



Increase Student Learning Activities by Using A Problem-Based Learning Model in Legum Technology Lecture Materials

Almira Ulimaz¹; Jesi Yardani²; Dewi Amelia Widiyastuti³

^{1,2}Program Studi Agroindustri, Politeknik Negeri Tanah Laut, Indonesia

³Program Studi Pendidikan Biologi, Universitas Lambung Mangkurat, Indonesia

¹Corresponding Email: almiraulimaz@politla.ac.id, Phone Number: 0813 xxx xxxx

Article History:

Received: Nov 25, 2022

Revised: Dec 31, 2022

Accepted: Jan 08, 2023

Online First: Jan 09, 2023

Keywords:

Activity, Learning,
Legum Technology,
Problem-based Learning
Model, Student

Kata Kunci:

Aktivitas, Belajar, ,
Teknologi Legum, Model
Problem-Based Learning,
Siswa

How to cite:

Ulimaz, A., Yardani, J., & Widiyastuti, D. A. (2023). Increase Student Learning Activities by Using A Problem-Based Learning Model in Legum Technology Lecture Materials. *Edunesia: Jurnal Ilmiah Pendidikan*, 4(1), 238-246.

This is an open-access article
under the CC-BY-NC-ND
license



Abstract: Student learning activities can be measured by how active students are while studying. A student-centered learning model is needed, especially for courses with no practicum, such as legum technology material, to make the classroom atmosphere more varied. Therefore, this study aims to increase student learning activities using a problem-based learning model in legum technology lecture materials. This research is a class action study conducted in 2 cycles, each consisting of 2 meetings. The research subject comprised 20 students majoring in Agricultural Industrial Technology, Agro-industrial Study Program. The data collection techniques include preserving student learning activities using a problem-based learning model. The results showed that the students learning activity increased with an average per cycle in cycle I of 2.14 and was included in the "sufficient" category with the description of group C, and on average in cycle II increased with the achievement of 2.85 and has been included in the "good" category. This research shows that the problem-based learning model has been proven to improve student learning activities in the classroom. In addition, this research also demonstrates that classroom action research can be carried out in elementary, middle, and high schools and at the college level.

Abstrak: Aktivitas belajar siswa dapat diukur dari seberapa aktif siswa saat belajar. Diperlukan model pembelajaran yang berpusat pada siswa, terutama untuk mata kuliah yang tidak ada praktiknya, seperti materi teknologi kacang-kacangan agar suasana kelas tidak monoton. Oleh karena itu, penelitian ini bertujuan untuk meningkatkan aktivitas belajar mahasiswa dengan menggunakan model pembelajaran berbasis masalah pada materi kuliah teknologi legum. Penelitian ini merupakan penelitian tindakan kelas yang dilaksanakan dalam 2 siklus yang masing-masing terdiri dari 2 kali pertemuan. Subyek penelitian terdiri dari 20 orang mahasiswa jurusan Teknologi Industri Pertanian, Program Studi Agroindustri. Teknik pengumpulan data meliputi pelestarian aktivitas belajar siswa dengan menggunakan model pembelajaran berbasis masalah. Hasil penelitian menunjukkan bahwa aktivitas belajar siswa meningkat dengan rata-rata per siklus pada siklus I sebesar 2,14 dan termasuk dalam kategori "cukup" dengan uraian kelompok C, dan rata-rata pada siklus II meningkat dengan capaian sebesar 2,85 dan mengalami peningkatan. termasuk dalam kategori "baik". Penelitian ini menunjukkan bahwa model pembelajaran berbasis masalah terbukti dapat meningkatkan aktivitas belajar siswa di kelas. Selain itu, penelitian ini juga menunjukkan bahwa penelitian tindakan kelas dapat dilakukan di tingkat SD, SMP, dan SMA serta di tingkat perguruan tinggi.

A. Introduction

Education is one of several aspects of human life whose role is vital. As a living being with reason, custom, logic, and noble ethics, everyone has the right to receive an education (Ulimaz, 2019). Education itself is an activity that involves many components or figures in it, ranging from students (students and students), teachers and educators (teachers and lecturers), the community, administrators, and even the government (Nefianthi & Ulimaz, 2017). The educational process can only occur optimally if the existing educational components are interconnected functionally in an integrated unity (Ni'mah et al., 2018).

Education in the government system of the Republic of Indonesia is also divided into several levels of education, starting from primary education (kindergarten and elementary school), secondary education (junior and senior high school), to higher education (lectures). The world of higher education is divided into two types: academic education and vocational education. One of the differences is that there are more practical activities than theoretical lectures for vocational education.

Vocational education prioritizes its students to learn more in practicum classes than in theory classes, but this does not mean that theory classes are eliminated (Ulimaz, 2022). Some courses only contain academic credits, and some only have practicum credits. One of the courses in the Agroindustry study program with academic credits without practicum credits is the Legum and Cereal Technology course. Based on this, students are expected to have strong intellectual abilities in the cognitive, affective, and psychomotor realms (Ulimaz et al., 2020).

This course contains two main subjects taught in it, namely Cereals and Leguminosae. Although this course does not have practicum credits like other courses, in the learning process, it is still necessary to carry out teaching and learning activities (KBM) that can hone students' *soft skills*. This *soft skill* is essential for students to master, in this case, students.

In addition to *hard* skills, a person must also have *soft skills* to compete in the world of work. Especially in the world of vocational education, students who take lectures on vocational-based campuses mean that they have taken a job-ready skills-based education. (Ulimaz & Agustina, 2020) Job-ready skills in the form of *soft skills* can be seen in student learning activities while in class.

Student learning activities can be measured by how active students are when studying in the classroom. Student activity in a discussion can also be a benchmark. Therefore, an alternative learning process is needed that can make students become centers or centers in the classroom (Ulimaz, 2016). Of course, the lecture method can still be done at the beginning of the lecture, but it is necessary to provide innovative models or learning methods that focus more on students (Ulimaz, 2021). This is because students at the college level, in this case, are different from those at the primary and secondary education levels, such as elementary and junior high schools / high schools. A slightly different approach is needed for learners studying at the college level (Wicaksono et al., 2021).

The approach in the learning process for *student-centered* students is expected to increase their learning activities both in class and outside the classroom (studying alone or self-taught) (Qibtiah & Ulimaz, 2017). If the learning activity improves in a better direction, it will be followed by a significant increase in learning outcomes in the cognitive, affective, or psychomotor realms (Rahmah & Ulimaz, 2017). The problem-based learning (PBL) (Ulimaz, 2018) model can be applied in vocational lectures where the course is a complete theoretical lecture without practicum credits so that classes become more varied and students can better absorb the material.

B. Method

This research is a class action research (PTK) where this research is a discernment of learning activities which can be in the form of an action in which the data of this research is presented. The discussion is presented descriptively (Ulimaz, 2018). This research is deliberately raised and usually occurs in a class together. The main objective of this research is to improve the quality or quality of learning practices in a class at the school level and the lecture level (Ulimaz, 2015).

The subjects of this study were 20 students who studied in the fourth semester of the 2019–2020 academic year in the Agroindustry study program, Department of Agricultural Industrial Technology, Tanah Laut State Polytechnic. The number of students who were the subject of the study was as many as twenty people who were the object of this study were student learning activities using a problem-based learning model or PBM on Legum Technology material. The research was carried out in April 2020 at the Tanah Laut State Polytechnic campus. The research time is carried out based on the lecture schedule in the classroom.

This research was conducted in 2 cycles according to the stages of research, which include:

1. Cycle I

a. Planning Phase

- Create a problem-based learning plan.
- Prepare an observation sheet for the student's activities.

b. Stage of Action Implementation

This stage carried out activities for implementing cycle I learning that has been made using problem-based learning.

c. Observation Stage

Student activity in learning is observed and recorded in a structured observation sheet.

d. Reflection

At this stage, the results obtained from the observation stage are analyzed so that they can reflect by looking at the observation data. These reflections will be used for consideration, development, and corrective actions for learning in the next cycle (Sylviaty et al., 2018).

2. Cycle II

a. Planning Phase

- Create a problem-based learning plan.
- Prepare structured observation sheets and systematic observation sheets.

b. Implementation Phase

This stage is carried out by cycle II learning activities planned in planning. The material in cycle II is a continuation of the material of process I.

c. Observation Stage

Research observations in cycle II use structured and systematic observation sheets as in cycle I. Cycle II is expected to perform better than previous cycle activities (Ulimaz, 2018).

The data collection techniques include preserving student learning activities using a problem-based learning model carried out in two cycles with four meetings (each process consists of two sessions). Data analysis techniques used in the study include student activity data which is analyzed by the formula:

$$\text{Students Activity Value} = \frac{\text{Total Score}}{\text{Maximum Score}} \times 4$$

Furthermore, the scores obtained are undervalued with the assessment categories listed in Table 1. the following.

Table 1. Categories Observation of Students' Activities

No	Value	Category
1	$3.33 < \text{final score} \leq 4.00$	Excellent
2	$2.33 < \text{final score} \leq 3.33$	Good
3	$1.33 < \text{final score} \leq 2.33$	Enough
4	$\text{Final score} \leq 1.33$	Less

The activity of students in learning legum technology material with the application of problem-based learning models at least achieved a score of more than > 2.33 .

C. Result and Discussion

Result

Research conducted on student learning activities in semester 4 of the 2019–2022 even academic year in the Agroindustry study program, Department of Agricultural Industrial Technology, Tanah Laut State Polytechnic, on legum technology material using a Problem-Based learning model which is carried out in 2 cycles with each cycle carried out in 2 meetings. The results of the study taken from the observation sheet of the student's activities obtained the following data:

Results of Observation of Student Activities in Learning Activities Cycle I

The assessment sheets of the activities of the students of the cycle I of meeting one and meeting two can be seen in Table 2. the following

Table 2. Results of Observations of Students' Activities in Cycle I Learning Activities

No	Observed aspects	Meeting 1	Meeting 2
1	Listening and paying attention to the lecturer's explanation	2,05	2,25
2	Group discussions	2,10	2,45
3	Work on student worksheets	2,05	2,20
4	Making conclusions	2,00	2,15
5	Delivering group work in front of the class	2,00	2,15
Sum		10,2	11,2
Average		2,04	2,24
Category		C	C

The student's activity in the learning process thanks to the "sufficient" e Gori, which means that it has not reached the excellent category, so it needs to be improved in the learning process in cycle II. Reflections on student activities in learning cycle I in more detail can be described as follows:

The activities of the students at the time of KBM took place in the first cycle of meeting 1 with the achievement of cooperation of members in the group were still in the category of needing to complete the tasks given by the lecturer. Students still need to be more enthusiastic about participating in learning activities; as stated in the first cycle of meeting 2, the cooperation of members in the group has entered the category of exceptionally good, and students have also begun to participate in learning activities enthusiastically. Still, it would be even better if the students' actions could be increased so they can later take the lectures to the fullest.

Results of Observation of Student Activities in Learning Activities Cycle II

The assessment sheets of the activities of the students of cycle II of meeting one and meeting two can be seen in Table 3. in the following,

Table 3. Results of Observations of Students' Activities in Cycle II Learning Activities

No	Observed aspects	Meeting I	Meeting II
1	Listening and paying attention to the lecturer's explanation	2,65	3,20
2	Group discussions	2,80	3,15
3	Work on student worksheets	2,65	3,25
4	Making conclusions	2,50	3,30
5	Delivering group work in front of the class	2,20	2,95
Sum		12,8	15,85
Average		2,56	3,17
Category		B	B

Based on Table 3. it can be seen that in cycle II of meeting one and meeting two, it can be concluded that the average value of the student's activity in meeting 1 with a value of 2.56 and meeting 2 with a value of 3.17 is a good category. Therefore, the average score of the student's activity is good.

Assessment of the activities of students in learning cycle I and cycle II is summarized in Table 4. in the following,

Table 4. Summary of Students' Activity Data in Cycle I and Cycle II Learning

Students activities	Cycle I	Cycle II
Meeting I	2,04	2,56
Meeting II	2,24	3,17
Average per cycle	2,14	2,86
Category	Enough	Good

Based on Table 4. In cycle I, the activities of the students can be categorized as sufficient, and in cycle II, they are classified as good. Based on the results of observations of student activity by observers in the process I of meeting one and meeting two, as in Table 2. using a problem-based learning model with an average achievement of 2.04 to 2.24 at meeting two falls into the excellent category, as well as in the activities of the students in cycle II of meeting one and meeting 2 in Table 3. showed an increase compared to the action of Students in the process I. Student activity in cycle II was declared victorious in learning using a problem-based learning model because the average score obtained from the data was 2.56 at meeting 1, rising to 3.17 at meeting 2 with good categories.

Discussion

The increase in student activity from cycle I to cycle II is due to improvements and reflections on the aspects of student activity observed. In cycle 1, it is categorized as still not good, so it has yet to be able to foster the interest and motivation of students in the teaching and learning process in the classroom. Therefore the progress of learning during the learning process using a problem-based learning model still needs to be improved. Therefore, learning is carried out in cycle II. Cycle II is implemented to correct weaknesses and maintain success in cycle I. There is a process II made planning such as motivating students and groups to be more active in learning, more intensively guiding students and groups experiencing difficulties, and learning more about problem-based learning models.

These results are in line with the research. His research has (Ni'mah et al., 2018) also been successful in increasing student learning activities in this case, students of SMPN 25 Banjarmasin, where based on the results of his research starting from the 1st to fourth meeting, it is known that there has been an increase in student learning activities. At the beginning of learning, students still need to pay attention when the teacher speaks or explains. However, the longer there are more positive changes, the more it increases to 98.85% at the fourth meeting. Likewise, with the activities of students in discussing or

conducting questions and answers, there have been many positive changes starting from the beginning of the first to the fourth meeting.

A positive change from cycle I to cycle II means that it has shown an increase in student learning activities in a better direction. If student learning activities increase, this will also have an impact on student learning outcomes themselves. Students' response shows this during the teaching and learning, producing a positive reaction during teaching and learning activities (KBM). In line with the results of research conducted by (Hidayah & Ulimaz, 2018), which shows that along with the increase in learning outcomes and also student activities that are increasingly heading in a positive direction, a response in a positive form is also obtained with a percentage of 97% to the implementation of KBM.

The results of this research are also corroborated by a previous study conducted by (Ulimaz & Yardani, 2022) those, who showed that by applying a learning model that activates students in the classroom or is student-centered, better results of teaching and learning activities were also obtained when compared to using conventional learning models or ordinary lectures. One learning model that can activate students in the classroom is the problem-based learning (PBL) model. This is because students are considered figures who are adults and not young children or teenagers anymore. The essential aspect that educators, both teachers, and lecturers, must understand is how educators can encourage and attract students (students and students) to like and be happy with learning activities and the material presented (Dacholfany et al., 2022).

D. Conclusion

Based on the results of research and discussions on efforts to optimize the increase in student learning activities by using a problem-based learning model in legum technology lecture materials, it can be concluded that the use of problem-based learning models in learning in legum technology lecture materials can increase student learning activities. The student's learning activities have increased with the "good" category, which is captioned with group B. In skills I, student learning activities are still in the "sufficient" class with the information group C, and in cycle II, have increased, and have been included in the "good" category, which is described with group B. Class action research activities should be carried out more often by teachers as an effort to improve the learning outcomes of students, both students, and students so that it is hoped that in turn, it will be able to improve the quality of education in general.

References

- Dacholfany, M. I., Fujiono, F., Safar, M., Hanayanti, C. S., & Ulimaz, A. (2022). Manajemen Pendidikan Berbasis Pembelajaran Inspiratif Dan Bermakna di Era Teknologi Digital. *Jurnal Pendidikan dan Konseling (JPDK)*, 4(6), 6853-6861. <https://doi.org/10.31004/jpdk.v4i6.9402>

- Hidayah, Y., & Ulimaz, A. (2018). Respon siswa kelas VII SMPN 3 Banjarbaru pada materi biologi melalui inkuiri terbimbing. *Jurnal Pendidikan Hayati*, 4(4), 163-169. <https://doi.org/10.33654/jph.v4i4.333>
- Nefianthi, R., & Ulimaz, A. (2017, May). Students' Science Generic Skills Using KNoS-KGS Model in Biology Learning. In *5th SEA-DR (South East Asia Development Research) International Conference 2017 (SEADRIC 2017)* (pp. 228-232). Atlantis Press. <https://doi.org/10.2991/seadric-17.2017.47>
- Ni'mah, S., & Ulimaz, A., & Lestari, N. C. (2020). *Aktivitas dan Respon Siswa Kelas VII C SMP Negeri 25 Banjarmasin Terhadap Penerapan Bahan Ajar Berbasis Inkuiri Terbimbing*. In: *The Innovation of Chemistry Education in Confronting Disruption Era to Build Excellent and Productive Generation*, 17 November 2018, Aula Rektorat 1 ULM Banjarmasin.
- Ni'mah, S., Ulimaz, A., & Lestari, N. C. (2018). Penerapan Bahan Ajar Berbasis Inkuiri Terbimbing Terhadap Pemahaman Konsep Biologi Siswa SMP Di Banjarmasin Barat. *Jurnal Biotek*, 6(2), 120-130. <https://doi.org/10.24252/jb.v6i2.6313>
- Ni'mah, S., Ulimaz, A., & Lestari, N. C. (2020). *Aktivitas Dan Respon Siswa Kelas Vii C Smp Negeri 25 Banjarmasin Terhadap Penerapan Bahan Ajar Berbasis Inkuiri Terbimbing*. Banjarmasin: ULM Repository.
- Qibtiah, M., & Ulimaz, A. (2017). Meningkatkan Keterampilan Berpikir Kritis Siswa Kelas X3 SMA PGRI 6 Banjarmasin Menggunakan Model Inkuiri pada Materi Perubahan Lingkungan. *Jurnal Pendidikan Hayati*, 2(3).
- Rahmah, R., & Ulimaz, A. (2017). Hasil Belajar Siswa Kelas X3 SMAN 10 Banjarmasin pada Konsep Ekosistem dengan Menggunakan Model Pembelajaran Inkuiri.
- Sylviaty, E., Hidayah, Y., & Ulimaz, A. (2018). Meningkatkan hasil belajar kognitif produk siswa pada materi Biologi ciri-ciri makhluk hidup Kelas VII SMPN 3 Banjarbaru. *Lentera: Jurnal Ilmiah Kependidikan*, 13(1). <https://doi.org/10.33654/jpl.v13i2.342>
- Ulimaz, A. (2015). Meningkatkan hasil belajar siswa kelas x pada konsep keanekaragaman hayati menggunakan model pembelajaran inkuiri. *Konstruktivisme: Jurnal Pendidikan dan Pembelajaran*, 7(1), 61-66. <https://doi.org/10.35457/konstruk.v7i1.26>
- Ulimaz, A. (2018). Aktivitas Guru dalam Pembelajaran Menggunakan Inkuiri Terbimbing pada Materi Ekosistem di Kelas X-“E Man 2 Model Banjarmasin. *Konstruktivisme: Jurnal Pendidikan dan Pembelajaran*, 10(2), 205-217. <https://doi.org/10.35457/konstruk.v10i2.520>
- Ulimaz, A. (2018). Hasil Belajar Kognitif Proses Siswa Kelas X3 SMAN 10 Banjarmasin Dengan Menggunakan Model Pembelajaran Inkuiri Terbimbing Pada Konsep Keanekaragaman Hayati. *Jurnal Pendidikan Hayati*, 4(2). <https://doi.org/10.33654/jph.v4i2.440>

- Ulimaz, A. (2018). Meningkatkan Hasil Belajar Kognitif Produk Siswa Kelas VII. A SMPN 1 Angsana pada Konsep Keanekaragaman Makhluk Hidup dalam Pelestarian Ekosistem Menggunakan Model Pembelajaran Kooperatif Tipe Think Pair And Share (TPS). *Konstruktivisme: Jurnal Pendidikan dan Pembelajaran*, 10(1), 74-83. <https://doi.org/10.35457/konstruk.v10i1.456>
- Ulimaz, A. (2019). Hasil Belajar Mahasiswa Prodi DIII Agroindustri Pada Materi Parameter Limbah Cair Menggunakan Media Pembelajaran Kahoot. *Jurnal Pendidikan Hayati*, 5(4). <https://doi.org/10.33654/jph.v5i4.876>
- Ulimaz, A. (2021). Pengembangan Bahan Ajar Berbasis Inkuiri Terbimbing pada Mata Kuliah Teknologi Pengolahan Limbah. *Jurnal Pendidikan Hayati*, 7(3).
- Ulimaz, A. (2022). Model Pembelajaran Inkuiri Terbimbing pada Mata Kuliah Mikrobiologi Dasar di Perguruan Tinggi Berbasis Vokasi. *Nusantara Hasana Journal*, 2(1), 198-206.
- Ulimaz, A., & Agustina, D. K. (2020). RESPON MAHASISWA VOKASI TERHADAP PEMBELAJARAN DENGAN KAHOOT PADA MATERI PARAMETER LIMBAH CAIR. *SENASTER "Seminar Nasional Riset Teknologi Terapan"*, 1(1).
- Ulimaz, A., & Yardani, J. (2022). Meningkatkan Hasil Belajar Mahasiswa pada Konsep Pengetahuan Bahan Agroindustri dengan Model Pembelajaran Kooperatif. *Jurnal Pendidikan Dasar dan Sosial Humaniora*, 1(9), 1941-1950.
- Ulimaz, A., Agustina, D. K., Anggraini, D. P., & Sulistiana, D. (2020). Pengembangan Lembar Kerja Mahasiswa pada Materi Nutrisi Mikroorganisme Berbasis High Order Thinking Skill. *Bioedusiana: Jurnal Pendidikan Biologi*, 5(1), 41-51. <https://doi.org/10.34289/bioed.v5i1.1565>
- Wicaksono, S. R., Lubis, M. S. A., Suprpto, E., Khasanah, K., & Ulimaz, A. (2021). Improvisation of Project Based Learning With Combination of Collaborative Learning as Rapid Response to Pandemic Learning. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 6(2), 215-224. <https://doi.org/10.25217/ji.v6i2.1408>