Feasibility Test Assessment of LENTERA as Learning Source Media

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Abstract— The purpose of this study was to determine the feasibility level of the Lentera Mini Server as a digital learning medium for both teachers and high school students in the 3T region (outermost, underdeveloped, leading) in the West Sumatra region. The method chosen is quantitative because it is considered suitable for conducting a feasibility test. The testing procedure is performed using Beta Test and Alpha Test techniques. In this study, students of class XI at SMAN 1 Siberut Utara Mentawai islands became the focus of research subjects. Data was collected by distributing questionnaires. Data analysis used quantitative analysis. The results obtained by Mini Server Lentera as a digital learning medium in Information and Communication Technology Subjects, hardware materials and their functions for Internet access purposes received an assessment of 8.50% from media experts, 85.83% of material experts, and 85.73% of users or students. So it can be concluded that the Mini Server Lentera as a digital learning media in Information and Communication Technology subjects, hardware materials and functions for Internet access purposes is very suitable for learning at SMA Negeri 1 Siberut Utara, Mentawai Islands.

Keywords— Validity Test, Feasibility Assessment, Learning Material Resources. Lentera.

BACKGROUND

Mini Server Learning Material Resources for Romote Areas (LENTERA) as a digital learning medium in Information and Communication Technology (ICT) subjects that have been successfully developed is an e-learning based learning innovation in 3T areas which is a source of material and evaluation of learning in a local network[1]. This Mini Server functions as a mini PC server that can be filled with e-learning applications[2]. This Lentera mini server also functions as an access point so that nearby devices can connect and interact with the applications in it. In the Lentera application there are learning materials that can be accessed by devices such as smartphones or laptops even though there is no internet network in the area. The development of this media is aimed at supporting Learning Activities (KBM) in remote areas without an internet network.

There are several stages before the Lentera mini server is implemented in the classroom, the first stage of the media needs to be tested on several indicators of feasibility assessment from the media and material aspects. [3]. Several aspects of indicators for evaluating media in teaching and learning activities, including aspects of affective considerations, subject matter, auxiliary information, interface, navigation, pedagogy,

and robustness.[4]. By meeting the eligibility criteria of these indicators, the media can be said to be feasible to use.

Figure 1: Mini Server Lentera

Departing from the problem points, this research was conducted to test the Mini Server Lentera in Information and Communication Technology (ICT) Subjects at SMAN 1 Seberut Utara. Assessment based on material and media aspects. From the results of this test, a digital learning media was born in a Mini Server Lentera container on Information and Communication Technology (ICT) subjects that meet the feasibility element and can be used to support the learning process at SMAN 1 Siberut Utara
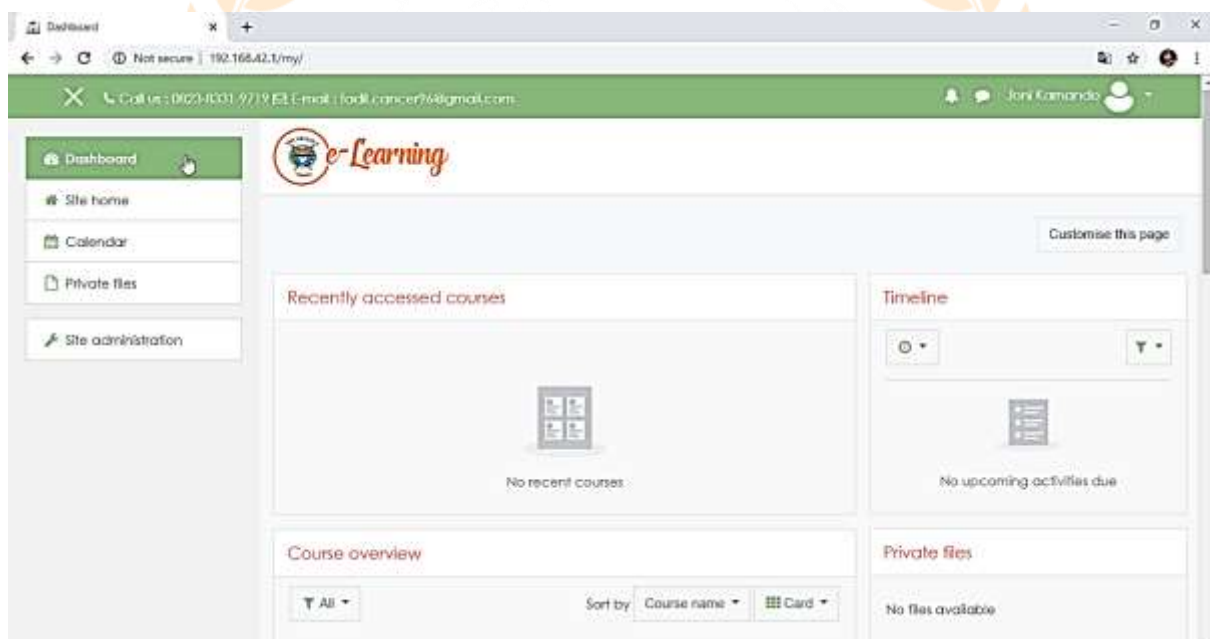

Figure 2: E-learning embed on Mini Server Lentera

The formulation of the problem from this research is how is the feasibility of Mini Server Lentera as a digital learning media in Information and Communication Technology (ICT) subjects tested at SMAN 1 Seiberut Utara? then this study aims to determine the feasibility level of the Mini Server Lentera as a digital learning media in areas with minimal internet network both from the material aspect and the media aspect.

When doing a multimedia development there are several components and criteria that must be evaluated referring to Amilia [5][6]namely: (1) Subject Matter, this is a test of whether the material submitted is in

line with the objectives of implementing the program and whether the level of understanding of the material has been adjusted to the students who will use the media, then from the structure of the content of the material whether it has been adjusted and the material presented is already well chosen. (Auxiliary Information), which is supporting information that is not directly related to the material, in terms of instructions, introductions, conclusions and assistance. (3) Affective considerations, this component can assess whether this product can increase students' motivation to study harder. (4) Interface, in a product the interface display is the main thing, for that the developer designs as well as possible the writing of text, graphics, animation in the media, audio and video. (5) Navigation, this is designed to be clear and as easy as possible to be understood by the user, consistency is required for this navigation. (6) Pedagogy, which is meant here are several components of methodology, interactivity, cognitive capacity, learning strategies, questions, quality of feedback, user control and level of mastery of the material. (7) Robustness, which is another name for product stability, which is designed in terms of the media that is made to work properly and there are no errors in the function.

By analyzing the results of research conducted by Bayu Rahman entitled the research "Development of Flash Animation Interactive Learning Media on Competency Standards for Installing Simple Building Electrical Lighting Installations at Smk Walisongo 2 Gempol" states that learning media developed using flash are categorized as very feasible to use in learning Administering computers in the Network.

In addition, research conducted by Dony[7](2013) with the research title "Application of Interactive Multimedia-Based Geography Game (Case Study of Class IX Students of SMPN 1 RAO)" it can be concluded that the development of Geography learning media using Interactive Games has a suitable category for use as student teaching materials. Based on the research above, it is known that the two research products are categorized as feasible. Where, the flash program has been proven to be able to create appropriate learning media to be used in the learning process.

LITERATURE REVIEW

Online Learning

Online learning is something that is often accessed by students through websites, intranets, CDs and DVDs (Smaldino, 2008).[8]. In online learning, it is necessary for the activeness of students to communicate by utilizing existing technology such as the internet[9].

From the explanation above, it is found that online learning is learning using computer networks, connecting one computer to another so that there is interaction between teachers and students.[10].

The advantages of online learning are variety of media, updated information, exchange of ideas, easy communication, and low cost[1][11]. And the disadvantages of online learning are inappropriate material, copyright, information seeking, encouragement, access, speed of access and lack of quality control (Smaldino et al., 2014).

Raspberry phi

The raspberry pi is an electronic circuit in the form of a credit card-sized single board computer that functions like a complete computer using an on-a-chip ARM system integrated on a PCB.[12]. The Raspberry Pi was first launched on February 29, 2012. Raspberry Pi has two models, model A and model B. The difference between model A and B lies in the memory used. Type A has 256 MB of memory while Type B has 512 MB of memory. Another difference that appears in type B is that it has equipped itself with an Ethernet port that is not in type A.

In developing this LENTERA mini server, the author uses the Raspberry pi B+ series which has a larger memory capacity and more complete features, making it easier to develop.

Figure 3: Raspberry pi type B+

Online Learning resources

One of the solutions to overcome the passive problem of students is using the implementation of digital learning via the internet (e-learning) according to Ika[13]The benefits of using the right learning media include: 1) Increasing students' learning desires, 2) direct interaction by each student, 3) creating an independent learning atmosphere, utilizing learning resources chosen by students, making academic thinking policies, then the achievement of the objectives of the learning activities[14].

For this reason, stimulating students to learn independently requires seriousness, willingness, craft, motivation, discipline, a sense of responsibility and a strong desire to seek answers from curiosity with the aim of advancing and developing existing knowledge. Marimis (2011).

the procedure for implementing e-learning in the classroom provides benefits for students, namely: a) increased interaction intensity between students and students and students and teachers[15], b) teachers get unlimited sources of teaching materials, c) the use of e-learning is considered effective for improving the quality of graduates from both high school and college, d) eleaning forms a learning community that actively interacts and provides new knowledge to each other without any geographical boundaries , e) e-learning lecturers can open the broadest horizons of knowledge, f) Digital learning media in the network have various ways of accessing them, both in the form of podcasts, websites, streaming videos and downloadable journals. Forum discussion rooms and social media, blogs and Wikipedia are forms of digital learning media.

METHODOLOGY

The researcher chose a method that was considered suitable, namely the quantitative method. This means that research using this method is research analyzing a sample or population, research instruments are used to collect data, then the data is processed quantitatively/statistically with the aim of testing the hypotheses that have been designed. The location of the research was carried out at SMAN 1 Siberut Utara Mentawai Islands for the 2018/2019 academic year even semester. The research schedule is planned to start from February 2018 to September 2018. This schedule includes time for travel preparation, preparation and research results. The subjects of this study were students of class XI at SMA Negeri 1 Siberut Utara. The object of research is Mini Server Lentera in Information and Communication Technology (ICT) subjects.

Alpha Testing is carried out as a testing stage by means of validation testing of learning material experts, media expert testing, instrument item testing, in other words, instrument item validity testing and finally instrument reliability testing. After completing the Alpha testing, Beta Testing is then carried out where the product is tested for use. Data obtained from questionnaires, this is a data collection technique by asking several questions to the target respondent, Sugiyono (2008). The closed questionnaire model is applied during field trials and product quality tests, in other words, answers have been provided for respondents to choose from (Wagiran, 2008). The instrument that has been designed is tested for reliability and validity so that the instrument used in the field is considered suitable for use. Instrument validation was tested and then tested for reliability. At each question item validity test is carried out. The value of r table is compared with calculated r with reference to df = n-2 and sig 5%. It is declared valid if r count > r table. Validity testing refers to the Product Moment correlation formula[16]

$$r_{xy} = \frac{n \sum XiYi - (\sum Xi)(\sum Yi)}{\sqrt{\{n \sum X_i^2 - (\sum X_i)^2\}\{n \sum Y_i^2 - (\sum Y_i)^2\}}}$$

Formula explanation:

n   : the amount of data X and Y

X   : Total number of X variables.

X   : Total number of Y variables.

X2   : The square of the total number of variables X.

Y2   : The square of the total number of variables Y.

XY   : The product of the total number of variables X and Y variables.

Reliability testing using the Alpha formula[17]

$$r_i = \frac{k}{(k-1)} \left\{ 1 - \frac{\Sigma \delta_b^2}{\delta_t^2} \right\}$$

Formula explanation:

r_i : Instrument Reliability

k   : number of statements

$\Sigma\delta_b^2$: Number of item variants

δ_t^2 : Total Variation

The value of the reliability coefficient of the next step is found to be included in the category

Table 1: Category of r value

r value	Category
0.8 < r < 1.00	Tall
0.6 < r < 0.80	Enough
0.4 < r < 0.60	Slightly Low
0.2 < r < 0.40	Low
0.0 < r < 0.20	Very low

The data analysis technique used quantitative data analysis methods. After the data obtained from the assessment results by the validator, the data is processed in a qualitative descriptive manner to become a benchmark for evaluating media improvement, so that the goal is to get a decent media. The design was validated by the validator using a questionnaire assessment sheet. The assessment data obtained were processed using a Likert scale. Aims to be able to assess an object and categorized from very good to very bad. The essence of the Likert scale is to determine the position of the assessment of an object by people from very good to very bad ratings (Wagiran, 2008). This research instrument is given 5 types of answer choices. Each answer has a score of one to five with the following conditions: 1 (very bad), 2 (not good), 3 (poor), 4 (good), and the last 5 (very good). In relation to the Lentera Mini Server, it was assessed that its feasibility was to be implemented in the class XI Information and Communication Technology (ICT) subject at SMAN 1 Siberut Utara, Mentawai Islands. The next step is to calculate the average response weight score using the following formula:

$$\bar{x} = \frac{\sum x}{n}$$

Explanation:

$\bar{x}$: Average Score

n : Number of raters

x : Total score of each

Then the formula for the presentation of results can be calculated with the following formula:

Result = $\frac{total\ skor\ yang\ diperoleh\ h}{skor\ maksimum}$ X 100 %

Eligibility categories based on the following criteria.

Table 2: Media eligibility criteria

No	Percentage score (%)	Category
1	<21%	Very Inappropriate
2	20 -40 %	Not feasible
3	40 – 60%	Decent enough
4	60 – 80 %	Worthy
5	80 - 100%	Very Worthy

RESULT AND DISCUSSION

Filling out the questionnaire/questionnaire was addressed to media and material experts for 2 experts, for the feasibility test, students were asked as respondents to fill out a questionnaire whether the Lentera Mini Server was suitable for use in the classroom. Before spreading the respondent's validation test, students and media and material experts tested the tools in the classroom by using Information and Communication Technology subjects at SMAN 1 Siberut Utara. Responses are obtained which will be analyzed and revised according to suggestions and input from media and material experts so that they get products that are feasible and ideal for use in class. The results of media expert responses are interpreted in a bar chart, which can be seen in Figure 4 below.
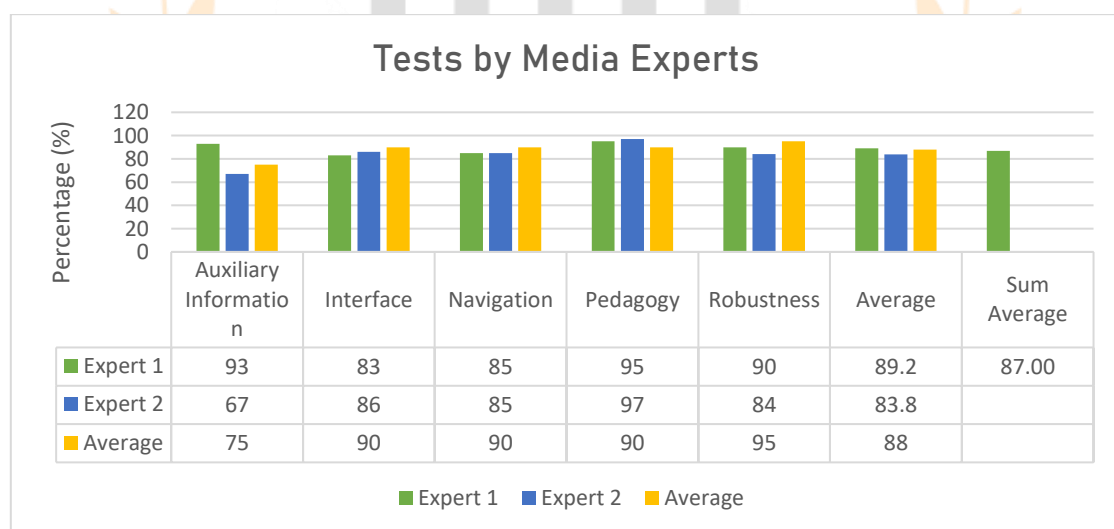

Tests by Media Experts

	Auxiliary Information	Interface	Navigation	Pedagogy	Robustness	Average	Sum Average
Expert 1	93	83	85	95	90	89.2	87.00
Expert 2	67	86	85	97	84	83.8	
Average	75	90	90	90	95	88	

Figure 4: Bar chart of media expert responses

The bar chart above explains the presentation of the feasibility test, the first one assessed from Robustness getting an average score from two experts 95%, from the pedagogy aspect from 2 experts a score of 90% was obtained, an average value of 90% was obtained from 2 media experts for the Navigation aspect, on the other hand another Product interface was rated 90% on average from two experts. Assessment of the auxiliary Information aspect obtained a value of 75%. From the data above, a statement is drawn that the

Mini Server Lentera in the Information and Communication Technology (ICT) subject in class XI of SMAN 1 Siberut Utara has a very appropriate category for use in class. As for the responses of material experts for material validation testing, the results of which will be analyzed and revised according to input from experts. The results of the validation can be seen in Figure 5 below.
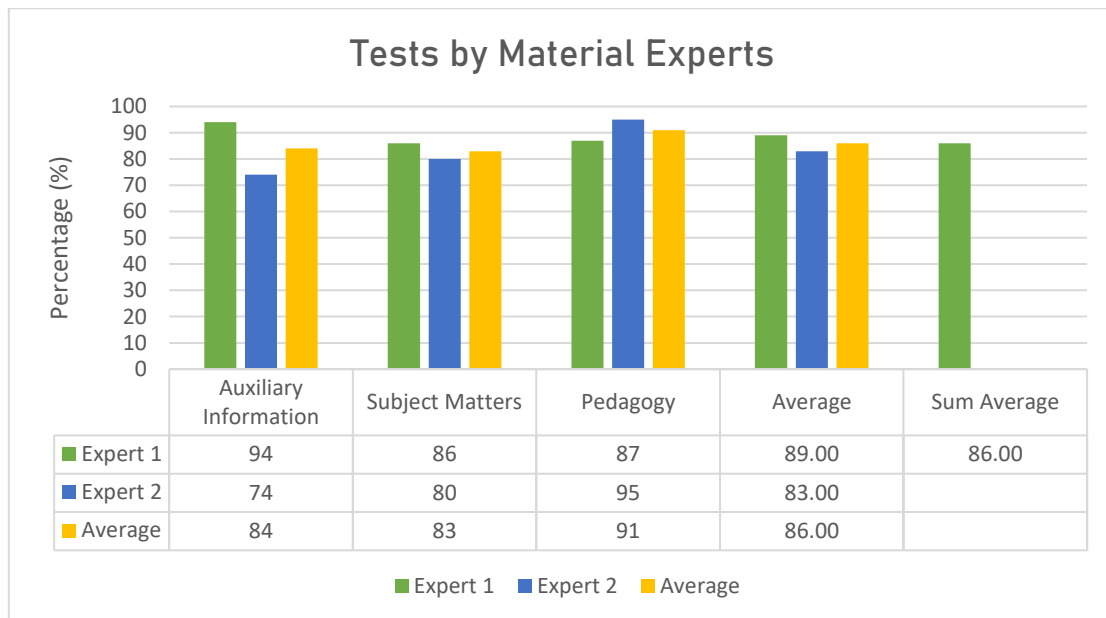

Figure 5: Bar chart of material expert responses

The feasibility test in terms of the Material aspect assessed by 2 experts as shown in Figure 5 above, based on the bar chart image above, the assessment from the expert in terms of the Pedagogy aspect obtained an average score of 91%.

The Auxiliary Information aspect is 84%, while the Subject Material aspect gets a score of 84%. Then the total average score of the two experts was 86.00% and it can be concluded that the Mini Server Lentera in the Information and Communication Technology (ICT) subject has a very feasible category to be implemented in the classroom.

Items of the instrument were tested for validity by applying directly to the class XI students of SMAN Siberut Utara totaling 30 students.

Processing of data obtained from students using Product Moment correlation. The results are recapitulated in an excel document before the direct trial of use is carried out. The validity of the questions is in the table below

Table 3: Results of instrument item validity

Question Points	R Value Calculate	Table R Value	Description
1	0.523	0.361	Valid

2	0.724	0.361	Valid
3	0.455	0.361	Valid
4	0.480	0.361	Valid
5	0.506	0.361	Valid
6	0.490	0.361	Valid
7	0.478	0.361	Valid
8	0.600	0.361	Valid
9	0.489	0.361	Valid
10	0.471	0.361	Valid
11	0.403	0.361	Valid
12	0.534	0.361	Valid
13	0.752	0.361	Valid
14	0.650	0.361	Valid
15	0.620	0.361	Valid
16	0.637	0.361	Valid
17	0.424	0.361	Valid
18	0.423	0.361	Valid
19	0.460	0.361	Valid
20	0.780	0.361	Valid

Research for reliability testing was decided by means of internal consistency, in this case the research was only tested once.

Data obtained and obtained. From these results it can be decided the reliability value of the instrument. Reliability testing using alpha test

$$r_i = \frac{k}{(k-1)} \left\{ 1 - \frac{\Sigma \delta_b^2}{\delta_t^2} \right\}$$

$$r_i = \frac{20}{(20-1)} \left\{ 1 - \frac{9,45}{64,32} \right\}$$

$$r_i = 0.895$$

From the alpha test above, a reliability value of 0.895 is obtained, which means that the reliability of the Lentera Mini Server is categorized as high.

The following is a testing phase by 30 students of class XI SMAN Siberut Utara who assess aspects of pedagogy, Interface, Auxiliary Information, Consideration, Robustness and Navigation, along with data after testing
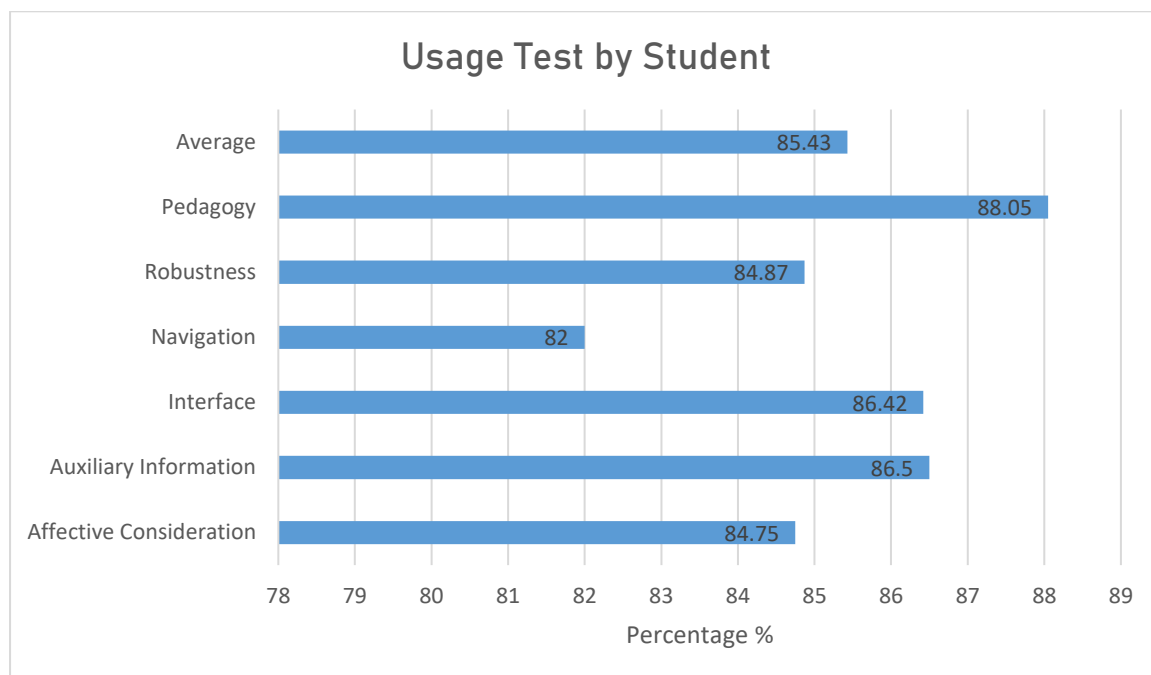
Figure 6: Usage Test Results by Class XI . students

In Figure 6 the bar chart of the usage testing by class XI students, the data obtained an average score of 85.43 for all aspects, for the first detail aspects of the Affective Consideration aspect, the average is 84.75%, the second from the Auxiliary Information aspect, the average score is 86.5 %, the third from the interface aspect got an average of 86.42, the fourth aspect of Navigation had an average score of 82%, the Robustness aspect got an average value of 84.87 and the last one from the pedagogy aspect scored 88.05. The average value of these six aspects concludes that for the use of Mini Server Lenteras as a digital learning medium in Information and Communication Technology subjects, the category is very suitable for use in class XI of SMAN 1 Siberut Utara, Mentawai Islands.

CONCLUSION

The results of the research obtained and discussed above, several important points can be drawn, such as: 1) Mini Server Lenteras in Information and Communication Technology subjects proxy server material can be categorized as very suitable for use in learning at SMA Negeri 1 Siberut Utara Mentawai. Based on the assessment scores from 2 experts on the media aspect, a score of 87% was obtained and from the material experts 86%, which means the assessment category concluded that the Mini Server Lentera Subject Information and Communication Technology (ICT) is very suitable for use in the classroom. Suggestions and inputs from experts from the two aspects are described as follows: 1) Materials for basic competencies in Information and Communication Technology subjects, including several Basic Competencies, should be added to some other basic competencies. (2) An explanation of how to configure a proxy server needs to be added, not only in the form of videos. An explanation in the form of a video simulation of accessing the

internet using the hardware, as well as an explanation of how to obtain, store and print the information obtained in the browser.

REFERENCES

[1] G. Ganefri, BR Fajri, F. Ranuharja, F. Prasetya, R. Fadillah, and F. Firdaus, "MINI LENTERA SERVER AS ALTERNATIVE TO DIGITAL LEARNING IN 3T AREA," J. Teknol. inf. and Educator., 2019.

[2] AD Samala, BR Fajri, and F. Ranuharja, "DESIGN AND IMPLEMENTATION OF MOBILE LEARNING-BASED LEARNING MEDIA USING MOODLE MOBILE APP," J. Teknol. inf. and Educator., vol. 12, no. 2, pp. 13–19, Dec. 2019.

[3] D. Novaliendry, R. Darmi, Y. Hendriyani, M. Nor, and A. Azman, "Smart Learning Media Based on Android Technology," int. J. Innov. Create. Chang., 2020.

[4] I. Ernawati, "FEASIBILITY TEST OF INTERACTIVE LEARNING MEDIA ON SERVER ADMINISTRATION LESSONS," Elinvo (Electronics, Informatics, Vocat. Educ., 2017.

[5] Amilia Sunan, "Readiness of Micro, Small and Medium Enterprises (MSMEs) to Apply Financial Accounting Standards for Micro, Small and Medium Entities (SAK EMKM)," Essay, 2020.

[6] Anita Adesti and Siti Nurkholimah, "DEVELOPMENT OF ANDROID-BASED LEARNING MEDIA USING ADOBE FLASH CS 6 APPLICATION IN SOCIOLOGY LESSONS," Edutainment, 2020.

[7] Dony Novaliendry, "Application of Interactive Multimedia-Based Geography Game (Case Study of Class IX Students of SMPN 1 RAO)," J. Teknol. And Educator., 2013.

[8] ESC Ho, "ICT familiarity of East Asian students and effect of ICT factors on students' CBA performance," in WHAT WE LEARNED FROM PISA: THE OUTSTANDING PERFORMANCE OF STUDENTS IN HONG KONG AND EAST ASIA, 2017.

[9] D. Putri Pangestu and R. Rohinah, "The Influence of Learning Readiness on Student Activity in the AUD Learning Process," Golden Age J. Ilm. Early Childhood Development, 2019.

[10] F. Ranuharja, BR Fajri, and AD Samala, "WEB-BASED SERVICES OF MENTOR HELPING SERVICES (BAMBIMBEL) SYSTEM," J. Teknol. inf. and Educator., 2020.

[11] F. Ranuharja, G. Ganefri, BR Fajri, F. Prasetya, and AD Samala, "DEVELOPMENT OF INTERACTIVE LEARNING MEDIA EDUGAME USING ADDIE MODEL," J. Teknol. inf. and Educator., 2021.

[12] A. Prasetyo, "Design and Analysis of Cloud Storage Infrastructure As Service With Raspberry Pi Control," J. Ilm. NERO, vol. 2, no. 1, pp. 27–35, 2015.

[13] IP Dewi and R. Sofya, "Adobe Development of Interactive Multimedia Learning Media Using Adobe Flash CS3 in Economics Learning Media Course Applying Project Based Learning Method," J. Teknol. inf. and Educator., vol. 11, no. 2, pp. 72–79, 2018.

[14] AZ Izza, M. Falah, and S. Susilawati, "Study of Literature: Problems of Learning Evaluation in Achieving Educational Goals in the Era of Independent Learning," conf. science. educator. Univ. Pekalongan 2020, 2020.

[15] YE Candra, Y. A, I. Irzal, and F. Prasetya, "INFLUENCE OF 2 AXIS CNC SIMULATOR MEDIA ON LEARNING OUTCOMES OF STUDENTS' BASIC CNC TRAINING AT SMK NEGERI 5 PADANG," J. Vocational Mek., 2019.

[16] DA Walker, "JMASM 48: The pearson product-moment correlation coefficient and adjustment indices: The fisher approximate unbiased estimator and the Olkin-Pratt Adjustment (SPSS)," J. Mod. app. stats. Methods, 2017.

[17] DH Ismunarti, M. Zainuri, DN Sugianto, and SW Saputra, "Test of Instrument Reliability on Continuous Variables for Measurement of Chlorophyll-A Concentration in Waters," bull. Oceanography Mar., 2020.