Android Based Application for Children Learning with Indonesian and Mongondow Language

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Abstract—**The purpose of this study is to design and build android based application for learning introduction of numbers, colors, and animals, for elementary school children with Indonesian and Mongondow language. Mongondow language is the Filipino family language used by the Mongondow Tribe in North Sulawesi, which at first Mongondow was the language used by the residents of Bolaang Mongondow Kingdom which later became Bolaang Mongondow District. The method used in building this application is the Luther-Sutopo version of MDLC development method and for testing this application using the white box for developer test testing method and the black box testing method for the end user test. This application uses the basic programming of Adobe ActionScript 3.0 on Flash with an Android OS. The results of this study began by displaying a number, color and animal learning menu choices. Then the system displays learning according to the choices made by the user. The system displays learning with the support of images accompanied by sounds that explain the learning material being displayed. This Android-based learning application can provide benefits for children in Bolaang Mongondow district, North Sulawesi Province, Indonesia.**

Keywords—Mongondow language; android based application; learning application

I. INTRODUCTION

Rapid science and technology development today is affecting the world of education [1], marked by existence various educational tools that surfaced [2]. The education sector has been heavily influenced by discoveries that refer to the of science and technology's development [3]. Education world requires tools and media technology for the information and data processing presentation [4]. Learning is a complex process that happens to everyone throughout their lives, from birth to death [5].

According to IDC (International Data Corporation) android controlled the market with total sales reaching 68.1%, then IOS 16.9%, Blackberry 4.8%, Symbian 4.4%, Windows Phone 7 / Windows Mobile 3.5% and the remaining 2.4% for others [6]. Android users can maximize the function and performance of their phones and tablets with various applications [7]. The use of smartphones today is not only a means for communication

tools but also be used as a learning tool even though mobile phones have positive and negative functions [8]. The problem is sometimes the application that really suits our needs is still rare or even we cannot get. Most of the applications intended for adults, while applications that are useful and intended specifically for elementary school children are still relatively small and limited materials. Why do we prefer using the Android platform? Android platform is a complete platform starting from the operating system, applications, tool developments, application market, mobile industry vendor support, even support from the open system community.

Current learning method that used in the teaching and learning process is the lecture method of observing [9,10]. This method is very monotonous and tends boring for children because they are more focused in playing so their learning outcomes become lace, that's why the need for interactive learning applications those children can learn while playing and influence the interest and learning outcomes of students. Elementary school children are given the objects introduction such as recognition, numbers, colors, and animals. The learning process in elementary schools is thematic; it means that in one theme it may include several subjects that need for learning applications that cover several subjects.

Some schools in Bolaang Mongondow has applied in their teaching and learning process local languages introduction, especially Mongondow Language to keep their culture which taught in Local Subjects. The obstacles faced in Pangian Elementary School 2, Passi Timur Subdistrict Bolaang Mongondow Regency are many students who do not understand the mother tongue so that it needs to preserved, so that students can understand and be interested. If the media used is less interesting, the students' willingness and interest will decrease. In addition, the level of teacher' success in delivering messages and information to students cannot be fulfilled properly, causing low student learning outcomes.

The purpose of this study was to create learning applications for learning numbers, animals, and colors by combining the learning of the local language "Mongondow Language" and designing it in a mobile device application based on Android operating system.

II. METHODS

The data collection method used is the observation method which is a process that carried out to find out something directly and thoroughly with literature study method that conducted by researchers to collect information relevant to the topic or problem that will be examined.

The software application development method is using Multimedia Development Life Cycle as illustrated in Figure I which consists of 6 stages, namely: concept, design, obtaining content material, assembly, testing, and distribution.
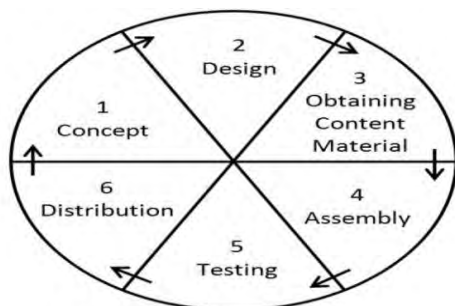

Fig. 1. Multimedia development life cycle.

Black box testing is a test that carried out by only observing the results of execution through test data and checking the software functions. So, like we see a black box, we can only see the outer appearance, without knowing what's inside it. Just like black box testing, evaluating only from the outside, its functionality without knowing what actually the detailed process (only knowing input and output data). White box testing is a test based on the details of the design or instructions to get the program correctly. White box testing needed to analyze a system whether it is running as it should or not.

III. RESULTS AND DISCUSSIONS

This Android-based learning application made to help the learning process. This application includes several subjects, namely Science, Mathematics, Indonesian Language and Local Content, especially introduction on Numbers, Animals and Colors. This application also provides multimedia materials namely, Image, Text, and Audio. This Android-based learning application aims to help teachers, parents and students in the learning process

Initial concept of this learning application is to give attractive appearance/display accordance with "Introduction to Numbers, Colors and Animals with 2 Languages" Learning material. The main menu screen has 2 buttons, enter and exit buttons. The entry button functions to enter the Sub menu and the exit button functions to exit the learning application. Each screen page that accessed designed to return to the main menu or home screen through a button, to make user more flexible in using this learning application. The purpose of this learning application is to help the learning process at Pangian 2 Elementary School. End users of this learning application are students of SDN 2 Pangian.

Material pages made in animations presentation and text material. The aim is that users do not easily get bored to open material in the form of static text, thus reducing interest in

learning from this learning application. To make this learning application, researchers use a menu hierarchy structure to make it easier in storyboarding or design.

In the second stage, namely Design or planning, the researcher made design of the application in each screen in the form of a storyboard sketch (mock-up). This stage includes the design of each screen, placement of text and button. Figure 2 shows Design of Main Menu.
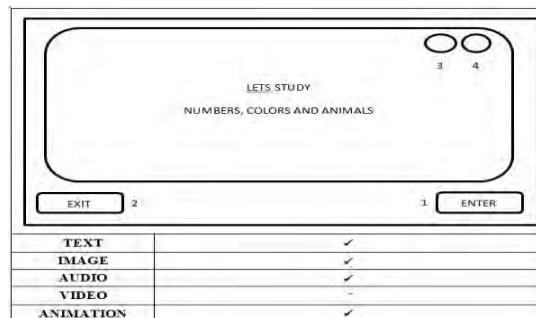

Fig. 2. Design of main menu.

The main menu (Home) is a screen that will appear automatically after the opening or the entry screen. On this screen there are 4 buttons, namely: 1) Enter button that functions to enter the sub menu, 2) Exit button that functions to exit the learning application, 3) Play music button to start the application's music background and 4) Stop music button function to stop the application's background music.

The Number menu is the page that will appear when the number menu button on the sub menu pressed. On this number menu screen there are 31 buttons with details of 30 buttons having the same function and 1 button having different functions.

The Animal Menu is a screen that will appear when the Animal menu button on the sub menu pressed. On this Animal menu page there are 31 buttons with details of 30 buttons having the same function and 1 button having different functions.

The Color menu is the page that will appear when the Color menu button on the sub menu pressed. On this Color menu page there are 8 buttons with details of 7 buttons having the same function and 1 button with different function.

In the third stage, Obtaining Content material, the researcher collect all the material needed for making this learning application from electronic media and print media, these images are in *.png format namely numbers, animal images, color assets, application background, button images, voice buttons and background music. In addition to the materials used, researchers also prepare the necessary tools such as hardware and supporting software for making learning applications.

The fourth stage is the manufacturing/building stage where all the tools and materials arranged and compiled refer to the concept and design storyboard. Adobe Flash CS6 applications with Action Script 3.0. mainly used in this Android-based learning application, for audio recording the researcher use audio recorder application.

The next step after this application built is to test it. The Testing stage aims to find out whether the learning application made is by the plan and can function as a whole or not.

Developer test is Alpha phase test using the MDLC (Multimedia Development Life Cycle) method. Developer test the application themselves to see how the application runs. Developer checks it using the white box testing method. White box testing is a test based the design or instructions details to get the program runs correctly.

White box testing was needed to analyze whether the system is running properly or not. This white box testing method is a testing method that is more suitable for user in Developer Test and better than the black box testing method because it is more detailed.

Researchers use cyclomatic-metric based on a graph or diagram in the white box testing stage. This cyclomatic-metric method is an easy white box test method, but researchers must make a flowchart diagram first to see the various conditions in the learning application they make.

Distribution is the last stage, the application stored in a storage media. This stage can also be called the evaluation stage for improvement of the product. Improvement for the next product design could be designed from this evaluation.

This Android-based learning application was built as attractive as possible to help the teaching and learning process. In presenting the material, this learning application displays screens with more interesting text, images and audio materials so that users are not bored to use it. This learning application made based on MDLC (Multimedia Development Life Cycle) and this research carried out until the testing stage (Testing). Based on the test results from the white box and black box method shows that this learning application can run properly, and the researchers conclude that this learning application is suitable for use in Pangian 2 Elementary School.

Figure 3 shows the main menu.

Fig. 3.   Main menu/ home screen.

Figure 4 shows Numbering Menu.

Fig. 4.   Number menu.

Figure 5 shows Animals Menu.

Fig. 5.   Animals menu.

Figure 6 shows Colors Menu.

Fig. 6.   Colors menu.

IV.   Conclusion

Based on the results of the study and discussion could be concluded that introduction of numbers, colors, and animals through a two-language android-based learning application that uses the MDLC (Multimedia Development Life Cycle) method, which finished up to the testing stage using white boxes for developer tests and black box for end-user test. This android-based learning application for elementary school children can help teachers and parents in the process of presenting materials and could be a learning tool for students. This learning application would also suitable after passing the test. Several subjects could be implemented in this application. Examples: Mathematics, Local Content, Indonesian Language, and natural science.

This learning application for elementary school students of Pangian Elementary School 2 is expected to be developed with more complex material with more interesting features. This learning application is expected to be a reference for the

creation of new learning media by using the concept of material about the preservation of local culture and language.

REFERENCES

[1] L. Johnson, S.A. Becker, M. Cummins, V. Estrada, A. Freeman and C. Hall, NMC horizon report: 2016 higher education edition, The New Media Consortium, 2016, pp. 1-50.

[2] M. Easterby-Smith and A.L. Cunliffe, "From reflection to practical reflexivity: Experiential learning as lived experience," in Organizing reflection, Routledge, 2017, pp. 44-60.

[3] A. Bergek, M. Hekkert, S. Jacobsson, J. Markard, B. Sandén and B. Truffer, "Technological innovation systems in contexts: Conceptualizing contextual structures and interaction dynamics," Environmental Innovation and Societal Transitions, vol. 16, pp. 51-64, 2015.

[4] Selwyn, N. Data entry: towards the critical study of digital data and education. Learning, Media and Technology, 40(1), 64-82, 2015.

[5] L. Berk, Development through the lifespan. Pearson Education India, 2017.

[6] O.S. Smartphone, Market Share, 2017 Q1. International Data Corporation, 2016.

[7] S. Yi, C. Li and Q. Li, "A survey of fog computing: concepts, applications and issues," In Proceedings of the 2015 workshop on mobile big data, ACM, pp. 37-42, June 2015.

[8] M. Anshari, M.N. Almunawar, M. Shahrill, D.K. Wicaksono and M. Huda, "Smartphones usage in the classrooms: Learning aid or interference?," Education and Information Technologies, vol. 22(6), pp. 3063-3079, 2017.

[9] J.R. Savery, Overview of problem-based learning: Definitions and distinctions. Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows, vol. 9, pp. 5-15, 2015.

[10] J.R. Tuna, C.T.M. Manoppo, D.R. Kaparang and A. Mewengkang, "E-Learning Development Process for Operating System Course in Vocational School," in IOP Conference Series: Materials Science and Engineering, vol. 306, no. 1, p. 012068 IOP Publishing, February 2018.