INTERACTIVE LEARNING APPLICATION DEVELOPMENT THE SUBJECTS ICT CLASS VI WITH COMPUTER ASSISTED INSTRUCTION (CAI) METHODS BASED ON ANDROID AT SD ISLAM AL-AZHAR 36 BANDUNG

Fathullah Al Karim[1], Iskandar Ikbal, S.T., M.Kom[2]

[1,2] informatics Engineering- Indonesian Computer University
Jl. Dipatiukur 112-114 Bandung
E-mail : fathullahalkarim@gmail.com[1], ikbal5710110014@gmail.com[2]

ABSTRACT

SD Islam Al-Azhar 36 Bandung is one of the schools that there are subjects of information and communication technology (ICT) as compulsory subjects are studied by students. Teaching and learning activities in SD Islam Al-Azhar 36 Bandung this method using lectures and practice. In addition there is a difficult matter is explained by teachers because it takes a picture or illustration to practice materials. Method of Computer-Assisted Instruction (CAI) is a computer-assisted learning, where the computer help for the learning process in presenting material that was already programmed, which have many types to the learning process including tutorials, drills and practice and simulation. An application that is built has two types of IE application front end to back end for students and teachers. The main feature on the application front end that is the subject matter, simulation and evaluation are packed using the concept of multimedia. Whereas, in the application back end there is a menu to manage the question of evaluation. Based on the results of testing the application of ICT to class VI interactive learning in SD Islam Al-Azhar 36 Bandung, conclusion that applications that are built can make it easier for students to understand the material presented, and can prepare students before practice in the lab by introducing functions of the students with tools that will be used.

.

Keywords : Application, Learning, Interactive, Computer Assisted Instruction (CAI), Information and Communication Technology, Android

1. INTRODUCTION

SD Islam Al-Azhar 36 Bandung is one of 36 elementary schools in West Java province that located on the street Van De Venter No. 12 and the Patuha No. 36. Same as the SD in General in Indonesia education at SD Islam Al-Azhar 36 Bandung is a 36 for 6 years of lessons, ranging from class I to class VI. SD Islam Al-Azhar 36 , Bandung is one of the 36 schools that there are subjects of information and communication technology as compulsory subjects are studied by students. SD Islam Al-Azhar 36 Bandung have one room computer lab which is filled by 20 computers. The process of teaching and learning in information and communication technology is divided into two, namely the learning process in the classroom and practice in computer lab. The material used by the pupils come from a module made by teachers and, in cooperation with the Foundation of Al-Madinah (AMD) computer based on the syllabus.

Based on the results of observation on the SD Islam Al-Azhar 36 Bandung, 36 teachers provided the material to students-siswinya with the method of lectures and practice. In addition to the observation, interviews have been conducted verbally with teachers of subjects information and communication technology called Mr. Andy Sukamdi, ST as the teachers POLITICAL class VI. According to the teachers concerned, indicating the existence of a problem experienced by students as well as teachers, obstacles experienced from students when learning i.e. they are less understanding content material due to a lack of information that is in the modules, teachers have difficulties in teaching this material, because it takes a real picture or illustration is not presented in the form of lectures. Yet the existence of the application of learning or the learning material on ICT as a tool to understand material visually to make it more interactive.

In addition to data collection by observation and interviews, have made the deployment a detailed questionnaire against 31 students of class VI. Based on a detailed questionnaire data have been calculated, the result of presentasenya i.e. 61.29% of those having trouble studying ICT. To support more effective ICT learning and engage it takes some aspects of material includes interactive tutorials and procedures material being taught.

This application can display a summary of all the material in the form of an attractive display. Learning methods are used in this application is the simulation tutorials. The purpose of the research makes it easy for Teacher ICT and particularly students of class VI in the process of learning and teaching, facilitate Teachers in providing a picture or

illustration, makes it easy for students to understand the lessons by way of providing a more interesting learning media.

1.1 Information and Communication Technology

Information technology is a technology that is used to process data, including process, obtain, compile, store, manipulate the data in various ways to generate quality information that is relevant, accurate information and timely that is used for the purposes of personal, business, and governance is a strategic information for decision making. This technology uses a computer to process data and telecommunications technology is used so that the data can be distributed and accessed globally. The meaning of information technology for the world of education means the availability of channels or means which can be used to broadcast educational programs.

1.2 Multimedia Elements

Multimedia can deliver and disseminate information in new ways that are informative and efficient. According To James A. Senn. Multimedia consists of several elements of the program that each item provides a facility for its users, i.e.

1. The text of this multimedia section to serve the writing on the screen. The text is the fast way to deliver and disseminate information, while text will always be used in any program.
2. The image used in the production of multimedia production, ranging from a simple clip art to photography. By looking at pictures, will yield a strong influence than merely reading it alone.
3. Film With a passage or multimedia programs, the computer can be turned into a television set, allowing for presenting or watched a movie that was played over and over.
4. Animation, animation is essentially serve the pictures in bargantian, until our eyes catch the changing of the pictures as a movement. Sometimes animation can express a stronger element of its characteristics compared to the movie.
5. Voice, an animation will be felt more beautiful because the vote will create a more vibrant, get rid of saturated and becomes an attraction for users of the application.

1.3 Computer Assisted Instruction (CAI)

CAI is a computer-assisted learning, where the computer help for the learning process in presenting material that is already programmed. The role of CAI in teacher does not disappear it so the computer only serves as a companion to the teachers in delivering the material in class. The development of computer application in education showed that computer-assisted learning is already adding a tool into the application package, so the difference in the use of computers in education as a tutor and the use of computers in education as the tool is becoming increasingly blurred.

The use of the computer as a medium of learning known as learning with computer-assisted (Computer Assisted Instruction – CAI, or Computer Assited Learning CAL). Judging from the situation of studying in which the computer is used for the purpose of presenting the content, CAI can-shaped tutorial, drill and practice, simulated and gaming.

1. Tutorial
   Tutorial learning program with the aid of tutor system to mimic the computer made by a teacher or instructor. Information or messages in the form of a concept is presented on a computer screen with text, pictures, or graphs. At the right moment is estimated to have students read, menginterprestasi, and absorb the concept of it, a question or a question asked.
2. Drill and Practice (Practice)
   The exercise aims to reinforce mastery of skills or mempermahir concepts can be done with the model of drill and practice. The computer prepares a series of question or questions that are similar to those usually found in a book/work sheet workbook. One question asked, and the answers given by the students will be evaluated/analyzed. Most of the drill and practice programs record the results of the students ' answers could then be reported or shown to students or teachers at the end of the activity, and became the Foundation for further learning.
3. Simulation
   Computer-assisted simulation program tries to match the dynamic processes that occur in the real world, for example, students with computers to simulate flying an airplane
4. Game
   The program well-designed games can motivate students and increase their knowledge and skills. Instructional game that manages to combine the video game action and the use of keyboard skills on the computer. Students can become skilled at typing because in the game the students being required to enter data by typing answers or commands correctly.

1.4 Multimedia interactive learning

Interactive sense associated with 2-way communication or more of components of communication. Components of communication in interactive multimedia (computer-based) is the relationship between human beings (as a user/users of the product) and a computer (software/application/product in a specific file format, usually in the form of CD). Thus the product/CD/applications are expected to have a two-way relationship of reciprocity between the/software/applications with their user. Interaktifitas in multimedia by Zeemry given the following constraints: (1) user (user) involved to

interact with the application program; (2) interactive information application aims to make users can get only the information you want without having to "devour" it all.

Based on such understanding 2 (multimedia and interactive) then it can be inferred that the interactive multimedia is a multimedia display designed by designer so that it looks filled the function of informing the message and have the interaktifitas to its users (user).

2. RESEARCH CONTENTS

2.1 Analysis Applications Built

The system to be built is the application of ICT-based mobile learning that can be operated by using the Android platform. In the development of this application aims to facilitate users in the learning process in delivering reserved material supported by the construction of the application interface FrontEnd and BackEnd applications to be built.

In the use of the FrontEnd is part of the application that is used by students to see ICT materials presented, evaluation, and simulation. While the use of the BackEnd is part of the application that is entirely done by the administrator (Teacher) in charging problem that has design and relate directly to the online application. Here is the workflow system is generally described as follows:

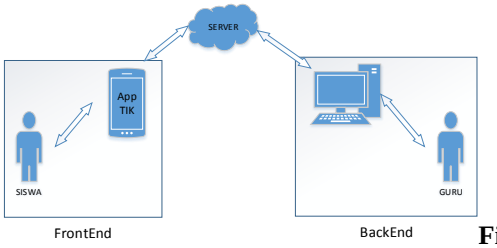


Figure 1. The workings of the application system of learning ICT

2.2 Analysis of System Architecture

System architecture to be constructed consists of several components, namely regarding the application system learning FrontEnd and BackEnd. The following is an overview of the architecture of the system:

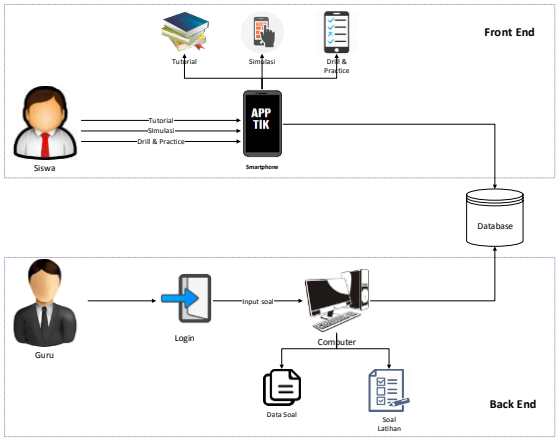


Figure 2. System Architecture

2.3 Analysis of Interactive Learning Methods

Interactive learning method is a method of instruction that is used to present a discussion or learning resources committed by teachers to create interactive educational atmosphere, between teachers and students with learning resources that support the occurrence of the processes of learning and teaching.

The model simulated learning present information in the form of grooves. The learning material is studied in accordance with the wishes of the user. Multimedia applications in learning ICT there are 4 simulations can be seen IE simulation simulation of CorelDraw, Microsoft PowerPoint and Microsoft Word, simulated a simulation of Adobe Photoshop. Model workout serves the subject matter to be used as a matter of practice.

2.3.1 Delivery of Material Flow

Delivery flow of material is the student has entered the application menu then choosing the materials.

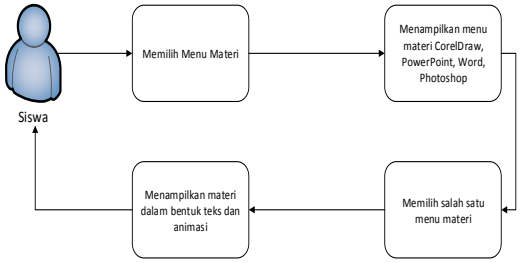


Figure 3. Delivery Of Material Flow

2.3.2 Delivery Flow Simulation

The flow simulation is presenting the material in a way that is more interesting. The way this is presented using an application by giving the case simulation including about drawing tubes, coloring tubes, insert images and others. Here is a picture of delivery flow simulation.

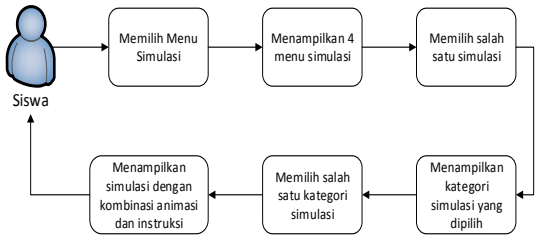


Figure 4. Delivery Flow Simulation

2.3.3 Plot of Exercise Questions

Exercise flow problem is flow shows how students choose exercise, then displays the problems based on the multiple choice question. The form of the test used was the form of multiple choice tests, as many as 10 reserved, any reserved the right to be given a value of 10.

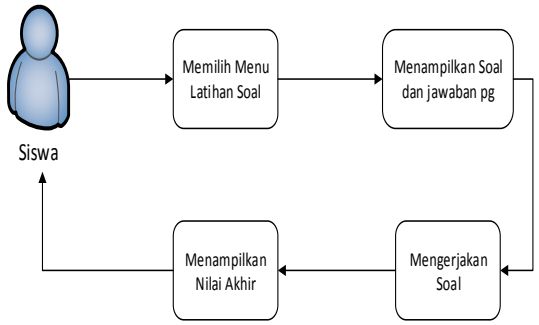


Figure 5. Plot of Exercise Questions

2.4 Analysis of the Required Data

Needs analysis data describes the data to be used on interactive learning Applications, ICT data used namely in the form of text, Image, Audio, and Animation can be seen in Figure 6.

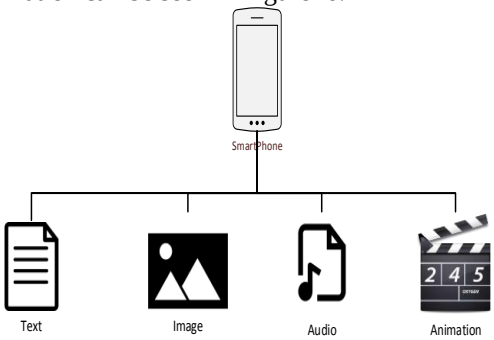


Figure 6. The analysis of the required Data

2.5 Use Case Diagram

Use case diagram illustrates the relationships between the actors and the system to be built. Where the processes contained on the application will be described using use case diagrams.

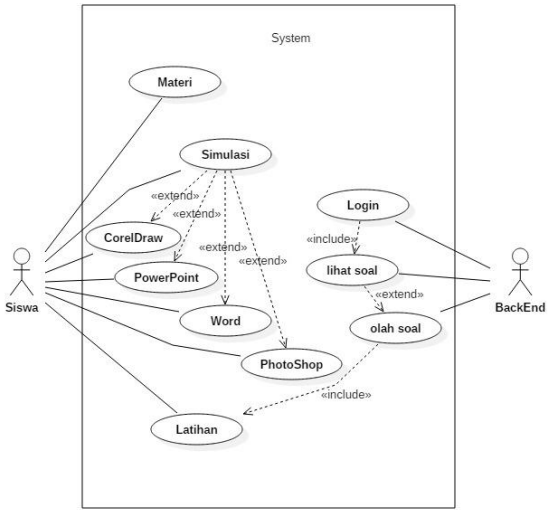


Figure 7. UseCase Diagram

2.6 Class Diagram

Class Diagrams are the specifications if diinsialisasi would be an object and is the core of development and object-oriented design. Class megFigurekan State (attributes/properties), as well as software can manipulate such circumstances (method/function). The following class diagram on the application of learning information and communication technologies in the image below.

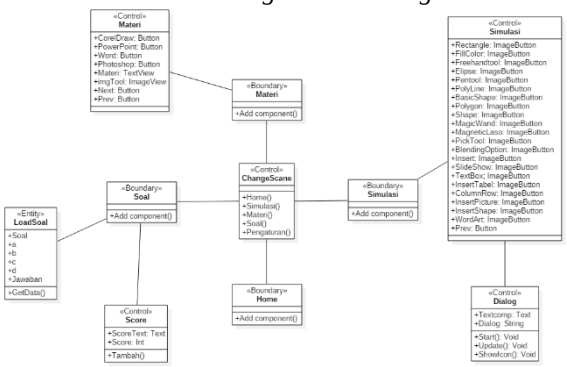


Figure 8. Class Diagram

2.7 Semantic Network

Semantic network is a picture depicting a relationship interface with each other, which can be seen in Figure 9.

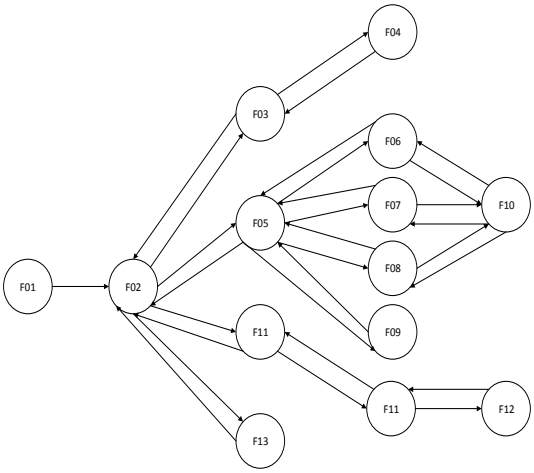


Figure 9. Semantic Network

2.8 Implementation Interface

Implementation of the interface is the interface of the application interface design. The following is a list of implementations of the interface of the application is interactive learning Subjects TIK class VI at SD Islam Al-Azhar 36, Bandung.

2.8.1 Implementation Interface Start Menu



Figure 10. The Start Menu Interface

2.8.2 Main Menu Interface Implementation

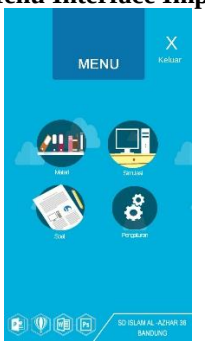


Figure 11. The Main Menu Interface

2.8.3 Material Interface Implementation

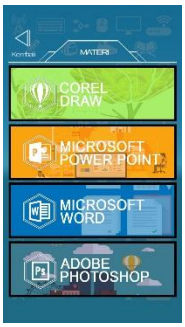


Figure 12. Menu Interface Material

2.8.4 Material Content of The Interface Implementation



Figure 13. Interface Material Content

2.8.5 Initial Simulation Interface Implementation



Figure 14. The Initial Simulation Menu Interface

2.8.6 Implementation Interface Simulation Content



Figure 15. Interface Simulation Of Landscape Mode

2.8.7 Interface Implementation Exercise Problem



Figure 16. Exercise Menu Interface Problem

2.8.8 Implementation Interface Settings



Figure 17. Interface Settings Menu

2.9 Testing System

In this study the testing done to the system i.e., functionally testing (alpha) and beta. The methods used in testing the alpha is a black box testing focuses on the functional requirements of the system to be built and at the beta stage is carried out an assessment of the user against the software.

2.10 Alpha Testing

Functional testing is used to test the new system is Alpha testing. Alpha testing focuses on the functional requirements of the software consists of a test scenario, cases and test results, and the conclusion of testing.

2.10.1 Scenario Testing

Black box testing is focused on the functional requirements of the software being built. Plan more testing can be seen in table 1.

Table 1. Scenario Testing

Menu	Menu Item	Type Testing
Start Menu	Select the sign in button	Black-box
Main Menu	Select the material button	Black-box
	Choose a button simulation	Black-box
	Choose the button problem	Black-box
	Choose the settings button	Black-box
	Choose the button out	Black-box
Material Menu	Select the material button CorelDraw	Black-box
	Select the material button in PowerPoint	Black-box
	Select the material button in Word	Black-box
	Select the material button Photoshop	Black-box
Simulation Menu	Choose a button simulation CorelDraw	Black-box
	Choose simulation button in PowerPoint	Black-box
	Choose the Word simulation key	Black-box
	Choose a button simulation of Photoshop	Black-box
Menu Matter	Choose the button problem	Black-box
	Fill reserved	Black-box
Settings Menu	Choose the settings button	Black-box
Admin Login	Verify your username and password	Black-box
Data Problem	Change data	Black-box

2.10.2 In Conclusion Alpha Testing

Based on the results of the alpha testing that has been done can be drawn the conclusion that the application is already running, built in accordance with the initial design, but does not cover the possibility of errors can occur, at the time the application is used, be it an error on the device used, user errors, and other errors. So in need of maintenance and checking of the process (maintenance) to keep the application running as expected.

2.11 Beta Testing

Beta testing is testing that is directly in the actual environment. Users can perform the assessment of the application by using a detailed questionnaire and also the media interviews. From the results of the questionnaire and the interviews then the conclusion can be drawn as to whether the application is in compliance with the purpose or not.

2.11.1 Scenario Testing Pre Test and Post Test

The test will be divided into 2 pre test and post test, given first class pre test (testing prior learning as usual) and post test (testing after learning as usual). While the second class is given a pre test (a test before running the application and learning as usual) and

post test (testing after you run the application and learning as usual). The assessment criteria in the pre test and post test are described in the following table.

Table 2. PreTest and PostTest assessment

The Given Material	The Number Of Reserved	The Value Of Each Answer	Total Value If Answer All Question Correctly
CorelDraw	10	10	100

2.11.2 Conclusion Testing Pre Test and Post Test

Based on the average value of the graph above, there is a change in the average score gains i.e. 0.33 on the control class and 0.41 in class experiments. It can be seen also the average value of a test post test i.e. 70 class control and 77 in class experiments. Thus it shows the existence of differences between the control and the experimental class. There is an increase in the average score of students before and after being given the treatment in every class.

2.11.3 Beta Test Questionnaire

This questionnaire consists of 5 statement by using the scale likert scale of 1 to 5. As for the points that the subject of the assessment of the questionnaire is as follows:

1. what material on the application of ICT to class Learning VI is easy to understand?
2. do with images and animation in the application of ICT to class VI Learning allows you to better understand the material being taught?
3. do with simulation presented in application of ICT to class VI Learning allows you to learn the material practices?
4. Exercise is reserved and evaluation on application of ICT to class Learning VI is already in compliance with the given material?
5. whether the application of learning ICT class VI is easy to use?
6. Whether multimedia content that is contained in the application of ICT Learning class VI is attractive and interactive?
7. Whether the introduction of the functions of the tools on the application of ICT to class Learning VI is already complete?

The following is an assessment score that is given with the use of likert scales on each of his statements, indicated in the following table.

Table 3. Score Questionnaire Answers

The Scale Of Answers	Description	Score
SS	Strongly Agree	5
S	Agree	4
BS	Regular Course	3
KS	Less Agree	2
STS	Strongly Disagree	1

Table 4. The Results Of The Questionnaire

Question	Answers					Total
	SS	S	BS	KS	STS	
Questionnaire 1	16	11	4			31
Questionnaire 2	13	16	2			31
Questionnaire 3	18	12	1			31
Questionnaire 4	18	11	2			31
Questionnaire 5	19	11	1			31
Questionnaire 6	18	12	1			31
Questionnaire 7	14	15	2			31

2.11.4 Interview Beta Testing

The interview was conducted with Mr. Andy Sukamdi, ST as the teachers POLITICAL results from the making of the application backend applications and interactive learning ICT subjects are as follows:

1. What is the application of learning ICT helps teachers in the process of teaching and learning?
   Yes, this application is very helpful in the process of teaching and learning with prestigious facilities such as material, simulations, exercises and question any students helped by the existence of these learning media.
2. do a simulation method used in the application of ICT Learning it can be used as an introduction to prepare students prior to students doing pratikum in the lab?
   Of course because the existing simulation on the application of this ICT learning help students in preparing for a before doing pratikum in the lab, even though not all the material there is on the application of this practice, at least the students know the functions of the existing programs that are taught.
3. whether the application of learning ICT allows teachers to give a picture or illustration on ICT subjects?
   Yes, not like in the book the package just a screenshot in Learning ICT Applications, there are animated and instructions make it easy to provide illustrations on ICT subjects.
4. Whether the display of the Application of learning ICT I woke up it was already exciting enough?
   It looks interesting, menu-menunya else simple not rigidly coupled presence of animation on the interfaces that make the students are very interested in using this application.
5. what existing material on the application of ICT Learning in accordance with the material presented at the Al-Azhar University Bandung 36?

Pretty as it is on the books of an integrated ICT, although there are still some material that is less obvious but delivery ways can be clarified by teachers when teaching and learning later on.

6. What is the advantages and disadvantages of the application of ICT to Learning this?
   Usually, this application has an interesting look, easy to use and also make students students don't get bored while studying ICT because it has interesting multimedia content, its shortcomings made clear again in the delivery of the material.

2.11.5 Conclusion Beta Testing

Based on the results of the beta test can be drawn the conclusion that the system that is being built is easy to use, useful and can assist the user in learning ICT information it has in accordance with the percentage of respondents answer terhapat questions (questionnaire) which has spread, in testing pre test and post test to see that the class experiments using interactive learning applications of ICT shows a rise in the value of the control class so well with the results of the interview , teachers feel helped by the existence of learning ICT applications.

3 CLOSING

Based on the test results obtained from research conducted in the preparation of this final task and refers to the purpose of the research that has been created, it can be concluded that:

1. this application can help students in learning with ICT material showing the class VI with the concept of multimedia.
2. Assists as well as make it easier for Teachers to deliver a picture or illustration of the particular content described in this application.
3. the existence of multimedia content and technology mobile android app can be a means of learning more interesting.

As for the suggestions to the development of applications for the future that is as follows:

1. this application only runs on one platform that is android. We recommend this application can be used across multiple platforms (multiplatform).
2. Add simulation to other material, so that not only the material that is important but all the material in the Handbook.
3. content and simulations delivered with more interactive.interaktif.

Bibliography

[1] A. H. Sutopo, Multimedia Interaktif dengan Flash, Yogyakarta: Graha Ilmu, 2003.

[2] M. S. Daulay, Mengenal Hardware-Software dan Pengelolaan Instalasi Komputer, Yogyakarta: C.V Andi OFFSET, 2007.

[3] M. Suyanto., Multimedia Alat untuk meningkatkan keunggulan bersaing, Yogyakarta: ANDI , 2005.

[4] A. Arsyad, Media Pembelajaran, Rajawali Pers, 2011.

[5] N.Heri, Pengembangan Media Pembelajaran Interaktif Berbasis Computer Assisted Instruction(CAI), Surabaya, 2015.

[6] N. Safaat, Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android, Bandung: Informatika, 2012.

[7] A. Nugroho, Rekayasa Perangkat Lunak Berorientasi Objek, Yogyakarta: ANDI, 2010.

[8] R. S. Pressman, Rekayasa Perangkat Lunak Pendekatan Praktisi, Yogyakarta: ANDI, 2002.

[9] Sugiyono, Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D, Bandung: Alfabeta , 2010.