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OVERCOMING CONFLICT RESOLUTION WITH ANDROID APPLICATION-BASED LEARNING: DESIGN, DEVELOPMENT, AND IMPLEMENTATION OF A CASE STUDY

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ABSTRACT

In today's era technology greatly affects our lives both in terms of education and daily needs. Technology in the telecommunications sector is currently very influential on the sustainability of education, especially for school students in Indonesia. Students in Indonesia are currently faced with a conflict between individuals and groups related to religion, ethnicity, and culture. Problems that arise can cause fellow students to deviate and become a serious problem. Conflicts that occur among students are now increasingly worrying. This is due to conflicts between students that lead to physical violence. So there needs to be an education about conflict resolution that can help students understand a problem. This study specifically aims to design an e-learning application that contains conflict resolution material and religious, ethnic, and cultural diversity for students in Indonesia. So, the students will be able to get an education related to conflict and diversity to create students who have good morals and behavior. The application is designed using Android Studio software. The application has main features, including information features, reading collection features, multiple-choice evaluation features, case analysis evaluation features, and video features. The reading feature is equipped with a recording from the teacher explaining each slide to help students who have visual impairments understand the material more deeply.

Keywords: *E-Learning; Self-Learning Application; Android; Mobile Application; Conflict Resolution.*

1. INTRODUCTION

Indonesia is the country with the 4th largest population with a total of 270.6 million people. The majority of Indonesia's population is inhabited by people aged 8 - 23 years, as many as 74.93 million people. Adolescence is very vulnerable to conflict problems because, at this time, a teenager experiences physical changes, social interactions, behavior, and the search for identity. In their daily lives, a teenager faces situations that tend to be competitive and disrupt self-control over these situations [1]. Among teenagers, especially teenagers who are still in junior high school, the trigger for conflict is misunderstanding or differences of opinion between individuals and groups [2]. Differences that occur can lead to social conflicts that cause disputes or quarrels between individuals or groups [3].

Research on conflict handling by identifying problems and rapidity of resolution was carried out by M. Gillebaart and J. Benjamin [1]. The research was conducted by observing 180 people to find out the rapidity in solving problems with the help of presenting the test scheme on the mobile application. The response about conflict resolution with the constructive resolution has been carried out by [4], which involves solving problems by studying the

needs of others and thinking how to handle conflicts has a good impact on this case. Case studies are used to resolve conflicts among public junior high school students in East Java by knowing the problems that often arise and concluding that the issues are related to religion, ethnicity, culture, and each individual's association [5].

Based on the background of the problems that arise in the community, especially students, it is necessary to have education about the diversity of Religion, Ethnicity, and Culture so that each student will be able to respect each other [6], [7], [8]. With the education provided continuously, it is hoped that it can reduce the problem of conflicts that occur between students. During the current pandemic, education cannot be done traditionally, which requires gathering students and conducting socialization, but it needs to be done in a better and modern way [9].

Researchers propose a way of delivering education by utilizing technology currently almost owned by all students, i.e., using the android platform [10], [11], [12]. Android application design can assist in distributing information and education to students by using electronic book (e-book) applications [13], [14], [15]. The e-book application has advantages in terms of cost, time, practicality, and easy access [16], [17], [18], [19]. The e-book design was chosen because today's teenage students already have smartphones that can be used anytime and anywhere to get an education [20], [21]. Applications are designed using Android Studio software with several main features available. Such as, information feature that provides the latest information about conflict resolution, a book reading content feature, and sound where this feature will provide digital reading books equipped with voice explanations, an evaluation feature as supporting education in the depth of student's understanding of the material presented, an educational video feature that provides educational videos to add insight into conflict resolution. This application is designed so that students can increase their understanding of conflict resolution and the value of diversity between students and society.

2. RELATED WORK

Designing an Android-based learning application to handle conflicts between students at school is a strategic step in providing educational information that plays a role in increasing positive character formation. The presence of this learning is not only important in resolving conflicts between students but also helps enrich their experience of facing social challenges in society. The main aim of this research is to develop a learning application that not only provides practical knowledge for resolving conflicts between students but also increases their awareness of the importance of nationality and citizenship. By using a mobile application-based information technology approach to design applications according to user needs for the purpose of conflict resolution.

A literature study by M. Tariq etc. [22] discussed the importance of learning applications in the world of education, especially technical education. The study resulted in seven main categories that need to exist from a learning application, including personality, learning style, instructional, situational, organizational, appropriate content, and technology used.

Mauro Figueiredo and Jose Bidarra [23], designed a learning application using Android as an educational gamebook. The designed application is formed into a dynamic book that serves as an educational game for Portuguese school students aged 9-10 years. This design aims to assist in the character-building of students by introducing learning about the surrounding environment. The results of the early-stage testing of this application reveal its excellent utility and potential as a promising pedagogical in the proposed learning model.

E-Book Design by J.C. Gonzalez, etc. [24], built an E-Book by combining two sources of educational data by providing an alternative to a more interactive E-Book format. This research focuses on the design of automatic control and interactive tools related to E-Books and aims to facilitate the work of teachers and student learning. A set of Web-based interactive tools modified to create a widget object can be combined with images in the E-Book and provide interactivity to the text and images that appear.

The results of a survey on the use of technology in electronic learning have been conducted by Alastair C. Gray, etc. [25], which was conducted by examining the behavior and attitudes of students towards the use of learning technology at the Endeavor College of Natural Health. The survey items focused on student demographics, educational background, and technology use. The Chi-square method was used to examine the relationship between bivariate relationships and characteristics in the use of learning technology based on the age of the respondents. The result is 576 responses stating that the majority of respondents have mobile phones (96.2%) or laptops (85.9%) rather than computers

(24.7%), with a percentage of smartphone ownership of 92%. It states that using mobile applications in technology-based learning approaches is more acceptable to every student.

3. METHODOLOGY

3.1 Android Studio Platform

The application is designed using android studio software version 4.1.3. Android Studio is the official Integrated Development Environment (IDE) that develops open source-based Android applications. Android studio is developed based on IntelliJ IDEA and comes with Android Development Tools (ADT). Features of the android studio include [26]:

- Projects based on Gradle Build
- Has a Graphical User Interface (GUI) android application
- Powered by Google Cloud Platform for every application development
- Refractory and fast bug fixes
- Instant Run to push changes to running apps without creating a new APK
- C++ and NDK support

3.2 Android Platform

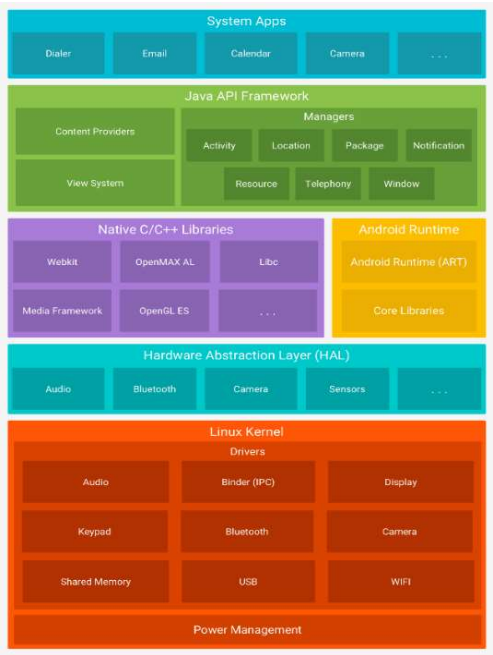

Figure 1: The android software stack. [27]

Android is an Operating System (OS) on mobile developed by Google and designed using the Java programming language [28], [29] and running on the Linux kernel [30]. Architecturally the Android platform is shown in Figure 1. The popularity of mobile devices as communication tools, activities, and learning devices, makes mobile applications an alternative technology for learning information based on Android and other operating systems. An approach based on statistics from the Google Play Store, within 18 months, the learning module application became very popular with 20,000 downloads. Comparative analysis of various applications regarding the android firewall is proposed with a significant improvement [27]. The impact of this increase is an important factor in students' understanding of practical learning, with the android platform as the main and highest choice at this time.

On top of the Linux kernel, there are Hardware Abstraction Layer (HAL), Libraries, Android Runtime, Java API Framework, and System Apps [31], [32], [33], [34]. Regular Android-based mobile applications can be obtained by downloading on the Google Play Store [35]. There are several applications related to e-books and can be obtained for free or paid. Of these many applications, e-Book applications that specifically contain material on conflict resolution and diversity are still not available. The applications offered still offer general reading.

3.3 Android Software Development Kit (SDK)

Android SDK is a software development that allows designing applications on the Android platform [36]. The Android SDK has several tools, including a debugger, software libraries, emulators, documentation, sample code, and tutorials needed in developing Android applications. Applications are designed using the Java programming language and running on the Linux Kernel.

Many research using android technology has been carried out before, such as the creation of a book donation application by Arushi Singh and Shilpi Sharma [31]. Implementation of an android application that is used to design intelligent alarm applications for hospitals by utilizing data exchange through an online system [32]. Jisha and Mathews use Android as a school bus tracking monitoring application so that it can be monitored by parents and teachers [35]. The design of an e-book application intended for dyslexic people and tested on twenty-two people has been successfully implemented [37]. The e-book application in Indonesia as a learning medium has been designed and utilizes a pdf reader as material input [38]. The Malaysia e-book club application designed by [39], who created an online reading system to facilitate readers, has been implemented in the community in Malaysia.

3.4 Manual Analysis of Commits

This study presents procedures for collecting literature study data and data collection in the form of case studies of conflicts among students with various approaches and an android-based application security system.

3.4.1 Data Collection

The design of the learning application requires supporting data to complete the ecosystem of features for users. The data needed for this research includes a review of the literature on the development of applications and the main issues that occur in students as the primary topic in internal conflict. Conflict among students is caused by various factors, including differences in religion, ethnicity, and culture.

As a basis for determining factors related to the internal conflict that arises in students, we gathered 100 respondents, consisting of 37 male students and 63 female students. All respondents have backgrounds in religion, ethnicity, and culture, which are essential elements in designing an application according to the characteristics of the respondents. The characteristics of the respondents are shown in Table 1.

Table 1: The Characteristic of Respondent.

Identity		Total Number	Explanation
Gender	Male	37	Number of Respondents 100
	Female	63	
Religion	Islam	62	Mayority of Islam
	Protestant	23	
	Catholic	15	
Tribe	Banjar	78	The tribe is dominated by the Banjar tribe, then the Bugis tribe
	Batak	3	
	Bugis	12	
	Dayak	5	
	Sunda	2	
Frequency of social media use	TikTok	45	One student can have more than one social media.
	Instagram	61	
	Facebook	15	
	Other	3	

3.4.2 Service System Security and Application System

The android architecture used is divided into service systems and application systems. The service system includes activity managers, user locations, and the used networks. In contrast, the application system includes the camera as a learning module interface and the user's internal repository. Application design prioritizes data security from users by considering both systems that require permission from each user to exchange data on service systems and applications that require learning applications [40].

3.4.2.1 Kernel System

The kernel is a UNIX-based operating system that can run on Android. The kernel is the deepest layer of an operating system on both Linux and Android. This layer does not have a direct relationship with users or developers but has functions that work in running the Android operating system.

The system in the kernel has the primary task of a translator between program language and machine language. Other functions are hardware abstraction controller, memory management, software energy management, driver as input and output hardware controller, and network stack.

3.4.2.2 Middleware Layer

A middleware layer is a software that functions as an intermediary between the controller and router on the system. This layer helps in data integration between different parts of an application. Middleware is generally used in distributed systems for software to communicate input and output. There is an API in the middleware provided by the system interface layer in life-cycle management.

The Security Module Layer (SML) implements a function for managing the system life-cycle for the initialization and shutdown processes [41]. The middleware API includes a notification interface on the system by prioritizing the use of SML. Further, the use of middleware in the interconnection process to some interoperability issues. It is very much needed to perform the migration process from mainframe applications to client-server applications and to support data communication between different platforms [42].

3.4.2.3 Android Runtime Layer

The android runtime layer has the function of running programs using the Java language. Runtime performs memory management, accesses all

variables, executes interface processes on the operating system, and performs compilation and execution on the machine. The android runtime uses Dalvik as a Virtual Machine (VM) [41]. Dalvik VM is a type of Java Virtual Machine specially designed to optimize the performance of the Android system. Dalvik VM makes every application on the android system can run independently. Dalvik designed the system to run on a register by optimizing using less memory.

Apart from the runtime system on Android, the use of libraries is one of the supporting systems in implementing the Android runtime layer. Libraries that are included in the development of Android utilize the Java language by focusing on the development of the User Interface, the use of graphical displays, and database access.

3.4.2.4 Permission Management

Android implements access protection for all information resources and services protected by Permission Management. This system controls permissions to control which apps have the privilege to access device resources and data. A more complex use occurs in permissions to use APIs on android access that require AndroidManifest.xml. This API has a high risk of disclosing user data and can cause bugs in the running system [41].

This section also handles shadowing data processing tasked with retrieving sensitive information in contact information, location data, and IMEI numbers. However, this can be prevented if the user does not give permission to access the shadowing data. The APK installation process also requires checking the initial installation with a policy-based check-in. It grants new app permissions, so permission management is instrumental in securing shadow data and primary data from android users before the new APK installer is carried out.

3.5 Architecture of Learning Application

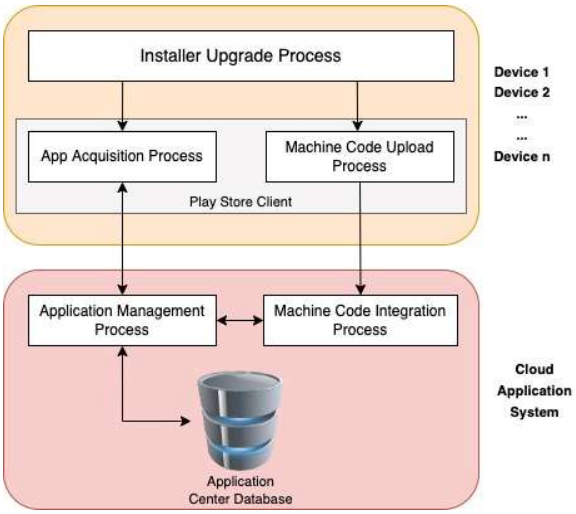

Figure 2: Cloud installer system architecture.

The learning app architecture has three parts to get the app installer. This part consists of the service system, the play store from the user side, and the cloud used from the server-side. Users can obtain the application by accessing the play store, which is available for the android operating system. Play store provides APK files for download by upgrading the installer process. The service system gives parallel access for users to access files simultaneously.

Meanwhile, in the play store section as an APK provider, it has the function to perform user data acquisition and perform machine code processing for the download module. Then the server section focuses on application management and integrating machine code in the main database [43], [44]. An illustration of the detailed architecture of the APK file installer upgrade is shown in Figure 2.

Every Android device currently has an application acquisition process by utilizing machine code processing. This process aims to adjust the APK installer process according to the user's mobile device. Each user's device supports the new APK format file to optimize the installer process [45].

The design of the e-learning application system is divided into three parts, namely the back-end, front-end, and Web Service. The back-end is the stage of processing data and content from applications in the database. The database has a data storage function that is used by the system to store data from students and administrators. The Front-end section ensures that students can use the

application in terms of the appearance of the application and the content provided so that students can obtain information and use the application comfortably [46], [47]. The web service has a role in working as middleware in exchanging data between the back-end and front-end so that the system can work simultaneously in online mode [48]. The general workflow of an application system that has a relationship between students and administrators via the internet is shown in Figure 3.

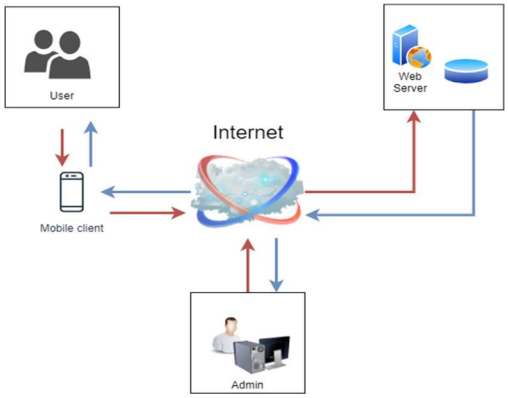

Figure 3: General workflow of android-based learning applications.

The administrator first prepares the required content in the application, such as book materials, information slides, voice recordings, evaluation questions, and videos uploaded into the application and stored in the database. Then students can install the application using a smartphone. After registering on the system, all features will be activated directly on the registered student account, and students can enjoy the features available in the application. When students start reading books, the system will automatically retrieve data from the database to be displayed in the student's accounts according to their choice.

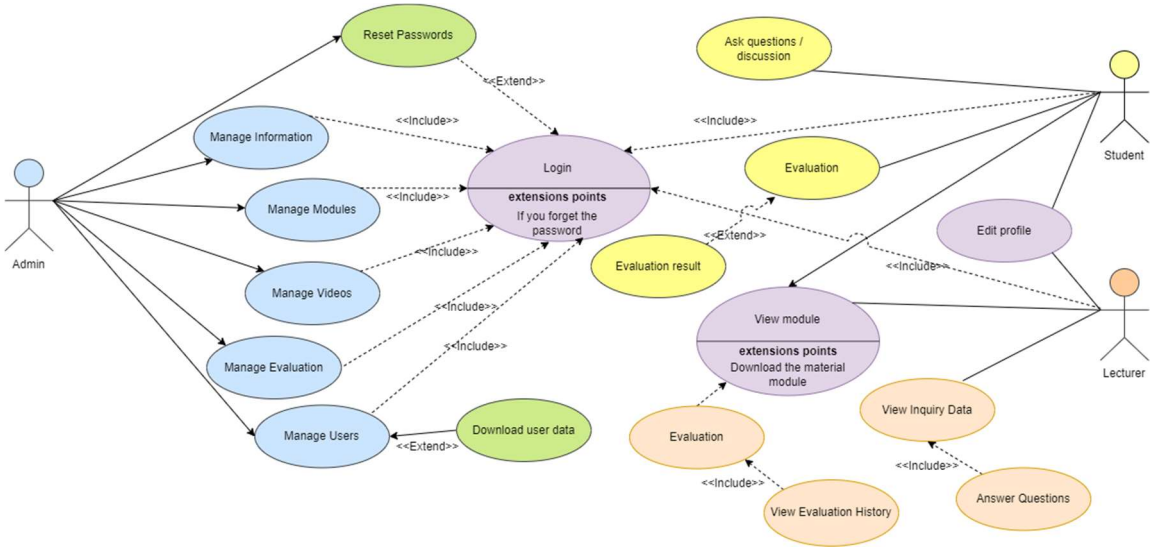

Figure 4: Use case diagram of android-based learning applications.

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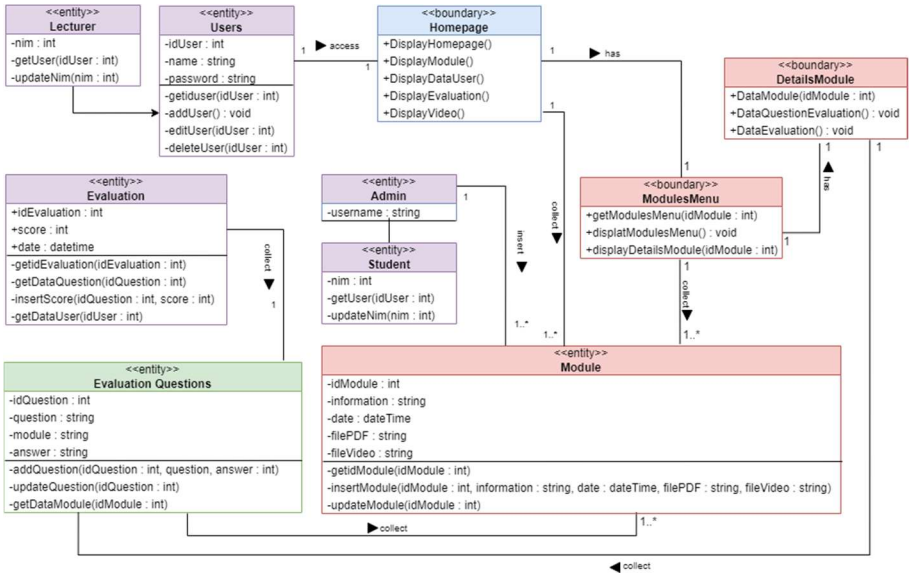

Figure 5: Class diagram on android-based learning system.

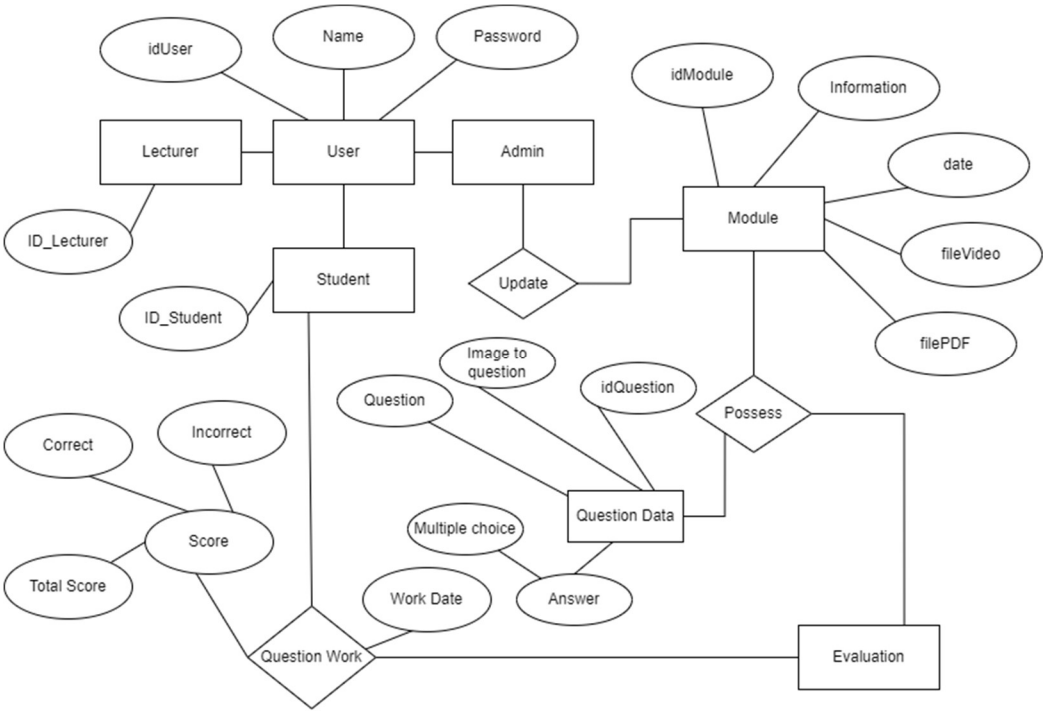

Figure 6: ERD on android-based learning system.

3.5.1 Use Case

A use case is used to depict the interaction between the system and the involved parties (actors) through the representation of actions or functions that the system can perform. It aids in understanding the main functionalities from the perspective of the users of the learning application, as depicted in Figure 4.

In the use case diagram, there are three actors: admin, lecturer, and student. Each actor has its own roles and tasks. The admin is responsible for managing features in the application, including information management, modules, videos, evaluations, and users. Meanwhile, the lecturer functions to update evaluations and learning modules. Finally, the student can access the application and use every feature provided within it.

3.5.2 Class Diagram

A class diagram provides an overview of the objects in the system that interact between classes and the attributes within each class, illustrating their

interconnectedness. The relationships between classes are represented using lines that indicate input and output values on each box within a class.

Class diagrams aid in the development of structured software based on the class hierarchy in a system. The class diagram depicted in Figure 5 shows that each feature in the application has relationships and interdependencies. These interconnections can be utilized as a history of the learning device usage process for each user accessing the system. Each class block has its own code and is equipped with data values.

3.5.3 Entity Relationship Diagram (ERD)

An Entity Relationship Diagram (ERD) is a graphical representation of the tables in a database, users, and the system in an e-learning environment. In the design of the database system, there are four superclasses that govern the system in the database, consisting of user, module, evaluation, and question work.

Each of these elements functions to store data in each class attribute with various distinct identities. Referring to Figure 6 on the ERD of the application system, the user has three parts, and one of them is interconnected with question work through the student. Meanwhile, the module and evaluation sections have relationships stemming from a process that is interrelated.

4. METHODOLOGY

The design of the learning application utilizes an open-source Android operating system as the main platform for building the e-learning application. The detailed results of the research are discussed as follows:

4.1 Login Feature

The login feature is the first screen that appears when accessing the application. This view serves as the initial gateway to start using the e-learning application. The login process can be carried out through two methods: by registering or by using the Google login system.

Users of the e-learning application must have a valid email address to access the application. The types of users who can utilize this application include administrators, teachers, and students. In the setup process, administrators and teachers act as managers, and system rules are applied by administrators through a separate system related to the accounts held by students. The front page view is illustrated in Figure 7.

4.2 Administrator Management Feature

The interface for the management feature for administrators takes primary control in handling users, learning modules, evaluations, videos, and information. Each section has specific functions according to the learning needs. This feature is expected to facilitate updates of innovative learning materials that align with the needs of students, especially in addressing conflicts at the secondary education level in Indonesia.

The presence of this management feature is crucial for maintaining the quality and relevance of learning materials. By enabling efficient and innovative updates, the application can continue to provide a satisfying learning experience for students.

Figure 8 visualizes the interface of this management feature, providing a clear and intuitive view for administrators to perform management tasks effectively. With this management feature, administrators can easily control user access, manage learning modules, evaluate student progress, provide learning materials in video format, and supply necessary information. Each function of this feature is designed in accordance with the needs and objectives of the learning process.

4.3 E-Learning Module Feature

The learning module presents features specifically designed to facilitate independent learning for students. The learning material presented not only provides information about conflict resolution but is also designed with a strong connection to conflict resolution learning with an archipelagic insight approach and knowledge of diversity in Indonesian culture. Thus, this module aims not only to enhance students' understanding of conflict resolution but also to foster a broader understanding of local values and cultural diversity in Indonesia.

The importance of understanding conflict resolution is highlighted in this learning module by providing various strategies and conflict resolution methods that students can apply. The module encourages students to develop problem-solving skills, effective communication, and empathy. By understanding various conflict resolution

approaches, students are expected to be able to identify, analyze, and resolve conflicts in a constructive manner. The application of local wisdom values and cultural diversity in the context of conflict resolution is also emphasized, so that students not only gain theoretical knowledge but can also apply it in the context of daily life in Indonesian society. The presentation of the material is shown in Figure 9.

4.4 Video Feature

The video feature showcases various functionalities specifically designed to facilitate independent learning for students, particularly through the video material feature that provides a more interactive visual learning experience. The selection of material through visual presentation using the video feature allows students to absorb information in a more dynamic and engaging manner. The presence of the video feature not only provides theoretical presentations of learning materials but also complements them with visual content that supports the understanding of complex concepts. Thus, this feature not only helps students understand the material more profoundly but also enhances their memory retention of the learned information.

Furthermore, the video feature provides flexibility for students to access learning materials anytime and anywhere, enabling more personalized learning tailored to individual needs. With the ability to pause, rewind, or select specific sections of the video, students can adjust the pace of learning according to their own understanding levels. The interface of the video feature is illustrated in Figure 10.

4.5 Learning Content

Learning material is the main feature that appears after students select the sub-topic they want to study. In this feature, students can read the learning material and have the option to save the lesson in PDF format. Students are also given the ability to choose video tutorials as an alternative means for a deeper understanding. One additional feature presented in the learning material application is the availability of automatic voice that can be activated to provide explanations more effectively.

This feature is specifically designed to support students who may have limitations in understanding written material and prefer reinforcement through audiovisual information. The interface of the learning material feature can be seen in Figure 11, providing a clear and interactive overview for students to better understand the learning material.

4.6 Video Content

This section showcases the video learning features provided in the e-learning application. Students are given the freedom to choose video-based learning, allowing them to acquire information about the material in a more visual and interactive way. Additionally, there is a feature to save videos locally, enabling students to access learning content anytime without needing an internet connection. This local storage feature provides flexibility and convenience in learning while supporting independent access to materials.

The video learning features in this e-learning application not only offer ease of access but also provide a deeper learning experience. By opting for video-based learning, students can delve into learning content in more detail, observe demonstrations, and visually understand complex concepts.

Overall, as shown in Figure 12, these video learning features enrich the student learning experience, support better understanding of the material, and provide the flexibility needed for independent and effective learning.

4.7 Content Evaluation Feature

The material evaluation feature shown in Figure 13 is a crucial element in enriching students' learning experience in the field of conflict resolution. This feature allows students to assess their understanding of conflict resolution concepts through a series of specially designed questions. The adaptive capability of this feature ensures that each student is presented with challenges suitable for their level of understanding, creating a personalized and relevant learning experience. Through instant feedback and a summary of results, this evaluation feature provides valuable information for students to enhance their understanding of conflict resolution and for educators to track overall class progress.

This evaluation feature can also support the development of analytical skills and the application of conflict resolution concepts in practical contexts. Students are not only tested on theoretical knowledge but are also exposed to real-life scenarios that require problem-solving and wise decision-making. Therefore, the evaluation feature not only creates an interactive learning experience but also aims to equip students with skills applicable to managing conflicts in their daily lives.

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4.8 Learning Video

The assessment, evaluation, and learning progress features in e-learning provide convenience and efficiency in monitoring and improving student progress. With the assessment system, teachers or instructors can create and manage various types of digital exams, assignments, or quizzes, allowing users to access and complete learning assessments from anywhere. This feature enables users, both students and teachers, to track and measure their understanding of the learning material.

The learning progress feature provides better visibility into overall student achievements. Students can easily view learning progress statistics, including the number of completed materials, evaluation scores, and time spent on learning. Additionally, by monitoring learning progress in real-time, teachers can provide additional support to students who need extra assistance or more challenging tasks. The assessment and learning progress features are shown in Figure 14.

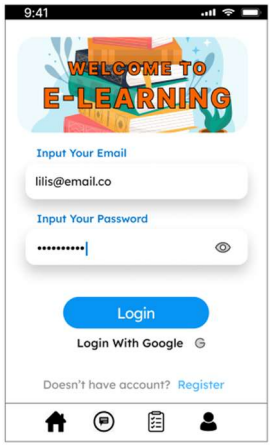

Figure 7: Front view of the e-learning application.

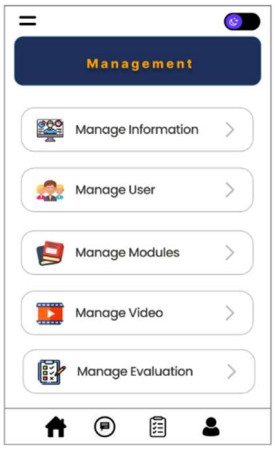

Figure 8: The management feature display

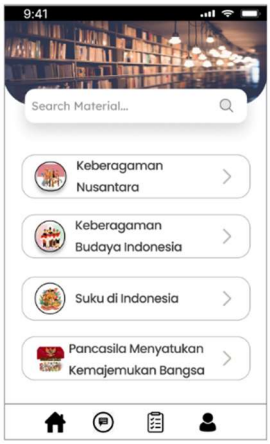

Figure 9: Display of the e-learning module.

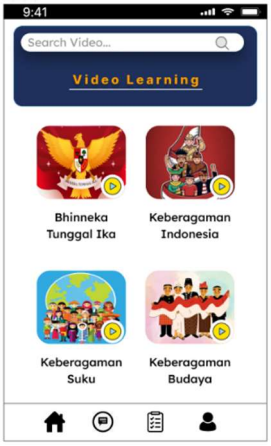

Figure 10: Learning video feature.

Figure 11: Learning content display

Figure 12: Learning video display

Figure 13: Content evaluation display.

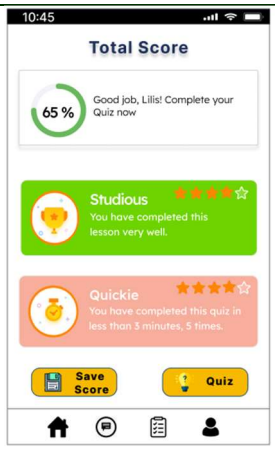

Figure 14: Assessment, evaluation, and learning progress features in e-learning.

4.9 Design and Power Survey

The developed learning application needs to have an appeal that can enhance the comfort of students as users, so that they can feel more comfortable in the learning process. In this research, the response to the application's use, especially in terms of user-friendliness and attractiveness, was evaluated through application testing involving 100 students as respondents. This testing aims to assess the reliability of the application and evaluate the design and features displayed in it.

The survey focused on the evaluation of features, colors, and design elements in each layout and control, involving the use of easily understandable icons and text. The researchers compiled 20 survey questions divided into 5 answer choices: Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). Respondents' responses to questions about the reliability of the application and design can be found in Table I. Table I reflects the survey results aimed at assessing the reliability and attractiveness of the application for students as respondents. Each question is designed to assess the attractiveness of the design adopted in each application layout, with reference to the placement of buttons and icons used. Each respondent is also asked to provide views regarding the completeness of the features provided to assess the overall quality of the learning application.

Table 2: Results of the e-learning application attractiveness survey.

Questions	Results of Respondents' Responses				
	SD	D	N	A	SA
The design of the Login interface in this application is attractive.	0	0	9	21	70
The design of the Registration interface in this application is attractive.	0	2	2	14	82
The user interface (UI) of this application is easy to navigate and attractive.	0	0	1	13	86
The features of the conflict resolution learning application can be easily accessed.	0	3	9	12	76
The font selection in the design is easily understood.	0	2	8	16	74
The variety of learning content such as modules, materials, videos, and evaluations in this application is already appealing.	0	2	8	9	81
The learning module feature has helped improve the understanding of conflict resolution concepts.	0	0	6	19	75
instructional videos provide an engaging visual learning experience.	0	0	1	7	92
The evaluation feature has improved understanding of conflict resolution.	0	2	10	15	73
The use of colors in each item within this	0	1	1	24	74

application is appropriate.					
The use is efficient and responsive in the learning process.	0	0	8	23	69
The design of the information display in this application is appealing to read.	0	2	6	19	73
The design of the display and features of the learning materials in this application is complete and attractive.	0	0	2	19	79
The page number display on the materials in this application is appropriate and attractive.	0	2	8	21	69
The content management feature in this application is complete and easy to use.	0	1	2	10	87
The voice control feature in this application is easy to use.	0	0	3	16	81
Automatic voice in the learning materials helps explain conflict resolution concepts more effectively.	0	1	6	20	73
The overall completeness of the features provided in this application is sufficient.	0	2	9	17	72
The overall design and features of this application are in accordance with conflict resolution learning materials.	0	0	1	15	84
I am satisfied with the overall design and features of this application, which have been engaging in enhancing the learning process.	0	0	0	5	95

The survey results regarding the success of the design on the login screen, registration, color selection, font type, and icons show approval for use in the application. Furthermore, in terms of the availability of features as learning support, it was found that each use of the provided features received a very agreeable response. Regarding the reliability of the application in terms of speed and comfort, the average response results indicate agreement and strong agreement with the overall performance of the application. This finding is reinforced by the last question in the survey, which reflects that 95% of respondents strongly agree to use this application.

4.10 Benefits of Conflict Resolution E-Learning Application

The e-learning application specifically designed for conflict resolution can support students in independent learning to enhance their understanding of conflict-related topics that frequently arise in society and the school environment. Students can utilize various features available according to their learning needs. Each material will be updated by the e-learning administrator working in collaboration with educational partners to determine relevant content.

The designed e-learning can also be customized to meet the needs of students, which can be differentiated based on their school level. This customization is done when students register and provide information about their educational level. As a result, students can only access learning materials that have been granted access by the administrator according to their proficiency level, ensuring that not all students have unrestricted access to all learning materials. This approach is implemented to ensure students are more focused on studying relevant content according to their educational level.

The Android-based application that has been designed aims to assist students in dealing with conflicts between students while also providing an in-depth understanding of nationality and government. This research produces a unique contribution in the context of learning topics. This is different from previous research, such as the E-Book application by J.C. Gonzalez [24], which focuses on general learning materials, as well as research by Mauro Figueiredo and Jose Bidarra [23], which places more emphasis on game-based learning. This application specializes in solving conflict problems that commonly occur among students in Indonesia, taking into account the various class and ethnic backgrounds of students.

The benefits of the e-learning application are also felt by teachers and other educational partners as instructors, who have more flexibility in providing diverse learning and teaching materials to enhance student understanding. Teachers can present materials in the form of learning modules, instructional videos, audio materials, and comprehension assessments. This can stimulate independent learning interest among students, allowing them to learn anywhere and anytime.

5. CONCLUSION

Based on the research results, the conflict resolution e-learning application based on Android, as an alternative for independent learning, demonstrates a high level of user satisfaction, reaching 95%. This application provides real-time

communication between the server and users on smartphones, enabling the utilization of diverse multimedia features. The research results indicate that the application's design, which incorporates learning modules, learning materials, instructional videos, and evaluation features, is capable of capturing students' interest in acquiring learning knowledge in a flexible place and time, thanks to efficient and reliable technology.

In focusing on improving technology-based learning media, future research will develop game and animation features in the learning application, aiming to enhance students' abilities and make the learning experience more engaging.

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