Implementation of Virtual Practicum in the learning process of MIPA (Mathematics and Natural Sciences) in the Pandemic Period, Case Study on Junior High School in Lhokseumawe City

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A B S T R A C T

This research was conducted in a junior high school in Lhokseumawe City. Based on the results of early observations of the study, virtual practicum activities are still rarely conducted in a number of schools in Lhokseumawe City. To pursue the government programs, learning has been shifted to online classes, so that the students can still get their right to acquire knowledge but stay safe at home during pandemic. The condition of online learning during pandemic providing efficiency of time and carrying out health protocols habit, but basically emerge several urgent problems among teachers, students and parents. This research type is descriptive in the form of case studies. This research is conducted deeply on a situation or condition in a systematic way starting from making observations, collecting data, analyzing information and reporting results. Based on the results of interviews, it can be concluded that schools in Lhokseumawe have implemented online learning, planning online learning by preparing syllabus, lesson plans, and teaching materials. The results of this closed questionnaire research are used to find out things that support the implementation of virtual practicum. From the results of the questionnaire, it is known that the implementation of learning through the virtual practicum module is very effective, this can be seen from the final report of the students practicum score are 100%, which means students understand the use of virtual modules. and able to make a final practicum report perfectly.

Keywords:

Virtual Practicum, Learning MIPA (Mathematics and Natural Sciences), Pandemic Period

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1. INTRODUCTION

According to Indonesian Law number 20 of 2003, Education is a conscious and planned effort to create a learning atmosphere and learning process so that students can actively develop their potential. The process of an active self-development can be carried out if the implementation of learning activities is conducted with learners-centered approach. This process has been stated in the regulation of the Minister of Education and Culture number 81A regarding the Implementation of the 2013 Curriculum which is also illustrated in the Regulation of the Minister of Education and Culture number 70 of 2013 where learning must be carried out in an active manner. It means using interactive network media where students actively gain knowledge through group learning activities based on multimedia tools in accordance with the development of students' potentials on multidisciplinary knowledge with critical learning patterns.

Based on previous discussion, a scientific learning approach is needed that utilizes various learning resources but it still remains with guidance during the process through “practicum”. According to Ural (2016) Practicum activities aim to increase theoretical knowledge through problem solving and scientific processes. Balram (2017:3) states that practicum activities will provide opportunities for students to acquire episode knowledge, the knowledge that has high retention. Furthermore, according to Ojediran, et al (2014) student learning outcomes using the practicum method increase higher than those taught by the lecture method. Meanwhile, Kandamby (2019) stated that practicum activities carried out in the laboratory had an influence on the success of students in learning.

However, virtual practicum activities are still rarely conducted in a number of schools in Lhokseumawe City. There are two constraints in implementing the practicum that needs to be analyzed properly in order to get the best solution. They may happen in virtual practicum activities or because of the lack of facilities that are available in schools. If the obstacle is caused by the facility, a virtual laboratory is a solution as mentioned by

Nirwana (2011) about the various benefits of virtual laboratories. Based on these problems**,** the researcher considers it is necessary to conduct a research entitled: Implementation of Virtual Practicum in the learning process of Mathematics and Natural Sciences (MIPA) at the Pandemic Period, Case Studies of Junior High School (SMP) in Lhokseumawe City**.**

1.1 Research Question.

1. How is the implementation of virtual practicum activities in the Mathematics and Natural Sciences learning process during the pandemic in terms of practicum activities for Junior high school students in Lhokseumawe City?
2. What are the obstacles faced by teachers, especially in conducting virtual practicums in the Mathematics and Natural Sciences learning process?

1.2 Objective of the Study

1. To find out the implementation of virtual practicum activities Mathematics and Natural Sciences learning process during the pandemic in terms of practicum activities for junior high school students in Lhokseumawe City?
2. To find out the obstacles faced by teachers, especially in conducting virtual practicums in the Mathematics and Natural Sciences learning process?

1.3 Significance of the Study

1. To obtain data of the implementation of virtual practicum activities in the Mathematics and Natural Sciences (MIPA) learning process during the pandemic in terms of practicum activities for junior high school students in Lhokseumawe City.
2. To obtain data toward the obstacles faced by teachers in implementing virtual practicums.
3. To find out and assist the availability of needs needed by junior high school teachers in preparing virtual practicums.

2. RESEARCH METHODOLOGY

2.1. Types of research

The type of research is descriptive in the form of case studies. This research is carried out in depth on a situation or condition in a systematic way starting from making observations, collecting data, analyzing information and reporting results.

2.2. Place and time of research

This research was conducted in a junior high school in Lhokseumawe City. This research was conducted in the odd semester of the 2021/2022 academic year.

2.3. Research subject

The subjects of this study were teachers at junior high school in Lhokeumawe City. The subjects or samples of this study were taken randomly because schools can be considered homogeneous based on a review of practical abilities.

2.4. The following below are the stages of data collection in this case study:

1. Preparation, preparation is carried out with preliminary observations of virtual laboratories at SMP in Lhokeumawe City, researchers apply for research permits to the education department, and discuss on a research schedule with teachers.
2. Data collection, researchers conducted research with a case study approach by visiting junior high schools in Lhokeumawe City which became the samples in the study.

2.5. Data Analysis and Data Presentation

Data analysis and data presentation in case studies are presented in a textual manner with evidence. Thus the data analysis in this study will be conducted with the following steps:

1. Data reduction. In this process the researcher summarizes, selects the main or important things to find the theme and pattern
2. Presentation of data. After the data is selected, the data is presented in the form of a narrative or brief description, charts and relationships between categories and predetermined assessment guidelines
3. Data Analysis. That is reviewing data based on theory
4. Drawing Conclusion. After the data is presented and analyzed then a conclusion is drawn.

The data obtained based on the questionnaire will be processed using descriptive statistics. Descriptive statistics are statistics used to analyze data by describing or describing the data that has been collected as it is without the intention of making generally accepted conclusions or generalizations (Ridwan, 2003). The rating scale used to analyze the standard module teaching materials is 1 to 4 score, where 1 is the lowest score and 4 is the highest score. The range can be determined through the range of the highest score minus the range of the lowest score then divided by the highest score. Based on the determination of the range obtained 0.75.

The criteria for the validity of the average analysis used can be seen in table 2.1 below:

Table 2.1. The criteria for the validity of the average analysis

Average	Validity criteria
3,26 – 4,00	Valid and does not need revision (very feasible)
2,51 – 3,25	Sufficiently valid and does not need revision (decent)
1,76 – 2,50	Not valid, some of the contents of the book need to be revised (not feasible)
1,00 – 1,75	Invalid and need a total revision (not feasible)

3. RESEARCH RESULT

This study collects data using various techniques, including interview, observation, documentation studies, and questionnaires. Interviews were conducted to obtain data directly from the object, as well as documentation and observation studies. Meanwhile, the questionnaire was conducted in this study as a reinforcement in triangulation of data from several methods above. The following below is the data of the result of the study:

3.1. Interview result

The interview technique is done by determining the representative sources in the beginning that in accordance with the research questions. In this study, the respondents were teachers of mathematics and science studies (MIPA).

Based on the results of interviews, it can be concluded that junior high schools in Lhokseumawe City have implemented virtual learning, by preparing syllabus, lesson plans, and teaching materials. Syllabus and lesson plans were made by loading virtual values in it, then a whatshap group was created to guide students to join Google meet.

3.2. Results of distributing questionnaires

Respondents who were taken as samples were 10 respondents, consisting of 2 men and 8 women. Respondents were taken randomly from several teachers in the field of mathematics and science studies at junior high schools in Lhokseumawe City. These respondents are OSIS (student organization) supervisors. They were chosen because they were more accessible.

Questionnaires for teachers are used to measure the success of implementing virtual practicums through virtual practicum modules compiled by researchers. The data is in the form of numbers, then described by descriptive analysis of percentages. The formula for descriptive analysis of percentages according to Ali is:

$$NP\% = \frac{n}{N} \times 100\%$$

Description:

1. NP% = percentage
2. n = value obtained
3. N = sum of all value

The results of the questionnaire will be adjusted to the success measurement indicators as follows:

Table 3.1 Success Measurement Indicator (Arbain, 2009)

Percentage score	Descriptive
85-100	Very good
70-84,99	Good
55-69,99	Pretty good
40-54,99	Enough
-39,99	Very less

Table 3.2. Teacher Questionnaire Results (Questionnaire processing results)

No	Indicator	Teacher	
		Mathematics	Science Studies
1	Understanding of material	70 %	75 %
2	Student Virtual Practicum Interest	80 %	75 %
3	Virtual Practicum Preparation and Implementation	90 %	90 %
4	Practicum Result Report	90 %	90 %
5	Evaluation of Practicum Results	100 %	100 %

Data collection method in this study was using a closed questionnaire. Data in the form of numbers obtained from closed questionnaires were analysed descriptively by percentage. The results of this closed questionnaire research are used to find out things that support the implementation of virtual practicum and how the practicum is conducted which can find out the practicum activities according to existing indicators.

Online learning from home is really hard for teachers, students and even parents. All societies are forced to transform and adapt to this pandemic condition. There are many ways that can be done to reduce the impact of it, namely through distance learning strategies. Mathematics as one of the fields of study taught in formal educational institutions is an important part of efforts to improve the quality of education. Mathematics lesson itself is a lesson that deals with many concepts.

Similarly with science studies which emphasizes providing direct learning experiences through the use and development of process skills and scientific attitudes, then the appropriate learning method is demonstration or experimentation. So with the current situation with the outbreak of Covid-19, learning must be carried out online. The thing that teachers need to pay attention to is how to make learning interesting for students. For this reason, teachers are required to innovate in carrying out learning.

Therefore, one of solutions to overcome this is by doing virtual practicum-based learning. The lack of student interest in online learning is due to a lack of understanding of the material presented because teenagers are still relatively difficult to study independently, it is mean that they still need a lot of guidance from the teachers, so far virtual learning has been carried out in schools, but virtual practicum has not been fully implemented. Researchers try to help the school by introducing a virtual practicum module to guide virtual learning in schools.

The limitation of virtual practicum teaching materials can be overcome by using a virtual practicum module. At the time of learning with this virtual practicum module, students seemed enthusiastic and showed interest in this media so that they were active in learning. This is because the media in the virtual practicum module can provide a clear and concrete picture that they cannot see if they experiment with simple tools. They become enthusiastic and active in participating in learning. By being active in learning activities, of course, it has an impact on increasing understanding of math and science studies concepts.

4. CONCLUSION

Based on the results of interviews, it can be concluded that junior schools in Lhokseumawe City have implemented virtual learning, by preparing syllabus, lesson plans, and teaching materials. Syllabus and lesson plans were made by loading virtual values in it, then a whatshap group was created to guide students to join google meet. The results of this closed questionnaire research are used to find out things that support the implementation of virtual practicums. From the results of the questionnaire, it is known that the implementation of learning through virtual practicum modules is very effective, this can be seen from the final report of the practicum students, they get a score of 100%, which means that students understand the use of virtual modules and are able to make a final practicum report perfectly.

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