



Peningkatan Hasil Belajar Siswa Pada Materi Struktur Dan Fungsi Sel Dengan Menggunakan Case Method Learning kelas X Di MA- Arrohmah Ledokombo

(Improving Student Learning Outcomes on Cell Structure and Function Material Using Case Method Learning for Class X at MA- Arrohmah Ledokombo)

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ABSTRACT. This study aims to enhance the learning outcomes of Grade X students at MA Ar Rohmah through the implementation of Classroom Action Research (CAR). The participants consisted of 25 students from Grade X. The study employed a two-cycle CAR design, with each cycle comprising the stages of planning, implementation, pretest, post-test, and reflection. Data were collected through learning outcome tests and student activity observation sheets. The findings demonstrate a consistent improvement in students' learning outcomes following the implementation of the classroom actions. In the first cycle, the average student score increased compared to the pre-action results; however, not all students met the Minimum Passing Grade (KKM). In the second cycle, after several instructional improvements were made, the average student score rose significantly, and the majority of students achieved or surpassed the established KKM. These results suggest that the systematic implementation of appropriate classroom action strategies can effectively improve the learning outcomes of Grade X students at MA Ar Rohmah.

INTRODUCTION

Education is one of the fundamental pillars in developing high-quality human resources [1]. It is a deliberate and responsible effort to help students develop their full potential. Human development aims to foster intellectual understanding, emotional intelligence, and creativity—dimensions that are essential to supporting the educational process [2].

In the learning process, students' success in understanding a subject is highly influenced by the teaching methods employed. In particular, the topic of *cell structure and function* is often perceived as difficult by students because it involves complex concepts that demand deep comprehension and critical thinking skills [3]. Biology learning in senior high school plays a crucial role in building students' foundational understanding of life sciences. One of the key, yet often challenging, topics in biology is the structure and function of cells. This topic encompasses intricate microscopic concepts, such as the components and functions of cells, which require strong conceptual understanding. In reality, many students struggle to master this material due to its abstract and theoretical nature. Commonly, the instructional methods applied are still dominated by rote memorization and one-way transmission of knowledge, which makes it difficult for students to connect these concepts with real-world phenomena or practical applications [4].

The Case Method Learning model encompasses cognitive, psychomotor, motivational, and affective (interpersonal and attitudinal) aspects. The effectiveness of this model depends on the diverse dispositions of all team members involved. Case Method Learning focuses on real-life problems or concrete examples, the actions that need to be taken, and the lessons that can be derived from them [4]. This learning approach can serve as a potential solution for developing students' ability to collaborate effectively [5]. The advantages of the case method include enhancing students' critical thinking skills, encouraging them to express their thoughts and ideas in problem-solving, fostering respect for others' opinions, and promoting cooperation and collaboration [6]. By connecting the concepts of cell structure and function with relevant case studies, learning is expected to become more contextual and meaningful. For example, by analysing how damage to certain organelles may lead to disease or bodily dysfunction, students can better understand the essential roles of cellular components in sustaining life [7].

Learning outcomes refer to the changes in behaviour or abilities acquired by students after participating in the learning process [8]. In the context of this research, learning outcomes are measured by students'



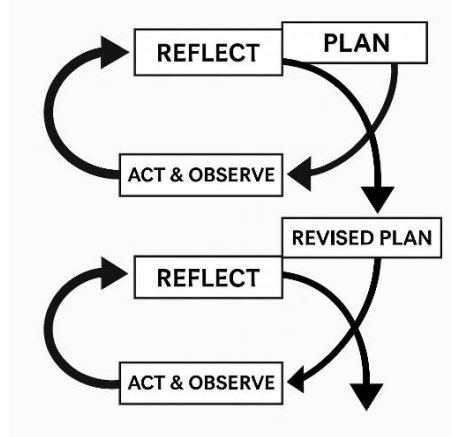
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understanding of the topic of cell structure and function, particularly in relation to the project-based discussions. The outcomes are assessed within the cognitive domain, encompassing aspects of knowledge, comprehension, and application. Students' learning outcomes are evaluated based on the improvement in test scores that reflect cognitive levels—specifically knowledge (C1), understanding (C2), application (C3), analysis (C4), evaluation (C5), and creation (C6) as outlined in Bloom's Taxonomy [9]. The measurement of learning outcomes therefore serves as an indicator of the extent to which students have mastered the learning materials following the teaching and learning process.

RESEARCH METHOD

Classroom Action Research (CAR) is a systematic inquiry conducted by a group of teachers to improve educational practices through planned interventions in the classroom, followed by reflection on the outcomes of those actions. It involves careful examination of learning activities that are deliberately initiated and collaboratively carried out within the classroom context.

This study consisted of a series of repeated cycles, beginning with a preliminary stage (pre-cycle). Each cycle comprised four main stages: planning, action, observation, and reflection. During the planning stage, the researcher formulated essential questions regarding what, why, when, where, by whom, and how the actions would be implemented. The action stage involved carrying out the activities designed in the planning phase. In the observation stage, the researcher systematically observed students' behaviour and participation during the learning process using structured observation sheets. Finally, in the reflection stage, the researcher and the teacher collaboratively analysed the data obtained from classroom activities to evaluate whether the outcomes aligned with the intended objectives and to determine necessary improvements for subsequent cycles [4].



Picture 1. Classroom Action Research Cycle.

DATA COLLECTION AND SUCCESS INDICATORS

The data in this study were collected through two primary instruments. The first was observation, conducted to obtain information regarding the presence or absence of the implementation of learning activities. The second instrument was a test, consisting of pretest and posttest items totaling 25 multiple-choice questions. The test items administered to students had been validated by experts in classroom action research, ensuring that the instruments used were both valid and reliable, thereby producing accurate data. To determine the success of the implemented actions, specific performance indicators were established. The main indicator of success in this study was the achievement of learning improvement, measured using the normalized gain (N-Gain) score, calculated with the following formula:

$$\text{Normalized Gain (g)} = \frac{\text{Posttest score} - \text{pretest score}}{\text{Ideal score} - \text{pretest score}} \quad (1)$$

RESULTS AND DISCUSSION

This study employed the Classroom Action Research (CAR) design, which follows a cyclical process aimed at improving students' learning outcomes. The research was conducted in two cycles, with each cycle consisting of four stages:

1. Planning, involving the development of a teaching module that was subsequently validated by expert validators.
2. Action, involving the implementation of the Case Method Learning model.
3. Observation, in which both teacher and researcher observed classroom activities to assess student engagement and participation during the learning process; and
4. Reflection, aimed at analysing the outcomes of the implemented actions to identify necessary improvements for the following cycle.

The subjects of this study were Grade X students of MA Ar Rohmah, located at Jl. KH. Sanhaji No. 57, Suren Village, Ledokombo District, Jember Regency. The total number of participants was 25 students, consisting of both male and female learners.

Table 1. Criteria for Assessing the Implementation of Learning Activities

Score Range (%)	Criteria
$k \geq 90$	Excellent
$80 \leq k < 90$	Good
$70 \leq k < 80$	Fair
$60 \leq k < 70$	Poor
$k < 60$	Very Poor

Cycle I

The results of the first cycle, involving all 25 students, indicate that the average student performance remained **below the Minimum Passing Grade (KKM)**. Based on the data presented in Table 1, it can be inferred that most Grade X students had not yet achieved the desired level of mastery. This suggests that students' learning performance in the first cycle was **still suboptimal, indicating** the need for further instructional improvements and reinforcement in subsequent cycles.

Table 2. The findings of meeting 1 and 2

No	Students' Name	KKM	Pretest Score	Posttest Score
1	Respondent	75	72	76
2	Respondent	75	68	72
3	Respondent	75	52	56
4	Respondent	75	56	64
5	Respondent	75	60	68
6	Respondent	75	68	72
7	Respondent	75	44	52
8	Respondent	75	52	56
9	Respondent	75	64	72
10	Respondent	75	56	60
11	Respondent	75	64	68
12	Respondent	75	48	52
13	Respondent	75	52	58
14	Respondent	75	40	48
15	Respondent	75	32	40
16	Respondent	75	52	56
17	Respondent	75	28	36
18	Respondent	75	64	72
19	Respondent	75	48	60
20	Respondent	75	40	52
21	Respondent	75	68	76
22	Respondent	75	60	72
23	Respondent	75	36	56
24	Respondent	75	44	60
25	Respondent	75	52	68

Based on the table above, there was an improvement in students' learning ability from the pretest to the posttest. Almost all students showed an increase in their scores, although the level of improvement varied, ranging from +4 points for respondents 1 and 2 to +20 points for respondent 23. The lowest pretest score was 28 for respondent 17, and the highest was 72 for respondent 1. The lowest posttest score was 36 for respondent 17, while the highest posttest scores were 76 for respondents 21 and 1. This indicates that the learning provided had a positive impact on improving students' learning outcomes. Although there was an increase, most students were still below the minimum passing grade (KKM). The table for Cycle 1 shows an increase from pretest to posttest both individually and in the class average; however, the level of mastery was still far from expectations because only two students reached the KKM. Therefore, the learning implemented was quite effective in improving students' learning ability but requires strengthening of strategies so that students' learning abilities can be optimized and more students can achieve the KKM.

Cycle 2

In Cycle II, the results obtained by the researcher indicated a noticeable change in students' scores. Among the 25 students, two showed inconsistent performance, while the remaining 23 achieved high scores in accordance with the assessment criteria established by the researcher.

Table 3. The findings of meeting 3 and 4

No	Students' Name	KKM	Pretest Score	Posttest Score
1	Respondent	75	76	84
2	Respondent	75	80	80
3	Respondent	75	76	88
4	Respondent	75	76	80
5	Respondent	75	92	96
6	Respondent	75	84	92
7	Respondent	75	76	80
8	Respondent	75	72	76
9	Respondent	75	80	84
10	Respondent	75	84	88
11	Respondent	75	88	92
12	Respondent	75	88	92
13	Respondent	75	76	88
14	Respondent	75	76	80
15	Respondent	75	76	84
16	Respondent	75	88	92
17	Respondent	75	72	76
18	Respondent	75	76	88
19	Respondent	75	92	92
20	Respondent	75	96	92
21	Respondent	75	76	92
22	Respondent	75	80	84
23	Respondent	75	80	80
24	Respondent	75	84	84
25	Respondent	75	84	92

Based on the data presented in the table above, the results of the second cycle indicate that students' pretest scores ranged from 72 to 96. After the implementation of the Case Method Learning model, students' posttest scores showed a noticeable improvement, with a range of 76 to 86 and an average score of 81. Several students demonstrated substantial progress, such as respondent 3 (from 76 to 88), respondent 21 (from 76 to 92), and respondent 18 (from 76 to 88). A few students maintained stable scores for instance, respondent 2 (80 → 80) and respondent 23 (80 → 80), yet remained above the Minimum Mastery Criteria (KKM).

Based on these findings, it can be concluded that the implemented learning model effectively improved students' academic performance. This improvement was reflected in the increase in the average score, the growing number of students achieving or surpassing the KKM, and the individual progress observed in nearly all respondents. Consequently, it can be affirmed that the Case Method Learning model has a positive and measurable impact on students' learning outcomes [10].

The overall findings of this study reinforce that the Case Method Learning model not only improved students' cognitive outcomes but also enhanced their engagement and learning behaviour throughout the two cycles of Classroom Action Research. The consistent increase in posttest scores from Cycle I to Cycle II indicates that students became more accustomed to analysing real-life cases related to cell structure and function, enabling them to construct deeper conceptual understanding rather than relying on memorization alone. This aligns with previous studies showing that the case method strengthens critical thinking, encourages active participation, and helps students relate abstract biological concepts to observable phenomena. Moreover, the substantial improvement in Cycle II suggests that the refinements made during the reflection stage—such as clearer case examples, more guided discussions, and structured collaborative activities—successfully addressed the shortcomings observed in Cycle I. These findings demonstrate that iterative instructional adjustments are essential in maximizing the effectiveness of the case method. In addition, the increased number of students reaching or exceeding the KKM in Cycle II reflects not only cognitive gains but also heightened motivation and confidence, indicating that the learning model promotes a more student-centered and interactive learning environment. Therefore, the results of this study strongly support the Case Method Learning model as a relevant and effective strategy for teaching complex biology topics within secondary education.

CONCLUSION

Based on the findings of this study, it can be concluded that the implementation of a well-designed learning model has a significant positive effect on improving students' learning outcomes. This conclusion is supported by the observed increase in students' average scores after the intervention compared to before it. The application of an active, collaborative, and student-centered learning model was proven to enhance students' motivation, participation, and conceptual understanding.

Therefore, the selection of instructional strategies that align with the characteristics of the learners and the nature of the learning materials is crucial for improving the overall quality of student learning outcomes. This research further underscores the importance of innovative pedagogical approaches, such as the Case Method Learning model, in fostering meaningful and contextualized learning experiences within the Indonesian secondary education context.

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REFERENCES

- [1] A. Saputra, U. Sambiri, and A. Hermawan, "Exploring Artificial Intelligence for Physics Learning in Indonesia : A Scoping Review," *SAINTIFIK@ J. Pendidik. MIPA*, vol. 10, no. 1, pp. 84–89, 2025, doi: 10.33387/saintifik.v10i1.10037.
- [2] U. Sambiri, A. Saputra, and H. H. Isra, "Analisis Hubungan Keterampilan Proses Sains Terhadap Hasil Belajar Fisika Pada Mahasiswa Pendidikan Fisika Universitas Khairun," *SAINTIFIK@ J. Pendidik. MIPA*, vol. 9, no. 1, pp. 31–36, 2024.
- [3] U. Sambiri, H. H. Isra, and A. Saputra, "Analisis keterampilan proses sains fisika pada mahasiswa pendidikan fisika fkip universitas khairun," *SAINTIFIK@ J. Pendidik. MIPA*, vol. 8, no. 2, 2023, doi: 10.33387/saintifik.v9i1.

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- [4] Sugiyono, *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta, 2018.
 - [5] Kemendikbud RI, *Pedoman Pelaksanaan Penelitian Tindakan Kelas*. Jakarta: Direktorat Jenderal Guru dan Tenaga Kependidikan, 2020.
 - [6] R. Lossen, S. Saprudin, A. Salim, and A. Saputra, "Pengembangan Konten E-Modul Interaktif Materi Alat-Alat Optik Untuk Meningkatkan Hasil Belajar Siswa Sekolah Menengah Pertama," *SAINTIFIK@ J. Pendidik. MIPA*, vol. 8, no. 2, pp. 1–5, 2023, doi: 10.33387/saintifik.v8i2.7067.
 - [7] Hosnan, *Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21*. Bogor: Ghalia Indonesia, 2021.
 - [8] R. Hidayat and N. Nurul, "Implementasi Model Case Method Learning pada Pembelajaran Biologi untuk Meningkatkan Hasil Belajar Siswa," *Biosf. J. Pendidik. Biol.*, vol. 13, no. 2, pp. 77–85, 2022, doi: 10.21009/biosferjpb.v13i2.12345.
 - [9] E. Ristiana, "Pembelajaran IPA Berbasis Kearifan Lokal Berdasarkan Systematic Literatur Review," *Celeb. J. Elem. Educ.*, vol. 2, no. 2, pp. 128–136, 2024, doi: 10.33387/saintifik.v10i1.
 - [10] A. Rohman, "Penerapan Model Pembelajaran Case Method untuk Meningkatkan Kemampuan Berpikir Kritis," *J. Pendidik. dan Pembelajaran Biol.*, vol. 6, no. 2, pp. 112–120, 2021, doi: 10.32528/jppb.v6i2.4213.