Optimization of Pitfall Trap-Based Practicum to Create Student's Well-being during the Covid-19 Pandemic

[1]**Tabitha Sri Hartati Wulandari** [2]**Salma Auliya Yoviska** [3]**Nur Ita Rahmawati** [4]**Sri Cacik**

Universitas PGRI Ronggolawe, Indonesia

Email: sricacik.mpd@gmail.com

Abstract

The Covid-19 pandemic has impacted all sectors including the education. The government applies online learning to stop the spread of Covid-19 virus. So that, motivation, results, and Student's Well-being have decreased. Teachers are required to be more creative in choosing learning methods that can create Student's Well-being. The purpose of this study was to create Student's Well-being in S-1 Biology Education by practical activities on insects's material. The practicum is carried out at home using a Pitfall Trap. This research is a quantitative descriptive study which was conducted using the One-case Study method. The research subjects were 9 student's class 2020 of S-1 Biology Education. The data collection was carried out by observation using a student response questionnaire sheet. The results showed that Pitfall Trap-based practicum carried out at home could create Student's Well-being in S-1 Biologi Education.

Kata Kunci: _Pitfall Trap, Student's Well-being_

Optimalisasi Praktikum Berbasis Pitfall Trap untuk Menciptakan Student's Well-being di Masa Pandemi COVID-19

Abstrak

Pandemi Covid-19 berdampak pada semua sektor kehidupan termasuk sektor pendidikan. Pemerintah menerapkan pembelajaran dalam jaringan (Daring) untuk memutus mata rantai penyebaran virus Covid-19. Hal tersebut berakibat pada menurunnya motivasi belajar, hasil belajar, dan kenyamanan dalam belajar. Sehingga, pendidik dituntut untuk lebih kreatif dalam memilih metode pembelajaran yang dapat menciptakan Student's Well-being. Tujuan penelitian ini adalah menciptakan Student's Well-being pada mahasiswa program studi S-1 Pendidikan Biologi dengan melakukan kegiatan praktikum pada insekta yang dilaksanakan di rumah menggunakan Pitfall Trap. Penelitian ini merupakan penelitian deskriptif kuantitatif yang dilakukan dengan metode One-case Study. Subjek penelitian adalah mahasiswa program studi S-1 Pendidikan Biologi angkatan 2020 yang berjumlah 9 orang. Teknik pengumpulan data dilakukan dengan observasi menggunakan instrumen penelitian berupa lembar angket respon mahasiswa. Hasil penelitian menunjukkan bahwa kegiatan praktikum berbasis Pitfall Trap yang dilakukan di rumah dapat menciptakaan Student's Well-being pada mahasiswa program studi S-1 Pendidikan Biologi.

**Keywords**: Pitfall Trap, Student's Well-being

INTRODUCTION

Improving the quality of education in Indonesia is increasingly demanded in order to keep up with the rapid development of the times. The education system is closely related to the environment in which the education is applied. Currently, there is a change in the curriculum in University where University enforces the *Kampus Merdeka*. This change aims to produce execellent Human Resources (HR), build professional learning, implement an integrated curriculum, and provide adequate facilities and infrastructure. To deal with this, lecturer must strive to improve the quality of theirself, one of which is through active learning. According Widyaningsih & Rosidi (2015), Active learning is a form of learning that allows optimal interaction between teachers and learners. In active learning, teachers and learners have the same role in realizing the maximum learning process. Active learning can provide benefits to Biology learning both carried out in the classroom and outside the classroom, namely providing opportunities for low-skilled learners to better understand learning materials.

The condition of the Covid-19 pandemic makes active learning activities changed. Covid-19 outbreak force teaching and learning process run by online environment to prevent spread of covid 19. The form of active learning that was originally done face-to-face between lecturers and students, and between students and other students, turned into a virtual meeting. The change in learning activities is a consideration and attitude in the face of the global Covid-19 pandemic. Covid-19 is a new type of disease originated from Wuhan, China and spread very quickly throughout the world (Ningsih, 2020). Furthermore, On March 11 2020, WHO (World Health Organization) designated it as a pandemic global (Cucinotta & Vanelli, 2020). However, to respond covid-19 situation, Indonesian government developed several policies on various sectors, especially the education sector. In the education sector, UNESCO provides direct support to every country affected by Covid-19, including solutions for inclusive Online learning (Purwanto et al., 2020). This urges educational actors to innovate and adapt by utilizing technology in the learning process (Ahmed et al., 2020).

Learning innovation efforts must be carried out as a form of adaptation to a change in the learning system, one of which is online learning methods. Online learning methods can be implemented by utilizing online applications and social media (Marleni & Asilestari, 2019). Various platforms that can effectively be used, including: applications, websites, social networks, and Learning Management System (LMS) (Gunawan et al., 2020). However, the results does not meet the expectations. The results of a survey conducted on 51 students showed that 78.4% of students felt bored when the class run online. Based on the results of research Nakayama et al. (2014), Almost all literature in e-learning shows not all students will be successful in participating in online learning. It's due to two important factors, namely the learning environment and student characteristics.

To overcome the condition of students who are bored in online learning, lecturers are required to increase student learning interest (Hasfira & Marelda, 2021; Sulami et al., 2022). It can resolved by innovations in learning methods to foster learning motivation in students with a well behavior in participating into online active learning. It became clear by observation results, where there are 70.6% of students admitted that there needs to be innovations that can cause Student's Well-being in online learning. According Frailon inside Wati & Leonardi (2016), *Student's Well-being is a condition in which a learner has an effective role in his group in the learning process. The rise of Student's Well-being is inseparable from the existence of School Well-being.* According Azhari & Situmorang (2019), School Well-being provides several positive impacts, namely learners feel comfortable and motivated to learn, learners feel that difficulties in learning are a challenge, making learners more successful in the learning

process, and learners easily adapt to the learning environment. Align with previous research Hasanah & Sutopo (2020) stated *School Well-being* has a strong correlation with learning motivation. Learning motivation has a positive correlation with learning outcomes, meaning that learners who have high learning motivation will get high learning outcomes as well. Furthermore, Irsyad & Fauzi (2020) reported that learning motivation has a positive relationship with the learning outcomes of Biology of MAN Tasikmalaya students. Based on this information, it can be concluded that Student's Well-being is one of the factors that affect student learning outcomes. Student's Well-being gives students a sense of pleasure to participate in learning. Student's Well-being plays a very important role in the learning process. High student's well-being has a positive effect on improving learning outcomes, meaning that students who are not pleasant in the learning process will get less than maximum learning results. Thus, it is needed to create a Student's Well-being atmosphere in Online learning, so as to make students happy and enthusiastic in following the learning process.. Regarding Na'imah & Tanireja (2017), Student's Well-being is based on the relationship between social, cognitive, emotional, physical, and spiritual dimensions, in addition to factors that can hinder Student's Well-being is the existence of problems in all four dimensions.

Practticum activities carried out online in courses in the Biology Education study program need to be pursued as activities that can create Student's Well-being, so that the success of practicums achieved in Online learning is maximized. The form of practicum activities that can be done is to hold a practicum at the home of each student. Practicum is one of the learning methods that can attract students to develop science concepts, because practicum can provide experience and knowledge by observing phenomena that occur directly, so as to increase students' understanding of the concepts that have been learned (Hamidah et al., 2014). Under normal conditions, practicum activities are carried out in the laboratory using complete materials and equipment so that they can run optimally (Yunus & Syam, 2021). During the Covid-19 pandemic, practicums that are usually carried out in the laboratory must be done by the Online method (Astuti et al., 2021). Online practicum can be done using a variety of methods and utilizing simple tools to replace the tools available in the laboratory. Based on the results of the questionnaire, 66.7% of 51 students agreed with practicum from home in online lectures. One form of practicum that can be done, namely in the Invertebrate Animal Systematics course, the subject of Insect Identification. In the activity of identifying insects can be done from home using Pitfall Trap.

Pitfall Trap is one method that can be used to capture or trap insects. Various types of insects can be framed using Pitfall Traps, such as ants, grasshoppers, cockroaches, etc. The effectiveness of using Pitfall Trap depends on several factors, including weather, food willingness, placement, construction of device materials, etc. According Fahmi (2016), Pitfall Trap is a very useful, inexpensive method, and can be used quickly to assess communities from macroarthropods. However, Pitfall Trap can only be used to assess population size because the catch using Pitfall Trap only represents the density and mobility of insects. Pitfall Trap consists of a bottle filled with preservative liquid or soap that is placed parallel to the surface of the soil. Pitfall Trap should be emptied daily and protected from rain by using a roof. This research aims to analyze the optimization of the application of Pitfall Trap-based practicum which is expected to create Student's Well-being in students.

METHOD

The research instrument used is a student response questionnaire to the implementation of pitfall trap-based practicum. The questionnaire grid includes: (1) ease and practicality in practicum, (2) timeliness in doing practicum, (3) feelings of pleasure in practicum, (4) ease of finding practicum tools and materials, (5) practicum benefits to reduce bored feelings, (6) ease of understanding material. Before the questionnaire was used in the study, researchers conducted an instrument validity test on two experts to determine the feasibility of the research instrument. The average percentage of eligibility obtained is 84% or good category, so the instrument is worth using. To analyze the data, researchers count the percentages and categorize of result from questionnaire with the formula and table below:

$$Precentage = \frac{Score}{Total\ Score} \times 100\%$$

Table 1. Criteria for Student Response to Pitfall Trap-Based Practicum during the Pandemic

Percentage (%)	Categorized
81,25 < score≤ 100	Excellent
62,5 < score ≤ 81,25	Good
43,75 < score ≤ 62,5	Fair
25 < score ≤ 43,75	Poor

Sources: Sugiyono in Auliya & Lazim (2020)

Current research is descriptive quantitative research with one-case study in aims to manage data from questionnaire regarding Online learning and remote practicum implementation on the intersection of Insect Identification using the Pitfall Trap tool. This research was carried out in the S-1 Biology Education study program, PGRI Ronggolawe University (Unirow) Tuban, odd semester of the academic year 2021/2022, which took the Invertebrate Animal Systematics course. The research was conducted in December 2021, when online learning was implemented during the Covid-19 pandemic.

The population of this study is all undergraduate students at Biology Education study program, Universitas PGRI Ronggolawe. Consists of 9 students and categorized as less of subject then researcher decided to use Saturation sampling as the sampling technique. It means all members of the population became sample of research. In the implementation of remote practicum, students do it individually. The research procedure had three stages, they are: (1) Online learning activities via Telegram to provide material on Insect Identification practicum using Pitfall Trap media, (2) explanation of practicum procedures, and (3) students carrying out practicum independently using the same tools and materials. In this 3rd stage, students carry out Pitfall Trap-based practicums in accordance with the Student Worksheet that has been given. In Student Worksheet, it has been determined the tools and materials to be used by students, the steps of practicum activities to be implemented, and the demands of output in the form of reports of practicum results collected. Furthermore, research data related to Student's Well-being was taken during the implementation of Pitfall Trap-based practicum using research instruments, namely questionnaires through Google Form. So, after the study subject conducted a Pitfall Trap-based practicum, the study subject filled out a questionnaire given by the researcher on the Google Form link given to show the response of the study subject. According Wati & Leonardi (2016), Many students feel less happy with the learning process they do in school, then students prefer not to participate in learning activities. The practicum procedure using Pitfall Trap and Pitfall Trap design is shown by Figure 1 and Figure 2.
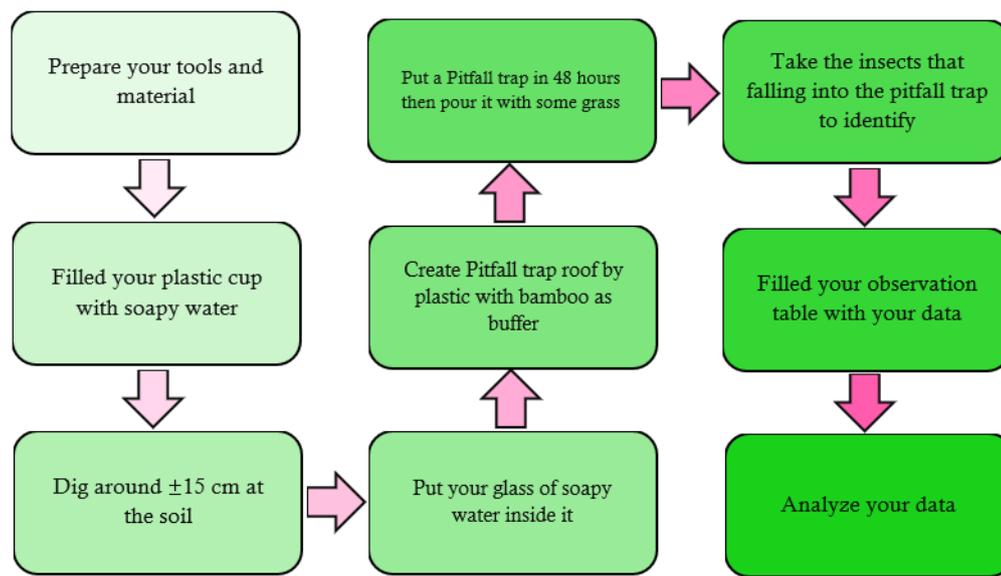
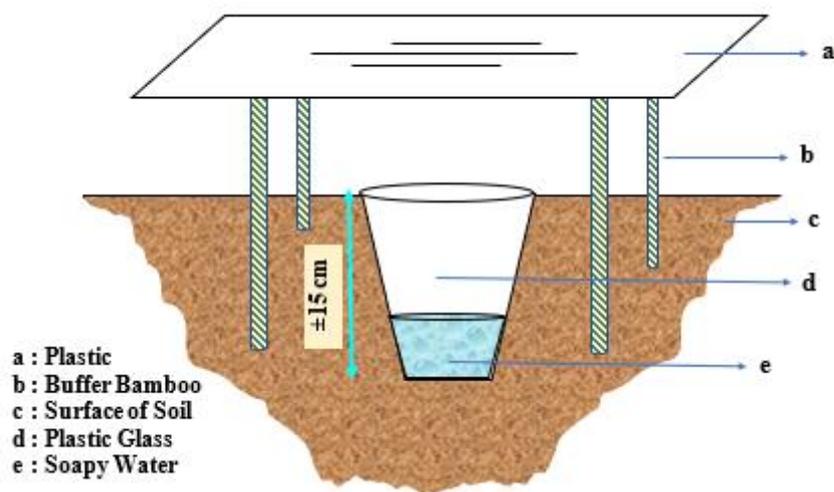*Figure 1. Practicum Procedure of Pitfall Trap*

a : Plastic
b : Buffer Bamboo
c : Surface of Soil
d : Plastic Glass
e : Soapy Water

Figure 2. Practicum Design with Pitfall Trap

RESULT AND DISCUSSION

Student questionnaire data shows students' responses to Fitfall Trap-based practicums that have been implemented during the Covid-19 pandemic as seen in Figure 3.
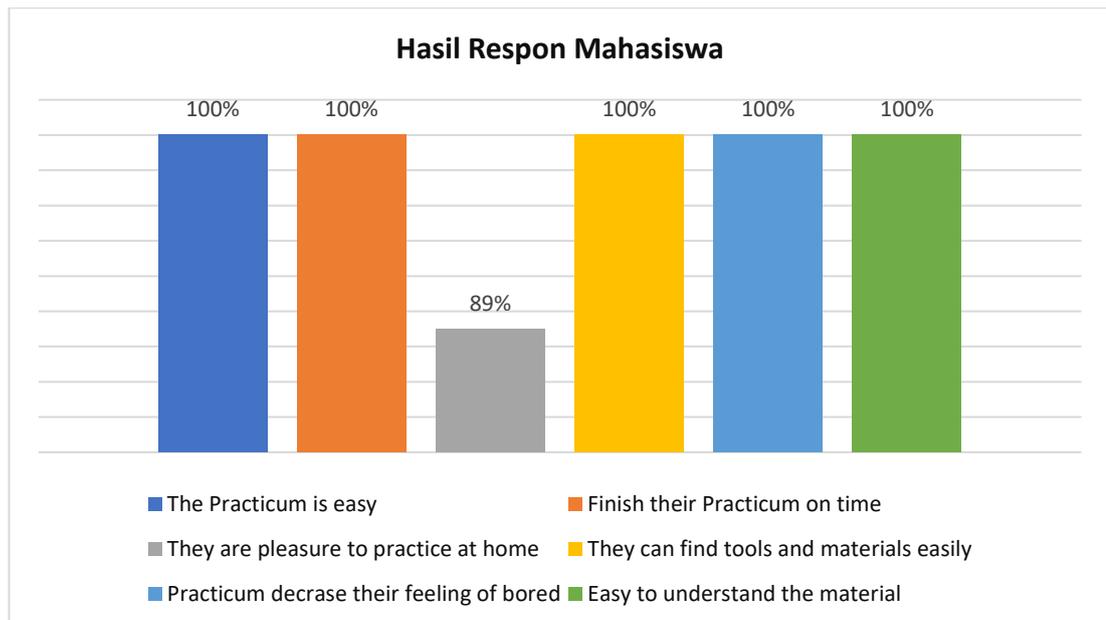
Figure 3. Students Response

Based on the bar diagram shown by Figure 3, as many as 100% of students feel that the implementation of the Insect Identification practicum using Pitfall Trap from home is easier and practical compared to practicum implementation in the laboratory. As many as 100% of students can do practicum on time. As many as 89% of students who feel happy because they can practice practicum from home and the remaining 11% do not feel happy with the reason of fear of insects. As many as 100% feel that practicum tools and materials are very easy to obtain in the environment around the student house. As many as 100% of students feel practicum with Pitfall Trap can reduce the saturation of staring at a laptop or mobile phone in carrying out lectures. The results of the questionnaire showed that 100% of students stated that it was easier to understand the material regarding Insect Identification after carrying out practicum using Pitfall Trap at home. All percentages of student responses show excellent categories, so the implementation of practicum from home by using Pitfall Trap on the subject of Insect Identification can create Student's Well-being.

During the Covid-19 pandemic, the S-1 Biology Education study program, Unirow Tuban carried out the first remote practicum on the subject of Insect Identification. The remote practicum procedure is in accordance with the learning achievements of invertebrate animal systematic courses. This is reinforced by the results of the student questionnaire, namely all students agree that the practiceum material of Pitfall Trap-based Insect Identification is in accordance with the learning materials in Telegram. Based on the results of the evaluation given to 9 students in Online learning through Telegram, only 4 students were able to achieve scores above 75, so it can be said that students have not been able to understand the material. Therefore, practicum is needed so that students are easier to understand the material. It align with Wusqo et al. (2016), They stated if Students tend not to be able to understand lecture materials because the delivery of material is too monotonous and there is no direct experience. Therefore, students need hands-on experience to identify insects through pitfall trap practicums. Practicum instructions in the form of MFI given by lecturers of courses consist of: (1) steps of preparation of tools and materials, (2) steps to make Pitfall Trap at home, and (3) identification of insects found in Pitfall Trap.

The results of pitfall trap-based practicum provided by students show that all students are able to identify the insects they have found and help them more easily understand the material described by lecturers when learning online. All students can understand the procedure for making pitfall traps used for practicum. This shows that students understand and are able to carry out practicum at home. Align with Arifa (2020), One of the causes of difficulties experienced by students in understanding the material when learning online is caused by the lack of concentration of students. All students are able to carry out pitfall trap-based practicum individually. Table 2 shows the practicum results of students by using Pitfall Trap to identify insects.

Table 2. Students' Practicum Outcomes

Total	Figures	Morfology Description
1	 Mosquito *(Culicidae sp.)*	▪ Black ▪ Life around the home ▪ Size ½ cm ▪ Abdomen has a cylinder shape and consist of 10 segments, 2 segments at least become its genitals ▪ It has 3 feet attaches on thorax, consiste of 1 femur segments, 1 tibia segments and 5 tarsus segments.
1	 Clothing moth (*Tineola bisselliella*)	▪ The body part is divided into 3 such as the head, thoracic, and abdomen ▪ It has 2 pairs of wings ▪ It has 1 pair of antennas ▪ Brown eyes ▪ It has 3 pairs of legs ▪ Pale brown body ▪ Size around 3.5 cm
1	 Beetle (*Chlaenius amplipennis*)	▪ Blackish brown ▪ It has a hard shell ▪ Small size but there are also large ones ▪ 3 pairs of legs ▪ It has an antenna ▪ It has 2 couples of wings
1	 Dragonfly (*Onychogomphus forcipatus*)	• Consiste of head (caput), chest (thoracic), and abdomen (abdomen) • Colored green and black interlude • The head is relatively larger than the body. • The shape is rounded/elongated to the side with the back notched inward • It has a pair of large compound eyes consisting of many small eyes called ommatidium • Between the two compound eyes is a pair of short antennae that are smooth like threads. • Thoracic consists of three segments, namely protoraks, mesotoracs, and metatoracs, each segment supports one pair of legs. • The abdomen consists of several internodes, slender, and elongated like a tail or slightly widened.

Total	Figures	Morfology Description
		• Wings are oblong/elongated and translucent
14	Black Ant (*Monomorium minimum*)	• Minimum monomorium has a shiny black body color • Length about 7 mm • On the head there are 2 antennas that are used as sensor organs, compound eyes, mandibles • The thorax part is evenly distributed and there are three pairs of legs, on the abdomen the tip does not have thorns
10	Black Ant (*Dolichoderus thoracicus*)	• Black • It has an antenna • Size 0.2 - 0.3 cm • The body is divided into parts of the cephalon, thorax, and abdomen • It has 3 pairs of legs
3	Red Ant (*Solenopsis invicta*)	▪ Reddish in color ▪ Has an antenna ▪ Measuring 0.2-0.3 cm ▪ The body is divided into parts of the cephalon, thorax, and abdomen ▪ It has 3 pairs of legs
1	Mosquito(*Culicidae sp.*)	▪ Black ▪ It has 2 pairs of thin wings ▪ Consists of parts of the cephalon, thorax, and abdomen ▪ Female mosquitoes have longer suckers ▪ Size 3-4 mm
10	Fire Ants (*Solenopsis invicta*)	• Red • It has 3 pairs of legs located on the chest • The body is divided over the head, chest and abdomen • It has antennae, has compound eyes • On the front of the head there is also a pair of jaws or mandibles used to carry food.

Total	Figures	Morfology Description
		• Building nests and defenses • It has a body length of 0.5 cm
1	 Mature Beetle of Lepidota (*Lepidiota stigma*)	• The body consists of 3 parts, namely coconut, thoracic and abdomen. • It has a pair of antennae on the head • It has 3 pairs of legs where the foot has thorns (a sharp surface to be able to climb trees) • It has 2 pairs of wings • It has a hard wing cover • Brown body • Body length approximately 3-4 cm • It is a nocturnal animal • Life as a parasite for sugarcane plants.
1	 Green Steamed Grasshopper (*Antractomorpha crenulata*)	• The body is green • It has a pair of antennae on the head • It has 3 pairs of legs attached to the thoracic • Including insects that have 2 wings • Generally has long hind limbs and 2 pairs of legs in front are smaller • It has 3 parts, namely the head, thoracic, and abdomen • Has a body length of approximately 4 cm
3	 Fly (*Musca domestica*)	• The relatively large head is equipped with antennae • Have compound eyes • Have a pair of wings on the front • It has a short antenna • Modified mouth according to its function (piercing, sucking, licking)
1	 Red Ant (*Solenopsis invicta*)	• The body consists of three parts, namely the head, mesosoma (chest), and metasoma (abdomen). • Morphology is quite clear when compared to other insects that both have antennae, metapleural glands, and peduncles. • The peduncle is the second part of the abdomen that is connected with the ant stalk forming a narrow waist • The peduncle is located between the mesosoma (part of the chest cavity and abdominal area) and the metasoma (abdominal lack of abdominal segments in the petiole) • Petioles are formed by one or two nodes (only the second or second and third abdominal segments of this can be realized)

Total	Figures	Morfology Description
		• It has 4 feet
205	Ghost Ants (*Tapinoma melancephalum*)	• Have a small body • The Head has a dark brown blackish • Reddish-yellow belly • It has a white legs

Based on the practicum results shown by Table 2, it is known that all students are able to observe practicum results, which include: observations of the morphology of insects found, insect habitats, and insect diversity in their respective regions. The ability to observe and write practicum data is a critical thinking ability developed through the implementation of practicum activities. It supported by Rosa & Nursa'adah (2017), they stated If learning with practicum requires students to play an active role in developing the ability to think critically for solving a problem through the identification of practicum data for answers to be found.

Although Pitfall Trap-based practicums are carried out at home with simple materials and equipment, the risk of practicum activities remains if the study subject is not careful in doing so. For example, Pitfall Trap-based practicum uses chemicals in the form of soap solution, if the soap solution hits the eyes will cause pain or irritation. The results of the questionnaire showed that all students were able to carry out practicum while still prioritizing work safety and health protocols. Practicum at home or remotely must be designed in such a way as not to be dangerous for students to be carried out at home.

The implementation of practicum activities in this research can be used as one of the alternatives to Online learning that can create Student's Well-being. Na'imah & Tanireja (2017) States that Student's Well-being as an atmosphere that is safe, happy, harmonious, healthy, and obeys the rules. From this it can be known that the welfare of students is not only from physical things but also from social, psychological, and cognitive things (Na'imah & Tanireja, 2017). Well-being is a broad and diverse concept that describes aspirations for students in living a happy and fulfilling life. Well-being includes subjective experiences and student abilities (psychological, cognitive, and social functions).

When compared to previous research, this study focuses on creating Student's Well-being in Online learning. It's carried out with Pitfall Trap-based practicum which occured independently at home. This research still has a drawback, that is, the study is only done in one class where the number of samples is equal to the number of populations, so it cannot be generalized. This is because the number of students in the undergraduate Biology Education study program, Unirow Tuban is relatively small. In addition, the residences of the study subjects were in the same or adjacent districts, so the insects found were less diverse. For further research, it can be done at other school or university levels, so as to strengthen the proof that practicum is based on Pitfall Trap and create Student's Well-being on Online learning.

CONCLUSION

Based on the results of the study, it can be concluded that Pitfall Trap-based practicum activities during the Covid-19 pandemic can create Student's Well-being. Pitfall Trap-based practicum is designed with clear stages and can foster a feeling of pleasure in students. In addition, Pitfall Trap-based practicum activities can also make it easier for students to

understand the materials delivered in Online learning. This can be known from the positive response of students through questionnaires that have been given through Google Form. As many as 89% of students are able to understand the material after a Pitfall Trap-based practicum is carried out at home. Furthermore, research can be conducted that supports or strengthens the effectiveness of pitfall trap-based practicums on learning outcomes and critical thinking skills. In addition, the same research can be done on students at the elementary, junior high, and high school levels.

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