

# **APPLICATION DEVELOPMENT MEDIA LEARNING PHARMACOGNOSY PHARMACY X CLASS IN HIGH SCHOOL VOCATIONAL HEALTH BHAKTI KENCANA CIMAH**

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## **ABSTRACT**

*This research aims to improve the student's understanding of the material against the media-based learning using pharmacognosy computer, help teachers provide the right props modeled in 3d form so that students understand material practices, provides a simulator to help students get an overview in the manufacturing process simplisia. As for the methodology used in this study i.e., data collection, analysis, design, application development, testing and the withdrawal of the conclusion. To prove the results of research carried out testing against students by giving a pretest and posttest control class and classroom experiments. The results of testing on the control class and a class experiment showed an increase in terms of value and understanding of students. To know the response of the students after using the application then do the dissemination of questionnaires to gauge whether the goals achieved are met. Based on the results of the questionnaire on average 81% of students agreed that the application of the learning media can improve understanding pharmacognosy students. An average of more than 85% of students agreed with the 3d simulator to help students get an overview in the manufacturing process simplisia. Based on the results of the application of media interviews that learning these can help teachers pharmacognosy serves props modeled in 3d form. On the basis of the test results the objective of this research was fulfilled and the average value of tested students using media learning pharmacognosy result in increased in value significantly.*

*Keywords: Learning Media, Pharmacognosy, 3D Object, Simplicia, Simulation.*

## **1. INTRODUCTION**

*Health Vocational high school of Bhakti Kencana Cimahi is a vocational high school health that existed in West Java province, Cimahi city. Vocational secondary schools this only focuses on the health sector in the field of Pharmacy and nursing. Pharmacy is a profession related to the art of making provision in the science of medicine, which can be of natural or synthetic sources that can be used in the*

*treatment and prevention of disease [1]. Pharmacognosy a science that studies about the parts of a plant or animal that can be used as a natural material that has passed through a variety of tests [2].*

*Based on the results of observation directly to Health vocational high school of Bhakti Kencana Cimahi conclusion that can be taken during the process of practice there are still some problems that the first problem the lack of props provided by school to practice as a container, cistern, knives, spoons and other utensils that are relevant in the making of simplicia. Thus making the teacher can't give an example at the time of execution practices. A second problem in any process of making simplisia takes quite a long time that depend on weather conditions, often in the process of making failure occurred due to weather a less support, so in the manufacturing process simplicia cannot be resolved. Based on the results of an oral interview with the teacher Yuslia Hasanah. S. Farm., Apt. one of the Subjects the teacher pharmacognosy can note that the lectures, students understand the explanation just disampaikan with the lecture so often times the occurrence of errors at the time of execution practices. This can be seen when the teacher gives the Job sheet that average students get value below 75. From the questionnaires submitted to 133 students. retrieved as many as 115 students liked subjects pharmacognosy, only 18 students who didn't like subjects pharmacognosy, 90 students who lack understanding of the material only 43 pharmacognosy, students are able to understand material pharmacognosy, 45 students more like the method theory, 88 students prefer the methods of practice, 120 students agree the material applied on application pharmacognosy based computer, only 13 students who disagree.*

*Media learning computer-based or Computer Assisted Intruction (CAI) is a system of delivery of learning materials designed and programmed into a system. This method displays the learning using a variety of media types (text, images, sound, animation), with the support of multimedia facilities are expected to help subjects pharmacognosy becomes more attractive, increasing interest and student achievement. The process of learning to type*

CAI including tutorials, Drills and practice and simulation.

Some research has been done to make the media learning to help students in the learning process. On the research of Usman Channy Affandi and Hari Wibawanto obtained the results of that study using a 3D object animation media which aim to add props on the object the human skeleton could attract the attention of students and raise the value of the students in the eye the lesson of Biology [3]. Similarly, research conducted by Murawan and Sufaatin obtained that using media applications of learning can help students understand material on the subjects of television troubleshooting [4]. However, in these studies there has been no research on the instructional media pharmacognosy, therefore will be made of a study entitled "application development Media Learning pharmacognosy Class X in Vocational middle school Bhakti wellness Kencana Cimahi "in an effort to help replace the lack of props provided by schools to improve students' understanding at the time of teaching.

As for the goal that will be achieved in this research are:

1. to help teachers provide the right props modeled in 3D form so that students understand the material practices.
2. Help provide simulators to help students get an overview in the manufacturing process simplisia.
3. Help improve understanding of students toward learning to use media pharmacognosy material-based computers.

## 2. RESEARCH CONTENT

### 2.1 Theoretical basis

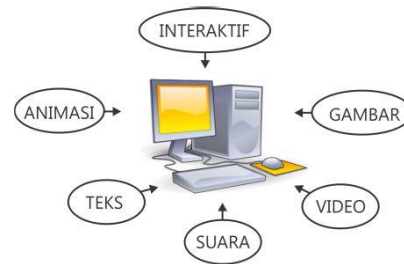
#### 2.1.1 Pharmacognosy

pharmacognosy learn about natural materials, especially of plants, animals and minerals that can be used in treatment. Fluckiger explain the definition of the scope of knowledge i.e. pharmacognosy, learn about natural medicine [2].

These subjects learn about the basics in knowing, understanding, and understanding of drugs derived from plants, animals or minerals as well as *lingkupnya* in modern as well as traditional medicine practice. In addition, these subjects also explains how to create *simplisia* from natural materials, namely, natural ingredients that are processed into traditional medicines [2].

#### 2.1.2 Multimedia

Multimedia is media utilizing the computer combined with other media such as text, graphics, audio, images, video and animations by using the links and tools that is able to make the user navigate, interact, create and communicate [5].



Picture 1. Multimedia Concept

### 2.1.2 Computer-Based Learning Media

Computer-based learning media, or commonly called computer-assisted learning Computer-Assisted Instructional (CAI), is one of the very interesting learning media and was able to increase the motivation of learning a very interesting and to increase the motivation of learning to learners. Media interactive learning using computers can be manifested in many forms, including programs of Computer Assisted Learning (CAL), computer conferencing, electronic mail (e-mail), and the computer multimedia, later called multimedia interactive learning [6].

## 2.2 Analysis And Design

### 2.2.1 Analysis System built

The system to be built is the application of learning subjects pharmacognosy class X-based Client Server. The system will have two interfaces where the Client as a FrontEnd and Server as BackEnd. Here is the workflow system in General:

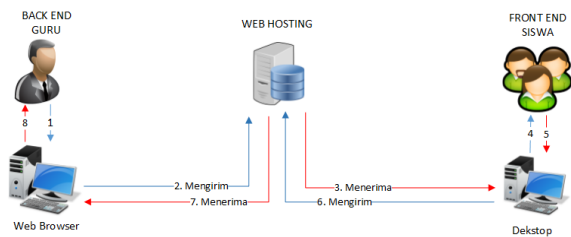
1. Teachers can login as Admin, which may renew materials and questions, as well as monitor student grades.
2. Students as client in charge saw the material, working on the problem and worked on simulations.

### 2.2.2 Description Of The System

Interactive learning applications to be built is a desktop-based client-server and uses a star topology (Star), a system was built using the method of Computer-Assisted Instruction (CAI) with the concept of a tutorial, drill and practice, and simulation. Now here is the overview of the architecture of the system that will be built. The system will have two interfaces i.e. a FrontEnd and a BackEnd.

The frontend is part of the application that will be used by students to the learning activities. The backend is a part of the applications done by teacher pharmacognosy to process data of students, teacher data, data content, data values, and data evaluation question.

### 2.2.3 System Architecture



Picture 2. System Architecture

Explanation of the Groove system architecture in Figure 2:

1. The teacher entering data content and data reserved in the system web browser.
2. System's web browser sends data insert into web hosting.
3. Web Hosting system to receive data from a web browser and then send data content and data reserved for display on desktop systems.
4. Desktop Systems to receive and display the data content and data reserved can be seen by students.
5. Students entering data of students and the value data into desktop systems.
6. Desktop Systems send data to web hosting.
7. Web hosting desktop systems receive data from and send data to the student and the value data on the system web browser.
8. The system web browser accepts and displays data on students and the value data can be seen by the teacher.

### 2.2.4 Analysis Network

Network analysis in a computer lab SMK Bhakti Wellness Kencana Cimahi is a client-server model and use the star topology (Star). This architecture puts a computer that resides on the server with the number of teachers as 1 piece of the computer, while the computer-computer students as clientnya amounted to 39 computers. The total number of computers in the computer lab Health SMK Bhakti Kencana Cimahi totalling 40 computers.

### 2.2.5 Description Learning pharmacognosy

#### 1. Material

Interactive learning on subjects pharmacognosy which will be applied to this application is the pembelajaran for class X pharmacognosy 2013 with curriculum Materials: introduction Simplisia, pharmacognosy, Rhizoma, Cortex, Radix, Bulbus, Cormus, Tuber, Lignum, and Caulis.

#### 2. Simulation

a simulation of the Form will be built on the application of interactive learning on subjects pharmacognosy using 3d Animation in order to clarify the submission of material provided and the scope for simulation i.e. the material concerned in the process of making simplisia vegetable.

#### 3. Evaluation

Evaluation is testing the ability of the menu which will give you a quiz-a quiz based on the

material studied, any material studied has reserved the evaluation. If the answer to question correctly will get a score, and then will go to the next question but if the answer is wrong will not reduce the score already come by and move on to the next question until the matter up, the message will appear at the end of the evaluation against the capabilities and total score obtained.

### 2.2.6 Software Requirements Specifications

Software requirements specification is a software requirement as a result of the process of the analysis conducted in the context of software development. Analysis of software requirements specification which will be explained is the analysis of functional requirements specification and non functional.

Table 1. Functional Analysis Of ForntEnd

No	Code	Description Of The Needs
1	SKPL-F001	System showing the selected material
2	SKPL-F002	System showing the selected simulation
3	SKPL-F003	System showing the selected evaluation
4	SKPL-F004	System displays the login form of the evaluation
5	SKPL-F005	showing registration form
6	SKPL-F006	System showing a matter that will be done
7	SKPL-F007	System displays the value in each questions answered

Table 2. Functional Analysis Of Backend

No	Code	Description Of The Needs
1	SKPL-F001	System displays data from the material and edit material
2	SKPL-F002	display data from and edit problem solved
3	SKPL-F003	System showing the value data and print the value
4	SKPL-F004	System showing sports student data
5	SKPL-F005	System showing sports teacher's data
6	SKPL-F006	System displays the login form

#### 2.2.6.1 Non-Functional Analysis

Analysis of non-functional requirements describe the needs of the area outside of the system needed to run applications built. As for the non-functional requirements on the application of interactive learning on subjects covering

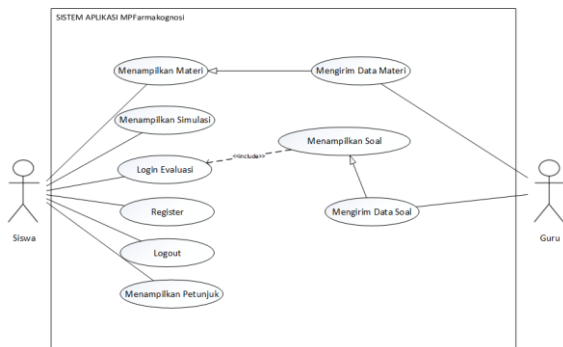
pharmacognosy, hardware requirements, software requirements and system users that will be using the application.

**Table 3. Non-Functional Analysis**

No	Code	Description Of The Needs
1	SKPL-NF001	System built based frontend and backend
2	SKPL-NF002	Use the look interesting, interactive and functional
3	SKPL-NF003	The application will display data from the database according to the wishes of the user
4	SKPL-NF004	To live right in the system need a Compiler to perform Unity
5	SKPL-NF005	The interface uses the language of Indonesia

**2.2.7 Usecase Diagram**

Use case diagrams are used to describe a number of external actor with a use case that is contained in the system. Use case diagram this is only describing the State of the system environment which can be seen from the outside by the actor. Use case consists of three parts, namely the definition of actor, definition, and use case use case scenario.



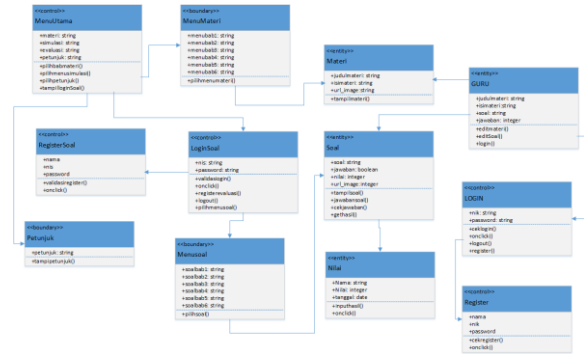
**Picture 3. UseCase Diagram**

**2.2.7.1. Were the actor**

**Table 4. Were the actor**

No	Actor	Description
1	Students	The student Is a person who uses or applications of learning media operte pharmacognosy
2	Teachers	It is the people who control the media applications to send data pharmacognosy learning material and data reserved

**2.2.8 Class Diagram**

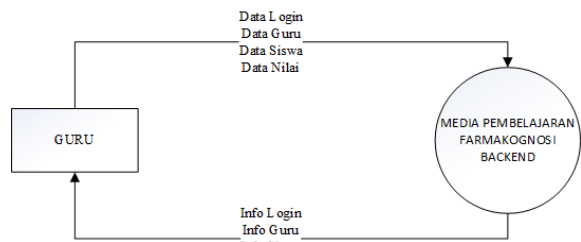


**Picture 4. Class Diagram**

**2.2.9 A Context Diagram Of The BackEnd**

A context diagram that describes the data model can be used to find out the process flow of data into and out of the system.

Here is a picture diagram of the proposed context on the application of the learning media pharmacognosy class X in Health vocational high school of Bhakti Kencana.

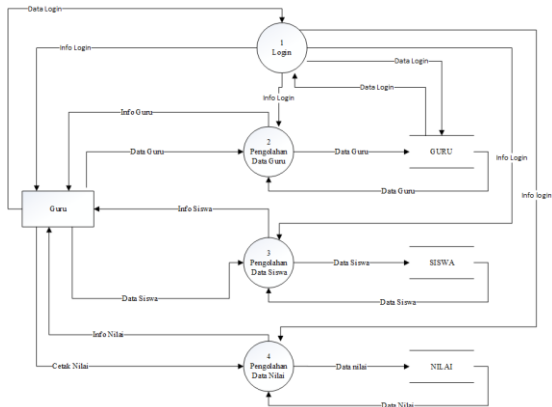


**Picture 5. Diagram Konteks**

**2.2.10 Data Flow Diagram**

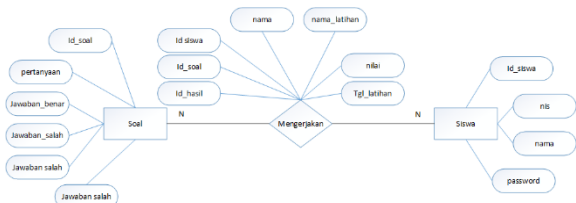
Data flow diagram is a model of the system to describe the parts of a system into smaller modle. data flow diagrams can be useful to make it easier for users who do not yet understand how to build a system using a computer.

Here is a picture of the proposed data flow diagrams in application media learning pharmacognosy class X in SMK Bhakti Wellness Kencana Cimahi.



Picture 6. DFD level 1

2.2.11 ERD



Picture 7. ERD

2.2.12 Implementation Of Interface

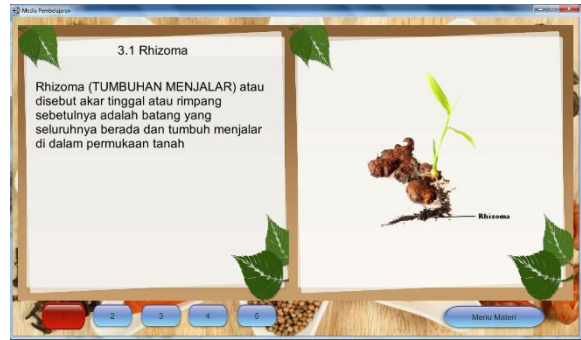
Implementation on the application Interface done by demonstrating the look of each program's interface



Picture 8. Interface Main Page



Picture 9. The Main Menu Interface



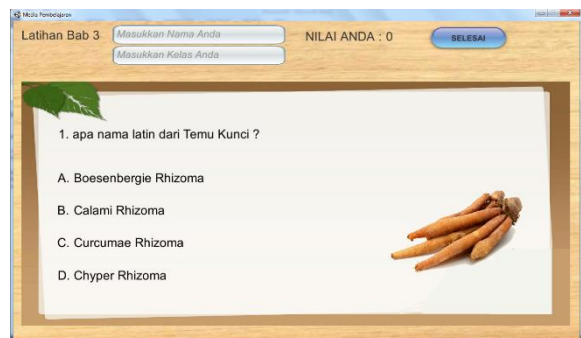
Picture 10. Interface Material



Picture 11. Simulation Interface



Picture 12. Login Interface Evaluation



Picture 13. Interface Evaluation Problem

2.2.13 The hardware implementation

Table 5. Hardware used

No	Hardware	Specifications
1	Processor	Processor dengan kecepatan 2.30 Ghz

2	Monitor	Monitor dengan resolusi 1366 x 768 pixel
3	Graphic Card	VGA 2 GB
4	Memory	RAM 4 GB
5	Mouse	Standar
6	Harddisk	500GB

#### 2.2.2.14 Software Implementation

**Tabel 6. Software used**

No	Software	Spesifications
1	Sistem Operasi	Microsoft Windows 7
2	Tool Player	Unity 3D 2017

#### 2.2.2.15 Testing The 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.*

#### 2.2.2.16 Scenario Alpha Testing

**Table 7. Test Input Scenarios ForntEnd**

No	Components are tested	Scenario Testing	Types Of Tests
1	Login Frontend	Student Login verification	BlackBox
2	Display material	Display material	BlackBox
3	Display The Simulation	Display The Simulation	BlackBox
4	Displays Reserved	Displays Reserved	BlackBox
5	Showing Instructions	Showing Instructions	BlackBox

**Table 8. The Test Scenario Input BackEnd**

No	Components are tested	Scenario Testing	Types Of Tests
1	Login Backend	Teacher Login verification	BlackBox
2	Data Processing teacher	Add a data teacher change the data teacher Delete data teacher	BlackBox
3	Student Data Processing	Add student data Edit the data students Delete students	BlackBox
4	Data Processing Material	change the data material	BlackBox

5	Data Processing reserved	change data reserved material	BlackBox
6	Processing Of Data Values	Print the value data Delete the value data	BlackBox

#### 2.2.2.17 The Test Results of the case and BlackBox

**Tabel 9. The FrontEnd Testing**

Cases and test results			
Data Input	Hope	Observation	The results
Material Data	The system displays the contents of the material	The system displays the contents of the material	[√] Received [ ] Rejected

**Tabel 10. Testing The Backend**

Cases and test results (Data Is Correct)			
Data Input	Hope	Observation	The results
Nik : 196704102 014121001 Password: guru	Display s the main menu page	Showin g the main menu page	[√] Received [ ] Rejected
Cases and test results (Wrong Data)			
Data Input	Hope	Observation	The results
Nik : 196704102 014121001 abc Password: guru	Display a message failed login	Display a message failed login	[√] Received [ ] Rejected
Cases and test results (Blank Data)			
Data Input	Hope	Observation	The results
Nik : Password:	Empty data message showing	Empty data message showing	[√] Received [ ] Rejected

#### 2.2.2.18 Blackbox Testing Conclusions

*Based on the results of testing a black box has done with cases that have been tested, then it can be inferred that in the application of learning media pharmacognosy class x can be run well and there are no errors in the process.*

#### 2.2.2.19 Dissemination Of The Questionnaire

*Dissemination of the questionnaire done by giving questionnaires to 33 students and interviews with teachers. The testing techniques used in the*

dissemination of this questionnaire likert scale is a technique [7].

### 2.2.19.1 Perhitungan Point Pengujian Kuesioner

For each question on the questionnaire will get a point a different assessment.

**Table 11. Point Assessment**

Jawaban	Point Penilaian
Very Agree	5
Agree	4
Hesitation	3
Not Agree	2
Strongly Disagree	1

After determining the score the answers, the next step to determine the ideal score. The ideal score is a score that is used to calculate the score on the rating scale. Formula to calculate score idel, namely:

[ Ideal Score = Score scale x number of respondents ]

**Table 12. The Ideal Score**

Skala	Rumus
SS	$5 \times 33 = 165$
S	$4 \times 33 = 132$
CS	$3 \times 33 = 99$
KS	$2 \times 33 = 66$
TS	$1 \times 33 = 33$

Were later determine the value of the rating scale and distance intervals of values. The formula of calculation of the length of the class:

1. The Minimum index value (lowest) = number of respondents answer lowest weight x ( $33 * 1 = 33$ )
2. The maximum index value (highest) = number of respondents answer the highest weight x ( $33 * 5 = 165$ )

3. Distance intervals = (maximum value – the value of Minimum)/5 =  $(165 - 33)/5 = 26.4 = 26$

As for the result of the calculation of the distance intervals:

**Tabel 13. The Ideal Score**

Angka	Keterangan
141 - 165	Very Agree
114 - 140	Agree
87 - 113	Hesitation
60 - 86	Not Agree
33 - 59	Strongly Disagree

### 2.2.20 Conclusion The Results Of The Questionnaire

Based on the results from testing the response to user applications, it can be concluded that the purpose of enhancing the understanding of student learning in learning subjects pharmacognosy given by teachers by providing the learning media

interactive student respondents, with an average of 81% agree so that first goal is met. With a 3d simulator to help students get an overview in the manufacturing process simplisia. get your students respond on average more than 85% of students agreed so that the second purpose is met.

### 2.2.21 Pretest dan Posttest

In addition to using questionnaires, testing is also done using the Pre Test and Post Test to 33 children of grade 10 in high school Vocational Health Bhakti Kencana Cimahi to know the extent to which understanding of the students against the given material. This testing is done before and after using the learning Medium then the test results analyzed using N-gain.

#### 2.2.21.1 Pretest Test scenarios and Posttest

On testing will be done using a pretest and posttest, to first class (the class of kontrol) will be given a test with test order pretest, posttest testing and learning. While the second class is given a pretest, testing of learning with the help of the media learning and then do test posttest.

### 2.2.22 Data Analysis Techniques

This data analysis techniques used to increase student learning outcomes after being given a test done with the analysis of the difference of two average by using a t-test and hypothesis.

### 2.2.23 Hypothesis Testing

Test the hypothesis is one step in the study of decision making that is based from the results analysis data that have been tested, the Data that have been tested can be said to be statistically significant if the incident was not caused by a factor deliberate action, in accordance with the limitations of pre-set probability [8].

#### 2.2.23.1 Test For Normality

Test data used to test normalized Gaussian or not.

H0: normal data

H1: data is not normal

Criteria test: H0 is rejected if sig < 0.05

		Tests of Normality					
		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
Kelompok		Statistic	df	Sig.	Statistic	df	Sig.
Nilai	Kelas Kontrol	.114	33	.200 <sup>*</sup>	.953	33	.167
	Kelas Eksperimen	.142	33	.088	.930	33	.035

**Picture 14. Test the Normality of N-gain**

the result of the calculation of the test of the normalization can be aware that the value of sig class control and experimental > 0.05, then it can be inferred that the results of a pretest and posttest data is Gaussian.

#### 2.2.23.2 Its Homogeneity Test

Test data used to know its homogeneity of variance of some populations are the same or not.

$H_0$ : the samples come from a homogeneous population

$H_1$ : sample derived from a population is not homogeneous

Test criteria i.e. If significant value greater than 0.05 then  $H_0$  is accepted, and if the value is significantly less than 0.05 then  $H_0$  is rejected.

Hasil Homogenitas			
Levene Statistic	df1	df2	Sig.
.047	1	64	.830

Picture 15. Homogeneity Test

the output value of its homogeneity test data obtained its homogeneity for grade control and experimental class of 0830, due to the extent of its homogeneity greater > 0.05 then it can be inferred that the homogeneous nature of the data.

### 2.2.23.3 Independent T-test test

Independent Sample T-test test is part of the inferensial parametric statistics (FR Bede).

$H_0$ : there is no difference between the average value of experimental class is equal to the average value of the class controller

$$(H_0: = \mu_{eksperimen} \mu_{Kontrol})$$

$H_1$ : there is a difference between the average value of experimental class larger than the average value of the class controller

$$(H_1: \mu_{eksperimen} > \mu_{Kontrol})$$

On the basis of decision making are:

1. If the value of the significant (Sig 2-tailed) > 0.05, then  $H_0$  and  $H_1$  accepted rejected
2. If the value of the significant (Sig 2-tailed) 0.05, then <  $H_1$  accepted and  $H_0$  in decline

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Has Equal variances assumed	.047	.830	-3.162	64	.002	-.09030	.02858
Equal variances not assumed			-3.162	83.908	.002	-.09030	.02858

Picture 16. Independent T-test test N-gain

the results of the independent T-test output test N-gain data obtained significant value (Sig 2-tailed) value of 0.002, because significant (Sig 2-tailed) smaller than 0.05 so inconclusive < there are significant differences between the results of the study class control experiments with class then  $H_1$  accepted  $H_0$  is rejected.

## 3. CLOSING

### 3.1. Conclusion

Based on the results of the implementation and the testing that has been done, then the conclusion of the final project "development Application of the learning Media pharmacognosy Pharmacy X Class

At Smk Bhakti Kencana Greenacres Health" as follows:

1. application media learning pharmacognosy can help improve students 'understanding of subjects pharmacognosy class X.
2. application media learning this is able to provide simulation pharmacognosy 3D objects to help students get an overview in the manufacturing process simplisia.
3. application medium learning pharmacognosy can help teachers provide the right props

### 3.2. Suggestion

In the application development Media Learning pharmacognosy Pharmacy X Class At Smk Bhakti Kencana Greenacres Health it still contained many deficiencies, therefore need to do some development to make this application better. As for the suggestions to the development of applications for the future that is as follows:

1. Advice on applications not only on subjects pharmacognosy only applications can be used. Try for future applications can be useful for all subjects.

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