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Realization of post-COVID-19 hybrid physics learning at Al-Ulum Islamic School in Pekanbaru

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ABSTRACT

In the post-COVID-19 pandemic, scholars and experts in scientific and social fields have provided each other with assistance and solutions to deal with problems in local communities' lives. The problems faced are quite realistic in everyday life, especially for students in the world of education in every school and college. This causes the quality of student education to relatively decline. Apart from that, the limited online learning media is an important factor that hinders the teaching and learning process. Therefore, physics management is needed through promotion in the development of current digital media in a hybrid manner to overcome problems in the education sector. This service method is carried out online by providing short material and several practical videos that explain various physical phenomena that occur in everyday life. The results of the first exam turned out to be still in the unsatisfactory category. Testing of insight and skills is carried out after learning activities by taking short and quick tests. The results of the second exam were very satisfying with an increase of 70% from the previous one.

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1. INTRODUCTION

Information technology makes an extraordinary contribution in terms of disseminating information to various parts of the world. The development of information and communication technology creates a new culture where everyone can connect to the global virtual world to access thousands of computers providing information [1-3]. This has a big influence on the world of education, whereby by utilizing ICT, the effectiveness and efficiency of education can be increased. The industrial revolution is the most important historical development in human life over the last three centuries which is sustainable in building modern world life [4, 5]. The term industrial revolution has long been used to explain changes in general aspects of the industry that are interrelated, such as the basic technology used in factories, the machines built from this technology, and the routines of workers who work [6]. The very rapid development of information technology recently has finally changed the conditions of learning which are always bound by the limitations of space and time. The development of the internet makes it easier for educational practitioners to carry out learning activities. The use of cell phones as a learning medium conditions students to learn independently and allows students to communicate with knowledge sources more widely when compared to just using conventional media [7, 8].

During the COVID-19 pandemic, the learning system in schools is no longer carried out face-to-face and directly in class. This is of course a challenge for teachers and other components in preparing learning material that will be delivered online so that learning objectives can be achieved and students can understand the learning material well despite the COVID-19 pandemic [9]. This causes the relative quality of student education to decline. This is because an effective learning process involves direct interaction between educators and instructors. Concentrating on studying in a quiet room will make the teaching and learning process run smoothly. Apart from that, limited online learning media is an important factor that hampers the teaching and learning process. It becomes difficult for teachers

to explain clearly to all educators [10, 11]. Therefore, physics management is needed through promotion in the development of digital media to overcome problems that occur in the education sector. With efforts and solutions, opportunities to think, and open horizons of utilization by using digital media to provide interesting practicum materials and videos to increase students' knowledge and interest in understanding the field of physics easily and effectively [12, 13].

According to Darmawan, regarding the equal distribution of learning opportunities, in the current digital era, the concept of distance learning is strongly supported by electronics [14]. The form of lectures that can be used as a solution during the COVID-19 pandemic is online learning. According to Moore, Dickson-Deane, & Galyen, online learning is learning that uses an internet network with accessibility, connectivity, flexibility, and the ability to create various types of learning interactions [15]. The use of the internet and multimedia technology can change the way knowledge is conveyed and can be an alternative to learning carried out in traditional classes. Online learning is learning that can bring together students and lecturers to carry out learning interactions with the help of the Internet [16]. The level of implementation of online learning requires the support of mobile devices such as smartphones or Android phones, laptops, computers, tablets, and iPhones which can be used to access information anytime and anywhere [17]. Universities during the WFH period need to implement online learning reinforcement [18]. Online learning has become a demand in the world of education for the last few years [19]. Online learning is needed in learning in the era of the Industrial Revolution 4.0 [20].

2. IMPLEMENTATION METHOD

The design of this service can be seen in Figure 1. The initial stage of research was carried out with a study in selecting topics to promote physics through digital media that could be easily understood and attract the attention of all students. Digital media to promote physics can be done through social media applications such as YouTube, Facebook, Instagram, TikTok, and websites. This promotion was carried out by explaining various physical phenomena in everyday life from a summary of the material and a short video. Several types of aspects can provide motivation and encourage students to increase their knowledge of physics in everyday life. Apart from that, promotional activities also introduce organizations related to physics at local and national levels, such as PSI (Physical Society Indonesia). This provides students with knowledge about the association of physicists throughout Indonesia who have carried out research in the development of intellectual technological advances. This process is a step to brand the unique characteristics of physical science which, without realizing it, is present at all times in the environment of everyday life. Then collect data from all the promotional plans that have been mentioned. The data that has been collected is analyzed and validated. Next, the research output is carried out by publishing an article and the next step ends with a report on performance results during the service process.

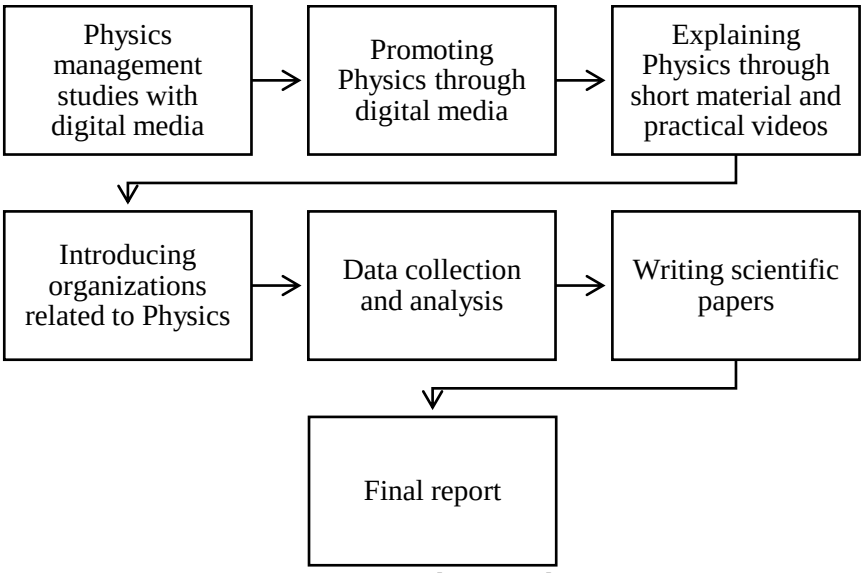

Figure 1. Dedication plan.

3. RESULTS AND DISCUSSION

Increasing the knowledge insight of students or teachers needs to be done by providing motivation and innovative learning in physics and science using simple practical methods. This activity is very important with a visual approach and interesting things that have never been practiced. This activity was carried out online at the end of the COVID-19 pandemic to minimize the rise of new variants. The learning service program for teachers is implemented in various secondary schools in the Meranti Islands Regency in a hybrid manner. Developing students' insight is also carried out by providing practical videos or simple research regarding physical and scientific phenomena. Apart from that, the assessment of service achievement indicators is carried out using short and quick tests on teachers. The indicator in question is increasing the knowledge and skills of students in learning physics and science in the classroom.

Figure 2. Implementation of service activities in meeting rooms.

Community service activities in developing creativity in physics learning using simple online practicum tools have been successfully implemented. The people of the Meranti Islands have a high level of enthusiasm to work together to make the community service activities carried out online a success. The level of achievement can be seen from the indicators obtained from short and quick tests on teachers. However, before starting learning activities, students are given a test first to measure how much insight and knowledge they have. The results of the first exam obtained were still less than satisfactory for all students. Therefore, innovative and motivating learning by lecturers is carried out for teachers.

This learning activity is carried out online by practicing several physical and scientific phenomena using simple tools. Then for each experiment, the teachers were allowed to ask questions and try it, and then they were given some interesting material from the lecturers. After the learning activities are carried out, a short and quick test is carried out to determine changes in indicators of achievement in increasing knowledge and skills. The results of the second exam were very satisfactory with an increase in indicators of 70%. These results prove that learning physics and science can be more easily understood with the help of a visual approach from practical work using simple tools.

4. CONCLUSION

Innovative learning service activities and simple practicums have been successfully implemented. This activity is educational to achieve educational goals. This is an advantage for teachers and other components to think creatively and innovatively in learning. The students involved in this activity seemed very enthusiastic in paying attention and understanding all the material presented. Before starting innovative learning activities, students first take a short and quick test in natural science questions, especially physics. The results of the first exam turned out to be still in the unsatisfactory category. Then the service program was implemented by providing innovative learning and motivation for teachers with several interesting questions. Testing of insight and skills is carried out after learning activities by taking short and quick tests. The results of the second exam were very satisfying with an increase of 70% from the previous one.

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