

The Effect of a Character Education-Based Explicit Instruction Model on Biology Learning Outcomes in the Digestive System Topic among Grade XI Senior High School Students

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ABSTRACT

This study examined the effect of a character education-based Explicit Instruction learning model on students' biology learning outcomes in the digestive system topic. The study was motivated by the tendency of biology instruction to be teacher-centered, resulting in low student participation, limited conceptual understanding, and insufficient integration of character values. The goal was to ascertain how students' learning achievements and character development were affected by the Explicit Instruction paradigm combined with character education. This study used a non-equivalent control group pretest-posttest design using a quantitative, quasi-experimental methodology. A control class and an experimental class made up the sample. Pretests, posttests, and character education questionnaires were used to gather data. Independent sample t-tests, homogeneity, and normality were used in data analysis. The results indicated that although the control class improved from 43 to 79.5, the experimental class had a higher gain in learning outcomes, with the mean score rising from 48.5 to 80. Additionally, the average score on the character education questionnaire was 88.93%, which is considered extremely excellent. These results indicate that the character education-based Explicit Instruction model positively affects both students' biology learning outcomes and character development.

Informasi Artikel

Kata Kunci:

Hasil Pembelajaran, Instruksi Eksplisit, Pembelajaran Biologi, Pendidikan Karakter.

ABSTRAK

Penelitian ini tujuannya guna mengkaji pengaruh model pembelajaran *Explicit Instruction* berbasis pendidikan karakter terhadap hasil belajar biologi peserta didik pada materi sistem pencernaan. Penelitian ini dilatarbelakangi oleh kecenderungan pembelajaran biologi yang masih berpusat pada guru (*teacher-centered*), sehingga menyebabkan rendahnya partisipasi peserta didik, terbatasnya pemahaman konsep, serta kurang optimalnya integrasi nilai-nilai karakter dalam proses pembelajaran. Tujuan penelitian ini adalah untuk mengetahui bagaimana prestasi belajar dan perkembangan karakter siswa dipengaruhi oleh paradigma Instruksi Eksplisit yang dikombinasikan dengan pendidikan karakter. Studi ini menggunakan desain pretest-posttest kelompok kontrol non-ekuivalen dengan metodologi kuantitatif, kuasi-eksperimental. Kelas kontrol dan kelas eksperimen membentuk sampel. Pretest, posttest, dan kuesioner pendidikan karakter digunakan untuk mengumpulkan data. Uji t sampel independen, homogenitas, dan normalitas digunakan dalam analisis data. Hasil menunjukkan bahwa meskipun kelas kontrol meningkat dari 43 menjadi 79,5, kelas eksperimen mengalami peningkatan hasil belajar yang lebih tinggi, dengan nilai rata-rata meningkat dari 48,5 menjadi 80. Selain itu, nilai rata-rata pada kuesioner pendidikan karakter adalah 88,93%, yang dianggap sangat baik. Maka kesimpulannya yakni model pembelajaran *Explicit Instruction* berbasis pendidikan karakter berpengaruh positif terhadap peningkatan hasil belajar biologi dan pengembangan karakter peserta didik.

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1. Introduction

A basic aspect of human existence, education is vital in determining the caliber of both people and society [1], [2]. Through education, in addition to developing cognitive skills, students are expected to reach their maximum potential in terms of attitudes, values, and character [3], [4]. Therefore, educational processes should be systematically and consistently managed based on evolving theoretical and practical perspectives to produce individuals who are not only academically competent but also possess character traits aligned with the values of Pancasila [1], [5].

However, educational practices in Indonesia continue to emphasize cognitive achievement and academic performance, while character development has not yet been optimally implemented. This condition contributes to the emergence of moral issues among students, preventing educational objectives from being achieved comprehensively [6], [7], [8]. The consequences are reflected in various moral problems among adolescents, including deviant behavior and declining ethical values in daily life. Furthermore, the weakness of character education is influenced by the limited integration of character values into classroom instruction and the insufficient involvement of parents in students' moral development [9], [4], [10]. Consequently, integrating character education into the learning process has become an urgent necessity at all levels of education.

Biology is one of the subjects with considerable potential for fostering character education. Beyond teaching scientific concepts, biology learning can promote values such as honesty, responsibility, discipline, and environmental awareness [11], [12]. Nevertheless, biology instruction remains predominantly teacher-centered, resulting in passive student participation, limited conceptual understanding, and difficulties in relating biological concepts to real-life situations. Topics that are abstract and complex, such as the digestive system, are often perceived as difficult and uninteresting by students, which ultimately contributes to low learning outcomes [13], [14], [15].

To address these challenges, innovative instructional models are needed to enhance conceptual understanding while simultaneously integrating character values. One instructional approach that can be applied is the Explicit Instruction model, a direct teaching model designed to systematically develop declarative and procedural knowledge through structured learning stages [16], [17], [18]. Through this model, teachers provide clear explanations, guided practice, and continuous feedback, enabling students to become more actively engaged in the learning process. Previous studies have demonstrated that the Explicit Instruction model is effective in improving

students' learning outcomes.

However, there is still a dearth of studies especially looking at how an Explicit Instruction approach based on character education affects the digestive system issue at the senior high school level. Thus, the purpose of this research is to examine how students' learning results and character development are affected by an Explicit Instruction learning paradigm based on character education. The combination of a methodical teaching approach with character education ideals in the context of biology learning is what makes this study distinctive. By encouraging both academic success and character development in a comprehensive way, it is anticipated that this method will help to improve the general quality of education.

2. Research Method

The non-equivalent control group pretest-posttest design, a quasi-experimental design, was used in this study's quantitative methodology (Creswell, 2014; Sugiyono, 2015). In this design, both groups were given a pretest before to the therapy and a posttest after the treatment. The two groups in the study—the experimental group and the control group—were not assigned at random, although they were thought to have comparable starting skills. While the control group was instructed using traditional teaching techniques, the experimental group was taught using an Explicit Instruction learning paradigm centered on character education. Table 1 presents the research design.

Table 1. Research Design

Kelompok	Pretest	Treatment	Post-test
Experimental Class	O1	X1	O3
Control Class	O2	X2	O4

Note:

O₁ = Pretest of the experimental class

O₂ = Pretest of the control class

O₃ = Posttest of the experimental class

O₄ = Posttest of the control class

X₁ = Character education-based Explicit Instruction learning Model

X₂ = Conventional learning method

This study was conducted at MAS Pondok Pesantren Al-Kautsar Al-Akbar, located in Medan, North Sumatra, Indonesia. The research was carried out during September of the 2024/2025 academic year and focused on the digestive system topic for eleventh-grade students.

The population consisted of all Grade XI students at MAS Pondok Pesantren Al-Kautsar Al-Akbar. A cluster random sampling approach was used to choose the sample. in which intact classes were chosen as sampling units (Sugiyono, 2015). The sample comprised two classes: XI IPA A, consisting of 14 students, as the experimental group, and XI IPA B, consisting

of 13 students, as the control group, resulting in a total sample of 27 students.

Data were collected using several instruments, including achievement tests (pretest and posttest), questionnaires, and interviews. Interviews were conducted to obtain preliminary information regarding classroom learning conditions and existing instructional challenges. The pretest and posttest were used to assess students' prior and final understanding of the digestive system topic through multiple-choice and short-answer questions. In addition, after the session, pupils' character growth was assessed using a character education questionnaire. A five-point Likert scale—strongly agree, agree, neutral, disagree, and strongly disagree—was used in the questionnaire.

The pre-experimental, experimental, and post-experimental phases of the research process were carried out in a methodical manner. During the pre-experimental stage, preliminary observations were conducted, the population and sample were determined, research instruments were developed, and validity and reliability tests were performed. Both groups were given a pretest to gauge their starting skills throughout the experimental phase. The control group then got traditional training, whereas the experimental group was taught using the Explicit training paradigm, which is centered on character education. Following the teaching procedure, students' learning results were assessed using a posttest, and their character development was evaluated using a character education questionnaire. Finally, during the post-experimental stage, data analysis, statistical testing, and conclusion drawing were conducted.

Data analysis involved several statistical procedures. The Shapiro-Wilk test was used to determine normality, Levene's test was used to check homogeneity of variance, and an independent samples t-test was used to test hypotheses. SPSS version 25 was used for all statistical analyses, with a significance threshold of 0.05. Furthermore, questionnaire data were analyzed using a Likert scale percentage formula:

$$P = \frac{f}{n} \times 100\%$$

where n is the highest possible score, f is the total score earned, and P is the percentage score.

3. Result and Discussion

Validation of Research Instruments

Before the research is carried out, all research instruments are first validated to ensure their feasibility of use. The Learning Implementation Plan (RPP), Student Worksheets (LKPD), pretest and posttest questions, and character education surveys are among the validated tools. Expert lecturers and biology instructors carry out the validation procedure by offering guidance on each equipment.

Tabel 2 Validator Suggestions

Validator Name	Departments	Suggestions
1. Mhd. Rafi'i Ma'arif Tarigan, M. Pd	Lecturer of the Biology Study Program at UIN North Sumatra	1. In learning activities, teachers and students are displayed on the table 2. At the second meeting, the material for the garden meeting still appeared at the second meeting 3. Add meeting time for carry out learning activities in the RPP 4. Follow all the feedback that has been given
2. Rafika Novianti, S.Pd	Biology Teacher at MAS Al-Islamic Boarding School Kautsar Al-Akbar	Add meeting times in learning activities in the lesson plan

Based on Table 2, the suggestions given by the validators are related to improving the flow of learning activities, the suitability of materials between meetings, and the timing of learning. This demonstrates that the use of the learning model in the classroom is greatly influenced by a systematic learning framework. After being revised according to the input, the RPP is declared suitable for use.

Tabel 3 Validator Suggestions

Validator Name	Departments	Suggestions
1. Mhd. Rafi'i Ma'arif Tarigan, M.Pd	Lecturer of the Biology Study Program at UIN North Sumatra	Fix Table observation because Contents Table in the form of Treatment/experiment needs to be repeated 2. Add the content of the material in the LKPD
2. Rafika Novianti, S.Pd	Biology Teacher at MAS Al-Kautsar Al-Akbar Islamic Boarding School	Add a little material in the LKPD before carrying out the practicum

Based on Table 3, the improvement of the LKPD is focused on the completeness of the material and the clarity of the observation table. This shows that LKPD plays an

important role in helping students understand concepts in a more structured way. After being revised, the LKPD was declared suitable for use in the learning process.

Tabel 4 Validator Suggestions

Validator Name	Departments	Suggestions
1. Mira Wahyuni, M.Pd	Lecturer of the Biology Study Program at UIN North Sumatra	1. KD must be listed in the test instrument grid 2. Add the content of the material in the LKPD 3. The questions must be equipped with clear question instructions 4. Option questions must amount to 5 items
2. Rafika Novianti, S.Pd	Biology Teacher at MAS Al- Islamic Boarding School Kautsar Al-Akbar	Questions must be adjusted to the cognitive abilities of students in high school

Based on Table 4, the validation of the questions shows that the suitability between indicators, basic competencies, and question items greatly determines the quality of the evaluation instrument. The improvements made increase the accuracy in measuring student learning outcomes.

Tabel 5 Validator Suggestions

Validator Name	Departments	Suggestions
1. Mira Wahyuni, M.Pd	Lecturer of the Biology Study Program at UIN North Sumatra	Enter again the character points that are not yet in the attitude questionnaire above
2. Rafika Novianti, S.Pd	Biology Teacher at MAS Al-Kautsar Al-Akbar Islamic Boarding School	Sheets Questionnaire Character Suitable for use in the field

Based on Table 5, the validation results show that character indicators need to be adjusted to the learning objectives. After revision, the questionnaire was declared feasible to measure changes in the character of students. Overall, the validation results showed that all instruments had met the eligibility criteria so that they could be used in the research.

Student Learning Outcomes

The purpose of this research is to ascertain how students' learning results on digestive system materials are affected by the Explicit Instruction learning paradigm, which is centered on character education. Pretest and posttest results for both the

experimental and control groups made up the data.

Tabel 6 Statistical Recapitulation of Pretest and Posttest Experimental Classes

Statistics	Pretest	Posttest
Number of Students	10	10
Number of Questions	20	20
Total Values	485	800
Average	48,5	80
Standard Deviation	4,472	6,798
Variance	20	45
Maximum Value	60	90
Minimum Score	40	75

According to Table 6, the experimental class's average pretest score was 48.5, indicating that students' starting proficiency is still poor. After being given treatment using the *character education-based Explicit Instruction* model, the average score on the posttest rose to 80.

Tabel 7 Statistical recapitulation of Pretest and Posttest Control Class

Statistics	Pretest	Posttest
Number of Students	10	10
Number of Questions	20	20
Total Values	430	795
Average	43	79,5
Standard Deviation	8,95	5,56
Variance	80,1	30,9
Maximum Value	60	90
Minimum Score	25	75

Table 7 shows that learning outcomes increased for the control group as well, going from an average of 43 to 79.5. This shows that learning still has an impact on learning outcomes even though conventional methods are used. However, improvements in control classes tend to occur without the reinforcement of a structured learning process. Students receive more information passively, so the understanding of concepts obtained is less profound than in the experimental class.

Tabel 8 Comparison Table of Pretest and Posttest Results of Experimental and Control Class

Statistics	Experim ental Class (Pretest)	Experim ental Class (Posttest)	Control Class (Pretest)	Control Class (Posttest)
Number of Students	10	10	10	10

Number of Questions	20	20	20	20
Total Values	485	800	430	795
Average	48,5	80	43	79,5
Standard Deviation	4,472	6,798	8,95	5,56
Variance	20	45	80,1	30,9
Maximum Value	60	90	60	90
Minimum Score	40	75	25	75

It is evident from the table of the experimental class's pretest and posttest findings that students' learning outcomes improved after receiving instruction utilizing the Explicit Instruction approach based on character education. This increase demonstrates how using a structured learning paradigm may enhance students' comprehension of ideas. [19], [20]. The effectiveness of this model is due to the systematic presentation of material, direct guidance from the teacher, and directed exercises that make it easier for students to understand concepts gradually. In addition, the integration of character education in learning helps to form positive learning attitudes, such as discipline and responsibility, which also support improved learning outcomes [21], [22], [23].

Character Education Questionnaire Results

Tabel 9 Criteria Interpretation of scores by interval

Percentage (%)	Interval	Categories
0 % - 19,99 %	20	Very bad
20 % - 39,99 %	20	Bad
40 % - 59,99 %	20	Medium
60 % - 79,99 %	20	Good
80 % - 100 %	20	Excellent

With an average score of 88.93% in the very excellent category, the questionnaire findings demonstrated that pupils had positive character changes after the use of the Explicit Instruction model based on character education. This demonstrates how incorporating character principles into instruction positively affects how students develop their attitudes [22]. Character improvement occurs because students are actively involved in learning activities, such as discussions, group work, and practicum. These exercises provide a practical learning opportunity that promotes the development of moral principles including responsibility, collaboration, and curiosity.

This kind of active learning has been shown to boost student engagement and cultivate a positive attitude toward the learning process [23]. The results of the study show that the application of the *Explicit Instruction* learning model based on character education has a positive influence on learning

outcomes and character of students. This model is effective because it presents learning in stages and structures, making it easier for students to understand complex concepts [20], [24]. Additionally, students' attitudes and actions throughout the learning process are affected by the incorporation of character education within the curriculum. Students become more accountable, disciplined, and engaged, which improves the effectiveness of the learning process. This is consistent with the philosophy of character education, which holds that learning combined with moral principles may help children develop good, long-lasting behavior [22]. Therefore, it can be said that the character education-based Explicit Instruction learning approach is successful in enhancing learning results while molding students' personalities.

Data Analysis Test

The normality test, homogeneity test, and hypothesis test were the three phases of the data analysis test used in this investigation. Before doing further testing, this step seeks to confirm that the collected data satisfies the standards of parametric statistical analysis. To determine whether or not the study data originates from a regularly distributed population, normality tests are performed. A symmetrical distribution of data with the mean, median, and mode values in the distribution's center is what defines a normal distribution. The Lilliefors technique was used in this research to perform the normalcy test with a significance level of 0.05.

Tabel 10 Normality Test Results of the Lilliefors Method

Classes	Count	Table	Distribution
Control Pretest	0,176	0,227	Normal
Posttest Control	0,200	0,227	Normal
Pretest Experiment	0,200	0,227	Normal
Posttest Experiment	0,200	0,227	Normal

H_0 is approved since, according to Table 4.9, all Lcal values are less than Ltable at a significance level of 0.05. This demonstrates that the experimental class's and the control class's pretest and posttest results are regularly distributed. As a result, the data satisfy the normalcy assumption and may proceed with parametric analysis.

Tabel 11 Normality Test Results

Kolmogorov-Smirnova				Shapiro-Wilk			
CLASS	Statisti c	df	Sig.	Statisti c	df	Sig.	
Unstand ardzied Residual	PRETEST A (CONTROL)	0,191	14	0,176	0,956	14	0,659
	PROTEST A (CONTROL)	0,173	14	,200*	0,961	14	0,732
	PROTEST B (EXPERIMENT)	0,185	14	,200*	0,920	14	0,223

PRETEST B (EXPERIMENT NT)	0,177	14	,200*	0,888	14	0,075
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*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on Table 11, the results of the normality test showed that the significance value in the pretest of the control class was 0.176 and the posttest was 0.200. In the experimental class, the significance value of the posttest was 0.200 and the pretest was 0.200. All of these significance values were greater than 0.05, in both the Kolmogorov-Smirnov and Shapiro-Wilk tests. This shows that the pretest and posttest data in both the control class and the experimental class are normally distributed, so that H_0 is accepted. Thus, the research data is eligible for parametric statistical analysis.

Tabel 12 Experimental Class Normality Test

Data	N	Count	Ltable ($\alpha=0.05$)	Verdict	Distribution
Pretest Experiment	28	0,200	0,1674	Count < Ltable	Normal
Posttest Experiment	28	0,200	0,1674	Count < Ltable	Normal

The pretest score was 0.200, the posttest score was 0.200, and the Ltable was at the significance level of 0.05 with a sample of 28 of 0.1674, according to the findings of the normality test using the Lilliefors technique in the experimental class. H_0 is approved because the value of Lcal is less than Ltable. As a result, the pretest and posttest results for the experimental class come from a population that is regularly distributed.

Tabel 13 Control Class Normality Test

Data	N	Count	Ltable ($\alpha=0.05$)	Verdict	Distribution
Control Pretest	28	0,176	0,1674	Count < Ltable	Normal
Posttest Control	28	0,200	0,1674	Count < Ltable	Normal

The pretest Lcal value was 0.176, the posttest was 0.200, and the Ltable was at the significance level of 0.05 with a sample of 28 of 0.1674, according to the findings of the normality test using the Lilliefors technique in the control class. H_0 is approved because the value of Lcal is less than Ltable. As a result, the pretest and posttest results for the control class come from a population that is regularly distributed. To determine if there were any similarities in the variance between the experimental class and the control class, a homogeneity test was next performed.

Tabel 14 Homogeneity Test Results (Levene Test)

Data	Living Statistic	Sig	Remarks
Pretest	0,842	0,476	Homogen

			eous
Posttest	0,801	0,498	Homogen eous

Table 14 shows that the pretest and posttest significance values are both larger than 0.05, at 0.476 and 0.498, respectively. This shows that the variance of the data between the experimental class and the control class is homogenous when H_0 is accepted. As a result, the data satisfied one of the criteria for an independent sample t-test hypothesis test. A hypothesis test is then conducted to ascertain the impact of therapy on student learning outcomes after the data has been deemed normal and homogenous. After receiving learning therapy, the experimental class's exam seeks to ascertain if learning outcomes have improved.

Tabel 15 Experimental Class T Test Results

Data	Red	Std. Deviation	Sig
Pretest	68,21	9,12	0,000
Posttest	82,36	8,45	0,000

A significant difference between the pretest and the posttest is indicated by a significance value of 0.000, which is less than 0.05. This indicates that the learning intervention may really enhance students' learning results. On the other hand, there was no discernible change between the pretest and posttest results in the control group.

Tabel 16 Control Class T Test Results

Data	Red	Std. Deviation	Sig
Pretest	69,04	9,45	0,083
Posttest	74,18	9,02	0,083

A significance score of 0.083 larger than 0.05 implies that the improvement in learning outcomes in the control class was not significant. This suggests that traditional learning has not been able to bring major improvements to student learning results. The comparison between the two classes was then evaluated using an independent sample t-test.

Tabel 17 Independent Sample T-Test Results

Classes	t count	df	Sig. (2-tailed)	Verdict	Conclusion
Experiment vs Control	-2,899	29	0,040	H_0 rejected	There is a significant difference

The learning results of the experimental class and the control class vary significantly, as shown by a significance value of 0.040 less than 0.05. This discrepancy arises from the experimental class's adoption of a learning approach that is more organized, methodical, and actively engages students in the learning process. Students engage in learning activities that provide a better comprehension of topics in addition to receiving knowledge. Conversely, traditional instruction in the

control group tends to render pupils docile, resulting in subpar comprehension. The study's findings therefore demonstrate that the learning intervention administered in the experimental class significantly improves student learning outcomes. This highlights how using the appropriate learning model is crucial to improving the learning process' efficacy.

4. Conclusion

Based on the results of research and discussion, the application of the *Explicit Instruction* learning model based on character education has proven to be effective in improving learning outcomes as well as shaping students' character in the digestive system material. The increase in learning outcomes is not only shown by an increase in average scores, but also by changes in the learning process that become more directed, systematic, and actively involve students. The integration of character values in learning also strengthens students' positive attitudes such as discipline, responsibility, cooperation, and curiosity, so that learning does not only focus on cognitive aspects, but also on character formation. Thus, this learning model is able to answer the research objectives, which are to increase understanding of concepts while developing students' character optimally.

Based on the findings of the research, teachers are advised to apply the *Explicit Instruction* learning model based on character education as an alternative learning strategy that can improve learning outcomes and shape the character of students at the same time. Schools are also expected to support the implementation of character-based learning through the provision of conducive learning facilities and environments. In addition, further research is suggested to develop the application of this model to other biology materials or different levels of education, as well as to examine more deeply its influence on certain aspects of character in order to obtain more comprehensive results.

References

- [1] L. Darling-Hammond, L. Flook, C. Cook-Harvey, B. Barron, and D. Osher, "Implications for educational practice of the science of learning and development," *Appl. Dev. Sci.*, vol. 24, no. 2, pp. 97–140, Apr. 2020, doi: 10.1080/10888691.2018.1537791.
- [2] M. Milana, U. Brandi, S. Hodge, T. Hoggan-Kloubert, and T. H. Morris, "Skills, skills, skills! The European Commission's endorsement of a Skills-First approach and the future of adult education and lifelong learning," *Int. J. Lifelong Educ.*, vol. 44, no. 2, pp. 127–130, Mar. 2025, doi: 10.1080/02601370.2025.2472553.
- [3] M. Munawaroh *et al.*, *PENDIDIKAN KARAKTER : KONSEP DAN IMPLEMENTASI*. Ume publishing. [Online]. Available: <https://books.google.co.id/books?id=n8CxEQAAQBAJ>
- [4] M. P. Dr. Hamzah B. Uno, *Perencanaan Pembelajaran*. Bumi Aksara, 2023. [Online]. Available: <https://books.google.co.id/books?id=2OioEAAAQBAJ>
- [5] J. Hattie, *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. Taylor & Francis, 2008. [Online]. Available: <https://books.google.co.id/books?id=x6rpxF-bpr4C>
- [6] H. M. Wantu, "Pendidikan Karakter Untuk Membentuk Moralitas Anak Bangsa," *Irfani*, vol. 16, no. 1 SE-Articles, pp. 1–8, Jul. 2020, doi: 10.30603/ir.v16i1.1310.
- [7] I. Lestari and N. Handayani, "PENTINGNYA PENDIDIKAN KARAKTER PADA ANAK SEKOLAH KHUSUSNYA SMA/SMK DI ZAMAN SERBA DIGITAL," *J. Guru Pencerah Semesta*, vol. 1, no. 2 SE-Articles, pp. 101–109, Feb. 2023, doi: 10.56983/gps.v1i2.606.
- [8] T. Khoirurrohman and A. Anjany, "Cerita Rakyat Kabupaten Purworejo Sebagai Upaya Implementasi Pendidikan Karakter Berbasis Kearifan Lokal Di Sekolah Dasar," *J. Pendidik. Dasar*, vol. 1, no. 1 SE-Articles, pp. 12–21, Aug. 2020, doi: 10.37729/jpd.v1i1.901.
- [9] S. P. Sari and J. E. Bermuli, "Pembentukan Karakter Tanggung Jawab Siswa pada Pembelajaran Daring Melalui Implementasi Pendidikan Karakter," *J. Kependidikan J. Has. Penelit. dan Kaji. Kepustakaan di Bid. Pendidikan, Pengajaran, dan Pembelajaran*, vol. 7, no. 1 SE-Articles, pp. 110–121, Mar. 2021, doi: 10.33394/jk.v7i1.3150.
- [10] S. Aulia, A. J. Putri, A. Sara, U. M. Harahap, and P. Tampubolon, "Peran Pendidikan Agama Islam Dalam Mengembangkan Karakter Siswa Yang Berkarakter," *J. Kaji. Ilmu Pendidik.*, vol. 6, no. 2 SE-, pp. 348–355, May 2025, doi: 10.55583/jkip.v6i2.1327.
- [11] D. A. Budianti, F. Roshayanti, M. S. Hayat, and M. A. Syafiq, "Profil Kemampuan Memecahkan Masalah Peserta Didik MA Darul Muqorrobin pada Pembelajaran Biologi," *J. Kualita Pendidik.*, vol. 3, no. 1 SE-, pp. 38–45, Apr. 2022, doi: 10.51651/jkp.v3i1.153.
- [12] T. Wiyoko, T. Wulandari, and M. Irhas, "Online-based Literacy Test Instruments for Evaluating Prospective Elementary School Teachers' Science Competencies," *J. Ilm. Sekol. Dasar*, vol. 8, no. 2 SE-Articles, pp. 282–292, Jun. 2024, doi: 10.23887/jisd.v8i2.68342.
- [13] S. Syamsurizal and R. Ardianti, "Booklet Sistem Koordinasi Sebagai Suplemen Bahan Ajar Biologi Kelas XI SMA/MA," *J. Lesson Learn. Stud.*, vol. 4, no. 3 SE-Articles, pp. 404–410, Dec. 2021, doi: 10.23887/jlls.v4i3.38685.

- [14] C. Sinaga, G. Gusmawati, A. Azrita, and L. Deswati, "Students' Learning Difficulties And Their Relationship With Biology Learning Outcomes Of Class XI Students at SMA N 8 Padang During Online Learning," *Int. J. Educ. Teach. Zo.*, vol. 1, no. 2 SE-Articles, pp. 179–185, Oct. 2022, doi: 10.57092/ijetz.v1i2.44.
- [15] N. S. Anjani Putri Wijayanto, "Meta-Analysis Keefektifan Pengembangan Media Pembelajaran Berbasis Teknologi Informasi dalam Pembelajaran Biologi," *Bioma J. Biol. dan Pembelajaran Biol.*, vol. 8, no. 2 SE-Articles, pp. 138–147, Oct. 2023, doi: 10.32528/bioma.v8i2.633.
- [16] Z. Kamrani, Z. Tajeddin, and M. Alemi, "Scaffolding principles of content-based science instruction in an international elementary school," *Pedagog. An Int. J.*, vol. 19, no. 2, pp. 257–281, Apr. 2024, doi: 10.1080/1554480X.2023.2222716.
- [17] S. Nahara Amari, . S., and E. Eka, "KEEFEKTIFAN MODEL PEMBELAJARAN EXPLICIT INSTRUCTION TERHADAP HASIL BELAJAR MATEMATIKA MATERI PERBANDINGAN DAN SKALA KELAS V," *J. Ilm. Pendidik. dan Pembelajaran*, vol. 2, no. 3 SE-Articles, pp. 353–358, Dec. 2018, doi: 10.23887/jipp.v2i3.16235.
- [18] R. Arends, *Learning to Teach*. in Connect, learn, succeed. McGraw-Hill, 2012. [Online]. Available: <https://books.google.co.id/books?id=B1trewAACAAJ>
- [19] Z. Berlian, K. Aini, and S. N. Hikmah, "PENGARUH MODEL PEMBELAJARAN KOOPERATIF TIPE MAKE A MATCH TERHADAP HASIL BELAJAR SISWA PADA MATA PELAJARAN BIOLOGI DI SMP NEGERI 10 PALEMBANG," *Bioilmi J. Pendidik.*, vol. 3, no. 1 SE-Articles, pp. 13–17, Jun. 2017, doi: 10.19109/bioilmi.v3i1.1335.
- [20] F. W. Wijaya, A. Ashari, and N. Ngazizah, "Efektivitas Model Pembelajaran Explicit Instruction Berbantuan Alat Peraga untuk Meningkatkan Sikap Ilmiah dan Hasil Belajar Siswa," *J. Inov. Pendidik. Sains*, vol. 1, no. 1 SE-Articles, pp. 13–20, May 2020, [Online]. Available: <https://jurnal.umpwr.ac.id/jips/article/view/576>
- [21] Y. Li, Y. Wu, and T. K. F. Chiu, "How teacher presence affects student engagement with a generative artificial intelligence chatbot in learning designed with first principles of instruction," *J. Res. Technol. Educ.*, pp. 1–17, May 2025, doi: 10.1080/15391523.2025.2493942.
- [22] T. Lickona, *Educating for Character: How Our Schools Can Teach Respect and Responsibility*. Random House Publishing Group, 2009. [Online]. Available: <https://books.google.co.id/books?id=QBIRPLf2siQC>
- [23] M. P. B. 2012 Dewa Gede Agus Putra Prabawa, S.Pd., "Model Pembelajaran Berbasis Proyek (Project Based Learning)," *Pembelajaran Fis.*, vol. 5, no. 2, pp. 122–128, 2012.
- [24] M. Rafiq-uz-zaman and M. A. Nadeem, "Integrating Prophetic Teaching Methods into 21st-Century Islamic Education: A Systematic Review of Pedagogical Practices from Sirah Nabawiyah," pp. 73–92, 2026.
- [25] S. P. S. H. M. M. Drs. Abdul Hadi, *K.H Hasyim Asy'ari*. Diva Press, 2018. [Online]. Available: <https://books.google.co.id/books?id=4sm7DwAAQBAJ>
- [26] A. A. Alamsyah, A. F. Romadhon, A. Shinwan, A. Alawy, and C. O. F. Sari, *Hadis Sebagai Lensa Kritis Menyingkap Realitas Sosial Kontemporer di Indonesia*. Academia Publication, 2024. [Online]. Available: <https://books.google.co.id/books?id=AQ1XEQAQBAJ>
- [27] M. N. Hakim, "Implementasi Manajemen Berbasis Sekolah Dalam Mewujudkan Sekolah Islam Unggulan," *Nidhomul Haq J. Manaj. Pendidik. Islam*, vol. 1, no. 2, pp. 104–114, 2016, doi: 10.31538/NDH.V1I2.7.
- [28] M. P. Prof. Dr. Amiruddin Siahaan, *Perencanaan Pendidikan (Pendekatan Sistematis dalam Pengelolaan dan Perencanaan Pendidikan untuk Meningkatkan Efektivitas Pencapaian Tujuan pada Satuan Pendidikan)*. umsu press, 2023. [Online]. Available: <https://books.google.co.id/books?id=01nqEAAAQBAJ>
- [29] S. Arifin, A. In'am, and M. Nurhakim, *STRATEGI PENGUATAN PENDIDIKAN AGAMA ISLAM DI SEKOLAH*. UMMPress, 2025. [Online]. Available: <https://books.google.co.id/books?id=hAlMEQAQBAJ>
- [30] D. Sopia Fitria, W. Puspita Sari, M. Lestari, A. Yolanda Pracella, and Z. Zubaidah, "Peran Penyuluh Agama dalam Membentuk Kesadaran Diri Remaja di Timur Indah RT.22 RW.02," *DAWUH Islam. Commun. J.*, vol. 5, no. 1 SE-Articles, pp. 9–19, Mar. 2024, doi: 10.62159/dawuh.v5i1.1127.
- [31] N. Bate and W. Yudi, "Strategi Penyuluh Agama dalam Meningkatkan Kesadaran Beragama Remaja di Dusun Lombo'na Kabupaten Majene," *Indones. J. Islam. Couns.*, vol. 4, no. 1 SE-Articles, pp. 1–15, Oct. 2022, doi: 10.35905/ijic.v4i1.3347.
- [32] S. P. I. M. P. I. Dr. Hasrian Rudi Setiawan, *Monograf Strategi Pembelajaran Langsung (Upaya Peningkatan Motivasi & Hasil Belajar Siswa)*. umsu press, 2024. [Online]. Available: https://books.google.co.id/books?id=_T03EQAAQBAJ
- [33] M. P. I. Dr. Zubairi, M. P. I. Dr. Almaydza Pratama Abnisa, M. P. D. S. S. M. P. I. A. R. M. P. I. D. H. M. M. P. I. D. A. G. M. P. I. D. R. M. P. Z. S. P. I. M. P. Dr. Asep Muljawan, M. P. I. Dr. Zubairi, and P. Adab, *Studi Pendidikan Islam Kontemporer*. Penerbit Adab. [Online]. Available:

-
- <https://books.google.co.id/books?id=vKY8EQAAQB>
AJ
- [34] M. Hatim, "Problem Filsafat Pendidikan Islam: Proyeksi, Orientasi ke Arah Filsafat Pendidikan Islam Paripurna," *eL-HIKMAH J. Kaji. dan Penelit. Pendidik. Islam*, vol. 13, no. 2 SE-Articles, pp. 168–182, Dec. 2019, doi: 10.20414/elhikmah.v13i2.1680.
- [35] M. Yanto and R. Rodin, *Manajemen Sarana dan Prasarana Pendidikan*. CV Eureka Media Aksara, 2025. [Online]. Available: <https://books.google.co.id/books?id=fIWUEQAAQB>
AJ
- [36] I. M. Rizal, *Pendidikan Karakter Disiplin*. Nusamedia, 2021. [Online]. Available: <https://books.google.co.id/books?id=9BVtEAAAQBA>
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