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METALAB AS A LABORATORIUM BIOLOGI METAVERSITAS

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Abstract

The impact of Covid-19, the increasing number of new technologies being applied in education, as well as increasing interest in the metaverse. Closely related to this virtual environment is life in the field of education. This study aims to explain the type of metaverse, the potential and limitations of its educational application. The four metaverse categories emphasize different functions, types, or sets of Metaverse technologies. There are four spectrums of technologies and applications in the metaverse, namely augmentation, simulation, intimate technology, and external technology. The application of augmented reality in health education in the form of virtual clothes so that it can examine the parts of the body as an anatomy laboratory simulation. Potential metaverse as an educational environment. The recent metaverse craze has begun again, befitting the transition to an unwise society due to the Covid-19 pandemic. As the metaverse is rapidly introduced to life today, several applications of the metaverse have been used in education. Therefore, it is necessary to understand the concept and types of metaverse as well as examples of educational applications. the concept of metaverse and types of metaverse and proposes thinking about metaverse as a connection point or combination of the real world and virtual reality. Avatars in the metaverse are identified with a person's true self. Avatars are involved in social, economic, and cultural activities in the metaverse world. Metaverse means a world where virtual and reality interact and evolve together, and social, economic and cultural activities are carried out in it to create value. During the COVID-19 pandemic, personal distancing was applied, making it difficult to practice in the laboratory. Thus, there are many metaverse developments to support the development of the use of virtual laboratories. Virtual laboratories in educational institutions can be used as an alternative and even the main choice in helping the teaching and learning process which will take place as a substitute for real laboratories if school and learning conditions are deemed inappropriate. To introduce a virtual laboratory, it is necessary to provide training and direct assistance to Biology teachers or lecturers who will use these media and methods in their learning. Activities can be started by conducting observations and field studies to check and get the right information regarding the state and condition of the laboratory and the learning process in schools and lectures that will use the virtual lab.

Keywords: Metaverse, Virtual Laboratory, Education.

1 INTRODUCTION

Biology is one of the subjects related to how to systematically find out about nature, so that Biology is not only the mastery of a collection of knowledge in the form of facts, concepts or principles, but also a process of discovery. Learning Biology is expected to be a vehicle for students to learn about themselves and the natural surroundings as well as prospects for further development in applying it in everyday life (Pangestuningsih, 2017). The learning problems experienced by educators for students are related to the cost of procuring tools and materials used to carry out practicum activities. Apart from the problem of costs, and the availability of tools during practicum in the laboratory. Learning during the Covid-19 pandemic. This is caused by a change in the design of the implementation of learning that needs to be adjusted to the health protocol, so that temporarily learning cannot be entirely carried out offline. Learning problems

during the Covid-19 pandemic can be substantial, such as curriculum. In addition, problems can also be technical in nature, for example problems in terms of practical implementation. The Covid-19 pandemic has greatly impacted various fields of education, especially education in Indonesia. Initially, the learning process was carried out at school. However, during the Covid-19 pandemic, learning was only carried out offline (Setiawan, 2020). So that during the Covid-19 pandemic it affected the practicum activities of biology students and biology education.

Development of a Virtual Biology Laboratory based on interactive multimedia as an alternative learning media and measuring the feasibility level. Virlab is an interactive simulation of an experiment in which all manipulations are performed on the computer (Špernjak & Šorgo, 2017). According to Abramov, et al. (2016) virlab is a software that simulates experiments in real laboratories. Virlab has been popularly used in most science learning, especially because it is supported by increased computer capabilities in information processing (Špernjak & Šorgo, 2017).

Virtual laboratories in educational institutions can be used as an alternative or even the main option in assisting the teaching and learning process which will take place as a substitute for a real laboratory if the school and learning conditions are deemed inappropriate. To introduce virtual laboratories, training and assistance are needed which are directly given to Biology teachers or lecturers who will use these media and methods in their learning. Activities can be started by making observations and field studies to check and get the right information regarding the conditions and conditions of the laboratory and the learning process in schools and lectures that will use the virtual lab (Suarja and Aswadi, 2016).

Virlab is an interactive simulation of an experiment in which all manipulations are performed on the computer (Spernjak and Sorgo, 2017). According to Spernjak and Sorgo (In Suryanti, et al, 2019) The use of virlab has several advantages, namely flexibility in setting practicum times and locations, practicum results are immediately available and reliable, practicum can be repeated immediately, no need to frequently buy laboratory equipment and materials, experiments safe and economical because it allows 'working' with hazardous or expensive materials, and shortens the duration of experiments.

Helping the practicum-based student learning process if you experience problems with limited practicum requirements, one of which is using a virtual laboratory. A virtual laboratory is a medium for simulating computer-based chemical practicum activities with the aim of describing chemical reactions that cannot be seen in real situations (Hikmah et al., 2017).

Online learning is a medium generated through programmed interactions via the internet, such interactions range from the complexity of simple downloads of instructional content to structured interactions that include assessments and assigned certifications (Daniel, 2013). According to Ziegler and Diehl (In Diki, 2015:29) suggest that the use of computer networks allows students to contribute ideas in parallel and increases their motivation through social competition. Students in online courses can share their ideas regardless of the contributions of other students. Even if other students contribute different ideas, the contribution of different ideas stimulates the generation of ideas for each student. (Diki, 2015).

The development of the virtual laboratory is currently developing using the metaverse. The metaverse concept was originally developed in 1992 in the science fiction novel Snow Crash by American novelist Neal Stephenson. The characters in Snow Crash become avatars and work in 3-dimensional (3D) virtual reality, and virtual worlds where people interact with each other and their environment without physical, real-world limitations called the metaverse. Metaverse in virtual reality that exists outside of reality. It is a compound word from "meta", meaning transcendence and virtuality, and "universe", meaning world and universe. The Metaverse is the start of creating something new, much like the early days of the Internet. After the metaverse concept emerged, extensive efforts and research were put into making the metaverse a reality. Metaverse as a layer between you and reality. Metaverse refers to a shared 3D virtual world where all activities can be carried out with the help of augmented and virtual reality services (Iswanto, et al. 2022).

According to Dunn, T.J. Kennedy (In Indarta, et al, 2022) Metaverse development also overcomes the weaknesses of currently developing virtual dimensional technology, which still has limitations on the sensations and experiences that are felt. The low self-perception created by 2D virtual technology makes it impossible for users to get an optimal experience when exploring virtual spaces.

A new model of Meta-education, Metaverse-powered online distance education, may emerge to enable new formal and informal learning experiences with the online 3D virtual campus concept (Kye et al., 2021). Online learning in the Metaverse will be able to push the boundaries of social connection and informal learning. Physical presence in the classroom will cease to be a privileged educational experience.

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2 METHODOLOGY

The method used in this research is literature study or literature study. That is, studies based solely on written studies, including published and unpublished studies. The library method is run by finding the relevant reading source and reading it first. Reading sources can be in the form of journals, academic papers, term papers, papers, papers, essays, and other sources that have been written before.

The data obtained were analyzed using descriptive analysis methods that explain the facts, followed by an analysis that not only explains the issues raised by the author, but also provides good understanding and explanation.

The metaversepedia flow, which begins with the Blender or Unity application, is made by students to create a Metaverse-based laboratory. Here we make a simple laboratory that will study cardiac anatomy and cardiac physiology.

3 FINDINGS AND DISCUSSION

By taking advantage of the infinity in the world of the metaverse, this scientific work initiated the idea of creating a metallab, namely a laboratory metaverse featuring laboratories and preparation of learning media. The media used is learning media for the anatomy and physiology of the heart.

At Metaverse Laboratory (MetaLab) we call Metaversitas Biology Laboratory.

Figure 1. Laboratory Metaverse in Front of View

Source: Metaverse Team-built apps, (2022)

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Figure 2. View of Entering a Room in the Metaverse Laboratory

Source: Metaverse Team-built app, (2022)

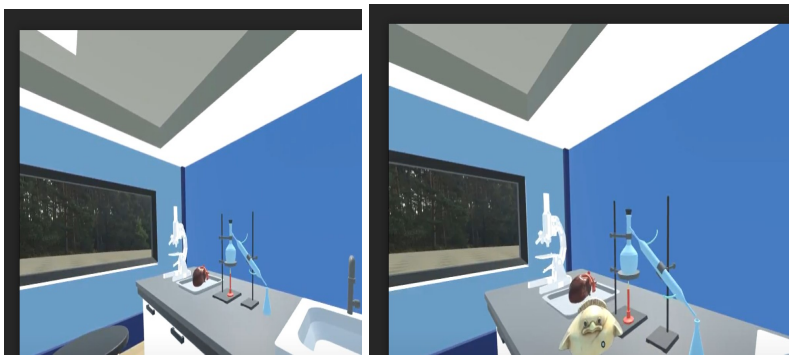

Figure 3. Display of the Lab Workbench in Metaverse Laboratory

Source: Metaverse Team-built app, 2022

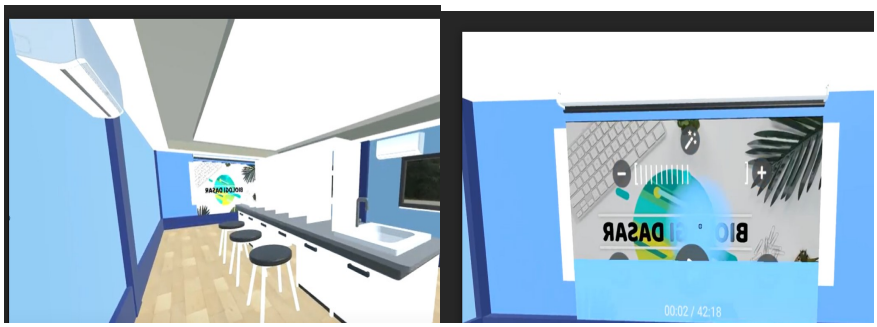

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Figure 4 View of the Material Table in the Metaverse Laboratory

Source: Metaverse Team-built apps, 2022

4 CONCLUSION

Metaverse makes laboratory practicum activities more interesting, cheaper, because it doesn't use consumables, it can be used during the COVID-19 pandemic to help with laboratory practicum learning.

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