APPLICATION DEVELOPMENT SUPPORT PRACTICUM PARASITOLOGY (CASE STUDY IN THE DEPARTMENT ANALIS HEALTH POLTEKKES BANDUNG)

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ABSTRACT

Health Polytechnic Bandung is health education institutions, under the Ministry of Health with one department is a health analyst. Analysts do an analysis in the clinical laboratory using a microscope. Parasitology is the study of living organisms with very small size. In practical classes with 40 students there are only 12 pieces microscope. Total microscopy less create student interest is reduced when queued for observation. Preliminary data questionnaire amounted to 83.33% of the students showed difficulty understanding the shape of parasitology. The purpose of this study is to provide an alternative learning in parasitology lab using the media as a learning tool that can be accessed online.

The solution offered is an independent learning by students with the help of computers. This research includes research on the development of previous research. Software development using Sutopo Luther. The software is then tested to polytechnic students and data collection is done through questionnaires and test pre-post test.

The results of the questionnaire to the user application provides results that are in accordance with the material application and assist the learning of parasitology. In testing the pre-test and post-test with the application as improvements of 8:17%.

***Keywords**: Parasitology lab, polytechnic, microscopes, image, learning media. ,*

1. INTRODUCTION

Bandung Health Polytechnic (Polytechnic) is the health education institutions, under the Ministry of Health in the teaching and learning activities can take advantage of the Science and Technology Information Technology-based health sector [1]. One is majoring in health analyst who uses a microscope to analyze in clinical laboratories.

Parasitology is the study of living things that depend on other living creatures. Parasites are very small, thus requiring a microscope to observe it [2]. In practical classes contained 40 students with the amount of 12 pieces microscope. Total microscopy less create student interest is reduced when queued for observation using a microscope. Questionnaire data showed 83.33% of students have difficulty understanding parasitology form, according to the statement of the head of the field of parasitology, Drs J.Samidjo OW M.Biomedik, it is a challenge for professors to be maximally in presenting the material and pack it into attractive. The solution offered is a self-centered learning students (student centered) with the aid of a computer. The hope students can evaluate and control the activities of their own. This model changes will also result in the active role of lecturers in giving content and work [3].

Previous research on the development of interactive multimedia learning in basic accounting subjects showed increases in value on the test results pretest to posttest of 30% [4]. As well as research in medical education student group S1 Gadjah Mada University, with the use of media display of photographs on histology lab practicum and exam showed the average score of the test group score> 60 becomes higher, at 97.49%, [5] The study utilizes multimedia material, using multiple media such as text, images, video with a specific purpose. [6]

On the basis of the problem and a review of previous studies, the researchers will build the application with the title "APPLICATION DEVELOPMENT SUPPORT PRACTICUM Parasitology (CASE STUDY IN THE DEPARTMENT OF HEALTH POLTEKKES ANALIS BANDUNG)".

1.1 Identification of Problems

Based on the above background, can identify the problems that used to build applications supporting parasitology lab, namely:

1. Lack of instructional media used for parasitology lab activities.
2. Students difficulty to understand the material with limited time.
3. Lecturer difficult to convey the material to the maximum.

1.2 Purpose and Objectives

The purpose of this research is to build multimedia-based applications help parasitology lab on the campus of Polytechnic department of health analysts.

The purpose of this study is:

1. *Provide alternative means to support the learning of parasitology lab.*
2. *Make it easy for students to obtain and study the material that can be accessed online.*
3. *Facilitate lecturers for the delivery of learning materials with a maximum,*

2. MATERIAL AND METHOD

2.1 Time and place of study

Research was carried out on:

Place: Laboratory Prasitologi, Polytechnic Bandung Health, Department of Health Analyst.

Time: October 01, 2017 until February 14, 2018

2.2 Research Methods

This research is using development (Research and Development), the researchers developed a study using the results of previous studies. Having identified the problem, and setting goals, the next step seek to preliminary data through observation, questionnaires, interviews and literature studies. Methods for the construction of the software to be used is the model-Sutopo Luther, and to test these products use the experimental method, to the target user group [7], End of the study will produce a report and conclusions and suggestions on the research undertaken.

2.3Method of collecting data

a. Observation, a method of data collection is done by direct observation to the field, namely by following the lecture at the Polytechnic of Bandung parasitology lab.

b. The questionnaire, the method of data collection by administering questionnaires to the students of polytechnic question being parasitology lab. The purpose of this questionnaire is to find out the data data to support research.

c. Interview, the method of data collection is done by a question and answer to the problems of parasitology lab professors at the campus Polytechnic of Bandung, especially in the subject of parasitology.

d. Literature, a method of data collection is done by looking at literature, books and learning diktat parasitology.

2.4 Software development methods

Multimedia software development method consists of six stages, namely the concept, collecting material design, assembly, testing and distribution [8].

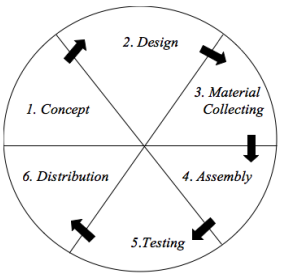


Figure 1. Methodology Development of Luther - Sutopo

1. Concept

Stage concept (concept) is the stage for the purpose and who will use the application, the target users of this app is the duo polytechnic students majoring in health analyst.

2. Design

Design is the design of the stage make the specifications regarding the program architecture, appearance and material requirements for the application. At this stage the design is made using the method stroryboard. Storyboard story contains steps parasitology lab supporting applications. This phase reference widened researchers to create an overview and more detailed modeling of the system.

3. Material Collecting

Collecting materials is a stage where the collected material according to need to do. This stage can be done in parallel with the assembly stage. In rare cases, Collecting material stage and the stage will be done in a linear assembly are not parallel. At this stage the materials collected are images, videos, text material that supports the parasitology lab materials

4. Assembly

Stage assembly (assembly) is the stage where all the objects or the assembly of multimedia materials made and put together. Once created the storyboard, the next stage is the creation of applications to take advantage of multimedia material. Applications built in this study a display face (frontend) with a polytechnic student users and display control (backend) that are intended professor of parasitology lab as admin.

5. Testing

After the completion of the manufacturing (assembly) by running the application / program and see whether there is an error or not. This stage is also known as alpha testing stage (alpha test) where testing is done by the manufacturer or the manufacturer's own environment and blackbox, which only sees the output or output after the application is given some input or feedback. Furthermore, the product tested to health analyst polytechnic student groups to get feedback in the form of assessment of the application.

6. Distribution

The stage at which the application is stored in a storage medium. At this stage the application will be stored on the media server and can be accessed by students and faculty polytechnic parasitology.

2.5 Parasitology

Parasitology is the study of all living things (organisms) whose life riding (dependent) on other living creatures.

Known as the term endoparasites and ectoparasites. Endoparasites are parasites that live in the human body, for example in the blood, muscle and intestine, for example Plasmodium sp. While ectoparasites are parasites that live attached to the outside of the skin and sometimes into the tissue under the skin, for example, Sarcoceptes scaebei.

Parasites into three groups, namely section protozoology group, entomology and helmintologi.

Parasitic relationship with the host and cause disease symptoms called infestations exist in microbiology is called infection. Then the disease caused by a parasite called parasitosis.Untuk know what kind of shape and structure rather than a wide range of parasite itself then this practicum conducted to understand various species of parasites that can harm the body.

Parasites classified in the order of the Phylum, Class, Order, Family, Genus and Species.

Protozoa are unicellular animals (one cell) and includes a eukaryotes organisms. In the taxonomy Protozoa located under the Kingdom Protista with the position as phylum Protozoa. Many animals that live in the waters Protozoa, also in the soil and in animals as normal fauna. Some species of the phylum Protozoa are parasitic.

Protozoa are generally aerobic and heterotroph. They prey on the microorganisms, ingesting particles of organic material. These animals do not have a thick cell wall, often have flagella or cilia. The outer layer of the cover body in the form of an elastic membrane called a pellicle. Cells that have pellicle structure requires a special structure which is useful for taking food.

Amoeba is one genus in Sarcodina class, sub-class Rhizopoda, and classified in the Order Amoebida (Lobosa).

1. Characteristics and Structure Amoeba

a. Amoeba shape is not fixed, irregular ..

Protoplasm is divided into two parts: the outer layer of ectoplasm in a colorless and endoplasmic in the central part of which consists of cytoplasmic granules.

b. In the endoplasmic are contractile vacuolization, nucleus and one or more vacuolization food.

c. Amoeba core on life rather difficult to see with a microscope, while the preparations preserved easily visible. At Amoeba young, biconcave shaped core, the core of the adult-shaped crease with changeable layout for movement.

d. Amoeba Asexual reproduction by means of binary fission.

e. Tools such as pseudopodia movement, with a body diameter of 0.25 mm.

Plasmodium belong to a class Sporozoa, and under sub-class Telosporidia (for core one on the adult stage). While other sub-level class is a sub-class Neosporidia (because multinucleated on adult stages). Plasmodium classified in order Coccidiomorpha, and sub order Haemosporidia, as human blood parasites.

In humans, there are four species of Plasmodium parasites that attack the blood as follows: Plasmodium vivax, Plasmodium falciparum, Plasmodium malariae and Plasmodium ovale. Fever caused periodic malarial infection relating to the outbreak of a number of mature schizonts and release of merozoites that enter the bloodstream (sporulation).

Skizogoni periodicity varies depending on the species. In Plasmodium vivax and P. ovale lasted 48 hours. In Plasmodium falciparum less than 48 hours, and 72 hours in P. malariae

[2]

2.6 Microscope

Microscope is a tool used to observe small organisms (microscopy) or very small, not easily visible to the eye.

Light microscope using three types of lenses, namely the condenser lens, the objective lens and eyepiece

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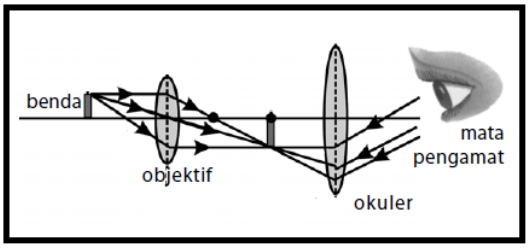
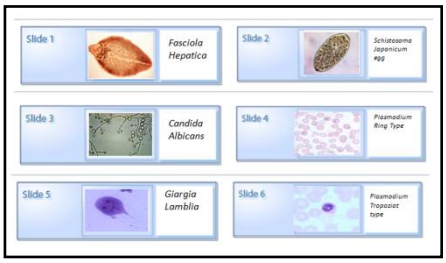


Figure 2 working principle microscope

The principle works as follows: the lamp as a light source will direct light into the condenser and focused / collected through the condenser lens will be forwarded to penetrate the specimen / object / preparations.



Gambar3 parasite preparations Preparations

2.7 Application in the wake

Practical Application Support Prasitologi (Case Study at the Department of Health Analyst Polytechnic of Bandung) can be accessed online and have an overview of the system as follows:

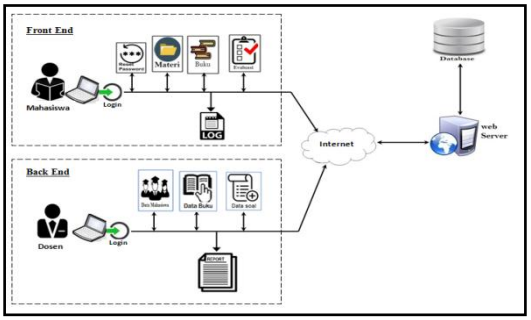


Figure 4. Practical Application System Supporting Prasitologi

Lecturer as an admin charge of managing the system and that are in the backend side. In this section, the admin will be able to control and process data including student data management, managing materials, and manage evaluations and manage data book, and manage student reports.

Students, as users can perform the activity, Doing login, view profile, reset passwords, view the log of student activities, viewing the material, each chapter material will contain text matter, do exercises, simulating the preparations preparations and magnification with the virtual microscopy, download material as a pdf, see information containing personal data the authors.

2.7. virtual Microscope

Virtual microscope is simulated by using magnification and aims to help students use such magnification microscope manual.

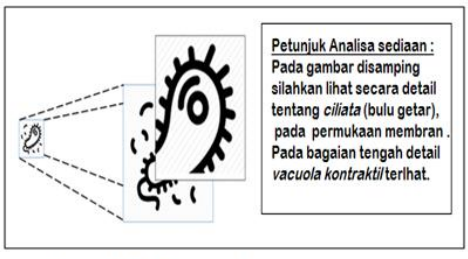


Figure 5. The concept of magnification with zoom

In this simulation, students can choose the simulation according to the preparation of preparations in the gallery and make observations on the virtual microscope.

2.8 Implementation and Application

Implementation of Web-based applications can be accessed at the web address:
http://parasit-poltekkesbdg.com
Display applications are as follows:



Figure 6. Display the home page of the website.

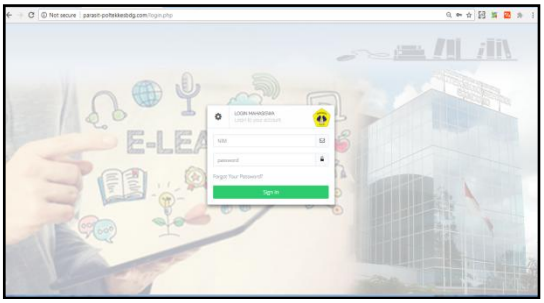


Figure 7. Page Login

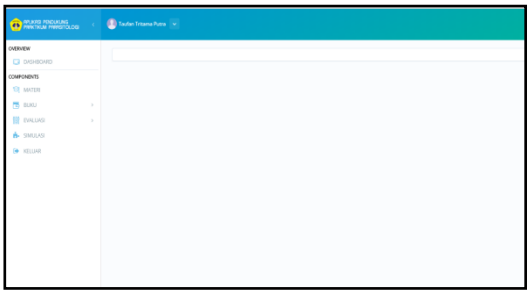


Figure 8. Display the user's main page

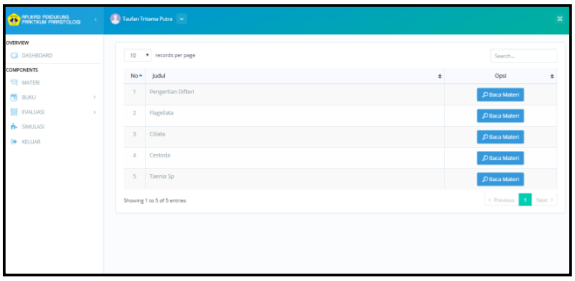


Figure 9. Display material selection page

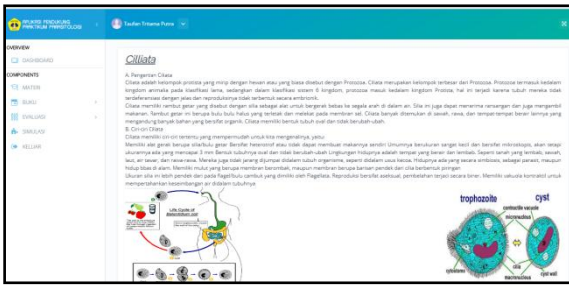


Figure 10. Material detail page



Figure 11 Display page of the book,

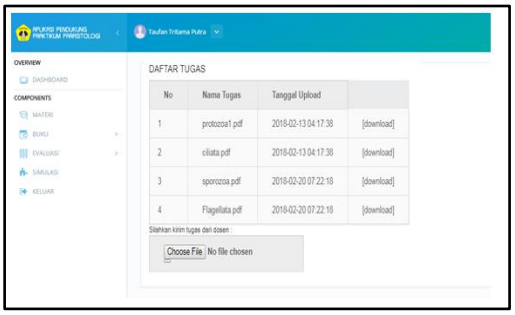


Figure 12. Display task page

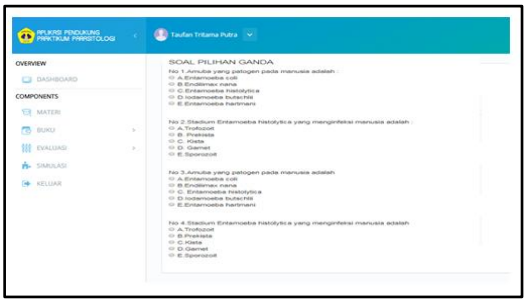


Figure 13.Page for practice

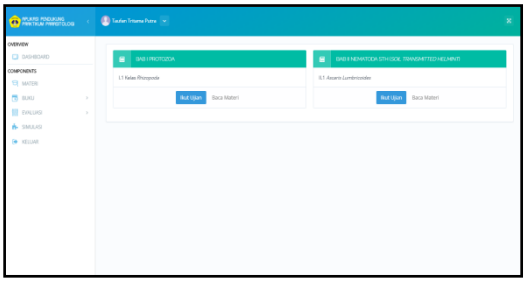


Figure 14. Display test selection page

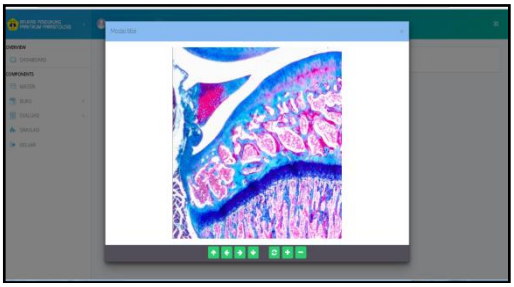


Figure 15. Display exam page

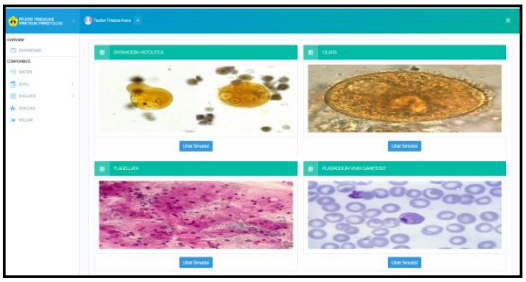


Figure 16. The simulation options

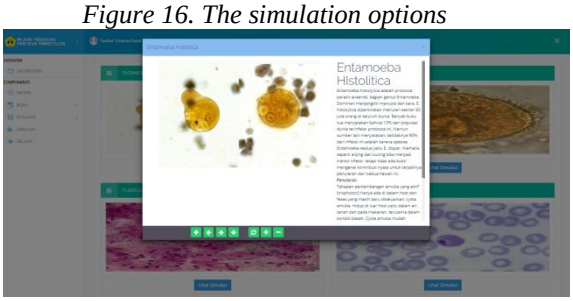


Figure 17. Display Virtual simulation Mkroskop

2.8 Discussion

After the application so it is at the moment in ujikan to the questionnaire about the app users are also given, the following list of questions - per tanyaan posed to the students:

1. *Is the subject within their app?*
2. *Is parasitology app can help learning?*
3. *Do instriksi given understandable. ?*
4. *Is this application is in accordance with the actual situation?*
5. *Is the application interface design, typography and color it obvious?*

The results of the questionnaire can be displayed in the following tabulation

Table 4. 1 Tabulation of questions with the group results agrees (positive)

		Agreed group				
NO	*Question*	*Strongly agree*	*Agree*	*amount*	*Calculation percentage*	*the percentage agreed*
1	*Whether the application is in accordance with the subject?*	*10*	*11*	*21*	$\frac{21}{21}$ *X 100%*	*100.0%*
2	*Is parasitology app can help*	*5*	*16*	*21*	$\frac{21}{21}$ *X 100%*	*100.0%*

	learning?					
3	*Is able to understand the instructions given. ?*	*4*	*14*	*18*	$\frac{18}{21}$ *X 100%*	*85.71%*
4	*Is this application is in accordance with the actual situation?*	*2*	*15*	*17*	$\frac{17}{21}$ *X 100%*	*80.95%*
5	*Is the application interface design, typography and color it obvious?*	*3*	*10*	*13*	$\frac{13}{21}$ *X 100%*	*61.90%*

In addition to the above data are data also hesitate to tabulate results of the questionnaire as follows:

Table 4. 2 Tabulation of questions 1-5 with the results of hesitation

NO	*Question*	*Doubtful*	*calculation of percentage*	*percentage*
1	*Is the subject within their app?*	*0*	$\frac{0}{21}$ *X 100%*	*0.00%*
2	*Is parasitology app can help learning?*	*0*	$\frac{0}{21}$ *X 100%*	*0.00%*
3	*Do instriksi given understandable. ?*	*3*	$\frac{3}{21}$ *X 100%*	*14:28%*
4	*Is this application is in accordance with the actual situation?*	*2*	$\frac{2}{21}$ *X 100%*	*9:52%*
5	*Is the application interface design, typography and color it obvious?*	*5*	$\frac{5}{21}$ *X 100%*	*23.80%*

Table 4. 3 Tabulation of the results disagree

		group disagree				
NO	*Question*	*Disagree*	*Strongly disagree*	*amount*	*calculation of percentage*	*the percentage agreed*
1	*Is the subject within their app?*	*0*	*0*	*0*	$\frac{0}{21}$ *X 100%*	*0.00%*
2	*Is parasitology app can help learning?*	*0*	*0*	*0*	$\frac{0}{21}$ *X 100%*	*0.00%*
3	*Do instriksi given understandable. ?*	*0*	*0*	*0*	$\frac{0}{21}$ *X 100%*	*0.00%*
4	*Is this application is in accordance with the actual situation?*	*2*	*0*	*2*	$\frac{2}{21}$ *X 100%*	*9.52%*
5	*Is the application interface design is that clear?*	*3*	*0*	*3*		*14:28%*

Testing with pretest and posttest

Testing pretest and posttest is a tool to measure the success of the application in helping students to improve their understanding of the material. Samples taken as many as 21 people from one class. Material testing include protozoa, Rhizopoda, ciliate, flagellates, sporozoa, nematodes, trematodes and cestodes.

Flow testing workmanship pretest and posttest namely on 6 February 2018 with as many as 20 questions. Results of the tests performed and compared to test whether an application built to help to enhance students' understanding.

Table 4. 4 Results pretest and posttest

No.	***Class***	***NIM***	***name of Respondent***	***pretest***	***posttest***
1	*IIA / DIII*	*P17334116001*	*Angga Apriadi*	*60*	*90*
2	*IIA / DIII*	*P17334116002*	*ariyanto*	*70*	*80*
3	*IIA / DIII*	*P17334116003*	*Sindi Nina Kurnia*	*90*	*90*
4	*IIA / DIII*	*P17334116004*	*Nabilah EKA Saputri*	*70*	*90*
5	*IIA / DIII*	*P17334116005*	*Ayunda Novita*	*80*	*90*
6	*IIA / DIII*	*P17334116006*	*afni Nurbayani*	*80*	*90*
7	*IIA / DIII*	*P17334116007*	*Novia Azahra Fatoni*	*70*	*80*
8	*IIA / DIII*	*P17334116008*	*Irma Nurlina Febriyanti*	*90*	*90*
9	*IIA / DIII*	*P17334116009*	*ISMI Baitya Zahra*	*60*	*80*
10	*IIA / DIII*	*P17334116010*	*Arina Nurmamitta*	*80*	*90*
11	*IIA / DIII*	*P17334116011*	*Salmah Saptari Rufaidah*	*70*	*100*
12	*IIA / DIII*	*P17334116012*	*Adnan Tandri Syahputra*	*70*	*90*
13	*IIA / DIII*	*P17334116013*	*Sera Septiani Lessy Princess*	*70*	*80*
14	*IIA / DIII*	*P17334116014*	*Hasna Nafisa*	*70*	*90*
15	*IIA / DIII*	*P17334116015*	*Ar Ridha Siti Nur Setiawan*	*70*	*80*
16	*IIA / DIII*	*P17334116016*	*Izmy Insani Firdaus*	*70*	*80*
17	*IIA / DIII*	*P17334116017*	*Fitriyani*	*80*	*90*
18	*IIA / DIII*	*P17334116018*	*Sri Rahayu Dewi Setiawan*	*70*	*80*
19	*IIA / DIII*	*P17334116019*	*Muhammad Rizky Anugrah*	*70*	*80*
20	*IIA / DIII*	*P17334116020*	*Risca Tri Octaviani*	*60*	*80*
21	*IIA / DIII*	*P17334116021*	*Fara Nurhaliza*	*70*	*80*
			Total	***1590***	***1720***
			Average	***72.27***	***78.18***

The average value of the reduced value posttest average pretest to determine at what happened after the increase in the value of the respondents use learning applications built gas turbine engine. Results comparison of pretest and posttest can be seen in the table comparison of pretest and posttest.
The formula to calculate the percentage of the increase in value is as follows:

Percentage Improvement = (x100$\frac{(V2-V1)}{V1}$) %

Information :
V1 = Old Value
V2 = New Value
Then the calculation of the percentage increase in the value of pretest and posttest are as follows:

Percentage Improvement = (x100$\frac{(78.18-72.27)}{72.27}$) %

Percentage Improvement = (x100$\frac{(5.91)}{72.27}$) %

Percentage Improvement = (x 100$0.0817$) %

Percentage Improvement = 8:17%

3.RESULT AND CONCLUSION

3.1 Conclusion

Based on test results obtained from studies conducted in the preparation of this thesis as well as referring to the purpose of the study that has been created, it can be concluded that:
This 1.Aplicarion became an alternative means of learning parasitology lab.
This 2.Aplication facilitate students to get the material online.
This 3.Aplikasi help lecturers for task delivery of learning materials and to get an evaluation of student activities.

3.2 advice

Based on the positive results achieved in the preparation of this thesis then, have some to suggest that future applications can support these parasites praktikuk better, namely:
1.Menambahkan video material moving, so that students get a real picture of the parasite
2.Mengemas order to look more attractive again.
3.Materi and exercises delivered with more interactive ..

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