



The Effect of Utilizing Cisco IT Essentials on Learning Outcomes in Computer Installation Processing Courses, Department of Information Management, AMIK Lamappapoleonro Soppeng during the Covid 19 Pandemic

^[1]Ihsanulfu'ad Suwandi, ^[2]Zul Rachmat

^[1] AMIK Lamappapoleonro, ^[2] AMIK Lamappapoleonro

^[1] Ihsansuwandi@gmail.com, ^[2] rahmat24098@gmail.com

Abstract— This study aims to determine the effect of using Cisco IT Essentials on student learning outcomes of the Informatics Management Study Program in the Computer Installation Processing course related to computer equipment installation materials as a digital demonstration simulation that can help lecturers and instructors to convey material to students so that hardware installation procedures are carried out. computers are more understood as a practical solution during the Covid 19 pandemic which was later described in an article at a conference. The use of Cisco IT Essentials in learning can affect student learning outcomes. In designing this learning media, researchers used the ADDIE development model. Precisely in the informatics management study program the test subjects were students of class 2019 the trials in this study were carried out three times, namely one-on-one trials on three students, small group trials on five students and field trials involving fifteen students. questionnaire. lecturers in field trials. Data collection techniques are validation, questionnaires and tests. Data Analysis Techniques is the proportion of validity, practicality and effectiveness. The results of this study are; (1) Cisco IT Essentials learning development process refers to the ADDIE model, namely analysis, design, development, implementation and evaluation; and (2) the resulting product is a valid Cisco IT Essentials Trainer learning with an assessment of 90% media experts, 91% material experts, 92% manuals, 81% lecturer responses, 81% student responses and 84% tests. Practically based on one-on-one trials 81.10%, small groups 84% and field trials 88.80%. Effectively used based on learning outcomes data of 0.72 with a high category on the gain test.

Index Terms— Cisco IT Essentials, Digital Simulation, Installation Materials, Practical Solution.

I. INTRODUCTION

Education in English means Education is a conscious, real, and planned effort that is applied in a learning process in order to improve the quality and abilities of students who have a desire to always develop their potential. Advances in information and communication technology have made the challenges faced by academics increasingly competitive. Only graduates who are creative and have competence in their field will be taken into account by the business world/industrial world.

Education during the Covid-19 Pandemic resulted in several quite complex problems, especially in the process of providing material in the classroom which had to be stopped instantly. [1] The Government Regulations and Regulations of the Minister of Health that will be formed are also part of the type of legislation so that their formation must also use definite, standard, and standard methods and methods. It is feared that the effects of this global pandemic will have an unfavorable impact and hamper the activities of the world community for the next few years. The impact of all the instability caused by this epidemic is very influential on the quality of the output of students (students) because the implementation of the educational process is different from before around the world.

In Indonesia, learning strategies that prioritize student skills to be more active certainly require more in-depth development and renewal, according to what has been

regulated in [2] Law no. 20 of 2003 concerning the National Education System in CHAPTER II Article 3 National education functions to develop capabilities and shape the character and civilization of a dignified nation in the context of educating the nation's life, aiming at developing the potential of students to become human beings who believe and fear God Almighty, noble character, healthy, knowledgeable, capable, creative, independent, and become a democratic and responsible citizen.

Especially in Soppeng Regency itself AMIK Lamappapoleonro is one of the leading universities, so it is always required and challenged to follow the development of science, especially in the field of informatics and computer competence, especially in the informatics management study program which is expected to always make a positive contribution to the realm of skills development. . However, as long as the lectures are conducted online-based, the educators come with various methods. Some are limited to discussions on WhatsApp Groups and only use the Hangout feature, some are only directly giving assignments using Google Classroom media. Constraints in the early days of online classes began to appear in several courses that tried to use the Zoom application, but in fact they did not get a good response from the students. Based on the results of observations of several students, there were some disturbances that were out of control, such as, blocked by an unstable network or even

students who were silent during lectures, some intentionally logged in, filled out the attendance form and then left. However, from all aspects of the problems above, the students admitted that they were happy to be able to learn while relaxing. So that most students are less likely to improve their learning outcomes due to the learning process they went through earlier.

This study aims to describe the learning outcomes of interactive multimedia Cisco-IT Essentials Virtual Desktop, describe learning outcomes using virtual media in computer assembly practicum, describe differences in learning outcomes before using virtual media and learning outcomes using interactive multimedia Cisco-IT Essentials Virtual Desktop in computer assembly practicum. , describes the difference in learning outcomes after using real media and learning outcomes using interactive multimedia Cisco-IT Essentials Virtual Desktop. In the end, this interactive multimedia learning media for computer assembly can be an alternative learning media that provides understanding and explanation of computer assembly practicum material during online lectures as it is today.

Lecture materials that support the competence of AMIK Lamappapoleonro Soppeng students in the Informatics Management study program, one of which is in hardware installation materials for assembling computer equipment based on the characteristics of students in the field of computer-based expertise who can be productive in the realm of using and maintaining and repairing computer equipment that supports the needs of the business world. or the industrial world (DUDI) has become constrained in terms of practicum due to the Covid 19 pandemic.

The Computer Installation Processing course is a very interesting scientific tool and even has the potential to be studied in depth. Learning media in the form of a Personal Computer/Notebook assembly simulation can be one of the potentials that can be used by students in order to face the demands of increasing knowledge and competence in facing the practicum learning process during the growing and endemic Covid 19 pandemic. Simulation-based learning media like this will also make students more interested in improving learning outcomes and eliminating the limitations of time and learning space.

II. LITERATURE REVIEW

A. Corona Virus Disease 2019

Submit your manuscript electronically for review.

B. Media

When you submit your final version, after your paper has been accepted, prepare it in two-column format, including figures and tables.

C. Learning and Learning Outcomes

[5] "According to students in a study, the function of lectures is to introduce new subjects and show their relationship to other fields of study, provide information

about new developments in the science that have not been included in textbooks, and open up opportunities to raise problems. problems and ways to find solutions.

Based on the description above, it can be concluded that learning itself is an effort made by an educator to distribute knowledge to students. The learning activities are no longer an activity that simply applies teaching procedures in face-to-face learning. However, in the process of learning activities, it is even better with the application of varied learning patterns. [6] Learning outcomes are abilities obtained by individuals after the learning process takes place, which can provide changes in behavior both in knowledge, understanding, attitudes and skills of students so that they become better than before. The following is one of the descriptions of previous researchers who discussed the effect of learning outcomes, [7] Research on Development of Augmented Reality-Based Computer Assembly Learning Media by Budiman, Ridho Dedy Arief, Verawardina and Unung The type of research used is Research and Development (R&D), the form of research used is an R&D model approach developed by Sugiyono by taking 7 steps which include (1) potential and problems; (2) Gathering information; (3) Product design; (4) Design validation; (5) Design improvements; (6) Product trial; (7) Product revision. Based on the results of the study, it was shown that the Augmented Reality-based learning media for computer assembly was feasible to use.

D. AMIK Lamappapoleonro Soppeng

Lamappapoleonro Soppeng Academy of Informatics and Computer Management has been accredited by BAN-PT. The total number of students is currently around 115, with a total of 5 permanent lecturers. With professional teaching staff, AMIK Lamappapoleonro Soppeng is able to make graduates have broad skills and knowledge.

No	Name	Title	Position	Education
1	AMRIADI	M.Pd	Expert Assistant	Magister
2	IHSANULFU'AD SUWANDI	M.Pd.	Expert Assistant	Magister
3	WAHYUDDIN S.	M.Kom	Expert Assistant	Magister
4	ZUL FADLI	M.A.P	Expert Assistant	Magister
5	ZUL RAHMAT	M.M.	Expert Assistant	Magister

Table 1. Qualifications of Permanent Lecturer AMIK Lamappapoleonro.

Source: <https://amiklps.ac.id/>



Figure 2. Location Map of AMIK Lamappapoleonro Soppeng . Campus

Source: Google Maps AMIK Campus Lamappapoleonro

E. Cisco IT Essentials

This virtual simulation application is a product of Cisco Systems Inc. It is explained on its official website that Cisco Systems Inc. is a global telecommunications company headquartered in San Jose California, United States. Founded in December 1984 by Sandy Lerner and Leonard Bosack. Then it is explained that this company produces networking equipment, wireless and mobility, security, data center, software, etc.

[8] “The company created the Cisco IT Essentials Virtual Desktop application as an interactive medium for computer assembly courses. This application describes the hardware components in detail and the menus that support it, so that it can be used as a medium for learning computer assembly in schools. This virtual program is similar to the real hardware. It is hoped that students can learn like assembling a real computer.”

The steps for using Cisco IT Essentials are very easy, just by opening the application, then selecting and following the flow from each of the menus provided. One of the efforts made is by using a virtual display in the form of Cisco IT Essentials as a complementary media in the learning process of the Computer Installation Processing course.

III. METHOD

The type of research used is Research and Development (R&D). Research and Development method or called research and development is a research method used to produce products and test the validity, practicality, and effectiveness of products.

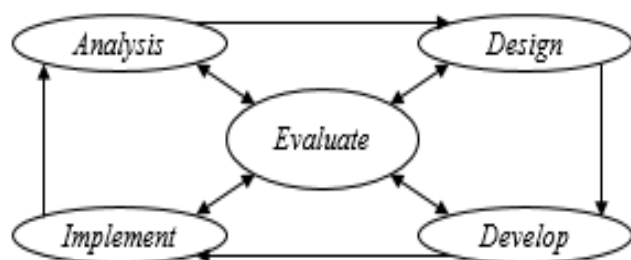


Figure 3. ADDIE Development Model

Source: Edmund Forest, Ph.D. Instructional Design Certificate (2018)

The research development procedure is described with the following stages:

1. Analysis Phase (Analyze)

The analysis stage is the initial stage of the ADDIE development research model. The analysis of problems in the microcontroller and interface courses, namely:

- a. Conduct an analysis of the competencies required of students;
- b. Analyze the characteristics of students regarding their learning capacity, knowledge, skills, and attitudes that have been possessed by students as well as other related aspects, and
- c. Conduct material analysis in accordance with competency demands.

2. Stage of Design (Design)

The design stage is the second stage of the ADDIE research and development model. At this stage the process of making plans from the results of observations focuses on the selection of test models and the achievement of learning outcomes. The steps are as follows:

- a. Material selection is in accordance with student characteristics and competencies.
- b. Develop learning objectives to be achieved by students.
- c. Arrange the tasks to be done to achieve the learning objectives.
- d. Evaluation design for the concept of the validation instrument, the concept of the practicality instrument, the concept of the productivity assessment instrument, and the preparation of the test.

3. Development Phase (Development)

The third stage is development activities, which are activities to create or develop learning resources. At this stage validation is also carried out. The development steps are as follows:

- a. Develop Semester Learning Plans.
- b. Develop Cisco IT Essentials which includes related learning materials.
- c. Create a manual book trainer for users.
- d. Validation by lecturers/teachers.
- e. Conducted individual trials of 3 people and limited trials of 5 people, after revision by experts. As for what is being tested at this stage is the Arduino microcontroller trainer.

4. Implementation Phase (Implementation)

This fourth stage applies the results of development in learning to determine the effect of the trainer being developed. The results of the development are tested in real terms to obtain the effectiveness and practicality of students. at this stage students are more active and educators monitor student performance.

5. Evaluation Phase (Evaluate)

This fifth stage is not only carried out at the end of the development stage but is carried out at every stage.

IV. TIMETABLE

No	Name of activity	Month											
		1	2	3	4	5	6	7	8	9	10	11	12
1	a. Research preparation b. Observation	■	■										
2	Implementation:: a. Treatment b. Data Collection c. Data Processing			■	■	■	■	■					
3	Report Preparation : a. Completion b. Final Report c. Coorrect d. Seminar								■	■	■	■	■

V. RESULTS

Utilization of the Cisco IT Essentials Trainer uses the ADDIE development model which consists of 5 stages, namely, (1) analysis (analyzing learning needs), (2) design (planning), (3) development (development), (4) implementation (field trials), (5) evaluation (revised trial results). The description is as follows.

1. Analysis Stage

Based on the results of interviews with students of the Informatics Management study program, information was obtained that students of the class of 2019, generally have PCs or laptops so that in the application process and individual training it is very possible to use a PC or laptop as a learning medium (design), especially in the Computer Installation Processing course which taught to Even semester students, especially the class of 2019. In this course students need to know more information about the latest component developments or the latest material on computer technology because this course is the basis for the application of computer component assembly knowledge. However, there are still some obstacles so that material that seems difficult to understand cannot be digested properly, trainer facilities should also provide a more realistic picture so that students who are still confused about the benefits and how to apply the material can find out about what is actually being learned, finally focus. their interest in the Computer Installation Processing course became more and more enthusiastic.

To be able to overcome this, we need a learning media that can help students maximize the mastery of the available material. Therefore, the Virtual-based Cisco IT Essentials learning media, in the form of Computer Simulation Trainer Software, is very important to be developed in that department.

2. Design Stage

Based on the discussion at the analysis stage, then adjusting the design of the Cisco IT Essentials learning media with the computer circuit model itself and various other devices that support the application of theory in the Computer Installation Processing course. The purpose of this stage is to prepare learning media in the form of the appropriate Cisco IT

Essentials stages. This stage includes the following steps:

- a. Format selection by following the existing device formats in the Semester Learning Plan (RPS), the RPS includes the expected final abilities, indicators, criteria, learning models, learning materials and assessments. Semester Learning Plans (RPS) in the learning model section, students conduct series and running tests to understand more deeply each material presented. (Appendix 2)
- b. The selection of media in the form of a virtual trainer is based on the learning objectives to deliver the material.
- c. Theory/Lecture guide for students and lecturers. After adjusting the learning materials on the virtual trainer.

The selection of media is based on the learning objectives to deliver the subject matter. So Cisco IT Essentials was chosen which has mechanics as a trainer learning media that will support the application of the Computer Installation Processing course. Trainers are structured educational learning media that have been prepared to be developed in lectures. By adjusting some of the available features, into learning such as simplification of material, operation of trainers, and others.

3. Development Stage

This stage of development goes through three stages, namely: (1) expert validation; (2) validation of one to one trials, and (3) field trials. Based on these trial stages, revisions were made and a development process occurred from the evaluation of each trial.

1) Expert Validation Test

At this stage the expert or expert is shown the media and devices that support the development of microcontroller and interface learning media and then provides an assessment based on the questionnaire given. This stage aims to produce appropriate learning media, based on expert input and after the trial.

Expert validators involved include experts in the field of material/content and learning media experts. Media experts as well as learning material experts consist of two people, namely a lecturer in Information Management at the Lamappapoleonro Information and Communication Management Academy.

2) One to one Trial

Learning that has been validated by the validator is then revised according to the validator's input and tested on 3 students (one to one trial). In this trial, students were given a questionnaire containing responses from students which were then corrected from these responses.

3) Small Group Trial

The revised learning based on the input in the small group trial was then tested on 5 students (small group trial), the small group trial was carried out with one face-to-face meeting. After the learning process is carried out, students are then given a questionnaire or questionnaire to assess what has been developed.

4. Implementation Stage

The implementation stage or field trials are carried out after

the revision of the results of the small group trial analysis. Field trials were conducted with 15 respondents. The field trial was conducted with 4 face-to-face meetings, the first meeting the students were introduced to learning media based on Cisco IT Essentials, then followed the instructor to guide in the assembly and delivery of the two initial materials. At the second meeting, students were given a pretest to see their cognitive abilities. Meanwhile, at the last meeting, students were given a posttest and a student response questionnaire.

5. Evaluation Stage

Based on the results of the implementation described above, data and evaluation are obtained at each stage which must be carried out after one stage has been carried out or implemented. In other words, this evaluation stage is carried out at every stage of development, starting from the analysis, design, development, and implementation stages.

A. The Effect of Utilizing Cisco IT Essentials on Learning Outcomes

1. Validity

a. Expert Validation

The results of expert validation of the Trainer include media, and materials.

1) Media expert validation

The media expert assessment instrument consists of the validity of the application and device aspects. Based on media experts that learning materials deserve to be included in learning media. The next step is to integrate learning materials in the available media then validate and test.

The assessment of the two validators on the Application and Device aspects obtained a percentage of 89.00% supporting the attractiveness of the media in the very valid category, which means that the display aspect is suitable for testing.

The assessment of the two validators on the aspect of media display obtained a percentage of 92.00% in the very valid category which means it is very well used and deserves to be tested.

Based on the validation analysis of media experts who have 2 aspects of assessment, namely: (1) aspects of the application and media devices, the percentage score of 89.0% is in the very valid category; and (2) the aspect of media display, the percentage score of 92.00% is in the very valid category.

The average percentage of the assessment items is 90.00% which indicates that the Trainer is very feasible or valid to be used at the product trial stage.

2) Validation of material experts

The material expert assessment instrument consists of aspects of content (content) and aspects of function. Based on the material expert that the media deserves to be included in learning. Based on the validation from the experts/material experts developed by giving a score on each aspect that is assessed with a score of 1-4 the expert assessment instrument of the material trainer consists of aspects of content (content).

Based on the assessment of the two validators on the

content aspect, a score percentage of 91.00% was obtained which indicates that this aspect is in the very valid category, which means that the content aspect of the media is very suitable for use in product trials.

Based on the validator's assessment of the language aspect, a percentage score of 100.00% was obtained which indicates that this aspect is in the very valid category, which means that the functional aspect used in the media is very feasible to use at the product testing stage.

The analysis on material expert validation has 2 aspects of assessment, namely: (1) the content aspect, the percentage score of 91.00% is in the very valid category; and (2) the language aspect obtained by the percentage score of 100% is in the very valid category.

The average percentage of the two aspects of the assessment is 91.00% which indicates that the learning material is very feasible or valid to be used in the media and is worthy of product testing.

3) The results of the validation of the lecturer's response questionnaire instrument.

Based on the validator's assessment of the guidance aspect, a percentage of 100.00% was obtained from validator 1 and 87.50% from validator 2 with an average presentation of 94.00% which indicates that this aspect is in the very valid category.

Based on the validator's assessment on the coverage aspect, the percentage of validator 1 obtained is 75.00% and 91.67% of validator 2 with an average presentation of 83.00% which indicates that this aspect is in the fairly valid category.

Based on the validator's assessment of the coverage aspect, a percentage of 75.00% was obtained from validator 1 and 87.50% from validator 2 with an average presentation of 81.00% which indicates that this aspect is in the fairly valid category.

The assessment given is in addition to a checklist, a comment column is also provided. The advice given by the validator is to use language that is easy to understand and does not have multiple interpretations.

Based on the validator's assessment of the guidance aspect, a percentage of 100.00% was obtained from validator 1 and 87.50% from validator 2 with an average presentation of 94.00% which indicates that this aspect is in the very valid category.

Based on the validator's assessment of the guidance aspect, a percentage of 100.00% was obtained from validator 1 and 87.50% from validator 2 with an average presentation of 94.00% which indicates that this aspect is in the very valid category.

Based on the validator's assessment on the coverage aspect, it was obtained that a presentation of 83.33% of validator 1 and 83.33% of validator 2 with an average presentation of 83.00% which indicates that this aspect is in the fairly valid category.

Based on the validator's assessment of the language aspect, a presentation of 75.00% from validator 1 and 87.50% from validator 2 with an average presentation of 81.00%

indicates that this aspect is in the fairly valid category.

The assessment given is in addition to a checklist, a comment column is also provided. The suggestions given by the validator on the aspects of scope and aspects of language are to use language that is easy to understand by students, not multiple interpretations, and the instrument in the student questionnaire is made in the form of statements.

Based on the validator's assessment of the guidance aspect, a percentage of 100.00% was obtained from validator 1 and 87.50% from validator 2 with an average percentage of 94.00% which indicates that this aspect is in the very valid category.

Based on the validator's assessment of the coverage aspect, a percentage of 75.00% was obtained from validator 1 and 83.33% from validator 2 with an average presentation of 79.00% which indicates that this aspect is in the fairly valid category.

Based on the validator's assessment of the language aspect, a presentation of 75.00% from validator 1 and 87.50% from validator 2 with an average presentation of 81.00% indicates that this aspect is in the fairly valid category.

The assessment given is in addition to a checklist, a comment column is also provided. The advice given by the validator on the validation of questions or tests is to improve the arrangement of the choice of questions and replace the double questions with other questions on the same basic competence.

2. Practicality

In general, the test results have met the practical requirements with a general assessment of all components that have been validated by experts. All validators gave an assessment that the assessed components were declared usable with minor revisions. To find out in more detail about the practicality of learning, a trial was conducted to determine the responses from lecturers and students. The student responses can be seen through three stages of testing, namely one to one or individual trials, small group trials and field trials. To find out more details about the test results, the following is described:

a. Lecturer Response

The collection of lecturer response data was carried out by involving a lecturer in the Computer Installation Processing course. Lecturers are given a questionnaire about learning. The results of the lecturer's response are in the very good category.

Based on the results of the lecturer's response test, the percentage of four aspects, namely the application aspect, display (media), content (content), and language showed that they were in the very good category with a percentage of 92.00%.

b. Individual trial (one to one)

This trial was carried out by involving 3 (three) subjects, namely three students of class 2019. The lecturer explained the material and also explained how to use the trainer. After the lecturer explained the material and the use of media, students were then given the opportunity to use the trainer

with the available assembly exercises. Furthermore, the three research subjects were asked to fill out a questionnaire containing a statement and a comment column to ask for the research subject's response to the product being developed.

Based on the results of the one to one trial, the percentage of student responses from four aspects, namely aspects of application, display (media), content (content), and language showed that the development was in the fairly good category with a percentage of 95.10%. The results of this trial are used for improvement by revising the product before a small group trial is carried out. The suggestions given by the one-to-one test subjects are to add programs and add pictures to the material presented.

Based on the results of the one-to-one test table, the percentage of total application aspects is 80.00%, display (media) is 80.00%, content is 82.00% and language is 81.30% which shows that learning media is in the very practical category.

The suggestions from students after this field trial are that the lecturers can explain in more detail in order to reduce the complexity in understanding the material so that learning is more interesting.

c. Small Group Trial

After making improvements, the second stage of testing is then carried out. In this trial as many as 5 (five) students who became the subject of the trial. As in the first trial in this second trial, the researcher explained the material and also explained how to use the trainer. Students pay attention to the explanation, after explaining the material and use of the trainer, students are then given the opportunity to assemble and test the trainer. Furthermore, the five research subjects were asked to fill out a questionnaire containing a statement and a comment column to ask research subjects for responses to the product developed.

Based on the results of small group trials, the percentage of student responses from four aspects, namely aspects of application, display (media), content (content), and language showed that learning was in the very practical category with a percentage of 96.00%.

Based on the Small Group Trial Result Recapitulation Table, the average application aspect is 97%, the display (media) is 97%, the content is 95% and the language is 95% which shows the very practical category.

The results of this trial are used for improvement by revising the product before field trials are carried out. The suggestions given by the small group trial subjects so that the components on the trainer were explained in more detail had been completed so that they could be used as learning materials and self-evaluations for students (self-assessment).

d. Field Trial

In this trial as many as 15 (fifteen) students were the subject of the trial. As in the first and second trials, in this third trial the lecturer explained the material, the students paid attention to the theoretical explanation. After explaining the material and using the trainer, then they were given the opportunity to use the learning trainer. Furthermore, the

fifteen research subjects were asked to fill out a questionnaire containing a statement and a comment column to ask for a response from the research subject to the product being developed.

Based on the results of field trials, the average percentage of student responses from four aspects, namely aspects of application, display (media), content (content), and language showed that learning was in the very good category with a percentage of 88.80%. The table for the recapitulation of the results of the field trials can be seen in the appendix of the results of the field trials.

Based on the table, the average percentage of application aspects is 88.00%, display (media) 87.30%, content (content) 89.80% and language 90.00% which shows learning media is in the very good category.

The percentage of instrument assessment is said to be very valid or very good if the overall acquisition value of the instrument is 85.01%-100%. Based on this, the student response is said to be adequate because during the three stages of the trial it showed a significant increase with an average category of very good.

there was a significant increase where in trial one 80.00%, trial two 85.00%, and trial three 88.00%. This proves that the application aspect of learning media is very well used in the teaching and learning process.

there was a significant increase where in the first trial the percentage was 80.00%, the second trial was 85.00%, and the third trial was 87.30%. This proves that in the aspect of displaying the learning media it is very well used in the teaching and learning process.

there was a significant increase where in the first trial the percentage was 82.00%, the second trial was 84.00%, and the third trial was 89.80%. This proves that in terms of content, learning media is very well used in the teaching and learning process.

3. Effectiveness

Effectiveness data analysis was obtained through observing the implementation of all activities in the teaching and learning process. The effectiveness of the Arduino Microcontroller Trainer learning media in the microcontroller and interface courses is also seen from the results of the 2019 student learning outcomes test of the Informatics Management Study Program AMIK Lamappapoleonro.

The data that has been collected after implementing this research can reveal the effectiveness of the trainer, namely the analysis of test data in the form of pretest and posttest. Test data obtained before and after implementation. The results of the pretest and posttest data can be seen as follows:

Students	Pretest	Posttest
Responden 1	12	76
Responden 2	28	72
Responden 3	28	76
Responden 4	56	84
Responden 5	8	76
Responden 6	16	60
Responden 7	16	88

Responden 8	16	68
Responden 9	28	84
Responden 10	48	64
Responden 11	28	84
Responden 12	24	84
Responden 13	12	64
Responden 14	36	84
Responden 15	20	84
Score	56	88
Mean	25	77
N-Gain	0,72	
Category	high score	

Based on the table, it can be seen that the minimum score obtained at the pretest is 25 while at the posttest it is 77. To get the difference between the pretest and posttest, N-Gain is used. The N-Gain is 0.72 which means it is in the high category. The results of the data obtained by the researcher after evaluating using the pretest and posttest, it is interesting that there is a cognitive change to the researcher after the researcher knows the implementation of the Effect of Cisco IT Essentials on Learning Outcomes.

CONCLUSION

Based on the results of research and development, it can be concluded several things as follows:

1. The Cisco IT Essentials development process was developed using the ADDIE development model which consists of 5 stages, namely, (1) Analyze; needs analysis to determine the right problems and solutions and determine student competencies in the Computer Installation Processing class of 2019 class students (2) Design; determine the special competencies, methods, teaching materials, and learning strategies of Cisco IT Essentials for class A students of class 2019 AMIK Lamappapoleonro Soppeng. (3) Development; developed the Cisco IT Essentials Trainer. (4) Implementation; carry out a learning program by applying the Cisco IT Essentials Trainer in class 2019 student courses (5) Evaluation; This evaluation stage is carried out at all stages, especially at the design stage and the development stage.
2. The resulting product is in the form of Cisco IT Essentials learning media which has been declared valid, practical, and effective to be used as learning media for 2019 students.

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