed.

Based on the questionnaire results shown in Table 4.3, data was obtained regarding students' responses to the use of the learning application being tested.

a. Ease of Understanding the Application : A total of 77.4% of students stated that the application was easy to understand when first used, while 22.6% of students disagreed. This shows that the majority of students did not experience significant difficulties when first trying to use the application, although there were still a small number who felt they needed to adapt.

b. Application Display and Learning Comfort : Regarding the display aspect, 74.2% of students felt that the application display was attractive and made them comfortable learning, while 25.8% of students stated the opposite. This data indicates that the majority of students feel that the application supports a pleasant learning atmosphere, but improvements are still needed in terms of design to meet the expectations of all users.

c. Technical Performance of the Application : In terms of technical aspects, 96.8% of students stated that the application runs smoothly without significant technical obstacles, while only 3.2% of students disagreed. These results show that the application has stable and reliable performance.

4. CONCLUSION

From the results of the research and explanations in the previous chapters, the following conclusions can be drawn. The use of virtual games as a learning medium can help high school students recognize the types and formation of self-identity because they provide a more interesting interactive experience than conventional methods. Through simulation and exploration in games, students can more easily understand and reflect on various aspects of self-identity.

The Villamil Molina method is able to increase student active engagement in the learning process about self-identity through structured multimedia development stages. With this method, virtual games are

designed according to learning needs, so that students are more motivated to participate, explore, and explore the material independently and collaboratively.

The use of virtual games in learning has a positive impact on students' understanding of the types of identity, including personal, social, and cultural identities. Games provide a space for students to explore roles, situations, and interactions that reflect real life, enabling them to understand the concept of identity in a more profound and practical way. This is evidenced by the results of a questionnaire survey, in which 77.4% of users were able to understand the application and material when using it for the first time.

REFERENCES

[1]   H. A. B. Cintya and V. H. Satria, "Mempromosikan Mata Kuliah Desain Visual Karakter Menggunakan Media Game Untuk Siswa SMA," *AMARASI: JURNAL DESAIN KOMUNIKASI VISUAL*, vol. 6, no. 1, pp. 51–62, Jan. 2025, doi: 10.59997/AMARASI.V6I1.4596.

[2]   R. Y. Ariyana, "Sistem Pengantar Multimedia," 2022.

[3]   A. Vickro, "Perancangan Storyboard Pada Game Edukasi Kerajaan Siak Sri Indrapura dengan Genre RPG Menggunakan Metode Balanced design," Jan. 2023, Accessed: Sep. 29, 2025. [Online]. Available: https://jpti.journals.id/index.php/jpti/article/view/266

[4]   L. K. S. Tolentino *et al.*, "IoT-based Closed Algal Cultivation System with Vision System for Cell Count through ImageJ via Raspberry Pi," 2021. Accessed: Sep. 29, 2025. [Online]. Available: https://papers.ssrn.com/abstract=3897266

[5]   R. Roedavan *et al.*, "Implementasi Teknologi Multimedia Interaktif sebagai Strategi Promosi Digital UMKM," *Jurnal Pengabdian Masyarakat dan Riset Pendidikan*, vol. 3, no. 2, pp. 65–70, Jan. 2024, doi: 10.31004/JERKIN.V3I2.355.

[6]   K. Indra Sukma, T. Handayani, and U. Muhammadiyah Hamka, "Pengaruh Penggunaan Media Interaktif Berbasis Wordwall Quiz Terhadap Hasil Belajar Ipa Di Sekolah Dasar," *Jurnal Cakrawala Pendas*, vol. 8, no. 4, pp. 1020–1028, Oct. 2022, doi: 10.31949/JCP.V8I4.2767.

[7]   N. Faijah, N. Nuryadi, and N. H. Marhaeni, "Efektiivitas Penggunaan Game Edukasi Quizwhizzer Untuk Meningkatkan Pemahaman Konsep Teorema Phytagoras," *PHI: Jurnal Pendidikan Matematika*, vol. 6, no. 1, pp. 117–123, Apr. 2022, doi: 10.33087/PHI.V6I1.194.

[8]   N. F. Anshori and M. Darwis, "Pengaruh Metode Pembelajaran Konvensional dan Pembelajaran Berbasis Teknologi Terhadap Pemahaman Materi PAI di SMPN 1 Randuagung," *Kitabaca : Journal of Islamic Studies*, vol. 1, no. 1, pp. 51–63, Jun. 2024, doi: 10.54471/kitabaca.

[9]   N. A. Hawari and E. D. Putra, "Analisis Perbandingan Metode Multimedia Development Live Cycle Pada Augmented Reality," *Jurnal Media Infotama*, vol. 18, no. 1, pp. 48–55, Apr. 2022, doi: 10.37676/JMI.V18I1.1759.

[10]   S. A. Rahman, W. Binti Hashim, and A. Yusof, "Designing A Use Case Diagram for Developing An Electricity Consumption (EC) System," *Proceedings - International Conference on Computer and Information Sciences: Sustaining Tomorrow with Digital Innovation, ICCOINS 2021*, pp. 282–285, Jul. 2021, doi: 10.1109/ICCOINS49721.2021.9497156.

[11]   O. Putri Aisyiyah Rakhma Devi and Y. Ayu Nastiti, "Edukasi Mobile Operating System Android Dan Ios Untuk Wawasan Siswa SMK YPI Darussalam 1 Cerme Gresik," *J-ABDI: Jurnal Pengabdian kepada Masyarakat*, vol. 4, no. 3, pp. 411–418, Aug. 2024, Accessed: Sep. 29, 2025. [Online]. Available: https://bajangjournal.com/index.php/J-ABDI/article/view/8364

[12]   M. F. Febriansyah and Y. Sumaryana, "Pengembangan Aplikasi Media Pembelajaran Sekolah Dasar Menggunakan Metode Multimedia Development Life Cycle (MDLC)," *Informatics and Digital Expert (INDEX)*, vol. 3, no. 2, pp. 61–68, Nov. 2021, doi: 10.36423/INDEX.V3I2.838.

[13]   S. Nila, H. P. Pahrudin, and M. Fahmi, "Analisis Tingkat Kepuasan Masyarakat terhadap Dampak Operasional Perseroan Terbatas menggunakan Metode Unified Modeling Language," *RIGGS: Journal of Artificial Intelligence and Digital Business*, vol. 4, no. 2, pp. 37–45, May 2025, doi: 10.31004/riggs.v4i2.449.

[14]   R. Novita and S. Z. Harahap, "Pengembangan Media Pembelajaran Interaktif Pada Mata Pelajaran Sistem Komputer Di SMK," *INFORMATIKA*, vol. 8, no. 1, pp. 36–44, Jan. 2020, doi: 10.36987/INFORMATIKA.V8I1.1532.

[15]   E. Setyaningsih, "Perkembangan Multimedia Digital dan Pembelajaran," *Indonesian Journal of Learning and Instructional Innovation*, vol. 1, no. 01, pp. 24–34, Jun. 2023, doi: 10.20961/IJOLII.V1I01.920.

[16]   R. (Rama) Donna, A. S. (Asep) Egok, and R. (Riduan) Febriandi, "Pengembangan Multimedia Interaktif Berbasis Powtoon pada Pembelajaran Tematik di Sekolah Dasar," *Jurnal Basicedu*, vol. 5, no. 5, pp. 3799–3813, Sep. 2021, doi: 10.31004/BASICEDU.V5I5.1382.

[17]   A. A. Pramesti, R. P. Sitompul, N. Sopiya, and Fitroh, "Systematic Literature Review: Pemanfaatan Virtual Reality (Vr) Sebagai Alternatif Media Pembelajaran," *Jurnal Pendidikan Teknologi dan Kejuruan*, vol. 19, no. 2, pp. 105–117, Jul. 2022, doi: 10.23887/JPTKUNDIKSHA.V19I2.48027.