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Submission date: 05-Mar-2022 11:19AM (UTC+0700)
Submission ID: 1776933423
File name: PBIO-60150816-IJOBE.pdf (316.66K)
Word count: 3208
Character count: 18050

2
Indonesian Journal of Biology Education
Vol. 4, No. 2, 2021, pp: 1-6
pISSN: 2654-5950, eISSN: 2654-9190
Email: ijobe@untidar.ac.id
Website: jurnal.untidar.ac.id/index.php/ijobe

Student Perception on Biology Subject Using Virtual Laboratory

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Article History
Received : 26 – 09 – 2021
Revised : 26 – 11 – 2021
Accepted : 23 – 12 – 2021

Keywords:
Online learning, Perception, V-Lab Biology

Article link

Abstract

The virtual laboratory plays an essential role in providing visualization of a process in the biological sciences, thus helping students understand biology learning. This study aims to determine students' perceptions at SMPN 15 Yogyakarta on the use of Virtual Laboratory (V-Lab) Biology developed by the Ministry of Education and Culture. This research is a quantitative descriptive study using a questionnaire technique. The data collection instrument is in the form of a questionnaire. The population of this study was students of class VIII odd semester in the 2021/2022 academic year at SMPN 15 Yogyakarta. The number of research subjects as many as 23 students in class VIII D SMPN 15 Yogyakarta. Data analysis was carried out using a Likert scale through 10 statement items related to the use of V-Lab. The results showed that most students gave a positive perception with a percentage range (39-75%). The student has a positive perception of V-Lab and can be an alternative to be used primarily in online learning.

Introduction

The change in learning from face-to-face to online due to the COVID-19 pandemic still leaves many problems. Among the problems that exist is the unpreparedness of teachers and students with online learning forms, so learning objectives cannot be achieved optimally (Dewi, 2020). Although various innovations have been made by utilizing various Zoom Meetings, Google Meet, Live Chat, WhatsApp (Dewi, 2020), Google Classroom (Harefa & Sumiyati, 2020), Exe-Media (Harefa & Suyanti, 2019) to support interaction in online learning.

Other obstacles in online learning that students feel include decreased enthusiasm for learning, boredom, and decreased self-confidence (Anugrahana, 2020). This problem can lead to learning loss; Engzell et al. (2021) stated that students only made little or no progress when studying from home and tended to experience learning loss, especially students from underprivileged families. Therefore, the minimum involvement of students in online learning from home needs special attention.

Students' activeness in learning biology can provide valuable experiences, especially when learning independently. The biology learning process will be more effective if students are invited to explore independent learning experiences (Wisacita, 2020). Nevertheless, the student cannot access the school laboratory to explore independent learning through a practicum. However, some practicum topics cannot be carried out independently at home because of limited tools and materials (Adi et al., 2021); virtual practicum using demonstrations on YouTube or virtual meetings often troubled unstable internet connection, inadequate prior knowledge (Rahmawati et al., 2021) and Lecturers' online learning is carried out to learn basic theory from a practicum (Ambusaidi et al., 2018; Cotta Natale et al., 2020). The online practicum biology using zoom meeting and tutorial on YouTube is not effective (Agustina et al., 2021).

Efforts to involve students in self-exploration can be done with virtual laboratories. The Virtual Laboratory Biology or often abbreviated V-Lab Biology is a practicum system used to help the online practicum-based learning process. According to Safitri and Herawati (2011), the use of V-Lab Biology is not to replace the practical process in Biology learning. V-Lab Biology is an alternative solution to the lack of biology practicum equipment in online learning during the COVID-19 period. Other benefits of V-Lab Biology, namely, students get real experience in learning natural sciences. Experiments are made as authentic as possible to describe the actual practicum. Other benefits that are felt with the presence of V-Lab Biology, namely, students can feel the sensation of conventional practicum without the need to do practical work directly (Dwiyanti et al., 2019). However, there are still many schools that have not utilized V-Lab Biology in the learning process.

Based on an interview with one of the biology teachers at SMPN 15 Yogyakarta in August 2021, information was obtained that the biology science learning process during the pandemic only uses Google Classroom, Google Meeting, Zoom Meeting, WhatsApp Groups, and demonstrations through learning videos. Use V-Lab Biology has not been used by the teacher. Supported by the results of interviews with class VIII students of SMPN 15 Yogyakarta, information was obtained that the use of V-Lab So far, biology has never been used in the biology science learning process. Therefore, on the PLP II program internship opportunities, students try to take advantage of V-Lab Biology on the material Structure and Function of Plant Tissues at SMPN 15 Yogyakarta, precisely in class VIII D.

Systematic analysis and evaluation of utilization V-Lab Biology need to be done to be utilized to the fullest. According to Harefa and Sumiyati (2020), one of the critical indicators to analyze is student perception which is closely related to learning outcomes. A good perception will generally optimize the independent learning process, improving student learning outcomes (Saifuddin, 2018; Surani & Hamidah, 2020). In line with this, perceptions will also affect students' learning interests (Wardana et al., 2018).

Based on this description, this research contributes to documenting students' perceptions of the use of V-Lab Biology at SMPN 15 Yogyakarta. Utilization V-Lab This research biology focuses on the structure and Function of Plant Tissues in Class VIII.

Methods

This research method uses descriptive quantitative research. The research was conducted at SMPN 15 Yogyakarta from August 16 - September 10, 2021. The selection of this location was considered because the school became a partner school for the PLP II Program. Class VIII Semester I Year 2021/2022 students who were given Biology Science lessons were used as the research population. The number of research subjects was 23 students in class VIII D. The sampling technique used was purposive sampling or sampling technique considering that the class that was used as the sample was a class that had a higher level of activity than other classes in the Biology Science learning process.

The data collection technique in this study is a questionnaire through the Google Form application. The questionnaire contains 10 statement items regarding students' perceptions of the use of the Virtual Biology Laboratory on a Likert scale with a range of 5 scales (strongly agree, agree, undecided, disagree, strongly disagree). Supporting data in this research is documentation. The collected data were then analyzed using a descriptive approach and presented in the form of a percentage.

Results and Discussion

V-Lab Biology is expected to increase the spirit of learning and make it easier for students to study Biology material. Research data regarding students' perceptions of the use of V- Lab Biology can describe the perception of utilization V-Lab biology so that the biology learning process can run following the learning objectives. Percentage diagram of students' perceptions of utilization V-Lab Biology, especially in Tissue Structure and Function The plants are presented in Figure 1.

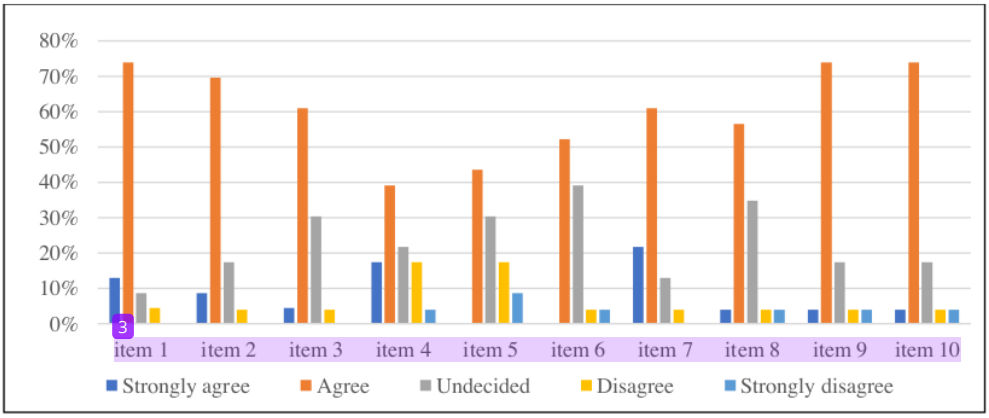

Figure 1. Students' Perceptions of Utilization V-Lab Biology

Based on Figure 1, the results showed that most of the students gave an agree response in the range of 39%-75%. Response data of students' perceptions of the use of V-Lab Biology in particular on the material Structure and Function of Plant Tissues. The agreed response can be measured through 10 statement items in Table 1.

Table 1. Statement of Students' Perceptions of the Utilization of the Biology V-Lab

Item	Evaluation Score
Item 1	V-Lab of Plant Tissue Structure and Function can access easily
Item 2	V-Lab of Plant Tissue Structure and Function can use easily
Item 3	V-Lab can help to learn the Plant Tissue Structure and Function
Item 4	V-Lab make the material on the Plant Tissue Structure and Function easy to understood
Item 5	Students prefer to take biology science lessons online using V-Lab
Item 6	V-Lab of Plant Tissue Structure and Function can increase learning interest students in online learning
Item 7	V-Lab as a media can support the online learning of biology
Item 8	V-Lab of Plant Tissue Structure and Function can motivate the student to learn
Item 9	Learned of Plant Tissue Structure and Function using V-Lab is enjoy
Item 10	Students interested in using V-Lab

Based on a questionnaire with 23 respondents in class VIII at SMPN 15 Yogyakarta, the results showed that most respondents gave a positive perception of the use of V-Lab in online learning of Biology subjects, especially the material on the Structure and Function of Plant Tissues. Positive perceptions from respondents will have a good influence on the learning process of Biology Science. According to Surani and Hamidah (2020), students who give positive perceptions will generally optimize the independent learning process, which can help improve student learning outcomes. Improving learning outcomes can be done with various solutions that can be offered. The use of V-Lab in Biology learning is one example. The following are some of the students' perceptions regarding using the V-Lab in Biology learning in Class VIII D at SMPN 15 Yogyakarta.

Based on Figure 1, the students' highest responses were on easy access (item 1), enjoy learn with V-Lab (item 9) and interest using V-lab (item 10). The ease of accessing the V-Lab is undoubtedly one of the advantages of using this V-Lab because V-Lab can be accessed through the website with the V-Lab URL address that the teacher previously prepared. In line with this Manikowati and Iskandar (2018), users can easily access and use the V-Lab that has been successfully placed at the URL address. Users can also use V-Lab anywhere and anytime (real-time). Virtual-Lab can be accessed quickly can increase students to using this application. If many students use Virtual-Lab can support realized the concept of the openness and sharing of teaching resources (Redel-Macías et al., 2013).

The lowest response showed to use the V-Lab (item 4), the material on the structure and function of plant tissue is one of the abstract biological materials and if it is not explained again, students tend to find it difficult to understand. Using the V-Lab, students can observe each part of the Structure and Function of Plant Tissues for themselves. According to Manikowati and Iskandar (2018), by doing independent

learning, students can construct their understanding of the material being studied during the learning process. Therefore, the use of the V-Lab in Biology learning, especially the material on the Structure and Function of Plant Tissues, is essential.

Utilization V-Lab This online learning process also has a good impact on students. The learning process of Biology Science learning material on the Structure and Function of Plant Tissue becomes easy to understand. Based on the questionnaire, it was obtained that students felt motivated to learn to use the V-Lab. Safitri and Herawati (2011), V-Lab can improve students' understanding and learning experience in learning material. Besides, participants also more easily understand the concept and application of a learning material that students learn.

In use, V-Lab students also feel that interest in learning has increased, and the online learning process has been greatly helped by their presence V-Lab. According to Puspaningtyas and Dewi (2020), it is stated that in online learning, students find it challenging to learn because there is no direct guidance from the teacher. Online learning also provides saturation in the learning process (Amri, 2021; Pavlovic et al., 2015). Thus, if online learning is associated with V-Lab, then the obstacles of online learning can be overcome. Kholiq (2021), learning conditions using the V-Lab have succeeded in generating a sense of pleasure and increasing students' interest in learning in the learning process.

Other benefits that V-Lab can obtain are that students' learning motivation increases, and students feel interested in learning to use V-Lab in the learning process According to Safitri and Herawati (2011), using V-Lab in the learning process will increase students' learning motivation. Hermansyah et al. (2017), state that some of the benefits of using the V-Lab are increasing students' learning motivation and problem-solving skills with critical thinking. Learning by using V-Lab can also provide variations in the learning process that are more interesting so that students are enthusiastic about participating in the learning process. Those are some of the advantages of using V-Lab. Utilization V-Lab can also be used as an alternative solution for learning media, especially in the online learning process as it is today.

Conclusions and Recommendations

Positive prespective showed by student to V-Lab biology, because it is beneficial in studying plant structures and tissues. Socialization to teachers needs to be improved so that more and more teachers are aware of various virtual-based learning media such as v-lab. On the other hand, developing various virtual laboratories on one web page makes it easier for teachers and students to access and support open educational resources.

Acknowledgement

Thank stakeholders of SMPN 15 Yogyakarta as a PLP II partner school and a research place and the Educational Professional Development Center (P3K) of Universitas Ahmad Dahlan for helping to prepare all the necessary administration.

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