

# Android-based English teaching material application at State Polytechnic of Fakfak

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**Submitted** : Nov 8, 2021 | **Accepted** : Dec 8, 2021 | **Published** : Jan 12, 2022

**Abstract:** One of the ways to attract students' interest in learning English is to use interactive teaching materials. However, the teaching materials used at State Polytechnic of Fakfak are still in the form printed materials which seem inefficient to be used during the Covid 19 pandemic because the all the teaching process is online. Therefore, one of the solutions to implement mobile learning. Using mobile learning provides the users accessing material through smartphones and learning through mobile learning applications anywhere and anytime. This study aims to develop teaching materials in the form of an Android-based English Learning Application at Department of Informatics Management at the State Polytechnic of Fakfak, West Papua. The method used in this study is the Waterfall method, where a software development model is carried out sequentially, which means that one stage is carried out after the previous stage is completed. With the teaching materials in the Android-based English course, it can help the educators to carry out their duty as a lecturer to handle learning process during the Covid-19 pandemic. The result of this study is an Android-based English Learning Application that is functionally tested using the Black Box method. Based on the test results, the application is functioning properly. This is proved by the feasibility test using distributed questionnaires to 40 students of the Department of Informatics Management. There are 96% of students stated that the application can be operated easily and is satisfying.

**Keywords:** Teaching Materials, English, Application, Android.

## INTRODUCTION

English has a role as a global language because English is used as a means of communication and studied many countries, both as a first language, a second language, and as a foreign language (Rintaningrum, 2014 In Indonesia, English as the first foreign language is learned as a compulsory subject from junior high school to university..

Fakfak State Polytechnic is one of the vocational colleges located in Fakfak, West Papua. Learning English for students who have non-English background is a challenge for the lecturers who support these courses. One way to attract students' interest in learning English is to use interactive teaching materials that are tailored to the needs of students and the demands of the applicable curriculum. However, the teaching materials used today are still in the form of handouts, modules, books and are still limited to the procurement of printed materials which are deemed inefficient to be used during the current Covid 19 pandemic.

Nevertheless, the Covid 19 pandemic is able to accelerate education 4.0 where the distance learning system is carried out by utilizing information technology. Therefore, one of the interesting solutions to implement is mobile learning. Using mobile learning will make it easier for users to learn something, this is because users can learn through mobile learning applications anywhere and anytime. Yusri, *et al* (2014) stated that mobile learning is a type of model that allows students to obtain learning materials anywhere and anytime by using all types of wireless handheld devices. This is in line with the results of research conducted by Hanafi and Samsudin (2012) which stated that all learning activities are now possible to be carried out through mobile learning, especially Android. Furthermore, the use of M-learning in teaching is an effective way to teach in this digital era (Dharmawati, 2020). Then, the previous research has been conducted by Jazuli, et al (2017) and they found that Android-based smartphone technology is not only used as a communication tool, but can also be used as a learning medium that can present practical teaching as well as Hardiansyah, et al. (2018) who also found the use of

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technology is a very competitive alternative in developing practical, interesting and effective mobile learning materials. Therefore, the development of these teaching materials is intended to provide technology-based teaching materials that are very much loved by students today and are still not widely available in schools.

Based on the results of some previous studies, this current research is focused on the development or innovation of Android-based learning which is expected to be able to follow the demands of the needs and circumstances of language learners during the current pandemic era. Thus, this research is aimed to develop English teaching materials in the form of Android-based application at the Department of Informatics Management at the State Polytechnic of Fakfak. The content in this application is teaching material of English 1 course which is taught in 1<sup>st</sup> semester and contains material for each meeting along with practice (quiz) related to the material which is accessed in the form of an Android application.

## LITERATURE REVIEW

### 1. The Overview of Teaching Materials

Sanjaya explained that one of the factors that influences the learning system is the existence of teaching materials that support the learning process itself (Sanjaya, 2013). Teaching materials are a set of materials that are systematically arranged that can be used by students as well as to create a condition that allows students to learn well (Majid, 2009). Teaching materials are also called learning materials which include visual aids such as handouts, slides/overheads; which consist of texts, diagrams, pictures and photos, plus other media such as audio, video, and animation. In addition, teaching materials are also known as materials provided for learning needs which include textbooks, video and audio tapes, computer software, and visual aids (Pujiati and Aisyah, 2015). Thus, what is meant by teaching materials here is a set of materials that are systematically arranged for learning needs, both printed materials and in the form of audio, visual, video, multimedia, and web-based materials.

According to Majid (2009), a teaching material at least includes several things, they are:

- (1) Study guide
- (2) Competence to be achieved,
- (3) Supporting information,
- (4) Exercises,
- (5) Work instructions, can be in the form of worksheets,
- (6) Evaluation.

Meanwhile, based on the shape, teaching materials can be grouped into four, namely:

- (1) Printed materials include handouts, books, modules, student worksheets, brochures, leaflets, wallcharts, photos/drawings, and models/ mockups.
- (2) Listening teaching materials (audio) such as cassettes, radios, LPs, and audio compact discs.
- (3) Listening teaching materials (audio visual), such as films.
- (4) Interactive teaching materials such as interactive compact discs.

In this study, the teaching materials developed were teaching materials for English courses in the form of interactive teaching materials, namely the use of mobile learning media in the form of Android. Sanjaya stated that the demands of learning media that developed along with current technological advances must be able to create more dynamic, efficient, and effective learning (Sanjaya, 2013).

### 2. Mobile Learning

Quinn (2011) defines mobile learning as all activities that allow individuals to be more productive by obtaining or providing information through mobile media that can be carried anywhere. M-learning functions as a complement, namely the material presented can be used to complement the learning materials received by students in the learning process in the classroom. Dwiyogo (2013) stated that there are benefits to implement M-learning for both educators and students. For students, M-learning can increase learning flexibility because of the practicality of M-learning tools. This means that it is easier for students to access learning materials at any time and repeatedly, even students who are unable to attend classes due to illness, travel, and so on can still learn them with M-learning. Meanwhile, M-learning can help educators to update learning materials as their responsibility in accordance with the demands of scientific developments, increase their insight and skills, and make it easier to deliver abstract subject matter with clear and attractive visualizations through mobile devices that used in M-learning.

### 3. Android

Android is an operating system for Linux-based mobile devices that includes an operating system, middleware, and applications released by Google. Android provides an open platform for developers to create their applications

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(Safaat, 2011). Android's interface is generally direct manipulation, using touch gestures similar to real actions, such as swiping, tapping, and pinching to manipulate objects on the screen, and a virtual keyboard to write text.

According to Aziz (2011), some of the advantages of Android include:

1. Android is open, because it uses Linux which is open sources, so it can be developed by anyone.
2. Easy access to android App Market: with Google Android App Market users can download various free applications.
3. Populist operating system: android phone, very different from iOS which is limited to the iPhone from Apple, then Android has many manufacturers, with their respective flagship gadgets from HTC to Samsung.
4. Full USB facility.
5. Easy in terms of notifications
6. Support all services
7. Install the modified ROM when the released version does not match the phone's specifications.

#### 4. Related Previous Research

According to the research conducted by Hardiansyah, et al., she found that the use of technology is a very competitive alternative in developing practical, interesting and effective mobile learning materials. This research aimed to measure the effectiveness of mobile learning. The method used in this research was research and development with the model developed by Dick and Carrey. The result is 89% of students like this learning and it runs effectively (Hardiansyah, Rusmono & Nurni Winarsih, 2018).

Then Negara, et al (2019) carried out research aimed at increasing students' interest in learning mathematics by using Information and Communication Technology (ICT), especially Smartphones in the form of an Android application. The results obtained were that participants were very enthusiastic in participating in the activities, this was shown by the number of participants who asked questions, and tried the learning media that had been developed, as well as the enthusiasm they showed in presenting the scores obtained from quizzes on each of the learning media (State, et al. , 2019). The use of technology in developing students' interest in learning has also proven effective as research conducted by Akhshabi and Khalatbari, where this study aimed to increase student interest in learning using mobile learning. This research was an experimental research conducted within a certain period of time, and the results obtained indicate that the use of mobile learning can improve the achievement of student learning outcomes (Akhshabi & Khalatbari, 2011).

Based on the results of the researches related to the use of technology that can increase student interest in learning, the authors take previous researches as a guide or example for conducting research at this time.

## METHOD

### Design Method

The method used to create an Android-based English Learning Application is a conventional method by utilizing the System Development Life Cycle (SDLC) model or more commonly known as the Waterfall Model. Waterfall is a software development model carried out sequentially, where one stage is carried out after the previous stage is completed. The following are the stages of the waterfall method (Wijaya, 2007).

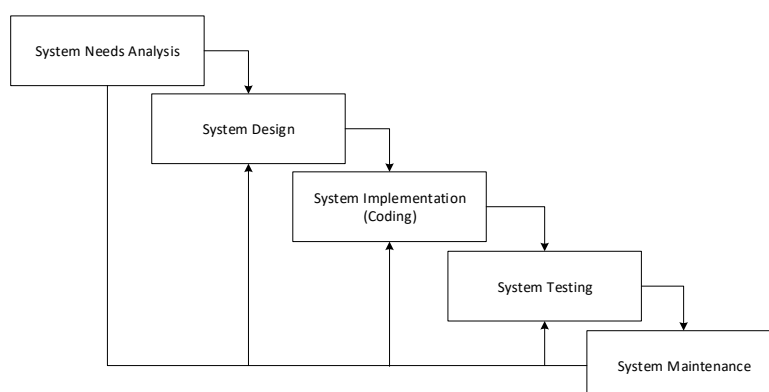


Figure 1 Waterfall Method Stage

### The Analysis of System Needs

At the beginning, research focus was centered on the study of literature. Interviews and observations were carried out in order to find solutions to the problems faced by the authors related to learning English and the need for mobile learning in the learning process. To support this research, needs analysis is carried out to provide an

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overview of solutions and system requirements that can be realized to solve a problem faced by researchers as the results of the previous process. In this case, a mobile learning-based educational technology is needed which is very close to students by device. In this stage, the preparation of teaching materials for English 1 courses is also carried out and adjusted to the needs of mobile devices.

**System Design**

System design was made based on studies and needs analysis results that have been carried out which adapted to learning needs in English course. This stage was carried out by the researchers in order to formulate a system design that is used or implemented with program code.

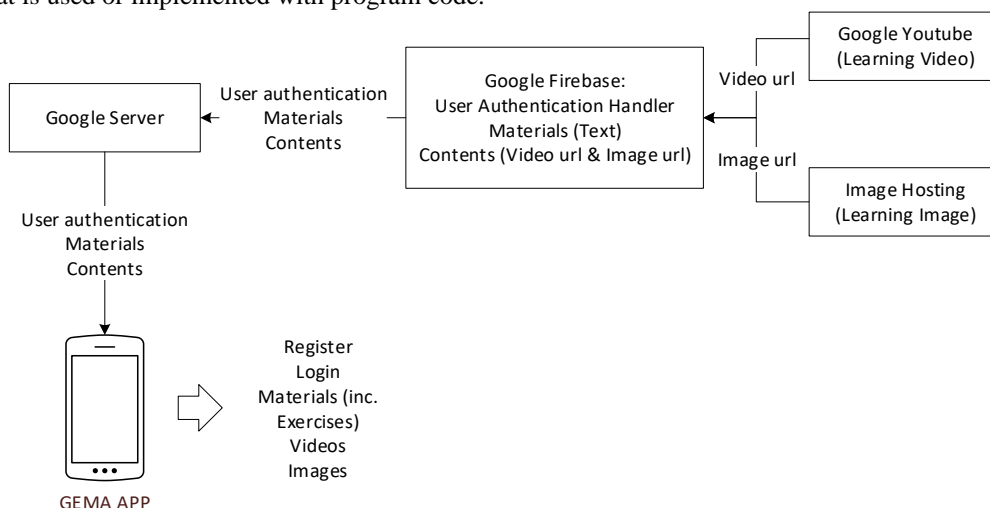


Figure 2 System Design

The display on Figure 2 is a flow when designing the system, where data in the form of images and You tube are created in a URL and stored in Google Firebase. Google Firebase also accommodates data materials, user management, and exercise. After the data is accommodated, then the data is sent to Google Server, after that google server 23 sends the data to the Firebase Realtime Database in the form of User Authandler data, contents and materials. Then, the data is sent to devices in the form of a real-time database that can later be used by the user.

The following is the data flow diagram which supports in application development processing:

**Context Diagram**

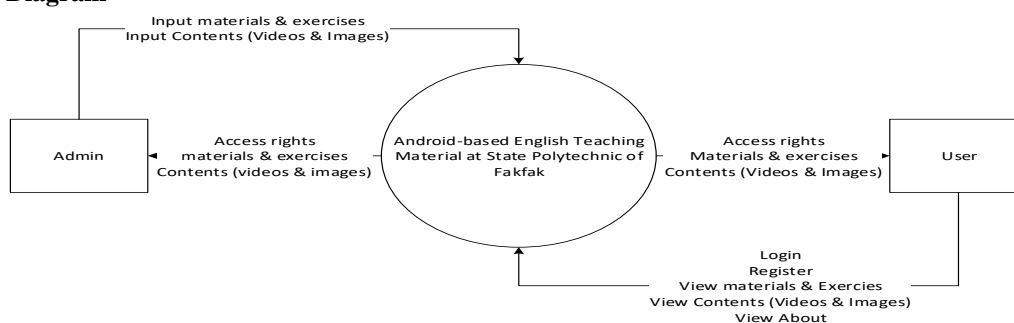


Figure 3 Context Diagram

Ini the figure 3 above is the context diagram which shows two users involved in the system, namely; admins and users. The admin is the one who will act as the responsible party for managing the system content, while the user accesses the application created.

**Data Flow Diagram (DFD) level 1**

At DFD level 1, it can be seen that there are several processes take place in the system, namely register which has function to register the users, and logins which are used as the login process to the application. Both registration and login processes use data from d. users. Next, the process of materials, videos, exercises management are linked to the d. contents table.

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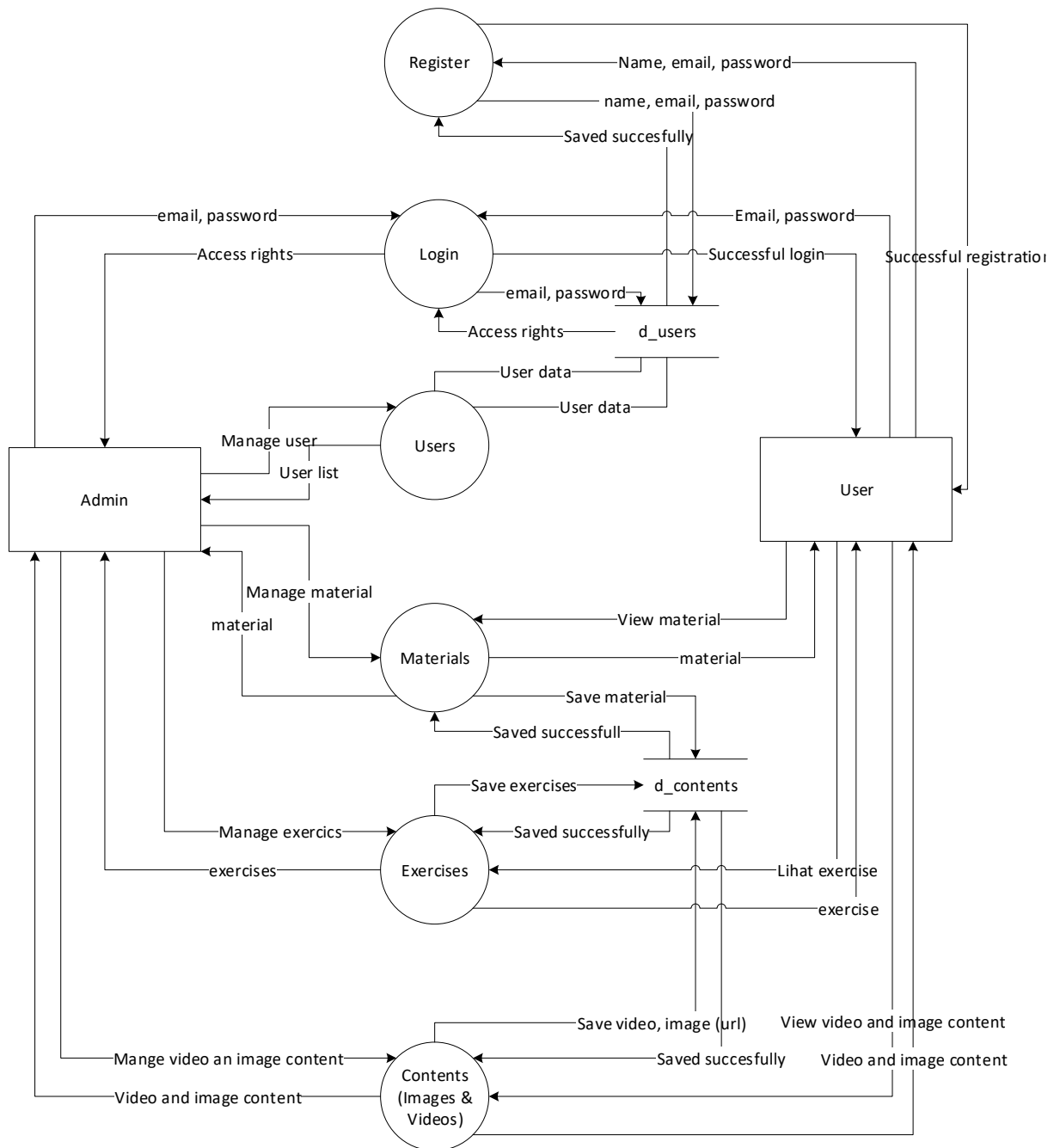


Figure 4 Data Flow Diagram(DFD) level 1

a. Flowchart

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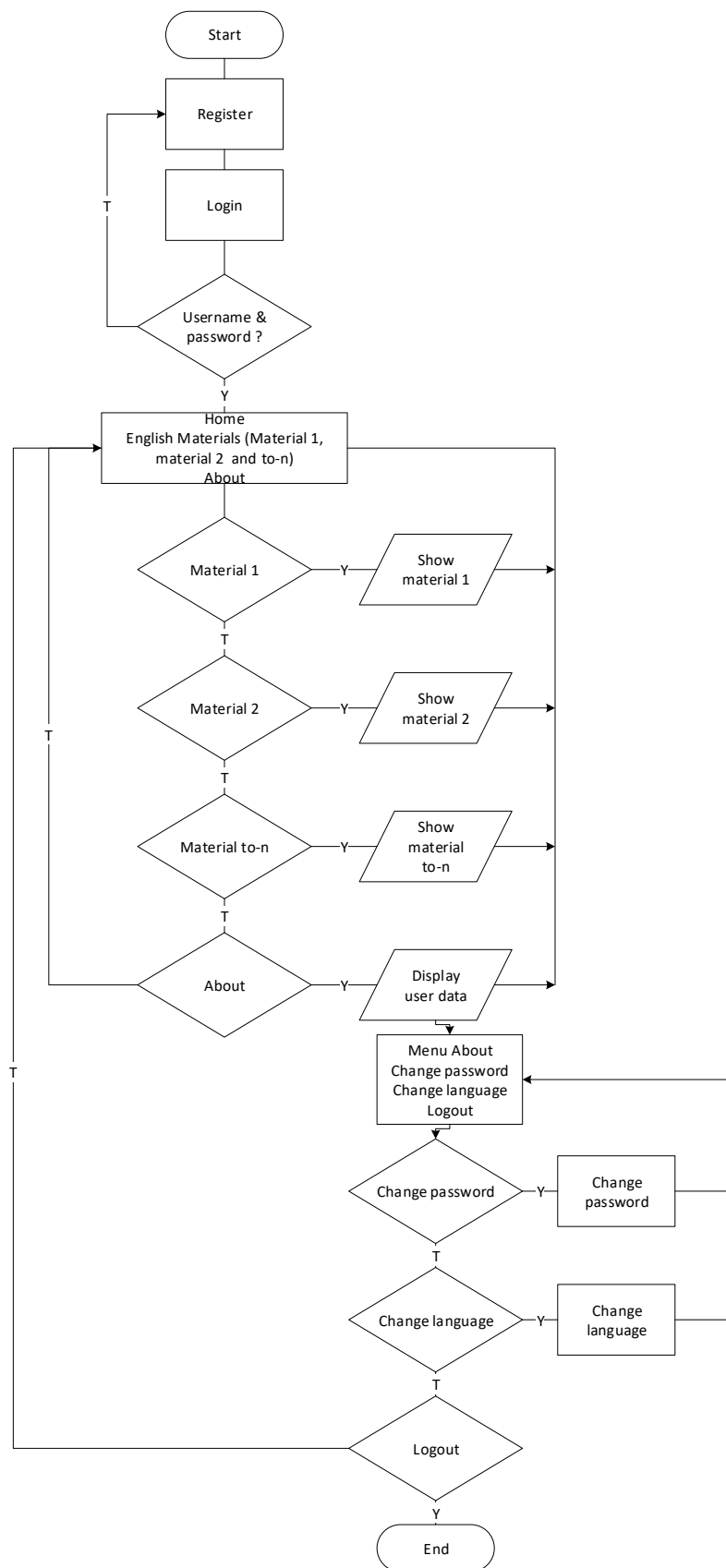


Figure 4 Application Flowchart

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As shown in Figure 4 on the application flowchart, the application starts by asking the user to enter a username and password. This page is connected to a real-time database based on Google Firebase. If the username and password do not exist, it will be directed to the register page. The registration process requires email and password data. If the username and password are correct and/or registration is successful, the users will be taken to the main application page. On the main page of the application, users will be given the option to access material from the 1st meeting to the 16th meeting according to the number of lecture meetings according to the academic regulations of the Fakfak State Polytechnic. If the user selects one of the material menus, the user will be taken to the material page which has 2 main features, namely the material at the meeting (in the form of learning videos by the lecturer, images and text) and exercises for users. On the main page, there is also an About menu, which shows the profile of the user who is currently using the application. On this About page, the users can change the password. In addition, users can also change the system language settings on this page. If the user chooses to log out, then to use the application the user must log back in the first page.

#### 4. Implementation

In this stage the researchers began to build the application according to the needs analysis of the application design. The design was translated into machine-readable form. In this stage, the program code is generated. Program code writing was carried out after the results of the system design have been tested and it has been agreed that it is feasible to implement using program code in its development on mobile devices. As a result, the design is done completely, then the process of writing code can be done and structured.

#### 5. System Testing

Application testing was carried out to ensure the program code that has been made runs well. The testing process focused on the internal logic of the software to ensure that all statements have been tested, and on the external function, which is directing testing to find errors and ensure that with limited inputs, actual results will be obtained as required. Tests were carried out using the black box method. Some of the purposes of testing this system were as follows:

- a. To ensure that no errors occur when the system is running
- b. To check the suitability between the system program design and the implementation results in the program
- c. To ensure materials and video materials can be viewed and run.

#### 6. System Maintenance

In this maintenance process, the researchers ensured that the application which has been designed related to software and hardware can run properly. In addition, system maintenance was carried out to ensure that the application can be widely used by students who take part in the lecture process. At this stage, monitoring was carried out and waiting for user feedback that the system can run properly and normally or vice versa. The maintenance process is carried out if at any time the application does not run properly.

## RESULT

### 1. Result of Display Implementation

#### a. Splash Display

The splash display is the initial display when the application is opened or run (figure 3).

#### b. Register Display

The register display is a form display that contains the register form before entering the application or logging in (figure 4).

#### c. Login Display

The login display is a display that contains an email and password, which is used to enter the main content materials (figure 5).

#### d. Forgot Password Display

Forgot password display is a display used to reset an email password that has been forgotten (figure 5).

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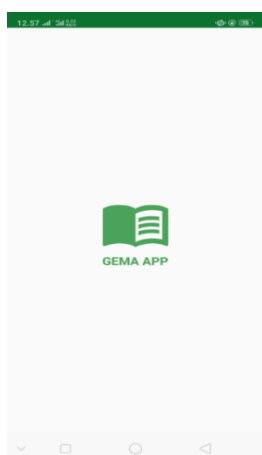


Figure 2. Splash

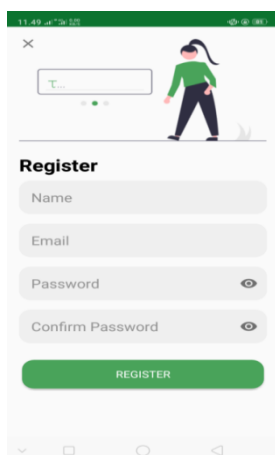


Figure 3. Register

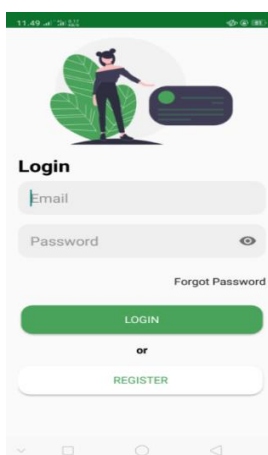


Figure 4. Login

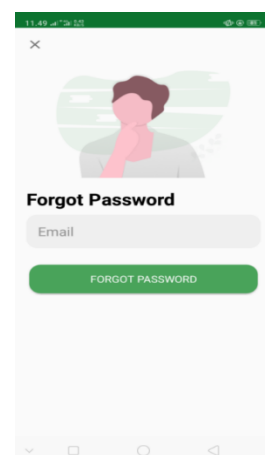


Figure 5. Forgot Password

e. Display of English Materials

English Materials display contains learning materials from meeting 1 to 15 at the 1<sup>st</sup> semester and it contains the material about basic English mastery for Informatics Management students. In this display, there are learning materials for each meeting along with explanation videos and also practice assignments for each material (see Figure 6, 7, and 8).

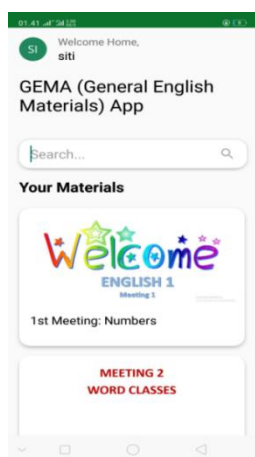


Figure 6. Main Display

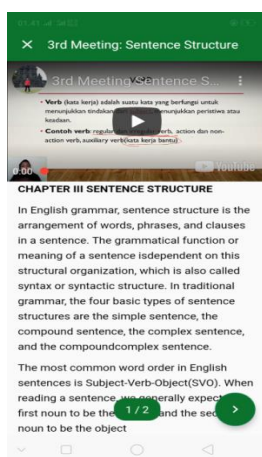


Figure 7. Video Explanation

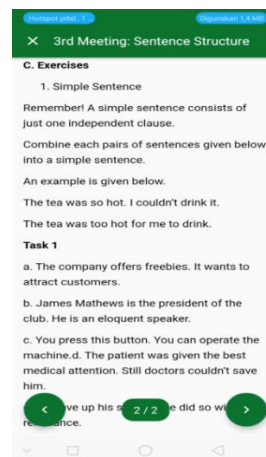


Figure 8. Exercise

f. Change Password Display

Change password display is a display feature that is used to change the old password to a new password.

g. Display Change Language

Change language display is a display feature that is used to change the language according to user needs.

2. Application Testing

In the testing process, the first step that must be done is the test planning. The test plan can be seen in the following table.

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Table 1. Application Testing

Users	The Tested Items
User	Login
	Login Display
	Register Display
	English Material Display (Text, Images, Videos)
	English Exercises Display

After conducting all the tests, it was found that the application can run well starting from login, register, and English material access. There are no significant obstacles in this testing. Overall, the application is successfully operated without any bugs.

### 3. Feasibility Test

After making sure the English learning application is running well. The researcher conducted a feasibility test to the expected users. The test was carried out to find out the user's response or reaction to the English learning application. The purpose of conducting this test is to measure the feasibility of this application before it is used officially for Informatics Management students at the 1<sup>st</sup> semester at State Polytechnic of Fakfak.

The proposed questionnaire consists of 11 items and there were 40 students involved in this test. They are 1<sup>st</sup> semester students at the Department of Informatics Management at the State Polytechnic of Fakfak. Each item in the questionnaire has 5 ratings, namely SS (strongly agree) with a value scale of 5, S (agree) with a value scale of 4, N (neutral) with a value scale of 3, TS (disagree) with a value scale of 2, STS (strongly disagree) with a value scale of 1, the value scale is used to determine the percentage of calculation results using a Likert scale (Hanafiah, et al, 2020). The interpretation results would be shown if the highest score (x) and lowest score (Y) previously found with the formula:

$$Y = \text{Likert's highest score} \times \text{number of respondents}$$

$$X = \text{the lowest score likert} \times \text{number of respondents}$$

The highest score for the item "strongly agree" is  $40 \times 5 = 200$ , and for the item "strongly disagree" is  $1 \times 40 = 40$ , then the assessment of respondents' interpretation of the use of English learning applications is obtained by using the index % formula

$$\text{Index formula \%} = \text{total score} / Y \times 100.$$

Interval Formula

$$I = 100 / \text{Total Score (Likert)}$$

Then =  $100 / 5 = 20$

Result (I) = 20

The following criteria for interpretation of scores based on intervals:

- 0% – 19.99% = Very (disagree/bad/very less)
- 20% – 39.99% = Disagree / Not good
- 40% – 59.99% = Fair / Neutral
- 60% – 79.99% = (Agree/Good/Like)
- 80% – 100% = Very (agree/Good/Like)

## DISCUSSIONS

The Android-based English material application has been built successfully. Next, before the implementation of this application to the Informatics Management students, the feasibility test is done to know the responses of the users. The result of the data collected based on the questionnaire responses can be seen as the following table:

Table 4. Questionnaire Result

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Items	Respondent					Total Score
	SS	S	N	TS	STS	
P1	18	16	6	0	0	172
P2	21	16	3	0	0	178
P3	22	9	9	0	0	173
P4	25	9	6	0	0	183
P5	23	12	5	0	0	178
P6	27	7	6	0	0	181
P7	22	13	4	0	0	174
P8	22	12	6	0	0	176
P9	25	8	7	0	0	178
P10	28	11	1	0	0	187
P11	34	5	1	0	0	193

Table 4 shows the results obtained from application testing and user testing regarding the feasibility of the Android-Based English Teaching Material Application. Overall, the majority of respondents stated that this application is very comfortable to use and easy to operate. This is proven by the users with the highest percentage gain at point 11, namely P11 96.5%. From the advantages of this application, of course it has disadvantages. This application has the two lowest percentage points and P1 and P3 of 86% and 86.5%, respectively. However, this application cannot be accessed offline because the database and videos must be accessed using the internet network, if the smartphone is not connected to the internet, the database and learning videos cannot run properly. However, this is not an obstacle to use this application.

## CONCLUSION

Based on the result of this research, it can be concluded that the design of Android-based English Learning Teaching Materials at the Department of Informatics Management at the State Polytechnic of Fakfak has been successfully created with the indicator that the application can display English course material for the 1st semester, where this material includes general English materials proposed to master the basic English. This material contains the materials starting from meetings 1 to 15 in one semester. In addition, this application can also display a video explanation of each meeting material and display some exercises for each meeting. Furthermore, the application of English teaching materials is tested for feasibility before being used forally in the Informatics Management Department. This is measured by distributing questionnaires to 40 potential users in this case the students of Informatics Management Department. From the results of the questionnaire collected, the majority of users stated that the application was very easy to use and easy to comprehend.

## ACKNOWLEDGMENT

The authors would like to thank to KEMENRISTEK DIKTI which has funded this research through novice lecturers grant scheme for the year of implementation 2021, and also many thanks to the chief of the LPPM State Polytechnic of Fakfak who has provided and facilitated the implementation of this research as well as the colleagues who have helped the completion of this research on time.

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