Edubiotik: Jurnal Pendidikan, Biologi dan Terapan
ISSN 2528-679X (print), ISSN 2597-9833 (online)
Vol. 6, No. 02, September 2021, pp. 91 – 98

Available online at:
http://ejurnal.budiutomomalang.ac.id/index.php/edubiotik

Research Article

OPEN ACCESS

Implementation of ecopreneurship-oriented project-based learning (pbl) to improve the entrepreneurial spirit and student learning outcomes

Ana Rokhmawati*, Puji Savvy Dian Faizati

Mathematics education, STKIP PGRI Lumajang, Lumajang, Indonesia
Email: rokhmawatiana@gmail.com*, savvydian@gmail.com

Article Information
Submitted: 2020-08-28
Accepted: 2021-09-01
Published: 2021-09-18

ABSTRACT

The Environmental Knowledge course is a compulsory subject for STKIP PGRI Lumajang students. The value of student learning outcomes in this subject is low. In addition, based on the results of the questionnaire, it is known that the entrepreneurial spirit of students is low. The objective of this research is to improve the entrepreneurial spirit and student learning outcomes through ecopreneurship-oriented project-based learning. This type of research is classroom action research. The subjects in this research were students of Mathematics Education STKIP PGRI Lumajang class 2019. The research instrument used was an entrepreneurial spirit observation sheet with a rating scale and cognitive learning outcomes test questions. There are 13 test questions in this research. Data collection techniques using observation and tests. Based on the results of the research showed that the entrepreneurial spirit of students in the first cycle was 77.24 and in the second cycle was 83.90. Student learning outcomes in the first cycle of 73.96 and the second cycle of 80.54. This shows that the implementation of ecopreneurship-oriented project-based learning improves the entrepreneurial spirit and student learning outcomes of STKIP PGRI Lumajang in the Environmental Knowledge course.

Keywords: Ecopreneurship; pbl; entrepreneurial; learning outcome

Publisher
Biology Education Department
IKIP Budi Utomo, Malang, Indonesia

How to Cite
Rokhmawati, A., & Faizati, P. (2021). Implementation of ecopreneurship-oriented project-based learning (pbl) to improve the entrepreneurial spirit and student learning outcomes. *Edubiotik: Jurnal Pendidikan, Biologi Dan Terapan, 6*(02), 91-98. https://doi.org/10.33503/ebio.v6i02.894

INTRODUCTION

Along with the development of the Asean Economic Community (AEC), higher education is required to produce graduates with entrepreneurial spirit (Santoso, 2018). Universities, as educational institutions, could produce entrepreneurs by offering entrepreneurship courses (Masjud, 2020). In this case, STKIP PGRI Lumajang also has a strategy to improve students' abilities in entrepreneurship. As stated in the STKIP PGRI Lumajang Strategic Plan, which is to increase the potential of students' talent and entrepreneurial interest, entrepreneurship-based courses are applied.

The Environmental Knowledge course is a compulsory subject for STKIP PGRI Lumajang students in Mathematics Education Program. Based on the results of observations in the Environmental Knowledge course at STKIP PGRI Lumajang, it is known that the learning methods in this course are lectures and discussions. The post-test score of students of Mathematics Education class 2019 in the subject of Environmental Knowledge, Basic Concepts of Environmental Science and Human and Environmental Relations has an average of 56.5. Based on the post-test results shows that student learning outcomes are low because to achieve the pass criteria at STKIP PGRI Lumajang a minimum score of 65. In addition, based on the results of the questionnaire, there are 17% of students who have businesses such as selling hijab, clothes, and pet businesses. The business is still self-managed on a small scale. Meanwhile, the other 59% of students who do not have a business stated that they have a desire to be entrepreneur but do not know what business opportunities they can do. This shows that there is a need to improve the entrepreneurial spirit of students so that students can make decisions about their business. Therefore, to improve the entrepreneurial spirit and student learning outcomes of STKIP PGRI Lumajang, the researchers applied Environmental Knowledge courses integrated with entrepreneurship material through project-based learning.

Entrepreneurship in this course is packaged in project assignments so that students are directly involved as a whole in making business products. Entrepreneurship in this course is carried out by utilizing the environment such as waste or other items that are no longer used to be processed into products that have economic value. Entrepreneurship with this model is called Ecopreneurship. Ecopreneurship is entrepreneurship through an environmental lens. The term ecopreneurship is a combination of two words "ecological" ("eco") and entrepreneurship. In this case, ecology contains the interaction between living things and their environment, while entrepreneurship contains business activities that use resources to produce goods and services. Thus, ecopreneurship is the search for new opportunities that help protect the environment in pursuit of environmental sustainability (Masjud, 2020; McEwen, 2013). According to (Saludung & Yahya, 2018), ecopreneurship is a term created to environmental problems in a sustainable manner. It is hoped that the existence of ecopreneurship can solve environmental problems that can generate benefits for the community.

This study showed the implementation of ecopreneurship-oriented project-based learning. Project-based learning has enormous potential to create a more interesting and meaningful learning experience for students (Handhika, 2011; Rokhmawati & Faizati, 2019). Project-based learning model is the assignment of tasks based on complex problems given to students to investigate problems in groups (Yulianto Aris, Fatchan A, 2017). In this case, it provides opportunities for students to achieve high learning outcomes because students are encouraged to be active in the process of asking questions, investigating, explaining, and interacting with problems. Next, students are asked to produce a product from the results of the investigation and present it.

Research result (Aryanto & Syaodih, 2017) state that development of ecopreneurship in primary school is expected to make students have creativity, innovation, and an unyielding spirit like entrepreneurs with balanced ecological behavior to maintain, utilize and manage the environment wisely. (Saerozi, 2017) research results show there is an effect of student learning outcomes on the welding system material in Vocational High Schools in the group with the Ecopreneurship-oriented project-based learning model and the teacher-centered learning model significantly. Research results in university, (Sulasari, 2016) stated that through the development of project-based learning methods, it was seen that Malang State Polytechnic students were interested in entrepreneurship development. It is hoped that student alumni will grow as young entrepreneurs who are able to be independent can create jobs. Based on this, there

is no research at the university level that implementation of ecopreneurship-oriented project-based learning in environmental knowledge courses to improve learning outcomes and entrepreneurial spirit. Objective of this study was to improve the entrepreneurial spirit and learning outcomes of STKIP PGRI Lumajang students in Environmental Knowledge courses through ecopreneurship-oriented project-based learning.

RESEARCH METHODS

This type of research is classroom action research. Classroom action research is a reflective research conducted in cycles by teachers/prospective teachers in the classroom. It is said so because the process starts from the planning, action, observation, and reflection stages to solve problems and try new things to improve the quality of learning (Susilo, 2011). The research stage refers to the spiral model from Kemmis and Tanggart, which is shown in Figure 1. The implementation of this method in this study was carried out in two cycles, namely, cycle I and cycle II. This research was conducted at STKIP PGRI Lumajang which was carried out in the even semester of the 2019/2020 school year. The research subjects used in this study were the Mathematics Education students of STKIP PGRI Lumajang, which consisted of one class in 2019 taking the Environmental Knowledge course with a total of 29 students.

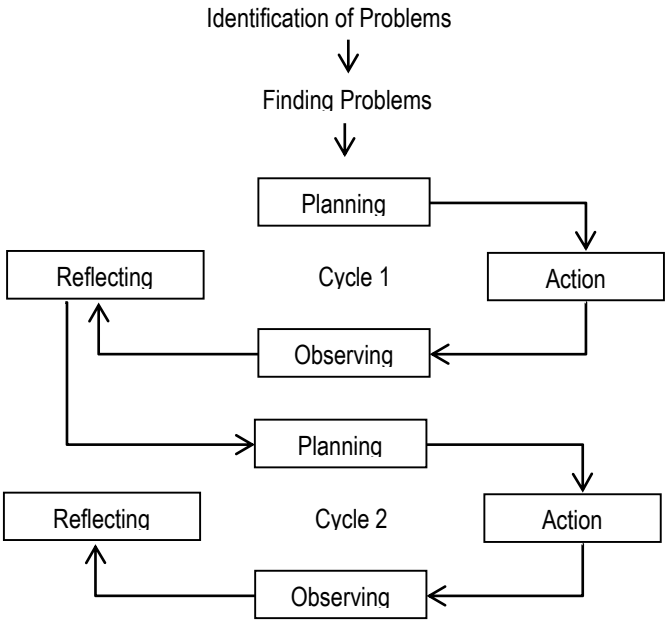

Figure 1. Classroom Action Research Chart by Kemmis and Mc. Taggart (Arikunto, 2010)

In this study, the research instruments used were observation sheets and cognitive learning outcome test questions. Data collection techniques used observation and testing. The observations carried out in this research aim to describe how the implementation of ecopreneurship-oriented project-based learning at STKIP PGRI Lumajang is related to the formation of entrepreneurial spirit. The entrepreneurial spirit observation sheet is used in the form of a checklist or rating scale accompanied by a rubric that is used to observe the presence or absence of a student entrepreneurial spirit during learning activities. The entrepreneurial spirit observed in the learning process is cooperation, creativity and innovative, the spirit of never giving up, and self-confidence as in the aspects of implementing ecopreneurship-oriented project-based learning shown in Table 1. The test is used to determine cognitive learning outcomes after the implementation of ecopreneurship-oriented project-based learning. There are 13 test questions in this research.

The data analysis technique used in this research is qualitative and quantitative data analysis techniques. The qualitative data analysis technique aims to describe the results of observations on the implementation of ecopreneurship-oriented project-based learning at STKIP PGRI Lumajang. Quantitative analysis was conducted to test the results of cognitive tests and entrepreneurial spirit. In addition, cognitive test scores were analyzed by calculating the normalized gain-score. It aims to see improvement in cognitive learning outcomes. The material in cycle I is Ecology as the basis of environmental science, where students are required to explain ecology as the basis of environmental science, identify ecological components in the surrounding environment and make products to optimize the ecological components in the environment. The material in cycle II is Environmental Problems and Solutions where students are required to analyze problems that occur in the environment and make solutions to these problems through making business products. Learning outcomes and entrepreneurial spirit in cycle II will be compared with learning outcomes and entrepreneurial spirit in cycle I to find out whether there is an increase or not.

Table 1. Aspects of Ecopreneurship-Oriented Project-Based Learning

No.	Problem-Based Learning	Ecopreneurship Aspect in the Formation of an Entrepreneurial Spirit
1	*Start with the essential question*	
2	*Design a plan for the project*	Planning the manufacture of products with materials that prioritize environmental aspects in collaboration (group) Create creative and innovative packaging and product labeling designs Planning for creative and innovative product processing
3	*Create a schedule*	
4	*Monitor the students and the progress of the project*	Making processed products with attention to environmental aspects in a spirit of never giving up
5	*Assess the outcome*	Presenting the product by explaining the opportunities and product marketing strategies produced in a confident manner
6	*Evaluate the experience*	

FINDING AND DISCUSSION

In this research, the planning stage was carried out by making lesson plans, preparing evaluation tools, designing data collection tools, preparing student activity sheets, and dividing students into heterogeneous groups. At the implementation stage of cycle I, students are given a project to identify the ecological components that exist in the environment around their residence then design the processing into products that have the potential to become an environmentally based business or what is called ecopreneurship. Students are required to make project plans before the project is implemented. One example of the implementation of ecopreneurship-oriented project-based learning in cycle I is shown in Figure 2.

Figure 2. Implementation of Ecopreneurship-Oriented Project-Based Learning Cycle I

Figure 2 shows students observing cassava plants as an ecological component in the surrounding environment. Students choose the tubers to be processed into crackers as a business product. Students bring this product to class for presentation. In the process of observing ecological component and making products, students need a long time so that not all students can produce products to be presented in this first cycle. This is because some students are still in the planning product processing. At the reflection stage of cycle I, suggestions for implementing ecopreneurship-oriented project-based learning in cycle II should provide an observation table with more specific instructions. In addition, instructions on planning product are provided so that students can complete projects on time. The results of this reflection activity are at the same time planning the implementation of learning in cycle II.

At the implementation stage of cycle II, students analyze environmental problems that occur in the environment around where they live. Students are given projects to make solutions to these environmental problems. The solution is through product processing that has economic value. Students plan to make products and their packaging in groups until the product is finished for presentation. One example of the implementation of ecopreneurship-oriented project-based learning in cycle II is shown in Figure 3.

Figure 3. Implementation of Ecopreneurship-Oriented Project-Based Learning Cycle II

Figure 2 shows students processing used materials into table accessories products that have economic value. Besides that, there is also a group of students who make mathematics learning media from used materials. Other groups also make chips from cassava peels and brownies from banana peels. Student products are presented in class. At the reflection stage of cycle II, the implementation of ecopreneurship-oriented project-based learning is in accordance with the plan. All student groups can produce products that can become business opportunities from solving environmental problems. This is in line with the research results of (Adinugraha, 2018) which states that used materials (garbage), namely used paper, used wood and used electronic equipment can be used as ecopreneurship-based learning media that are worthy of being produced for sale. In this research, students do not only create learning media. Students can make accessories, food and beverage products. All student products can be traded because during product presentations there are many positive suggestions from lecturers and other students.

The entrepreneurial spirit of students based on the implementation of ecopreneurship-oriented project-based learning is shown in Table 2. Cognitive learning outcomes are also summarized in Table 2 and the gain scores of cognitive learning outcomes are shown in table 3. Based on table 2, it is known that there is an increase in entrepreneurial spirit in students of 6.66 with indicators of cooperation, creativity, and innovative, a spirit of never giving up, and self-confidence. In implementing ecopreneurship-

oriented project-based learning, students collaborate well in groups and are creative and innovative when planning and designing product (stage of designing plans for projects in project based learning). Students also show a high spirit of never giving up in making their products (stages of monitoring the progress of the project). In addition, students are very confident when presenting their products in class (stages of assessing the outcome and evaluating the experience). This happens because in project-based learning, students are challenged and directly involved in groups to design, make, and present entrepreneurial products so that the entrepreneurial spirit can be increased during the learning process.

Based on the research results of (Rohayati et al., 2016) stated that project-based learning contributes to the entrepreneurial spirit of senior high school students in Magelang in the aspects of cooperation, discipline, responsibility, communicative, confidence, tenacious, creative and innovative. The research results of (Rahayu et al., 2017) states that project-based learning model can develop ecopreneurship potential in class VII-A students of MTs Ar Rohmah Bandung. This can be seen from the indicators namely create, explore, creative, innovative, and confident which increases after 2 cycles. In this research, the implementation of ecopreneurship-oriented project-based learning at the university level, especially in environmental knowledge courses. The implementation of ecopreneurship-oriented project-based learning can improve the entrepreneurial spirit of students, namely cooperation, creative and innovative, a spirit of never giving up, and self-confidence. Cooperation can be increased through group work to solve problems in the environment when designing plans for projects. Creative and innovative can be increased through product manufacturing planning. A spirit of never giving up can be increased through the product manufacturing process. Self-confidence can be increased through the presentation process. Finally, students can produce products that can be marketed.

Table 2. Entrepreneur Spirit and Cognitive Learning Outcomes on the Implementation of Ecopreneurship in Project-Based Learning

Component	Cycle I	Cycle II	Enhancement
Entrepreneur Spirit	77,24	83,90	6,66
Cognitive Learning Outcomes	73,96	80,54	6,58

Table 3. Gain Score of Cognitive Learning Outcomes

Component	Cycle I	Cycle II	Enhancement
Gain Score of Cognitive Learning Outcomes	0,47	0,55	0.08
Category	Medium	Medium	

Based on Table 2, student learning outcomes on the implementation of ecopreneurship-oriented project-based learning have increased by 6.58. Based on Table 3, the gain score of cognitive learning outcomes have increased by 0.08. This shows an increase in learning outcomes from cycles I and II by implementing ecopreneurship-oriented project-based learning. When implementing ecopreneurship-oriented project-based learning, the students analyze problems that occur in the surrounding environment and then plan products by prioritizing ecopreneurship aspects as an effort to solve the problems found. After that, students make products to be presented by explaining the opportunities and marketing strategies for the resulting products. Through this learning process, students in groups can be directly involved in thinking to create products as an effort to solve problems. It improved student learning outcomes which include the ability to remember, understand, apply, analyze, evaluate. According to (Yulianto & Fatchan, 2017) in project-based learning, problems are solved in groups. This provides the opportunity for students at MTs Sunan Kalijogo to be more active in learning because students are encouraged to be active in the process of asking, investigating, explaining, and interacting with problems.

With an active learning process like this it can improve student learning outcomes. It is in line with the results of (Damayanti & Surindra, 2018) research, show that the implementation of a project based learning model in entrepreneurship courses can improve student learning outcomes. This is also in line with the results of research by (Tohiroh, 2020) which states that with ecopreneurship-based LKPD, students are required to solve problems in the surrounding environment so that students can find their own solutions. Learning experiences like this will be more meaningful and can be used as a learning method that is able to clarify concepts through direct contact events. In this study, researchers put the ecopreneurship aspects in project-based learning. Therefore, students not only have higher learning outcomes but also produce products that pay attention to environmental aspects.

In this research, the implementation of ecopreneurship-oriented project-based learning not only improves the entrepreneurial spirit of students with indicators of collaboration, creativity and innovation, a spirit of never giving up, and self-confidence but also improves student learning outcomes including the ability to remember, understand, apply, analyze, evaluate. The implementation of ecopreneurship in the Environmental Knowledge course is appropriate to be applied in project-based learning because in this learning process students can understand and analyze conditions in the surrounding environment and then make products that pay attention to environmental aspects. When the product has been produced, students can also evaluate the product to be marketed.

CONCLUSION

Based on the results of the research, it was concluded that the implementation of ecopreneurship-oriented project-based learning can improve entrepreneurial spirit and student learning outcomes of STKIP PGRI Lumajang. The entrepreneurial spirit of student increased by 6.66 with indicators of cooperation, creative and innovative, a spirit of never giving up, and self-confidence. Student learning outcomes increased by 6.58 including the ability to remember, understand, apply, analyze, evaluate. The implementation of ecopreneurship in the Environmental Knowledge course is appropriate to be applied in project-based learning because in this learning process students can understand and analyze conditions in the surrounding environment and then make products that pay attention to environmental aspects. When the product has been produced, STKIP PGRI Lumajang students can also evaluate products to be marketed.

ACKNOWLEDGEMENT

Gratitude is conveyed to Kemenristek Brin and LLDikti Region VII who have supported the implementation of this research. I also expressed his gratitude to the LPPM of STKIP PGRI Lumajang for facilitating the implementation of this research activity well.

REFERENCE

Adinugraha, F. (2018). Media pembelajaran biologi berbasis ecopreneurship. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *7*(3), 219–233. https://doi.org/10.30998/formatif.v7i3.2233

Arikunto, S. (2010). *Penelitian tindakan kelas*. PT. Bumi Aksara. http://repository.unpas.ac.id/

Aryanto, S., & Syaodih, E. (2017). Development of ecopreneurship in primary school. *IJAEDU-International E-Journal of Advances in Education*, *III*(9), 597–602. http://ijaedu.ocerintjournals.org

Damayanti, S., & Surindra, B. (2018). Penerapan model pembelajaran project based learning pada mata kuliah kewirausahaan dalam meningkatkan hasil belajar mahasiswa. *Jurnal Kependidikan Dasar Islam Berbasis Sains*, *3*(2), 111–120. https://doi.org/10.21154/ibriez.v3i2.49

Handhika, J. (2011). Upaya peningkatan aktivitas belajar dan pembentukan karakter mahasiswa melalui

pembelajaran berbasis proyek. *Seminar Nasional Lesson Study 4*, 173–178. http://ojs.semdikjar.fkip.unpkediri.ac.id/index.php/SEMDIKJAR/article/view/17

Masjud, Y. I. (2020). Ecopreneurship approach as a solution to environmental problem: implication for university entrepreneurship education. *Journal of Environmental Science and Sustainable Development*, *3*(1), 97–113. https://doi.org/10.7454/jessd.v3i1.1041

McEwen, T. (2013). Ecopreneurship as a solution to environmental problems : implications for college level entrepreneurship education. *International Journal of Academic Research in Business and Social Sciences*, *3*(5), 264–288. https://hrmars.com/papers_submitted/9566/fraydan-branch-islamic-azad-university-isfahan-iran.pdf

Rahayu, S., Supriatna ayu, N., & Yeni Kurniawati, Y. (2017). *Development of student ecopreneurship potential through learning based projects model in social studies learning (classroom action research in class VII-A MTs Ar-Rohmah Bandung)*. *2*(2). https://ejournal.upi.edu/index.php/pips/article/view/10166

Rohayati, Sumarni, W., & Wijayati, N. (2016). Kontribusi pembelajaran berbasis proyek terhadap jiwa kewirausahaan siswa. *Jurnal Inovasi Pendidikan Kimia*, *9*(2), 1556–1565. https://journal.unnes.ac.id/nju/index.php/JIPK/article/view/4823/3991

Rokhmawati, A., & Faizati, P. S. D. (2019). Pembelajaran berbasis proyek melalui lesson study untuk meningkatkan hasil belajar mahasiswa STKIP PGRI Lumajang. *Jurnal Pendidikan Dan Pengembangan Profesi*, *9*(2), 806–814. http://jurnaljp3.stkippgrilumajang.ac.id/

Saerozi. (2017). Pengaruh model pembelajaran project based learning berorientasi ecopreneurship dan motivasi terhadap peningkatan hasil belajar siswa pada materi sistem pengelasan di sekolah menengah kejuruan. *Jurnal Pendidikan Teknik Mesin*, *17*(1), 43–49. https://journal.unnes.ac.id/nju/index.php/JPTM/article/view/12735

Saludung, J., & Yahya, M. (2018). Pemanfaatan buah lontar untuk pengembangan kewirausahaan berbasis ecopreneurship melalui home industry pada ibu-ibu PKK di Makassar. *Seminar Nasional Pengabdian Kepada Masyarakat*, 515–520. http://ojs.unm.ac.id/semnaslpm/article/viewFile/7800/4554

Santoso, I. H. (2018). *PKT.01-Pendidikan tinggi sebagai sistem*. kementerian riset teknologi dan pendidikan tinggi lembaga layanan pendidikan tinggi wilayah VII. https://lp3.unitri.ac.id/

Sulasari, A. (2016). Pengembangan metode pembelajaran kewirausahaan berbasis proyek untuk menigkatkan karakter wirausaha mahasiswa di politeknik negeri malang. *Jurnal Akuntansi, Bisnis, Dan Manajemen*, *23*(1), 16–27. http://journal.stie-mce.ac.id/index.php/jabm/article/view/139/18

Susilo. (2011). *Penelitian tindakan kelas*. PT Bumi Aksara. http://repository.unpas.ac.id/

Tohiroh, N. A. (2020). *Keefektifan lkpd bioteknologi konvensional berbasis ecopreneurship untuk melatihkan berpikir kreatif dan inovatif siswa kelas xii melalui metode pembelajaran pjbl*. *9*(1), 115–123. https://jurnalmahasiswa.unesa.ac.id/index.php/index/index

Yulianto Aris, & Fatchan A, K. A. (2017). Penerapan model pembelajaran project based learning berbasis lesson study untuk meningkatkan keaktifan belajar siswa. *Jurnal Pendidikan, 2*, 448–453. http://journal.um.ac.id/index.php/jptpp/article/view/8729