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Development of Virtual Learning System Based on Moodle as A Platoform Online Learning tn the Covid-19 Pandemic

Sirwan[1]✉, Radhiani.A[2], Sartika[3]

Informatics Engineering, Nani Bili Nusantara University, Indonesia[1.2]

Electrical Engineering, Nani Bili Nusantara University, Indonesia[3]

E-mail: sirwan.unbn@gmail.com[1], Ahyani.unbn@gmail.com[2], Sartikaririn75@gmail.com[3]

Abstrak

Tujuan dari penelitian ini adalah untuk; 1) Menghasilkan *Virtual Learning System* (VLS) berbasis *Moodle* sebagai platform pembelajaran online Covid-19; 2) Menguji kelayakan *Virtual Learning System* (VLS) dari aspek penampilan dan kepraktisan. Jenis penelitian ini adalah *Research and Development* (R&D) dengan model pengembangan Borg and Gall. Model Borg and Gall dimodifikasi menjadi enam (6) langkah, analisis kebutuhan, perencanaan, pengembangan, Implementasi, revisi. Subjek uji coba melibatkan dua ahli media, satu ahli materi dan 30 siswa dari SMKN 1 Sorong, Papua Barat yang dipilih secara acak. Instrumen yang digunakan untuk mengumpulkan data adalah angket validasi produk. Data yang diperoleh berupa data kualitatif yang dikuantifikasi, ditabulasi dan dianalisis secara deskriptif. Hasil penelitian menunjukkan bahwa; 1) Penelitian Pengembangan ini telah menghasilkan *Virtual Learning System* (VLS) berbasis Moodle. Aplikasi *Virtual Leaning System* (VLS) berbasis Moodle lulus uji kualitas dan kepraktisan oleh pakar media; 2). Hasil uji coba produk ahli media pada aspek tampilan diperoleh nilai kriteria sangat layak 89,5%, sedangkan aspek kepraktisan adalah kriteria praktis 90,0%. Sedangkan dari aspek *Usabily Virtual Learning system* (VLS) berbasis moodle, 90% siswa menyelesaikan pelajaran secara mandiri, kemudian 98% siswa memahami pelajaran.

Kata kunci: Pengembangan, *Virtual Learning System, moodle, Learning Platfotm* di Era Covid-19.

Abstract

The objectives of this research are to; 1) Produce a Virtual Learning System (VLS) Based on Moodle as a Covid-19 Online Learning Platform; 2) Testing the Feasibility of the Virtual Learning System (VLS) from the Appearance and Practicality Aspects. This type of research is Research and Development (R&D) with the Borg and Gall development model. The Borg and Gall model was modified inti six (6) steps, needs analysis, planning, development, Implementation, revision. The subject of the trial involved two media experts, one material experts and 30 student from SMKN 1 Sorong, West Papua were selected randomly. The instrumen used collect data is a product validation questionnaire. The data obtained in the form of qualitative data which are quantified, the tabulated and analyzed descriptively. The results showed that; 1) Research This development has produced a Moodle-based Virtual Learning System (VLS). Moodle-based Virtual Leaning System (VLS) application passed the quality and practicality test by media experts; 2). The results of the trial of the media expert's product on the display aspect obtained a value of 89.5% very feasible criteria, while the practicality aspect was 90.0% practical criteria. Meanwhile, from the aspect of Usabily Virtual Learning system (VLS) based on moodle, 90% of students complete the lesson independently, then 98% of students understand the lesson.

Keywords: *Development, Virtual Learning System, moodle, Learning Platfotm in the Covid-19 Era.*

✉ Corresponding author :

Email : sirwan.unbn@gmail.com

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INTRODUCTION

Pandemic Covid-19 impact in all sectors, including the education sector. Educators are required to continue to carry out the learning process with students at home (Herliandry et al., 2020). On the other hand, the implementation of online learning is not optimal in delivering material, because students are not accustomed to using online platforms and the learning process focuses more on giving assignments to students(Satrianingrum & Prasetyo, 2020). Various problems that arise due to the Covid-19 Pandemic are the uneven readiness of schools, teachers, and students in carrying out online learning. The results of an initial survey conducted at SMK Negeri 1 Sorong, West Papua showed that the level of readiness of schools to implement online learning was only 45%, while teacher readiness was 30% and student readiness for online learning was only 20%. The data is analyzed that schools, teachers and students are not ready to carry out online learning. In addition, the initial survey also identified that SMK Negeri 1 Sorong, West Papua does not yet have a *Learning Management System* that is used as an online learning management system. *Learning Management System* is an application package that is automatically able to handle the administration, implementation, reporting of a learning activity. Therefore, this study aims (1) to produce Virtual *Learning System* a Moodle-basedas a Covid-19 online learning platform; (2) to test the feasibility of the Virtual Learning system from the appearance and practical aspects. *The Virtual Learning system is* very suitable to be developed and implemented during covid-19 as the main system in managing online learning. Based on the description previously stated, it is deemed necessary to conduct research on the development ofVirtual *Learning System* a Moodle-based to be applied to vocational secondary education in the context of the online learning process during COVID-19 at SMK Negeri 1 Sorong Regency, West Papua.

Learning Management System is a software application that can automatically handle the administration, implementation, and reporting of a training activity. *LMS* has several functions as follows, namely; (a) Centralize and automate administration; (2) Able to provide services and guidance that can be done by *users* themselves without involving other people; (3) Arranging and presenting learning content on a regular basis; (4) Using the *web-based platform* as the application platform; (5) Supporting ease of portability and better standardization; (6) Regulating learning content that is resue. *Learning Management system (LMS)* is a software or software for administrative purposes, documentation, reports on an activity, teaching and learning activities andactivities *online, e-learning* and training materials which are all done *online* (Nurlisah, 2019). LMS provides features that can meet all user needs in the learning process. Currently, many types of LMS are offered, each LMS has its own features according to the facilities provided. LMS can contain materials packaged in the form of multimedia (animation, video, text, sound) which are provided as *supplements* and *enrichments* for the development of learning competencies (Nurlisah, 2019).

Modular Object Oriented Dynamic Learning Environment (Moodle)

Moodle as an abbreviation of *Modular Object-Oriented Dynamic Learning Environment* which means a dynamic learning place using object-oriented models (Jason Cole; Helen Foster, 2008). The application *Moodle* was first developed by Martin Dougiamas in August 2002 with *Moodle* version 1.0. Currently, *Moodle* can be used by anyone in an *open source* (Dwi Surjono. Herman, 2013). Besides being an acronym, Cole and Foster (2008) also define *Moodle* as a verb which means the process of doing something like a fun game that leads to additional insight and creativity. *Moodle* which is a production software from *e-learning* for a learning media into web form. This application allows students to enter digital classrooms to access learning materials. By using *Moodle*, we can create learning materials, quizzes, electronic journals and etc. *Moodle is* designed to assist in educational activities which are a *social construct*. This can be applied when *Moodle is* created, and ethics of teachers and educators conducting teaching activities inlearning *online, Moodle* can be installed *online* or *offline* (Pratama, 2018).

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This research is relevant to the research conducted by Ervan Johan Wicaksana in 2020 on the Effectiveness of Learning using Moodle on the motivation and interests of students' talents in the midst of the Covid-19 pandemic. The results of his research show that there is an increase in positive interest in participating in learning and the majority play an active role in discussions in participating in online learning (Wicaksana, 2020). In addition, this research is also relevant to research by Matilda Ujulawa in 2017 entitled "Designing a *Learning Management System* (LMS) Using *Moodle* at Tarakanita High School Jakarta". Research has similarities and differences with the system that will be made by the author. The similarity is that they both create a *Learning management system* to facilitate the teaching and learning process. While the difference is that the system created by Matilda Ujulawa is a *Learning management system* that uses one of the open source LMS, namely *Schology*, while the *Virtual Learning system* that will be created uses *Moodle.* Furthermore, by Sapto Haryoko in 2020 entitled Development of a Virtual Learning Environment Technology Acceptance Model for Vocational Secondary Students". This study aims to determine the acceptance model of using the Virtual Learning Environment (VLE). The results of his research show that the Virtual Learning Environment is influenced by factors of perceived usefulness, perceived ease of use, attitudes towards users, and behavioral interest in using a virtual learning environment (Haryoko, 2020). In addition, this research is also relevant to the research conducted by Hamdanah Said in 2014 which examined the development of virtual learning models to improve learning effectiveness in State Madrasah Schools in Pare-Pare City. The results of his research show that there is a significant effect on students after using Virtual learning (Hamdanah, 2014).

The description of the study of the results of previous studies discusses more about the *Learning Management System* and its effectiveness in increasing the enthusiasm and motivation of increasing students' learning. In addition, other research is more on the Development of Virtual Learning Environment and LMS Models. This proves that the Learning Management System has great potential to serve as the main platform for online learning during the Covid-19 pandemic. This research will focus on the development of a moodle-based Virtual Learning System (VLS) for SMK Negeri 1 Sorong, West Papua. *The Virtual Learning System* (*VLS*) is very suitable to be developed and implemented during COVID-19 as the main system in managing online learning. Based on the description previously stated, it is deemed necessary to conduct research on the development of *Virtual Learning System* a Moodle-basedto be applied to vocational secondary education in the context of the online learning process during COVID-19.

METODE

The research method used in this study is *the Research and Developmentmethod* (R&D). The development model used in this study is thedevelopment model *R & D* proposed by Borg and Gall in Sirwan (2021) which is a model that conducts research that is needs analysis for developers so that know the potential based on researched information into a particular product through a step of planning, validation, and product testing to obtain the effectiveness and practicality of the products developed by researchers (Sirwan et al., 2021).

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Development Procedure

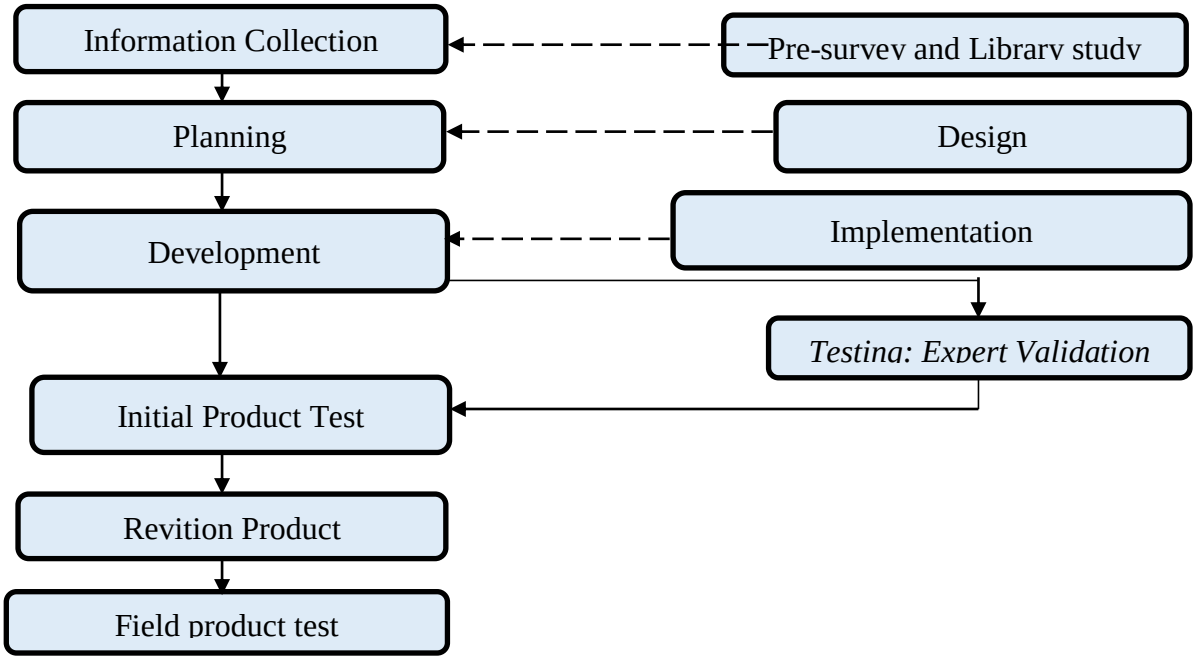

Figure 1. Prosedure Development by Bord and Gall

Subjects

Subjects The experimental subjects in this study were one material expert, two media experts, 30 students of SMK Negeri 1 Sorong, West Papua. The selected material experts are UNBN lecturers with at least a master's degree. While the media expert in this development is someone who is an expert in the fields of design, media and programming. While the product trial was carried out in class 11 of the 2021-2022 academic year at SMK Negeri 1 Sorong, West Papua. Data were collected using product validation instruments.

Instrument and data collection techniques

Collection techniques and instruments used in this development research were observation, questionnaires for the validation of Virtual Learning System (VLS) products. Observation data was collected using closed questionnaires distributed in the form of google forms. While the questionnaire is intended for the subject of the assessment.

Data Analisys

Techniques Data analysis in this study is to describe all the opinions, suggestions and responses of the validators obtained from the criticism and suggestions sheet.

Analysis of Observational Data

Assessment of observational data usedanalysis *descriptive statistical* by calculating the mean (*mean*) of each student's choice. Data were analyzed usingprogram. *IBM SPSS 22* ***b) Feasibility Analysis of Virtual.***

Learning System (VLS)

Qualitative assessment of mobile-based electronic modules throughassessment *checklist.* Results of the assessment of expert lecturers in the form of product quality encoded with a qualitative scale then quantified

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with the following scale:

Table 1. Rating Scale Feasibility

Value	Score
Very Good	5
Good	4
Pretty Good	3
Less than	2
Very Less	1

(Sumber: Djemari, 2008:122)

Student Response Analisys

Assessment of student responses to the use of theapplication *Virtual Learning System (VLS)* through aassessment *checklist* with a Likert scale. Alternative answers in the Likert scale used are scored as follows:

Table 2. Scala Likert

Type	Score
Very Agree	4
Agree	3
Disagree	2
Very Disagree	1

(Sumber: Sugiyono, 2015:135)

To determine the feasibility level of Moodle-Based VLS aspects of appearance, aspects practical, and Functional Aspects. Student's limited test is adjusted to the following eligibility criteria:

Table 3 Category Feasibility

No	**Percentage (%)**	**Level feasibility**
1	25%-34,75%	Very Less Feasibility
2	34,76% - 62,50%	Less Than Feasibily
3	62,51 – 81,25	Feasibility
4	81,26% - 100%	Very Feasibility

(Sumber: Sugiyono, 2013:143).

Results And Discussion

Collection Information

The results of the initial interviews conducted at SMK Negeri 1 Sorong, West Papua obtained data that the level of school readiness to implement online learning is only 45%, while teacher readiness is 30% and student readiness to carry out online learning is only 20%. The data is analyzed that schools, teachers and students are not ready to carry out online learning. In addition, the initial survey also identified that SMK Negeri 1 Sorong, West Papua does not yet have a *Learning Management System* that is used as an online

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learning management system. An online survey of the use of the VLS system was conducted at SMK Negeri 1 Sorong Regency, West Papua with Teacher Respondents as users of the VLS system. Survey results show that on average, teachers have not/not used Moodle-based VLS in online teaching during the Covid-19 pandemic. For more details, it can bein Figure 2 below.

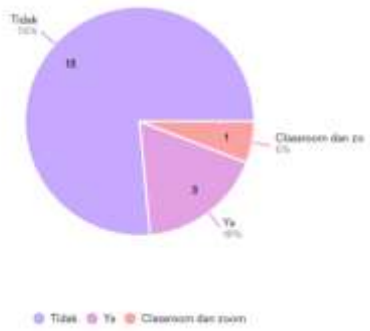

Figure 2 data on the use vls during the Covid-19

Based on the survey results in Figure 2 above, it can be analyzed that from a total of 17 respondents 76% of teachers at SMK Negeri 1 Sorong Regency, West Papua during the pandemic Covid-19 has not used Moodle-Based VLS, while 3 out of 17 teachers have used Moodle-Based VLS. This shows that the development of a moodle-based VLS system is one system that is needed by teachers and students at SMK Negeri 1 Sorong Regency, West Papua. In addition, other data show that teachers are highly motivated to use Moodle-based VLS. For more details, it can be seen in Figure 3 as follows.

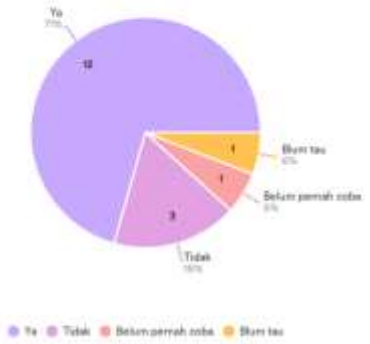

Figure 3 Response to the use of VLS Based Moodle

Based on Figure 3 above, data obtained that 71% are highly motivated to use VLS, 18% are not motivated to use VLS, 6% have never used it, and while the other 6% don't know at all. From this data, it can be analyzed that VLS is very important to be developed and implemented in SMK Negeri 1 Sorong Regency, Papua. This data also shows the positive potential to be implemented by teachers in schools. However, other responses that teachers at SMK Negeri 1 Sorong Regency, West Papua really hope for a training on the use of VLS for teachers and students. Teachers' readiness to use Moodle-based VLS is the main key to effectiveness in using a system.

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Figure 4. Readiness to use Moodle-based VLS

Planning

Desain Infrastruktur VLS Berbasis Moodle SMK Negeru 1 Kabupaten Sorong

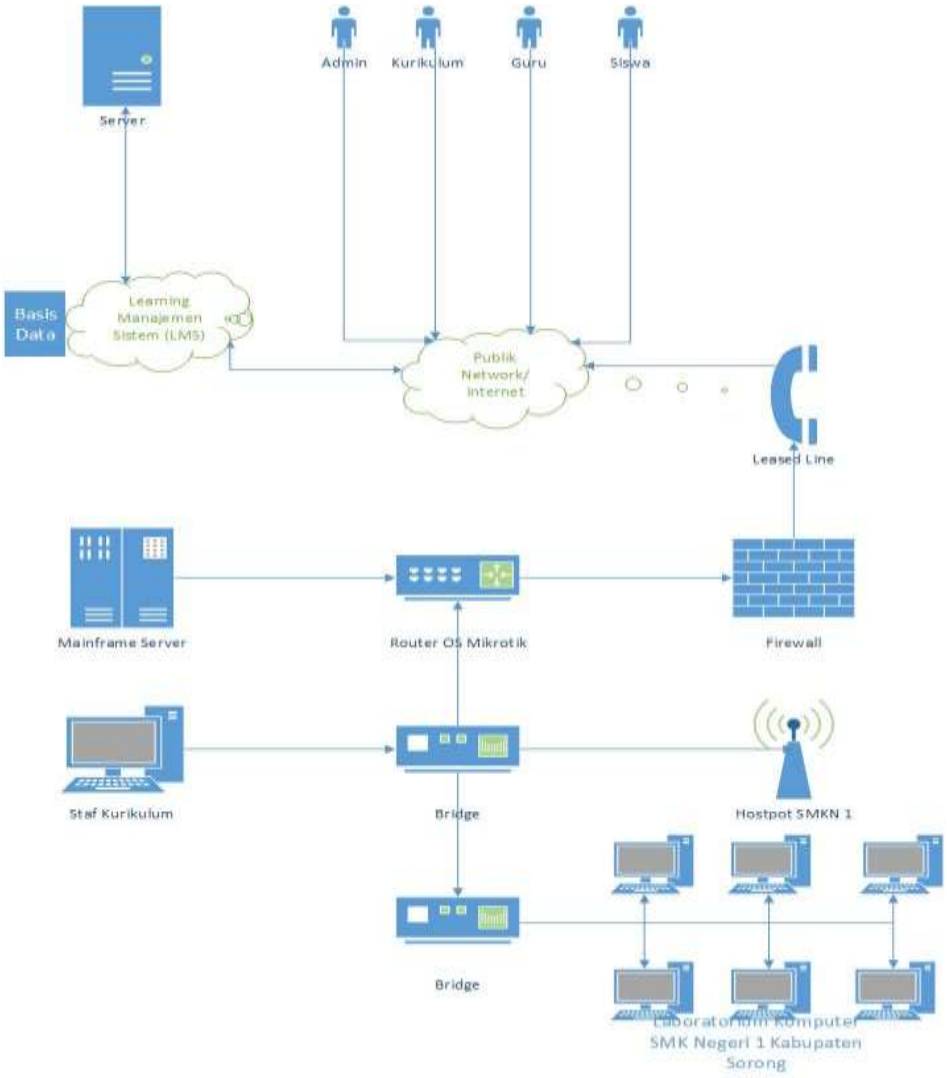

Figure 5. Design Infrastructur Virtual Learning System Based On Moodle

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Design System Virtual Learning Besed On Moodle

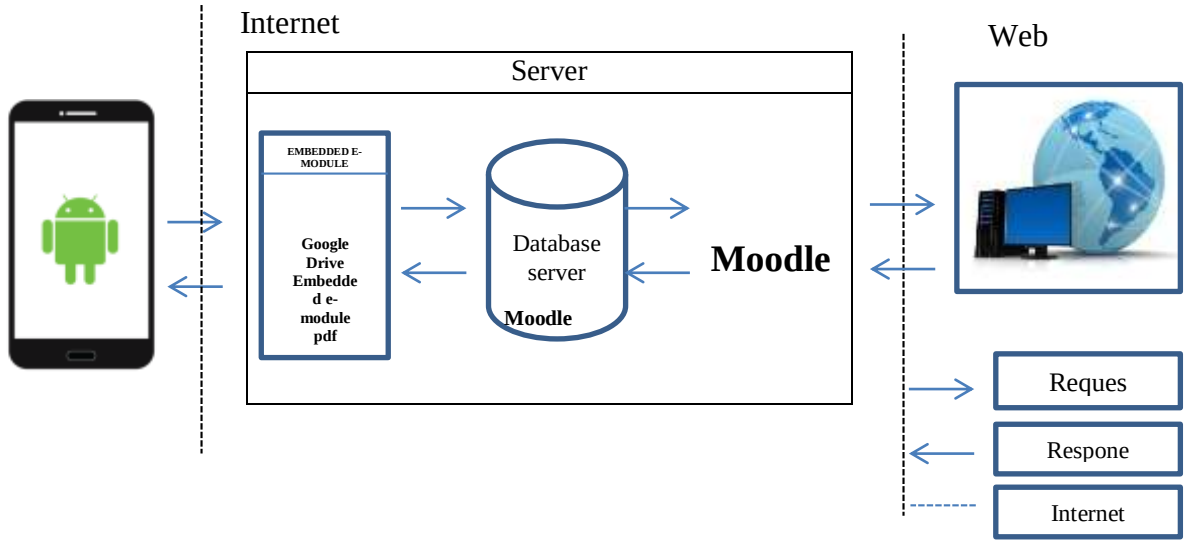

Figure 6. Design System Virtual Learning

Design Use Case System Aplikasi Learning Management System (VLS)

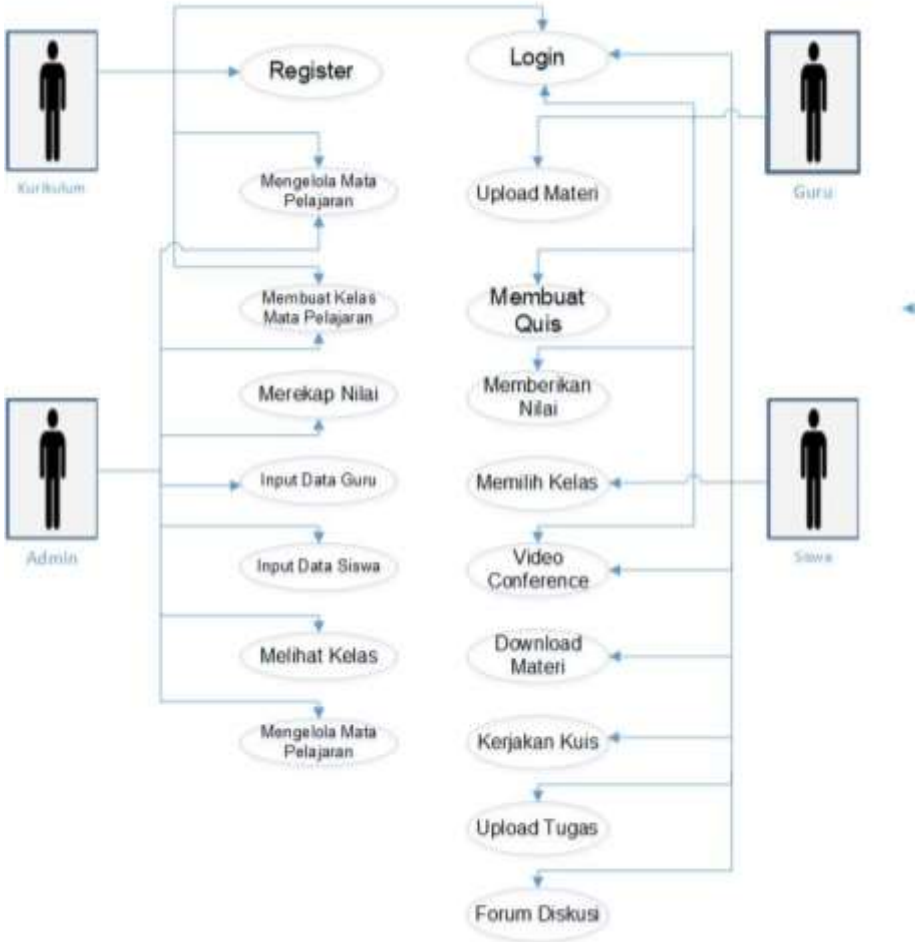

Figure 7. Design Use Case System Virtual Learning

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Results Development Product

Figure 8. Login Page View Virtual Learning System Based On Moodle

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Figure 9. Dasboard Page View

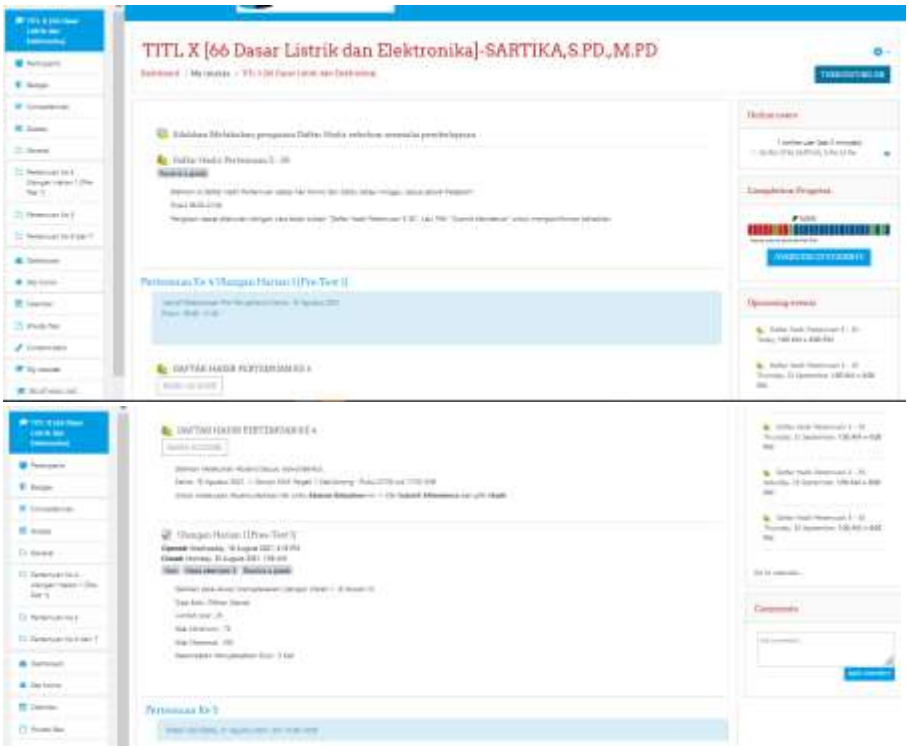

Figure 10. Class Teacher Page View

Results Product Test Virtual Learning System

Results Test Media Expert

Product trial The application *Virtual Learning System* consists of two aspects that are assessed, namely the Display aspect and the practical.

Table 4. Results of Feasibility Test Analysis of Media Experts *Virtual Learning System* Based on *Moodle*

Aspect	Before Revision	Category	After Revision	Category
Display Aspect	80,20 %	feasible	89,5 %	Very Feasiblity
Practical Aspect	85,55 %	Practice	90,9 %	Practice

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Results Test Expert Material Virtual Learning System based on moodle

Assessment by material experts consists of three aspects, namely content feasibility aspects, presentation feasibility aspects, and language aspects. The content feasibility aspect consists of three indicators, namely the suitability of the material with the learning objectives, the accuracy of the material, and the support of the subject matter. While the feasibility aspect of presentation consists of three indicators, namely presentation techniques, supporting presentation and presentation of learning, and the language feasibility aspect consists of four indicators, namely grammatical accuracy, grammatical correctness, correctness of terms and correctness of punctuation.

Table 5. Analysis Results of Feasibility Test of Material Expert Virtual Learning System based on moodle

	Cntent Feasibility	Presentation Feasibility	Language Feasibility
Expert Material	83,91 %	80 %	91%
Category	Very Feasible	Feasible	Very Feasible

Student Test Results

Student test were conducted at SMK Negeri 1 Sorong Regency class XI with a total of 17 students as respondents. Student Trials are conducted online using zoom meetings for virtual face-to-face and using Moodle-based VLS for online learning platforms. The data from the students' limited trial results can be seen as follows:

Display Aspect

Aspect aspect consists of five indicators, namely the text or writing in virtual learning system is easy to read, the image looks clear or not blurry, the color integration is appropriate, the text and color integration is appropriate and the background and color integration is appropriate. appropriate theme. The data on the results of student assessments can be seen in Figure 11 as follows:

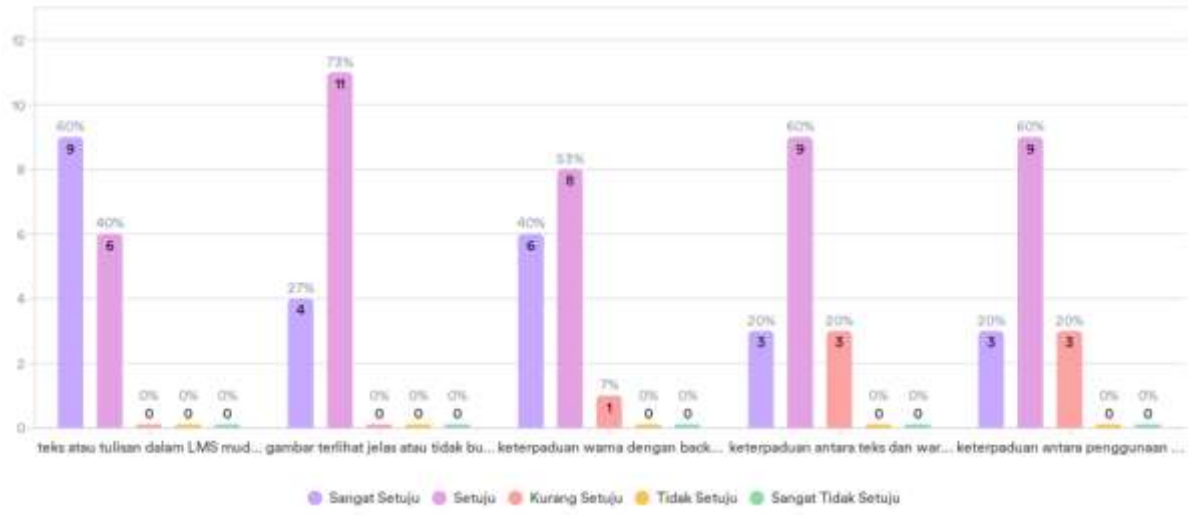

Figure 11 Results of the Moodle-based VLS Assessment Aspect Display of

Aspect Content

Aspects of material presentation consist of 8 indicators, namely VLS equipped with Chat and sharing facilities, VLS contains a coherent syntax and is easy to follow by the teacher and students, VLS is equipped with learning videos, presentation of material in VLS encourages students to study independently, material in VLS is easy to understand, use of language in VLS is easy to understand by students, Sentences in VLS do

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not have multiple

Figure 12 Results of Assessment Aspects of Presentation of Material

Aspect Usability

Aspects the usefulness of Virtual Learning System consists of 7 indicators, namely I can complete lessons independently according to instructions from the teacher, I can understand lesson instructions from Virtual Learning System, I find it easier to learn to use the Virtual Learning System, I am interested in using Virtual Learning System, I easily learned with the help of learning videos, I can Understand the material in a Virtual Learning System with ease, the instructions for using the Virtual Learning System makes it easier to understand the subject matter.

Figure 13 Results Assessment of Usability of Virtual Learning System Based moodle

Discussions

Based The survey results in Figure 2 above can be analyzed that from a total of 17 respondents 76% of teachers at SMK Negeri 1 Sorong Regency, West Papua during the Covid-19 pandemic have not used Moodle-Based VLS, while 3 of 17 teachers have used Moodle-based VLS. This shows that the development of a moodle-based VLS system is one system that is needed by teachers and students at SMK Negeri 1 Sorong Regency, West Papua. In addition, other data show that teachers are highly motivated to use Moodle-based

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VLS. While in Figure 3 above, data shows that 71% are highly motivated to use VLS, 18% are not motivated to use VLS, 6% have never used it, and while the other 6% do not know at all. From this data it can be analyzed that VLS is very important to be developed and applied at SMK Negeri 1 Sorong Regency, Papua. This data also shows the positive potential to be implemented by teachers in schools. However, another response was that teachers at SMK Negeri 1 Sorong Regency, West Papua really hoped for a training on the use of VLS for teachers and students. The online survey results also show that only 13% of 100% are ready to use Moodle-based VLS. 6% are only ready to use Google Classroom, and 81% need training.

Table 4 shows that the assessment of the two media experts. The average appearance aspect before being revised was only 80.20% with proper criteria, while the practical aspect was 85.55% with practical criteria. Furthermore, media experts re-assessed theapplication product *Virtual Learning System* (*VLS*Based) *Moodle*-. The average score of the display aspect after the revision was 89.5% with very decent criteria. While the practicality aspect is 90.9% with practical criteria. Based on these data, it can be concluded that from the media aspect, theapplication product *Virtual Learning System* (*VLS*-based) *Moodle* is very feasible and practical to be used by students and teachers.

Based on Table 5, it can be analyzed that the *Virtual Learning System* (*VLS*) has met the criteria for being very worthy of limited trials. The results of the assessment by material experts from the aspect of content feasibility are 83.91% with very decent criteria, while from the aspect of presentation feasibility the percentage is 80% with proper criteria, while from the language aspect 91% with very feasible criteria. Based on these data, the Moodle-based Virtual Learning System (VLS) application product is feasible to be implemented at SMK Negeri 1 Sorong Regency, West Papua.

Test results for display aspect students got an average point of 60% for the text in the *Virtual Learning system* Based *Moodle* easy to read, 70% of students considered that the use of images in the *Virtual Learning system was* -based *Moodle* clear and appropriate, 63% students considered that the color integration was appropriate and 60% of students agreed that the use of background and themes in the *Virtual Learning system* Based *Moodle* was appropriate. From these data, it can be analyzed that the *Virtual Learning system (VLS)* -based *Moodle* from the display aspect has met the Eligible criteria. While aspects Usabily *Virtual Learning System* Based *moodle* 90% of students can complete the lessons independently, then 98% of the students can understand the instruction lessons through the use of *Virtual Learning System B*ased on Moodle.

Conclusion

Based on the results of research and development carried out by researchers, it can be concluded that: 1) This Development Research has produced a Moodle-based Virtual Learning System (VLS). The Moodle-based Virtual Leaning System application passed the quality test of appearance and practicality by media experts and was declared feasible by material experts in terms of content, presentation and language. The process of developing a Moodle-based Virtual Learning System goes through several stages, namely information gathering, planning, development, testing, revision, and field trials. 2). The results of the Feasibility test from media experts from the display aspect have been declared to have passed the product trial with a percentage of 89.5% with very feasible criteria, while from the practical aspect with a percentage of 90.0% with practical criteria. While aspects Usabily *Virtual Learning System B*ased on *moodle* 90% of students can complete the lessons independently, then 98% of the students can understand the instruction lessons through the use of *Virtual Learning System* Based on Moodle.

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