Android-Based Practical Applications in Educational Evaluation

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ABSTRACT

The purpose of the researchers in making this literature review is to obtain information related to the use of android-based practical applications in educational evaluation so that they can be implemented at Manado State University. The method in making this study uses a systematic literature review approach which requires researchers to use scientific-based findings literature. Based on the studies that have been carried out by the researcher, some information is obtained regarding the use of practical android-based applications that are suitable for use in educational evaluations, including (1) the Quizzme application for evaluating android-based student learning at the junior high school level, (2) the Application for Assessment of Productive Subject Practices for Vocational High School Students Android-based at SMK 45 Wonosari, (3) Android-based sign language learning and evaluation. These three studies are suitable to be applied in educational evaluation at Manado State University to replace PBT which is not effective for use today.

Keywords: *Practical Android Based, Applications, Educational, Evaluation*

INTRODUCTION

Learning evaluation is an evaluation carried out by the teacher on students to measure the results of the learning process. The evaluation system that is widely used is the Paper Based Test (PBT). In PBT, paper is the main tool because both the question sheets and answer sheets are distributed using paper. PBT has been commonly used in learning evaluation, starting from

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elementary school to the university level. In its implementation, PBT uses written questions and the answers are also written. Mirnasanti (2018) explains "PBT has a weakness, namely the types of questions are less varied because it can only present questions in the form of writing and motionless images, the colours of text and images are generally only black and white. The time needed for the correction process is longer, so the results cannot be known immediately. The risk of cheating is relatively high, this is because all the questions are the same, so examinees can easily copy other examinees. Requires a lot of money to procure question sheets and answer sheets and after using the question sheets and answer sheets they cause waste.

In addition to the PBT problem, a new problem arose, namely virtual learning due to the Covid-19 pandemic which limited community activities in public places, and many changes in regulations and people's behaviour. Everything is limited including learning activities, activities that are usually carried out in schools and face to face and are free to ask questions directly to teachers, are now being replaced virtually. Manado State University 2020 has restricted face-to-face learning in lectures. This refers to the Government's call through the Joint Decree of the Minister of Education and Culture, Minister of Religion, Minister of Health, and Minister of Home Affairs Number 03/KB/2020 concerning Guidelines for Organizing Learning During the COVID-19 Pandemic.

In its implementation at Manado State University, there were many problems, especially in network conditions. The government does provide assistance to maximize the implementation of learning but the results have not been as expected. In addition, the evaluation that was carried out could not accurately measure the ability of students. This happens because of several things, firstly there is no motivation to learn, secondly, the evaluation tools used are not appropriate, thirdly the evaluation tools used are not understood by educators. With the ineffectiveness of the PBT test system, educators must design a new evaluation system that must be following the current Covid conditions. With the development of information and communication technology and systems, it is no longer difficult to create new evaluation tools that are in line with today's online learning. Educators can develop evaluation tools by utilizing the android system on Smartphones. This can be done considering that each student already has a Smartphone device.

Some of this research can be used as a reference in making Android-based evaluation tools, such as research conducted by Lisa Tri Setyowati (2022), using the QuizzMe application. In this study, it was shown that the results of the validity trial on the respondents obtained an average value of 72% and were declared suitable for use. Research conducted by Danu Ristianto (2018), by developing an Android-based assessment application. In this study, it was shown that the results of the validity trial on the respondents were obtained at 82.8% and were stated to be very feasible to use.

Apart from that, there is also research on learning and evaluating language requirements based on Android (Husain, 2022). In conclusion, this application helps people in learning sign language to be more efficiently and makes it easier for people to learn sign language anywhere using Android. Based on the above problems and existing research references, the researcher is interested in conducting a study on the Utilization of Android-Based Practical Applications in Educational Evaluation.

METHOD

This literature review uses a systematic literature review approach that is consistent with recent impactful studies. The systematic review method supports researchers to use evidence-based current literature to reach science-based findings. To reduce the risk of bias in a research literature review must be based on empirical evidence to maintain methodological transparency by presenting a process that is replicable, scientific and transparent (Human Hardy, 2020).

RESULTS AND DISCUSSION

This literature review aims to summarize information related to the development of an Android-based educational evaluation tool that can be used at Manado State University. This study will contain the creation and implementation stages of an Android-based evaluation. Discussion of research and studies related to the development of evaluation tools is described in the following section.

Quiz Application for Android-Based Student Learning Evaluation

Research conducted by Lisa Tri Setyowati (2022) with the title Quizzme Application for Evaluation of Android-Based Student Learning at the Middle School Level. This research begins with system design from making flowcharts, use case diagrams, activity diagrams, sequence diagrams, and storyboards.

The flowchart is a chart with certain symbols that describe the sequence of processes in detail and the relationship between a process (instructions) and other processes in a program. Admin and user flowcharts can be seen in 2igures 1 and figure 2.
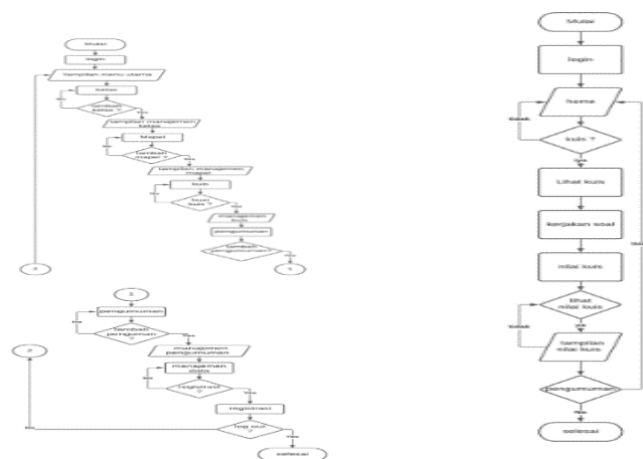
**Figure 1**. Admin Flowchart; **Figure 2.** User Flowchart

The use case is a diagram that describes the relationship between actors and the system. Use case diagrams can describe an interaction between one or more actors and the system to be created. Use case diagrams can also be used to find out what functions are in a system and can also represent

an actor's interaction with the system. Admin and user use cases can be seen in Figures 3 and figure 4.
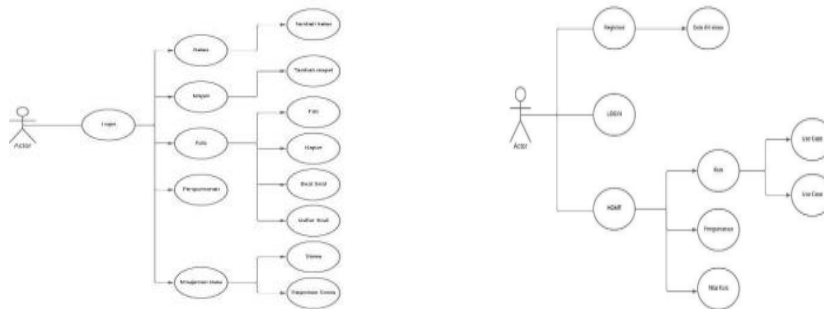
Figure 3. Use Case Admin; **Figure 4.** Use Case User

An activity diagram is a design flow of activity or workflow in a system that will be run. Activity diagrams are also used to define or classify the display flow of the system. Activity diagrams have components with certain shapes connected by arrows. The arrows point to the sequence of activities that occur from start to finish. Admin and user activity can be seen in Figures 5 and figure 6.
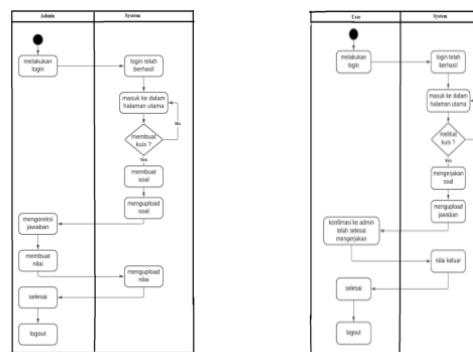
Figure 5. Admin Activity; **Figure 6.** User Activity

The sequence is one of the diagrams in UML, this sequence diagram is a diagram that describes the dynamic collaboration between several objects. Its use is to show the series of messages sent between objects as well as interactions between objects. Something that happened at a certain point in the system's execution. Admin and user sequences can be seen in Figures 7 and figure 8.

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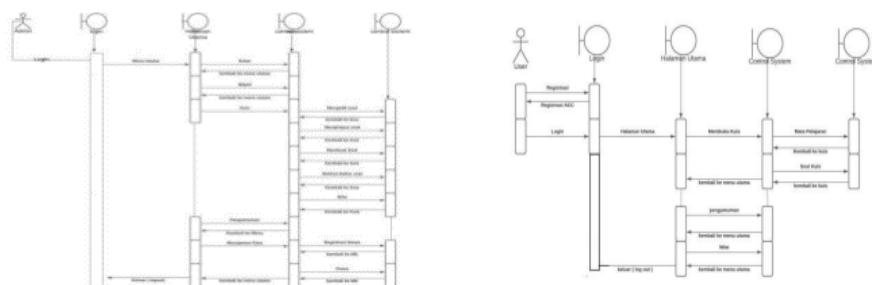
Figure 7. Admin sequence; **Figure 8.** Admin sequence

A storyboard is a collection of sketches arranged sequentially and adapted to the script so that story ideas can be conveyed easily. According to Luther Storyboard, namely, a description of each scene aims to explain or describe multimedia objects and behave them. The menus in Storyboard include (1) Student registration menu display, (2) Student login display, (3) Student main page display, (4) Student home display, (5) Student quiz menu display, (6) Menu display student announcements, (7) Display of student quiz scores, (8) Admin login display, (9) Display admin main page entry, (10) Admin main page display, (11) Admin home display, (12) Admin class management menu display, (13) Admin subject management menu display, (14) Admin announcement menu display, (15) Data management menu display.

After conducting product trials and statistical testing, it can be concluded:

1) The results of the material expert validation calculations obtained an average result of 97.5% and were declared very feasible to use. While the calculation results of media expert validation obtained an average result of 75% and declared fit for use.

2) The test results of 15 respondents obtained an average result of 72% and were declared suitable for use.

Android-Based Practice Assessment Application

Research conducted by Danu Ristianto (2018) with the title Application Development for Productive Subject Practice Assessment for Android-Based Vocational High School Students at SMK 45 Wonosari. This research begins by designing an Android-based assessment application. The assessment application feature consists of nine menus that support teachers in conducting productive subject practice assessments, namely: (1) Assessment Menu, (2) Department List Menu, (3) Class List Menu, (4) Student List Menu, (5) Menu Subject List, (6) Competency List Menu, (7) Assessment Components, (8) Instructions Menu, (9) About Menu and Exit Menu.

The next stage is making the Android-based assessment application program code. The first begins with the preparation of the development environment. Preparation of the development environment is an activity to prepare supporting devices in application development. In this study, the product to be developed is an android-based application for evaluating productive subjects in Vocational High Schools. Apps are built using the hybrid apps development type, which combines HTML 5 apps with native apps. To be able to make the application, the researchers made the following preparations: (a) Installing Phonegap (b) Installing Notepad++ (c) Installing Chrome.

Next, implement the program interface. Consists of implementing the main menu. The main menu is the first menu that appears when the android application is opened it consists of an assessment menu, majors list menu, class list menu, student list menu, subject list menu, competency list menu, instructions menu, about the menu and exit menu. The implementation of the main menu can be seen in Figure 9.

Figure 9. Main Menu Implementation

The third stage is the implementation of the assessment menu. The assessment menu is a menu where the user can enter student grades and save the assessment results. The implementation of the assessment menu is shown in Figure 10.
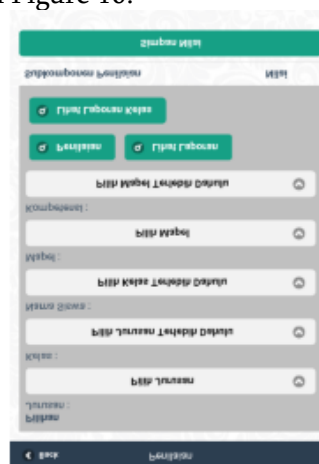
Figure 10. Implementation of the Assessment Menu

The fourth stage is the implementation of the major list menu, in this menu the user can manage the majors' list such as adding, changing and deleting majors. Figure 11 is an implementation of the majors' list menu.

Figure 11. Implementation of the Department List Menu

The fifth stage is the implementation of the student list menu, in this menu the user can manage student data such as displaying, adding, changing or deleting student name data. Figure 12 is an implementation of the student list menu.
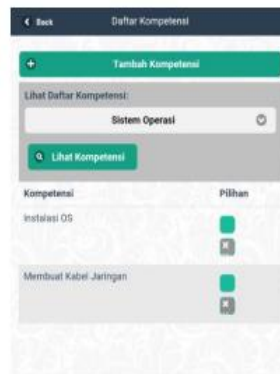

Figure 12. Implementation of the Student List Menu

The sixth stage is the implementation of the subject list menu, in this menu the user can manage subject data such as displaying, adding, changing or deleting student name data. Figure 13 is an implementation of the subject list menu.


Figure 13. Implementation of the Subject List Menu

The seventh stage is the implementation of the competency list menu, in the competency list menu, the user can add the competencies needed for each subject. The competency list menu display is shown in Figure 14.

Figure 14. Implementation of the Competency List Menu

The eighth stage is the implementation of the assessment component menu, in the assessment component menu the user can add various assessment components and their weighting according to needs. The display of the assessment component menu is shown in Figure 15.
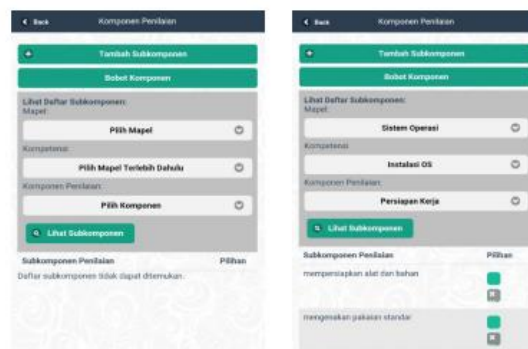
Figure 15. Implementation of the Assessment Component Menu

The ninth stage is the implementation of the guide menu, instructions on how to use the application and introduction to features in this guide menu. The implementation of the guide menu can be seen in Figure 16.

Figure 16. Implementation of the Help Menu

The tenth stage Implementation of the about menu. Users can view information regarding the assessment application using the about menu. The implementation of the about menu is shown in Figure 17.

Figure 17. About Menu Implementation

In the eleventh stage of implementing the exit menu, users can exit the assessment application using this menu. When this menu is selected, a user confirmation dialogue will appear to exit the application as shown in Figure 18. The exit menu is found in the main menu options.

Figure 18. Confirmation Dialog on Exit Menu

The productive subject practice assessment system in the assessment application uses a number system using the standard 1-100. The assessment consists of work preparation components, processes, results, attitudes, and time components. The five components consist of several sub-components with a maximum score of 100. Each component has a different percentage of weight with a total weight of 89 equal to 100%. Each assessment result for each component is then added up to get a final score with a maximum value of 100.

The form of assessment of productive subject practices uses a formative assessment model using product (results/work) assessment techniques. Assessment of productive subject practice uses non-test type instruments that are used to measure student practice results from the aspects of preparation, process, results, attitudes and aspects of time by observing students during practicum activities.

Based on the results of the feasibility testing of the Android-based productive subject practice assessment application using the ISO-25010 standard covering four aspects of testing (functional suitability, compatibility, usability and performance efficiency) with the following results:

1) The feasibility of the assessment application from the functional suitability aspect obtained a feasibility percentage of 100% (all functions in the assessment application can run properly). Included in the category is very feasible to use.

2) The feasibility of the application based on usability testing was tested on respondents consisting of five productive subject teachers, SMK 45 Wonosari students obtained a percentage of 82.8%, which means that the application can be declared very feasible to be used for assessment.

3) Compatibility testing has been carried out by installing the application on an Android device. The assessment application can be installed and used on all Android devices used for testing with a 90% percentage of 100%, so application testing on the compatibility aspect can be categorized as very feasible.

4) Testing aspects of performance efficiency using the Monkop cloud testing website consists of testing time behaviour and resource utilization (on CPU and memory). Through time behaviour testing, it can be seen that android devices accessing the assessment application take the longest time 2.544 seconds and the fastest time required 0.8 seconds. Testing resource utilization on the CPU can be seen that the average android device using CPU resources to access assessment applications is 11% and a maximum of 68%. While the test results on resource utilization on memory show that the average use of memory resources for devices to access assessment applications is 27 MB and a maximum usage of 37 MB. During testing, there were crash reports that appeared but the application was still running normally so the results of application testing on the performance efficiency aspect could be stated to be quite good.

Android-Based Sign Language Learning and Evaluation

This research was conducted by Husain (2022) with the title Android-Based Sign Language Learning and Evaluation. This research begins by making a simulation design. Simulation design aims to design and design a good system. The simulation contains the operational steps in data processing and procedures that support the operation of the system in the simulation which is carried out to achieve the simulation objectives.

In one of the problems in society, namely the lack of understanding of how to communicate with the deaf and hard of hearing, the researchers used several system designs to facilitate communication with the deaf and hard of hearing without barriers. There are several plans to achieve a system that will be used by users. UML (Unified Modeling Language), Database Design, Interface Design.

In the application interface design, the first menu created is the Login Interface (Admin & User). In the login view, the admin can log in to be able to access the sign language learning application by entering a username and password. And in the login interface, users can log in to be able to access the sign language learning application by entering a username and password. See figure 19.

Figure 19. Admin & User Login Interface

Both admin and user home interfaces. The home interface displays the application's main page when it is run in the form of alphabets and numbers, verbs, evaluation questions, about us, settings, and logout. And on the home user interface, it displays the application's main page when it is run in the form of alphabetical and numeric menus, verbs, evaluation questions, about us, and logout. See figure 20.

Figure 20. Admin and User Home Interface

The three interface letters are the admin number and interface letter, user number. In the letters and numbers interface, display the letters and numbers menu page, consisting of letters of the alphabet from a-z and numbers from 0-9. See figure 21.

Figure 21. Alphabet Interface, Admin and User Numbers

The fourth view evaluates admin interface problems and user interface problems. The evaluation interface displays the evaluation menu page which contains 10 questions and answers and there are the answer and reset buttons. See figure 22.

Figure 22. Admin Problem Interface and User Evaluation

All five score admin and user interfaces. The scoring interface displays the score menu page which contains correct, and wrong answers, results, and a back button. See figure 23.
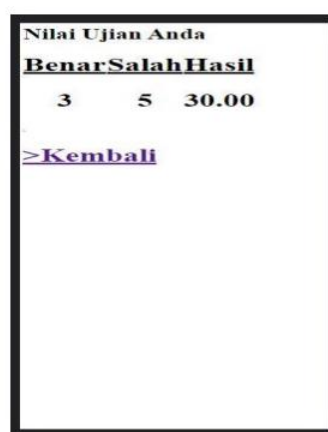
Figure 23. Admin and User Score Interface

Based on the results of product trials, the following conclusions are obtained:

1) With the Android-based Sign Language Learning and Evaluation application, the community makes learning Sign Language more efficient.
2) This application is made in such a way as to make it easier for people to learn sign language anywhere while using Android.

CONCLUSION

Based on the results of a literature study on the use of android-based practical applications in educational evaluation, some information was obtained, such as: 1. The Android-based Quizzme application is suitable for use in evaluating student learning at the junior high school level. This is based on the results of the material expert validation test which obtained an average result of 97.5% and was declared very feasible to use. While the calculation results of media expert validation obtained an average result of 75% and declared feasible to use.

In addition, the results of the trial of 15 respondents obtained an average result of 72% and were declared suitable for use. 2. The development of android-based vocational productive subject practice assessment applications is suitable for use in educational evaluation. This is based on the results of the feasibility test covering four aspects of testing including: (1) The feasibility of the assessment application from the functional suitability aspect obtained a feasibility percentage of 100% (all functions in the assessment application can run properly). Included in the very feasible category to use, (2) The feasibility of the application based on usability testing was tested on respondents consisting of five productive subject teachers at SMK 45 Wonosari, a percentage of 82.8% was obtained, which means the application can be declared very feasible to be used for assessment, (3) Compatibility testing that has been carried out by installing the application on an Android device. The assessment application can be installed and used on all Android devices used for testing with a percentage of 90 100%, so application testing on the compatibility aspect can be categorized as very feasible, (4) Testing the performance efficiency aspect using the Monkop cloud testing website consists of testing time behaviour and resources utilization (on CPU and memory). Through time behaviour testing, it can be seen that android devices accessing the assessment application take the longest time 2.544 seconds and the fastest time required 0.8 seconds. Testing resource utilization on the CPU can be seen that the average android device using CPU resources to access assessment applications is 11% and a maximum of 68%. While the test results on resource utilization on memory show that the average use of memory resources for devices to access assessment applications is 27 MB and a maximum usage of 37 MB. During testing, there were crash reports that appeared but the application was still running normally so the results of application testing on the performance efficiency aspect could be stated to be quite good. 3. Android-based sign language learning and evaluation is feasible to use. This is based on the results of research which show that (1) The existence of an Android-based sign language learning and evaluation application makes people learn Sign Language more efficient, (2) This application is made in such a way as to make it easier for people to learn sign language anywhere while using Android.

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