

Development of Android-based Learning Media in Improving the Quality of Senior High School Students' Learning

Nurhadi^a, Muhammad Sobri^{b*}

^aSTMIK Dumai, Dumai, Indonesia

^bUniversitas Bina Darma, Palembang, Indonesia

Abstract

Learning methods become one of the factors that are very influential, especially for students' academic achievement. Nowadays students are required to be more active in expanding the knowledge they not only get from teaching and learning activities in school, but they can also add knowledge such as from a learning application that they can learn by themselves to hone their understanding of subjects. In the subject of Natural Science, often the methods or methods used by teachers in teaching are still many that are difficult to understand by students, the existing learning media less interest of students to study harder, and students sometimes consider easy subjects Natural Sciences. The aims of this research is make learning media in senior high school visually displayed in the form of applications that can be accessed with Android-based phones is expected to improve the quality of learning, especially in science subjects.

Keywords: Learning media, android, learning methods, subjects of natural science

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1. Introduction

The Today's most well-known technology is a mobile phone called smartphone that is a mobile communication device that not only as a communication tool, but we can add insight by accessing the internet directly from the mobile phone, besides that no less famous is still from the new smartphone type the newly emerging is the android phone. Which one example the operating system for smartphone based on Linux is Android. Developers to create their mobile applications can using open platform provided by Android. An interactive learning, by using Mobile learning concept, is something to make learning more interesting and not monotonous. Mobile Learning is a new trend in e-learning nowadays, the use of portable media such as Smartphone either using iOS, Windows Phone or Android [1]. Example of learning media that have been for children of early age to know the numbers as well as Arabic and English language made by [2] mobile based. The way of work, study and daily act experiencing changing as more and more smartphone and tablet users [3] and pay attention to the application to ease of learning, ease of use, attitude of users, flexibility, and efficiency of learning media [4].

Motivation is the basic thing a student needs to understand about biology lessons especially in Senior High School. The learning method becomes one of the most useful factors for the students' academic workers. Currently students are required to be more active in learning science that does not allow them to also add knowledge of a learning application that they can learn for themselves. The Natural Science Subjects, often the methods or methods that teachers teach are still much difficult to understand by the students, the existing learning media is less interesting for students to learn more, and also the students easily conclude the Science Lesson. The importance implanted collaborative learning as a pedagogical method from elementary schools to universities to increase in personal learning and collaborative experience [5].

Biology as a science related to the life and nature around but received less attention from the students in learning it [6]. To make it easier for students to search for Resources or unique Natural Sciences materials apart from their Lesson books. Based on the current technological developments that most of the students in Senior High School have communication tool that is smartphone with Android operating system.

* Corresponding author. Tel.: +62 813-6857-7423

E-mail address: sobri@binadarma.ac.id

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2. Research Methodology

2.1. Data Collection Technique

To get data that is really accurate, relevant, and valid then the researchers collect data by:

- **Observation:**
The Observation is a method of collecting data by way of observation and recording directly at the place of research or the parties involved in the study. At this stage the researchers conducted direct observations to Senior High School (SMAN 1 Dumai).
- **Interview:**
An Interview is a method of collecting data by making a question and answer directly to sources related to research. At this stage the researchers conducted interviews to Teachers who teach the eyes of Science Lesson in Senior High School (SMAN 1 Dumai).
- **Documentation:**
The documentation is a method of collecting data by reading literature books or documents relating to research topics.

2.2. System Development Method

The method of development used in this study using methods according to Simarmata Waterfall model is a model that spur developers team to collect and determine what is done before the system is developed [7]. This model is suitable for systems that prioritize quality over development costs or development time. Excess waterfall model is the freedom and clarity of interpretation. This model is structured and matched to be adapted for management control.

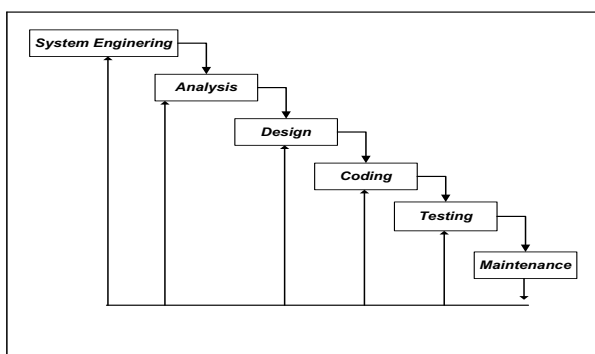


Fig. 1. Waterfall Model.

The stages in the waterfall method are as follows:

- a. **Software Analysis**
The process required to intensify the needs of the device in order to make software like what is needed by the user. This stage needs to be documented software requirements specification used.

- b. **Design**
This stage doing software design such as data structures design, interface design, software architectures, and coding procedures in order to be implemented into the program and after that this stage also needs to be documented for next stage.
- c. **Creating a program code**
The design should be translated in the software program. The result of this stage is the computer program in accordance with the design that has been made in the early stages of the design.
- d. **Testing**
This stage doing testing on the software focus of logic, functional and ensure the resulting output in accordance with the desired.
- e. **Maintenance**
This stage doing changes the software because of errors that appear and can occur after the user tries for maintenance but not to create new software.

2.3. Design

According Jogiyanto, System design is the stage performed to perform system analysis, defining the needs of the system to be built, and preparation for the implementation of the system to be built [8]. System design is run by understanding the running system and using the system to be built normally using diagrams depicted by diagrams or diagrams.

2.4. Application

An applications according to Jogiyanto, is the use in a computer, instruction or statement arranged in such a way that the computer can process the input into output [9]. An applications are programs created for computers and used by users. An application is a series of activities or commands to be executed by computer information.

2.5. Android

Which one example the operating system for smartphone based on Linux is Android. Developers to create their mobile applications can using open platform provided by Android. Started with Google Inc. bought Android Inc. to makes software for smartphones. Then the Open Handset Alliance was formed to develop Android, a consortium of 34 companies in area telecommunications, software, and hardware such as Google, Intel, HTC, Qualcomm, Motorola, Nvidia, and T-Mobile. Currently, Android development developed by Google for a mobile devices operating system based on the Linux.

Android is designed for smartphones and tablet computers, with a user interface based on direct manipulation of real-world actions such as tapping, swiping

and pinching on-screen objects. Android had products like for televisions (Android TV), cars (Android Auto), and wrist watches (Android Wear). [9]. The Smartphones are mobile terms that have multimedia and quality capabilities more prominent on mobile phones in general. This is because there are more apps in the smartphone device. Smartphones have various platforms, such as Symbian platform, Blackberry, Windows, iOS, and Android. The Android platform is the most complete tool from the operating system, application, development, application market and also because of the open system of the community [10].

Android the inaugural release of November 5, 2007, Android with Open Handset Alliance enters the development of open standards on mobile devices. On the other hand, Google released Android codes under Apache, a software and mobile open platform device. Around September 2007 Google introduced the Nexus One, one of a kind smartphone that uses Android as its operating system. The phone is manufactured by HTC Corporation and available on the market on January 5, 2010.

On December 9, 2008, new members joining ARM Holdings' Android work program, Atheros Communications, were produced by Garmin Ltd., Asustek Computer Inc., Sony Ericsson, Softbank Vodafone Group Plc. and Toshiba Corp. Together form the Open Handset Alliance, OHA announced their first product, Android, mobile device which is a modified linux kernel 2.6. [11]. Android provide service system library for the developers is support their the application framework. Other than connecting between the application framework and Linux Kernel, these libraries can also be utilized as components on the different the Android system caused is developed in C or C++ language. [12].

2.6. PHP

According Saputra PHP stands for PHP (Hypertext Pre-processor) which is a website in the world. PHP as a programming language that involves within the web server [13]. There is some understanding about PHP, but PHP can be interpreted as Hypertext Pre-processor. This is a language that can only be run on a server accessible on the client. The PHP interpreter in executing PHP code on the server side is called server side, unlike the Java machine that executes the client-server program.

PHP which is a server-side scripting programming language. So, it can be concluded, PHP requires web server to be able to run it. PHP integrates with HTML code to create a dynamic web. The purpose of the fused can illustrate that the HTML code works to create or build the web, while the PHP code works to create dynamic operations.

PHP is a software that is open source and capable of cross platform, which can be used with any operating system and web server. PHP is capable of running on Windows and some linux versions. PHP can be run in two ways, ie as apache module in web server and as binary in CGI [13].

2.7. MySQL

According to nugrohoMySQL (read: mai-se-kyu-el) is software that belongs to DBMS (Database Management System) which is open source [13]. Open Source states that this software comes with its executable source code or code that can be run directly in the operating system, and can be obtained by downloading on the internet for free. According to mancoms MySQL or read "My Sequel" is RDBMS (Relational Database Management System) is a system application that runs data processing [15].

3. Result

This research has resulted in an alternative of learning media of natural Sciences based subject of Android for Senior High School.

3.1. The Initial App View

To use this application is very easy, after the user clicks the next shortcut menu like the picture below which provides 2 keys ie in and out.

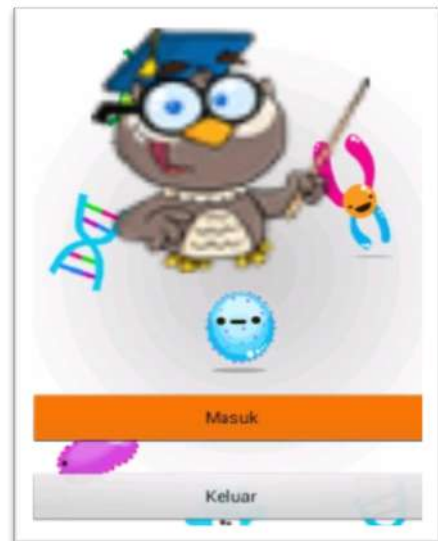


Fig. 2. The Initial App View

3.2. Main Menu

This application provides 5 key learning materials, namely carbohydrates, tissues, motion systems, and digestion, in addition to having exercise and score.



Fig. 3. Main Menu

3.3. Subject Matter

Here is an example of material available in this app:



Fig. 4. Subject Matter

3.4. The Exercise

This app provides an exercise that consists of 10 questions, multiple choice, if the user hesitates to get back in by clicking the previous button, if you want and return to click the button that will be used for this application. Finish those questions.



Fig. 5. View The Exercise

3.5. The Score

The After the user finished answer the questions, then click the button is completed and the results appear in the form of scores, scores ranging from the value of 0 to 10. Users can repeat again for the answer if it does not get a value of 10 by clicking the button again and if you want to see the wrong choice click the check button.



Fig. 6. View The Score

4. Conclusion

An application is that has been created can be used as a learning medium for biology subjects in addition to books or study in the Senior High School. This happens because learning by using learning media can be anywhere and anytime. With a good understanding of the students make the learning outcomes obtained by students increases. So that the improve in Senior High School students' learning outcomes on biology subjects, it is expected that educators can use the same way for other subjects with appropriate material.

References

- [1] J. K. A, K. Y. H, M. M. V, and N. P. G, 2017, "Android Based E-Learning Application ' Class - E,'" *Int. Res. J. Eng. Technol.*, vol. 4, no. 3, pp. 1745–1748.
- [2] Sobri, M. 2014. *Perancangan Aplikasi Pembelajaran Untuk Pengenalan Angka Dengan Multilingual Berbasis Mobile*. Konferensi Nasional Ilmu Komputer. ISSN : 2338-2899.
- [3] K. B. Lee, R. Clark, and H. Nosekabel, 2011, "Developing Mobile Collaborative Learning Applications for Mobile Users," *Int. J. Interact. Mob. Technol.*, vol. 5, no. 4, pp. 42–48.
- [4] Sobri, M., Ijab, M. T., & Nayan, N. M. (2018). Systematic Literature Review untuk Membuat Model Aplikasi Pemantauan Kesehatan Cardiovascular. *Jurnal Rekayasa Sistem Dan Teknologi Informasi*, 2(2), 458–464.
- [5] K. Nachiketa, A. Rahatekar, A. Dhotre, and S. A. Saoji, 2013, "Developing an Android Based Learning Application," *Int. J. Adv. Comput. Sci. Cloud Comput.*, vol. 1, no. 1, pp. 36–38.
- [6] Noranita, B., 2013, *Aplikasi Data Mining Analisis data Transaksi Penuaian Obat Menggunakan Algoritma Apriori (Studi Kasus di Apotek Setya Sehat Semarang)*, Semarang: Universitas Diponegoro.
- [7] Simarmata. 2010, *Rekayasa Perangkat Lunak*, Yogyakarta: Andi.
- [8] Jogyanto, 2010, *Analisis & Desain Sistem Informasi*, Yogyakarta: Andi
- [9] K. Tamhane, W. T. Khan, S. R. Tribhuwan, A. P. Burke, and S. B. Take, 2015, "Mobile Learning Application," *Int. J. Sci. Res. Publ.*, vol. 5, no. 1, p. 22503153.
- [10] Pranasiwi, Oktorina. 2015. *Pengembangan Aplikasi Kunci Determinasi Berbasis Android Pokok Bahasan Mamalia Di SMA/MA*. Tidak Diterbitkan. Skripsi. Jember: Program Studi Pendidikan Biologi FKIP Universitas Jember.
- [11] Ramadhani, A. 2013. *Hubungan motif bermain game online dengan perilaku agresivitas remaja awal (studi kasus di warnet zero wings candela dan mutar)*. Samarinda. http://ejournal.ilkom.fisipunmul.ac.id/site/wpcontent/uploads/2013/03/eJournal_Ardi%20Ramadhani%20.pdf
- [12] L. Ma, L. Gu, and J. Wang, 2014, "Research and development of mobile application for android platform," *Int. J. Multimed. Ubiquitous Eng.*, vol. 9, no. 4, pp. 187–198.
- [13] Saputra, Agus. 2011, *Trikdan Solusi Jitu Pemrograman PHP*, Jakarta: IKAPI.
- [14] Nugroho, 2010, *Aplikasi Pemrograman Web Dinamis dengan PHP dan MySQL*. Yogyakarta: Bunafit
- [15] Madcoms, Litbang. 2011, *Aplikasi Web Database dengan Dreamweaver dan php-MySQL*. Yogyakarta: Andi.