



Excursion Study Course Based on Student Location as a Practicum Model During the Pandemic Project Based Learning Model

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Abstract. In the covid 19 pandemic era, lectures and practicums cannot be carried out on campus, including the Biology Excursion Study/Biology Field Study course. The learning achievement of this course is that students can design, implement, report, develop learning products and evaluate learning independently through the Project Based Learning model. To achieve this goal, it is necessary to make several adjustments in various aspects, including determining the object of biology, data collection methods, observation locations, data collection and processing techniques, product preparation techniques, and results dissemination techniques. Learning is delivered by lecture of concepts and examples of excursion studies that have been carried out, from proposal preparation to reporting and product preparation. Furthermore, students identify objects and problems to be studied in the environment where they live, followed by the formation of committees and preparation of proposals. All biological objects available around student can be used as learning objects including Ornamental Plants, Medicinal Plants, Macro Fungi, Insects, etc. The problems studied are adapted to the theme of biological problems, and agreed by the students to be adapted to the conditions of residence and available equipment, including the diversity of organisms, classification, structure, function, ecology, etc. The observation methods are adapted to the object of observation. Data were collected by students, then collected and analyzed communally. The research results and discussion are compiled in the form of a book and validated by experts in their fields. Books as research products are registered ISBN in the national library.

Keywords: Biology education · Excursion study · Online practicum · Project Based Learning

1 Introduction

Digital transformation has been going on since before the covid 19 pandemic, it's just that with the pandemic the process of digital transformation is getting faster. The COVID-19 pandemic hurts not only human health, but also the economy as well as other sectors of life throughout the world [1, 2]. The education sector especially has also been hardly

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affected by the COVID-19 pandemic [3]. The teaching and learning processes are organized differently as a result of the COVID-19 pandemic in the education sector. The implementation of teaching and learning as part of student activities is completely limited. Options to do activities outside the room is very limited, even people are forced to “stay at home” in order to reduce the rate of transmission of covid 19 [1].

Students who are also included in the community group that must “stay at home”. Lectures are no longer held on campus, but from the homes of each student. Lectures are held online by lecturers with university facilities. The more severe the impact of the COVID-19 pandemic, making more people choose to change their daily routine to digital routine [4]. School and university students and office workers, become the most transform routines. Covid 19 is not directly related to the digital transformation process, but the existence of covid 19 has made a lot of people choose to stay at home and change their work patterns to digital. [5].

Learning that is carried out digitally, has quite a lot of challenges and difficulties in addition to the convenience [4]. [6] said that many learning institutions such as universities or schools need to rethink how to organize effective learning using digital technology following the policy regarding the closure of learning places, as well as restrictions on community activities. Including in biology learning, teachers do a lot of re-evaluation in terms of processes, methods and techniques used in learning, especially in the distance learning process. [4].

In the biology learning process, the biggest challenge of distance learning or digital learning is students cannot face with biological objects directly. [7, 8] states that a biology teacher, should be able to bring biology learning to an experiential level, because learning gained from experience will provide higher retention and can increase the effectiveness of learning. In biology learning, providing opportunities for students to study biological objects directly in their habitats can produce learning outcomes with the strongest retention rate. This illustrates that learning biology by meeting directly with the object of biological study has a higher learning effectiveness than those who do not meet the object of biological study directly.

These problems are clearly illustrated in the pattern of distance learning or digital learning. How so that students can meet the object of biological studies in the middle of learning that is held digitally. Of course, this can be solved with the existence of learning media. [9] states that learning media can increase the effectiveness of learning. Of course, this statement must be supported by appropriate learning media in accordance with the material and learning patterns. The learning media created, of course, need to be arranged as closely as possible like direct learning.

Learning media that are able to provide a learning experience as close as possible to direct learning, of course, require high digital competence and also need to be supported by sophisticated computer devices. [10, 11] explained that the process of developing digital learning media requires certain computer specifications so that development can run well. Likewise, later when the digital learning media is used by students, the computer to run the learning media also requires minimal applications and specifications so that the media can operate properly. With these considerations, it is not easy to use digital learning media because not all students have qualified computer equipment.

Apart from the computer specifications that have minimal requirements to be able to carry out their operations properly, there are other major difficulties that are often still a barrier to the learning process online in Indonesia. This is not fast enough and strong telecommunications network in Indonesia. This is also coupled with the unequal distribution of telecommunications networks throughout the Indonesian archipelago, so that students often have difficulty accessing signals [12, 13].

By considering these things, of course, the team of lecturers for excursion studies needs to look for other alternative solutions so that they can continue to organize online learning, but students can still access biological objects directly so that students can interact directly with the objects of biological studies. Of course, this as part of field lectures, can provide a better learning experience than if students were only studied by online learning [14, 15].

To be able to facilitate the need for excursion study lectures, the lecturer team tried to find other learning models that could be integrated with the online learning process. Learning that is used as an alternative solution in excursion study lectures is Project-Based Learning. The excursion study lecturer team made several adjustments to be able to make project-based learning an appropriate alternative solution during the COVID-19 pandemic.

1.1 Project-Based Learning

[16] who was the first to say that the basis for all education held at universities are lectures held with a project-based learning model. Students are asked to be more sensitive to their surroundings, by trying to pay attention to the details around them. Problems found by students are then analyzed to find alternative solutions. The solutions that have been obtained are then worked on together in teams so that the problems that occur can be completely resolved. This makes students a solution to the problems that exist in the daily life of the community.

This explanation is in line with what was stated by [17] who said that utilizing project-based learning provides students with opportunities to be able to focus on goals and results but balanced with a collaborative process to be able to practice solving problems that actually occur. This of course makes the power balance between focusing on results and goals but also paying attention to the process in achieving these goals.

[18] in his research stated that project-based learning can be a good alternative to be applied in biology learning. This is because students can be motivated to learn to make biology projects individually or in groups. The same thing was also conveyed by [19] that the strength of project-based learning is the project-based learning model, students can apply theoretical knowledge with psychomotor skills directly and students have the opportunity to learn directly from their mistakes.

[20] provide reinforcement that strong interactions between students and their learning materials, teachers, other students are some key components of the learning process. With a strong interaction between student-teacher-material, students can apply their knowledge and develop a strong mentality to be able to connect information and concepts. It can all be facilitated in a project-based learning.

In the learning process using project-based learning, all areas of learning can be measured, so that student achievement can be described holistically. This is as expressed

by [21] that cognitive, affective and psychomotor outcomes can be measured in learning using a project-based learning model, which of course uses different instruments.

Teachers in Finland are claimed to have proven that project-based learning in their learning can increase student motivation and collaboration as well as student-centered learning. [22]. [23] in his research found that students' attitudes were improved as an effect of being motivated to learn through project-based learning. This is also due to the involvement of physical learning. The same thing was also conveyed by [24] that to increase the effectiveness of learning behavior for both teachers and students, is to use a project-based learning model.

So many advantages of using a project-based learning model, there are also some disadvantages of this learning model. [25] stated that one of the shortcomings of project-based learning is the lack of uniformity in the teacher's vision so that project-based learning cannot be implemented exactly the same in every class, the impact is that the evaluation results are also still too biased. This is also in line with [26] who said that the use of project-based learning resulted in knowledge and learning experiences that varied greatly from one student to another. This causes uneven learning outcomes.

If this project-based learning is carried out in an offline class, the teacher needs to ensure that the class remains well conditioned. This is due to the fact that classes with project-based learning tend to be more difficult to condition [27]. Several other things that also become difficulties from implementing project-based learning include time and costs which tend to be larger, requiring more complete and adequate facilities and infrastructure [28]. Another thing that needs to be addressed if you want to apply lectures using project-based learning is a strict and disciplined schedule of activities to be carried out according to the plan.

One of the trends in the use of this project-based learning model is the lack of time for project completion. One of the characteristics of the use of project-based learning is the existence of learning outcomes in the form of products in the form of goods or services to be able to help the community directly or indirectly. The preparation of this product is often not completed on time, although it can be an exercise for students to be able to anticipate it.

Among the numerous discussions on the benefits and drawbacks of combining lectures with project-based learning, in the end the excursion study lecturer team held a joint discussion to be able to deal with lectures so that lectures could take place well. Several considerations are mixed and made into a single unit so that the lecture can take place well, and students can experience the learning first-hand experience.

2 Discussion

Observing the advantages and disadvantages of project-based learning put forward by the researchers, our team of lecturers of excursion studies conducted a discussion to determine what patterns could be applied to excursion study lectures. Lecturer team discussions were also held online and carried out before the first week of lectures. This is also done to uniform the pattern of lectures between one class and another class.

In terms of the achievement of lecture results, the competencies that need to be mastered by students after taking excursion courses are that students can design field research,

choose objects and themes of biological problems to be studied, prepare research tools and materials, collect field data, process and analyze field data and produce products from the research in the form of goods or services. All of this is done independently by students, as an exercise to prepare themselves as biologists. Lecturers have the capacity as facilitators in this lecture process.

As a consideration that project-based learning takes a long time, the lecturer team has considered it by making project-based learning throughout the semester. That way, project-based learning syntax can be allocated a long enough time so that it can get good results. In one semester there are 16 meetings in excursion study lectures. So, the syntax of project-based learning will be allocated into 16 meetings, except at the first meeting as an introduction, discussion and lecture assistance and lecture contracts, and the last meeting which is used for seminars resulting from excursion study products. The finished product will be held in seminars through an online meeting platform that can be attended by all academics.

The results of this excursion study are compiled in the form of a book as a reference book. Books arranged in excursion study courses follow the pattern of 4D modelling [29]. The book from the results of this excursion study course goes through the process of define-design-develop-dessiminate, although not all the detailed stages of the steps are met. The resulting book is then edited by selected lecturers as well as being an expert judgment in providing a review of the resulting book. The results of the review of the book, will be a revision for the book to be even better. Books that have gone through the review and revision process will be registered with the National Library of Indonesia, so that the National Library of Indonesia will issue an ISBN.

Of the remaining 14 meetings, the following is the allocation of time per week for excursion study lectures (Table 1).

The project-based learning process, which does take a long time, is circumvented by implementing it throughout the semester. The uneven learning outcomes described earlier as a lack of project-based learning were circumvented by dividing small groups of students based on the objects and themes of the biological issues raised. With this small group division, it is hoped that learning outcomes can be more evenly distributed among fellow students in the class.

The selected biological object is a biological object that is easily found in the location around the student's residence. It can be animals, plants, or fungi, generally macroscopic is chosen because students will need special tools if the object under study is microscopic. On the other hand, the biological issues raised are also important to be considered together. The most basic biological research is the identification and inventory process. From this research, the theme of biological problems closest to identification and inventory is the uniformity and diversity of living things.

Functional structure, ecology and environmental science, behavior of organisms, are other choices of the chosen theme of the problem. In principle, each student collects biological facts and data independently in the location around his residence. The collected data is then processed into shared class data and analyzed based on the right methodology. The discussion of the methodology will not be separated from the discussion of data collection techniques. In the study of biology, data collection techniques are relative, depending on what object is chosen to be observed and the data taken.

Table 1. Distribution of project-based learning based on the number of lecture meetings.

Session	Assigned activities
1	Introductions, assistance, and college contracts
2	Planning the object and theme of the biological problem to be studied, adjusted to the location of the student's residence, and discussion of research methodology.
3	Creation of student working groups and preparation of communal proposals.
4	Preparation of tools, materials, schedules for data collection and online tools that are used as a joint container for the data that has been collected.
5	Data retrieval 1
6	Data retrieval 2
7	Data retrieval 3
8	Data retrieval 4
9	Re-examination of data that has been and has not been collected
10	Data retrieval 5
11	Presentation of the results of the data collected
12	Presentation of the results of the data collected
13	Analysis, discussion and develop the product.
14	Product review process to expert judgment. Presentation of the results of data analysis and discussion.
15	Improvement of the product in accordance with the revised results of the reviewer.
16	Seminar on research results and ISBN submission to the National Library of Indonesia

3 Conclusion

By using a project-based learning model, and with students doing the project in their respective homes, the lecture process of excursion studies can take place online in the implementation of class facilitation and students can continue to meet the object in person and be able to examine biological problems directly in the habitat of the biological object. Students also produce products in the form of goods, namely books containing the results of research conducted by students during the lecture process.

Project-based learning models can be the best alternative to be able to carry out the learning process during a pandemic, especially learning with practices based on student locations.

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