

Virtual Laboratory Media Training at Muhammadiyah Langsa High School in Supporting The Independent Curriculum

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Abstract: Learning media has a very close relationship with the independent curriculum. As a curriculum that gives students the freedom to choose and determine the direction of their learning, an independent curriculum requires appropriate learning media to support and facilitate this freedom. The learning media used in this service activity is virtual laboratory media as a learning media that can be a solution to the problem of learning loss. The aim of this service activity process is to provide an explanation that is presented by presenting material about the importance of technology in learning, introducing examples of technology that can be used in the virtual practicum learning process. To carry out training in creating practical learning media based on simulation and animation media in accordance with the materials contained in science subjects which can be used in online science practicum learning. Carrying out training on creating a YouTube channel to uploading materials and getting YouTube links for materials that have been uploaded on the channel to sharing YouTube links with science teachers through online learning applications used such as Google Classroom. The method used in service activities is the service learning method with 4 activity stages, namely the Investigation Stage, Preparation Stage, Action Stage and Reflection Stage. The results of community service activities at SMA Muhammadiyah Langsa which were given to teachers and students had a positive impact on the use of virtual laboratory media applications to support the Merdeka curriculum.

Keywords: Media Training; Virtual Laboratory; Independent Curriculum

Introduction

One of the uses of technology in learning is through online media in the form of e-learning. E-learning has had a big impact on the transformation of learning into digital form, both systems and lesson content (Liu et al., 2009; Park, 2009). Various learning models can be applied using e-learning media. The learning model using e-learning is more effectively applied to help the learning process for both teachers and students (Bell, 2011). E-learning can provide better results because there are learning facilities for students without being hampered by space and time (Chen et al., 2010). Through the development of this technology, it will really help the educational process, especially in its application during the learning process (Erixon, 2010).

In 2022 SMA Muhammadiyah was selected to be the driving school in the Merdeka curriculum program. The election of the Muhammadiyah SMA is a spearhead for implementing the Merdeka curriculum program. This is the target of the service team to carry out community service activities at the Langsa Muhammadiyah High School. Thus Muhammadiyah Langsa High School is obliged to implement the Merdeka curriculum. Teachers as part of the education unit must have an understanding of the implementation of the Merdeka curriculum. One of the understandings prepared is the use of virtual laboratory media as a tool to support curriculum implementation.

A good learning process will determine learning outcomes (Handhika et al., 2014). Improving the quality of the learning process can be done using a laboratory (Admoko & Supriyono, 2016). Increasing

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students' mastery of the concepts taught using a virtual laboratory (Putri et al., 2016). A virtual laboratory, according to (Nirwana, 2017) is a practice space in cyberspace or a social space where scientists interact in cyberspace. A virtual laboratory is a medium that is used to help understand a subject and can solve the limitations or absence of laboratory equipment (Chin et al., 2002).

A virtual laboratory is a computer-based medium that contains activity simulations to describe reactions that may not be visible in real situations. (Hermansyah et al., 2017). A virtual laboratory is defined as an interactive environment for creating and conducting simulated experiments (Jaya, 2012). In addition, based on research (Hikmah et al., 2017) virtual laboratories can improve students' understanding of concepts. One of the learning media that can be applied in a virtual laboratory is simulation-based practicum learning with student simulations that can experience it directly because students are in control of the use of the media.

The target of the service that will be given the training is teachers and students of SMA Muhammadiyah Langsa. The existence of this school is an example of a school that has knowledge of educational development, especially in implementing the Merdeka curriculum which applies e-learning and virtual practicum learning. That's why the service team will provide training to teachers and students regarding Virtual Laboratory Media Training at Muhammadiyah Langsa High School.

So based on this, some of the solutions that are expected to be able to solve the problems faced by partners include : 1) Providing explanations presented by presenting material about the importance of technology in learning, introducing examples of technology that can be used in the virtual practicum learning process, 2) Doing Training in making practicum learning media based on simulation and animation media in accordance with the materials found in science subjects that can be used in science practicum learning in the network (online), 3) Conducting training on making a YouTube channel to uploading and material and getting a YouTube link for the material which has been uploaded on the channel to share the YouTube link with science teachers through online learning applications that are used such as Google Classroom. This community service activity is in accordance with the Free Learning-Free Campus Policy (MBKM) launched by the Minister of Education and Culture,

Method

The process of community service activities carried out by the Community Service Team takes the form of training. This activity will be carried out in August 2023, which will be carried out in classrooms at Muhammadiyah Langsa High School. The participants in this service activity consisted of 4 science teachers while there were 20 students.

This service uses the method of using service learning with 4 stages of activity, namely (1) The Investigation Stage is the stage of interviewing teachers and representatives of schools in the curriculum section, where asking for a needs analysis of problems in implementing the Merdeka curriculum used in learning activities; (2) The Preparatory Stage for the Community Service Team makes a letter of assignment and permit for community service activities submitted to the LPPM and PM of Samudra University. Furthermore, the Service Team prepares materials and tools as well as materials as media in training; (3) The Service Team's Action Stage delivers training materials on virtual laboratory media to teachers and students; (4) Reflection Stage where an evaluation is carried out in assessing the process of community service activities that have been given to teachers and students (Pramanik et al., 2021).

The Service Team hopes that the results of the service activities will be for teachers and students to be able to utilize technological learning media and develop their creativity in preparing technology-based learning resource media, and be able to master virtual laboratory media applications.

Result and Discussion

The implementation of community service activities that will be carried out by the Community Service Team consists of 4 stages as follows:

Investigation Phase

The investigation stage was carried out by the Service Team by conducting investigations and interviews with teachers and deputy principals for the curriculum section to analyze the needs and problems that were being felt. The results obtained at this stage were that teachers at SMA Muhammadiyah Langsa in subjects, especially in exact subjects, were not equipped with adequate practicum media. The limitations of laboratory media mean that teachers and students cannot carry out practical learning activities optimally so they cannot develop their competencies. The implementation of the learning process more often uses teacher-centered lecture methods rather than

using student -centered learning. This school is also currently preparing to implement the independent curriculum. However, teachers are not ready to implement this new curriculum concept because their understanding is still lacking regarding the curriculum.

Preparatory Stage

In the preparatory stage carried out by the Community Service Team, the first carried out the application for service permits and assignment letters submitted to the LPPM and PM Samudra University as document administration to carry out community service activities. Furthermore, the Service Team carried out outreach activities to representatives to schools in the field of curriculum at Langsa Muhammadiyah High School which aimed to carry out community service activities. In this case the school agreed to the process of community service activities and allowed the implementation of these activities at Langsa Muhammadiyah High School. The process of proving this activity can be seen in Figure 1.



Figure 1. Preparatory Stage for Implementation to SMA Muhammadiyah Langsa

This stage is the action stage of providing training to teachers and students regarding virtual laboratory media. At that time, there were 4 teachers present, 1 deputy head of Muhammadiyah Langsa High School for the curriculum section and 20 students. This activity was carried out in the Muhammadiyah Langsa High School classroom. The first activity is that the moderator handles the flow of the ongoing service activity process, where the moderator gives representatives of the school the opportunity to provide direction on the purpose of the service activity process being carried out at Muhammadiyah Langsa High School.

The representative to the school said that it was important to carry out training for teachers so that they could prepare themselves before the

independent curriculum was implemented. Next, material was delivered and training was carried out for teachers in utilizing virtual laboratories as a medium to support the implementation of the independent curriculum. After that, the Head of the Service Team provided training material regarding the Merdeka curriculum and virtual laboratory media in the physics study field practicum. As for proof that this service activity was carried out, you can see Figure 2.



Figure 2. Opening of Community Service Training

The picture above explains that the moderator reads the biodata of the presenter who delivered the material in the Merdeka curriculum training activities and virtual laboratory media. Furthermore, the process of presenters giving material to trained participants, namely teachers and students, is shown in Figure 3.

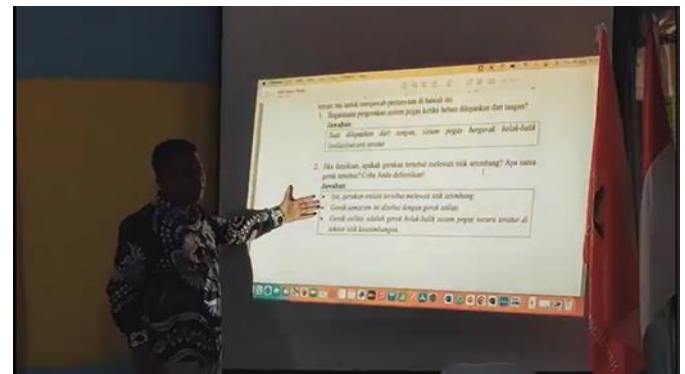


Figure 3. Presentation of Service Training from the presenters

In connection with the picture above which explains the Merdeka curriculum and virtual laboratory media, then in the next meeting the virtual laboratory media application is given to teachers and students who can practice directly how to use the virtual laboratory media. This can be seen in Figure 4.



Figure 4. Teachers practice virtual laboratory applications

Regarding figure 4 above, the teacher practices virtual laboratory media applications regarding practical learning in physics, chemistry and biology. Next, we can see the practices carried out by Muhammadiyah Langsa High School students, which can be proven in Figure 5.



Figure 5. Students Practice Virtual Laboratory Applications

Based on the activity process of the action stages in providing Merdeka curriculum materials and virtual laboratory media to teachers and students of Muhammadiyah Langsa High School, it shows that these activities have a positive impact on teachers and students. Teachers and students enthusiastically participated from start to finish in the process of knowledge training activities regarding the Merdeka curriculum and virtual laboratory media applications provided by the Service Team.

Reflection Stage

At this stage the Service Team reflects or evaluates the results of the usefulness of the service activities that have been carried out. This stage is carried out by giving questionnaires to trained participants which can be proven in Figure 6.

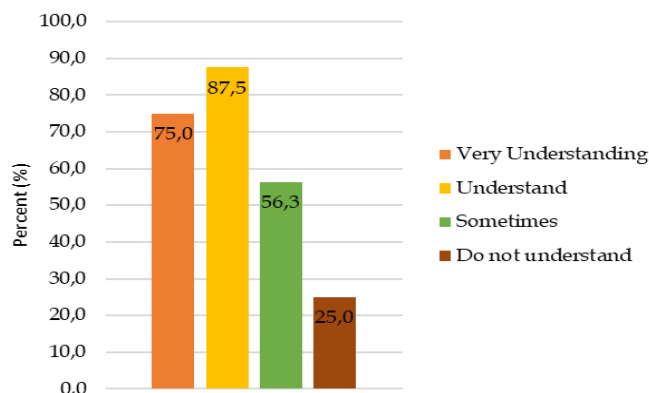


Figure 6. Questionnaire for Understanding the Use of Virtual Laboratory Media Applications

Discussion

Based on the results of the service activities carried out by the Service Team which consists of 4 activity stages, namely the investigation stage, preparation stage, action stage and reflection stage. This effort needs to be made considering that online learning in schools has relatively found obstacles (Futra et al., 2021) including being less effective (Handayani & Jumadi, 2021) (Ahmar et al., 2022) and minimally creating student learning motivation (Mulyani & Sartika, 2022). This is exacerbated by the Covid-19 pandemic and teachers' digital literacy skills are still minimal (Kismiati et al., 2022).

Virtual laboratory is a series of laboratory learning innovations in the form of software. Virtual laboratory or virtual laboratory is a practical learning development that is currently widely researched in an effort to integrate the use of information technology (Dwiningsih et al., 2018). This is based on the idea that information technology provides an alternative learning environment that can facilitate meaningful learning (Gambari, et al., 2018; Vasiliadou, 2020). It is important to develop virtual laboratories because the use of virtual laboratories has been proven to improve students' understanding (Darby - White et al., 2019; Sari et al., 2022) and can improve students' thinking skills (Widowati et al., 2017; Decaprio, 2013; Sony & Katkar, 2014). The development of virtual laboratories can still convey important concepts to students (Qesada, 2020).

Conclusion

The results obtained in community service activities in the packaging of virtual laboratory media training in supporting the independent curriculum received a positive response in the form of the benefits of getting to know virtual laboratory media and their implementation. Activity

participants can develop virtual laboratory media applications based on science subjects that are aligned with the needs of the Merdeka curriculum.

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