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ADOPTION AUGMENTED REALITY FOR THE DEVELOPMENT OF MEDIA SOCIALIZATION DRUG ABUSE PREVENTION

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Abstract: Drug abuse in Indonesia is currently very worrying because of the lack of information and knowledge about the risks posed by drug abuse. Much information about drug abuse prevention is disseminated through various media such as films, seminars, training, and guidance groups. This study aims to create drug counseling media that uses 3D technology and is created through the Blender 3D tool, by combining text, audio, and video. 3D models of Image objects are represented by Augmented Reality (AR) technology. Application development is made using the MDLC (Multimedia Development Life Cycle) method. The results of this study are the development of an Augmented Reality application for social media for drug abuse using the Trilib Technique, which is a cross-platform 3D model importer.

Keywords: Augmented Reality; Drugs; Blender; Trilib; MDLC

Abstrak: Penyalahgunaan narkoba di Indonesia saat ini sangat mengkhawatirkan karena kurangnya informasi dan pengetahuan tentang risiko yang ditimbulkan oleh penyalahgunaan narkoba. Banyak informasi tentang pencegahan penyalahgunaan narkoba disebarkan melalui berbagai media seperti film, seminar, pelatihan, dan kelompok bimbingan. Penelitian ini bertujuan untuk menciptakan media penyuluhan narkoba yang menggunakan teknologi 3D dan dibuat melalui perangkat Blender 3D, dengan menggabungkan teks, audio, dan video. Model 3D objek figur direpresentasikan dengan teknologi Augmented Reality (AR). Pengembangan aplikasi dibuat dengan menggunakan metode MDLC (Multimedia Development Life Cycle). Hasil pada penelitian ini merupakan sebuah pengembangan aplikasi Augmented Reality untuk media sosialiasi penyalahgunaan narkoba dengan menggunakan Teknik Trilib yang merupakan importir model 3d secara runtime dengan lintas platform.

Kata kunci: *Augmented Reality*; Narkoba; *Blender; Trilib; MDLC*

INTRODUCTION

Drug abuse is increasingly spreading in various regions worldwide, including Indonesia. The number of people using drugs in the past year has increased from 1.80% in 2019 to 1.95% in 2021. Generally, the number of people using drugs in rural areas has decreased. However, conversely, the number of people using drugs in urban areas tends to increase[1].

Drug abuse is one of the persistent issues faced by society. Drugs pose a serious threat to the younger generation. Etymologically, the term "narkoba" or "narkotika" originates from the English word "Narcose" or "narcosis," which means to produce a sleep or anesthesia effect. "Narcotic" itself derives from the word that refers to something that can

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cause confusion or a dazed state, including anesthetics and sedatives[2]. Drugs are commonly used in the field of medicine as a means of treatment. Doctors often use certain drugs for diagnostic interventions, such as calming patients or during surgical procedures. When used with the appropriate dosage and under medical supervision, the use of these drugs can provide benefits as part of effective medical treatment efforts[3].

Drug abuse, especially among teenagers, is a major concern in prevention efforts. Steps that have been taken include increasing recreational activities, providing education and awareness campaigns to students about the dangers of drug abuse, and promoting effective communication with parents. Additionally, addressing drug abuse problems in a serious and appropriate manner is also a focus in preventing drug abuse among teenagers[4].

In supporting prevention programs, there have been innovative educational media developments, one of which is the use of Augmented Reality (AR) technology. The utilization of AR in this context provides an engaging and effective approach to delivering information about the dangers of drug abuse to teenagers[5]. With AR, users can experience interactive and engaging experiences by blending the real world with virtual elements, providing a stronger awareness of the negative impact of drug abuse. Thus, the use of AR becomes an innovative effort in preventing drug abuse among teenagers. Augmented Reality (AR) is a technology that has the capability to merge virtual objects, both in 2D and 3D forms, with the real world in real-time[6]. Additionally, Augmented Reality (AR) enables the integration of virtual objects into the real-world environment, displayed in real-time, thereby enhancing understanding and motivating students to learn[7].

One of the studies related to Augmented Reality, who developed a learning media application for vertebrate animal classification using marker-based Augmented Reality. This application enables the creation of interactive and engaging learning media by leveraging technology to enhance understanding of animal classification and convey information about the classification of living organisms. The application is built using Unity 3D software and is accompanied by a marker book[8].

The research titled "Mobile Augmented Reality Application based on Vuforia and Unity for 3D Object Recognition with a Case Study of M Building, Universitas Semarang" explains the development of a mobile Augmented Reality application using a camera and camera focus with markers placed at a distance of 0 cm to 50 cm from the camera[9]. The research you mentioned, "Drug Abuse Awareness Media with Augmented Reality Technology based on Mobile Android" describes the development of an application for drug abuse awareness using Augmented Reality technology based on mobile Android. This application utilizes the camera and markers to provide interactive information and understanding about the dangers of drug abuse to the users[4]. The research titled "Digital Education for Early Childhood Drug Awareness based on 3D and Augmented Reality" by Mustaqim et al. in 2021 explains the utilization of Augmented Reality technology combined with the display of 3D objects or images of various types of drugs. This approach is used for interactive drug awareness among early childhood learners. The research involves utilizing the distance, tilt, camera focus, and markers on a

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smartphone camera to enhance the interactive experience of drug awareness education for young children[10].

The previous research analysis reveals a gap where several studies only focus on using camera with Marker-Based Tracking method. Moving forward, there is a need for the Trilib technique. In this research, the Trilib 2.0 technique is employed, which is a cross-platform 3D model runtime importer for Unity. Trilib utilizes the Open Asset Import Library (Assimp) method, which enables cross-platform model import and provides interfaces for various 3D models. This eliminates the need for markers as the library manager files are already available on the smartphone. Furthermore, there is no need to rebuild the application when adding new 3D objects.

Trilib 2.0 is a cross-platform tool that can be used to import 3D model projects into various platforms such as Windows, Mac, Linux, UWP, Android, WebGL, and iOS. It utilizes the Open Asset Import Library (Assimp) method, which enables the import of 3D models across different platforms and provides interfaces for various types of 3D models.

Based on the description above, this research aims to adopt Augmented Reality for the development of drug abuse awareness media. The objective is to provide drug awareness educational media created in 3D using Blender 3D tools, combining text, audio, and video elements. The 3D models of Image objects are visualized using Augmented Reality (AR) technology.

METHOD

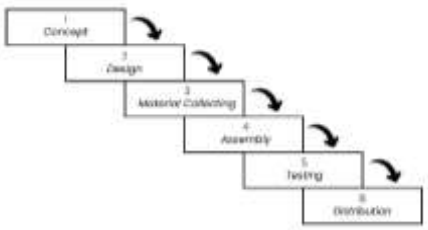

Image 1. Multimedia Development Life Cycle Method (MDLC)

In this study, the Multimedia Development Life Cycle (MDLC) method is employed. The MDLC is a systematic approach used to develop multimedia projects. It involves various stages, including concept, design, material collecting, assembly, testing, and distribution. By utilizing the MDLC method, this study ensures a structured and organized process for developing multimedia content, as explained in Image 1.

Concept

In this stage, the author designs the augmented reality application for drug abuse awareness in such a way that it provides a general overview of various types of narcotics in a 3D format. The application includes several essential features for running the application, such as 3D objects, educational videos, and accompanying audio materials.

Design

The media design stage, which includes creating flowcharts and designing the overall media, is the design phase. This phase focuses on the design aspects, including the layout, appearance, and types of materials required for development. It involves determining the visual elements, such as graphics, colors, and typography, as well as selecting the appropriate media format, such as images, videos, or interactive elements, needed for the development process.

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Material Collecting

In this stage, the developer gathers the necessary materials for creating the application. The materials required include collecting resources, design objects for different types of narcotics in Blender, UI and UX elements, Vuforia SDK, Trilib 2.0 assets, and other supporting files.

Assembly

This stage is the production phase where all multimedia objects or materials are created. Subsequently, the application development stage involves the process of integrating all the content created in the previous stages into the application. The application development is carried out using Unity 3D software, specifically version 2022, with the main plugin used being Vuforia 10.12.

Testing

After completing the creation of the simulation application, testing is conducted. In this research, testing is performed using the Black-box testing method or simulation functionality testing. Additionally, device testing is conducted using smartphones based on the Android operating system with various versions.

Distribution

The distribution stage is the final stage after the application has undergone testing and is ready for use by end-users. The application is distributed by saving it in the .apk file format, which is then stored on Google Drive. Users can download the application by clicking the Google Drive link provided.

RESULT AND DISCUSSION

Application Result

In this chapter, we will discuss the results of developing the AR Drug Abuse application. Here is an overview of its appearance.

Homepage

On the Homepage, there are several menus, including the Scan AR page, Material page, Import 3D page, Play Video page, and About page, as explained in Image 2.

Image 2. Homepage

Halaman Scan AR

The Scan AR page is used to scan markers and convert them into 3D objects. In Image 3, it explains the markers that are used. In Image 4, it describes the result of scanning the marker, which displays a 3D object.

Image 3. Object Marker

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Image 4. Objek 3D

Import 3D Page

On the Import 3D page, you can import 3D objects that have been created. In Image 5, it explains several menu options for importing 3D objects, including Load Model from File, Load Model from URL, and Load Skybox from File. Load Model from File is used to import models from a file. Load Model from URL is used to import models from a URL. Load Skybox from File is used to import a skybox from a file. The result of importing the model from a file is a 3D object, which will be explained in Image 6.

Image 5. Import 3D Tools

Image 6. Import 3D Result

Material Page

On the Material page, it is used to provide the content of the various types of drugs and the dangers of drug abuse. The content of these materials will be explained in Image 7.

Image 7. Material Page

Play Video Page

On the Play Video page, it is used to play a video about Anti-Drug Education, as explained in Image 8.

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Image 8. Play Video Page

About Page

On the About page, it is used to explain or provide information about the AR Drug Education application, as described in Image 9.

Image 9. About Page

Application Testing Result

The results of testing using the black box method are presented in Table 1. This test utilizes black box testing, which can characterize various information statuses and perform tests on practical program details. The experimental results indicate that the application can function properly and all data sources or outputs can operate with normal results. Table 1 represents the consequences of testing this application, where the AR Drug Education augmented reality application demonstrates excellent performance. The side effect of this test is the User Acceptance Testing (UAT) results. The consequences of this UAT have mentioned several observable facts from various networks and have generally shown a high level of success. As a result, the consequences of this client recognition testing indicate that the AR Drug Education augmented reality application is needed by the community. Table 2 shows the test results for various Android devices used.

In Table 1, the User Acceptance Testing (UAT) results are displayed, which involve multiple tests. The first test resulted in 25 respondents, with 21 respondents answering "Yes" and 4 respondents answering "No," yielding a percentage of 84%. The second test resulted in 25 respondents, with 20 respondents answering "Yes" and 5 respondents answering "No," yielding a percentage of 80%. The third test resulted in 25 respondents, with 18 respondents answering "Yes" and 7 respondents answering "No," yielding a percentage of 72%. The fourth test resulted in 25 respondents, with 19 respondents answering "Yes" and 6 respondents answering "No," yielding a percentage of 76%. In Table 1, the results obtained from the total respondents answering "Yes" indicate that the Augmented Reality application has successfully provided drug education to the community.

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Table 1. User Acceptance Testing (UAT) Result

Observation	Response		Total Responses	Percentage (%)
	Yes	No		
In your opinion, is the Augmented Reality Drug Abuse Awareness Application important?	21	4	25	84%
In your opinion, does using the Augmented Reality Drug Abuse Awareness Application help in raising awareness about the dangers of drug abuse?	20	5	25	80%
According to you, is the appearance of the Augmented Reality Drug Abuse Awareness appealing to you?	18	7	25	72%
According to you, is the Augmented Reality Drug Abuse Awareness application functioning well?	19	6	25	76%

Table 2. Android Device Testing Result

Device Name	Android Version	RAM	Screen Size	Back Camera Resoultion
Oppo F11	9.0	4gb	6.5”	48mp
Oppo A3	8.1	4gb	6.2”	16mp
Xiaomi Redmi 4X	6.0.1	4gb	5.0”	13mp

Table 2 shows the results of testing on several Android devices. This testing was conducted on devices such as Oppo F11, Oppo A3, and Xiaomi Redmi 4X, each with their respective specifications. In Table 2, the results indicate that the Augmented Reality application can be successfully executed on all three Android devices: Oppo F11, Oppo A3, and Xiaomi Redmi 4X, according to their capacities and specifications.

Based on the Blackbox testing results, specifically the User Acceptance Testing (UAT) results, it indicates that the use of Augmented Reality in providing Drug Abuse Awareness is highly needed. The testing involved a total of 25 respondents, and the average agreement rate was 80%, indicating that the use of Augmented Reality for Drug Abuse Awareness is crucial in providing education to the community.

Furthermore, the testing was conducted on various Android devices. It was found that several Android devices, such as Oppo F11, Oppo A3, and Xiaomi Redmi 4X, are capable of running the Augmented Reality Drug Abuse Awareness application.

CONCLUSION

Based on the conducted research, it was found that the "Augmented Reality as a Medium for Drug Abuse Awareness" application has been successfully developed using the Multimedia Development Life Cycle (MDLC) method and Augmented Reality technology. The purpose of this application is to provide an alternative educational media for learning about different types of drugs and the dangers of drug abuse.

The implementation of the application has been carried out, and the results show that Unity can be used to create three-dimensional visualizations of various types of drugs. This facilitates users in learning and understanding the subject matter. With the existence of this application, it is expected to contribute to the prevention of drug abuse by providing an engaging and interactive approach

through Augmented Reality technology. The application can be used as an effective educational tool to enhance users' understanding and awareness of the dangers of drug abuse.

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