

## THE INFLUENCE OF DIFFERENTIATION STRATEGY, LEARNING MOTIVATION ON STUDENTS' CRITICAL THINKING SKILLS ON THE ECOSYSTEM THEME

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### Abstract

*This study aims to analyze the influence of differentiation strategies and learning motivation on critical thinking skills of fifth-grade students of Madrasah Ibtidaiyah on the theme of Ecosystems, as well as the interaction between the two. This study used a quantitative approach with an ex post facto method. The sample consisted of 41 students from grades VA and VB. The instrument was a critical thinking skills test, and the data were analyzed using a two-way ANOVA test. The results showed that differentiation strategies had a significant influence on students' critical thinking skills ( $p = 0.030$ ), which indicates the importance of implementing learning tailored to students' needs, interests, and abilities. In contrast, learning motivation did not show a significant effect ( $p = 0.812$ ), as did the interaction between differentiation strategies and learning motivation ( $p = 0.859$ ). These results indicate that an appropriate and differentiated learning approach has a greater influence on the development of critical thinking skills than internal learning motivation. Therefore, teachers are advised to implement adaptive and responsive strategies to optimally support students' critical thinking skills.*

*Keywords: Students' Critical Thinking, Learning Motivation, Differentiation Strategies*

### Abstrak

*Penelitian ini bertujuan untuk menganalisis pengaruh strategi diferensiasi dan motivasi belajar terhadap keterampilan berpikir kritis siswa kelas V Madrasah Ibtidaiyah pada tema Ekosistem, serta interaksi keduanya. Penelitian ini menggunakan pendekatan kuantitatif dengan metode ex post facto. Sampel terdiri atas 41 siswa dari kelas VA dan VB. Instrumen berupa tes keterampilan berpikir kritis, dan data dianalisis menggunakan uji ANOVA dua arah. Hasil menunjukkan bahwa strategi diferensiasi memiliki pengaruh signifikan terhadap keterampilan berpikir kritis siswa ( $p = 0,030$ ), yang menunjukkan pentingnya penerapan pembelajaran yang disesuaikan dengan kebutuhan, minat, dan kemampuan siswa. Sebaliknya, motivasi belajar tidak menunjukkan pengaruh yang signifikan ( $p = 0,812$ ), begitu pula interaksi antara strategi diferensiasi dan motivasi belajar ( $p = 0,859$ ). Hasil ini menunjukkan bahwa pendekatan pembelajaran yang tepat dan berdiferensiasi lebih berpengaruh terhadap pengembangan kemampuan berpikir kritis daripada motivasi belajar internal. Oleh karena itu, guru disarankan untuk menerapkan strategi yang adaptif dan responsif guna mendukung keterampilan berpikir kritis siswa secara optimal.*

*Kata kunci: Berpikir Kritis Siswa, Motivasi Belajar, Strategi Diferensiasi*



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## INTRODUCTION

The field of education is now facing new challenges due to technological advances and changes in the global environment. One of the main challenges is preparing the younger generation to think critically in understanding and solving various complex problems in life.<sup>1</sup> Learning strategies in the 21st century are focused on developing the ability to be innovative, establish solid cooperation, be able to think critically in the sense of being able to choose the best and have effective communication skills, this is the development of Human Resources.<sup>2</sup> The learning process that relies primarily on the teacher tends to be boring and less interesting because students only receive material without developing their competencies.<sup>3</sup> The implementation of the Independent Curriculum is a strategic step in responding to the needs of the ever-changing era, particularly in developing student competencies. This curriculum emphasizes the freedom of schools and teachers to determine learning strategies tailored to the conditions or circumstances of students and the school environment.<sup>4</sup> The main focus of the Merdeka curriculum is the development of competencies and soft skills, such as communication skills, critical thinking, collaboration, and creativity, which are integrated into the learning process.<sup>5</sup> The Independent Curriculum implements learning that is adapted to the developmental stage and learning achievements of students, known as differentiated learning.<sup>6</sup>

Differentiated learning is an approach or strategy used by teachers to adapt learning to meet the needs and expectations of each student.<sup>7</sup> Differentiated learning aims to optimize the development of the diverse potential or competencies of each student in the class, through variations

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<sup>1</sup> I. Ummah, "Pengaruh Pendekatan Science, Environment, Technology, and Society (SETS) Terhadap Kemampuan Berpikir Kritis Siswa Pada Materi Pemanasan Global," *Repository.Uinjkt.Ac.Id*, 2024, <https://repository.uinjkt.ac.id/dspace/handle/123456789/83611>.

<sup>2</sup> Yonira Mike Vindi Marta et al., *Development of Physics E-Module Integrated with STEM Approach to Promote Students' Critical and Creative Thinking Skills*, 2024, <https://doi.org/10.29303/jppipa.v11i1.4829>.

<sup>3</sup> DA Wijayanti and DR Prihandini, "Realisasi Merdeka Belajar Dengan Menggunakan Strategi Pembelajaran Diferensiasi Proses Pada Siswa SMA Kelas X," *Pubmedia Jurnal Penelitian Tindakan Kelas*, 2024, <https://edu.pubmedia.id/index.php/ptk/article/view/55>.

<sup>4</sup> F. Zahro and ANM Fauziah, "Peran Dan Tantangan Guru IPA Dalam Pengimplementasian Kurikulum Merdeka Untuk Konservasi Alam Dan Kearifan Lokal," *Prosiding Seminar Nasional*, 2024, <https://proceeding.unesa.ac.id/index.php/semnasipa/article/view/729>.

<sup>5</sup> PR Utami et al., "Pengembangan Kompetensi Dan Soft Skill Dalam Implementasi Kurikulum Merdeka: Tinjauan Literatur," *MANAJERIAL: Jurnal Inovasi Manajemen Dan Supervisi Pendidikan*, 2025, <https://www.jurnalp4i.com/index.php/manajerial/article/view/4734>.

<sup>6</sup> NP Swandewi, "Implementasi Strategi Pembelajaran Berdiferensiasi Dalam Pembelajaran Teks Fabel Pada Siswa Kelas Vii h Smp Negeri 3 Denpasar," *Jurnal Pendidikan Deiksis*, 2021, <https://www.jurnal.markandeyabali.ac.id/index.php/deiksis/article/view/54>.

<sup>7</sup> W. Herwina, "Optimalisasi Kebutuhan Murid Dan Hasil Belajar Dengan Pembelajaran Berdiferensiasi," *Perspektif Ilmu Pendidikan*, 2021, <https://www.neliti.com/publications/521293/optimalisasi-kebutuhan-murid-dan-hasil-belajar-dengan-pembelajaran-berdiferensia>.

in content, processes, and tailored learning outcomes.<sup>8</sup> Differentiated learning is an approach that is considered capable of accommodating student diversity, is inclusive, and strives to meet the needs of each individual in the learning process.<sup>9</sup> These needs can include existing knowledge, preferred learning methods, interest in a topic, and the student's level of understanding of the subject matter.<sup>10</sup> The implementation of differentiated learning encompasses three main approaches: content, process, and product differentiation. All three can be a specific focus in designing learning activities. Differentiation that focuses on the material students learn, which is directly related to the curriculum and teaching materials, is called content differentiation. Second, process differentiation refers to how students understand concepts and information, including adapting to their individual learning styles. Third, product differentiation relates to the form or way students demonstrate their understanding of the material they have learned.<sup>11</sup> Differentiated learning is an approach in which teachers adjust learning facilities to the needs of each student. This is because each student has different characteristics, so that in this case they cannot be treated the same in learning activities.<sup>12</sup> In general, differentiation is understood as a learning approach that is designed to suit the needs of each individual.<sup>13</sup>

The process of learning Natural Sciences needs to be designed in an interactive and enjoyable way, so that it can encourage active participation from students and foster a creative and independent attitude that is in line with their wishes and their stage of development.<sup>14</sup> Learning science naturally demands student engagement in the scientific process, which stimulates critical thinking and develops science process skills. Through these skills, students learn to manage information objectively, relate various data, conduct analysis and evaluation, draw conclusions, and apply knowledge in new contexts.<sup>15</sup> Natural Science materials such as themes An ecosystem is defined as the relationship between living things and their environment, which is formed through

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<sup>8</sup> R. Fauzia and ZH Ramadan, "Implementasi Pembelajaran Berdiferensiasi Dalam Kurikulum Merdeka," *Jurnal Educatio FKIP UNMA*, 2023, <https://ejournal.unma.ac.id/index.php/educatio/article/view/5323>.

<sup>9</sup> S. Fatimah and R. Mashar, "Peran Guru Dalam Pembelajaran Berdiferensiasi Di Taman Kanak-Kanak Aba al-Furqon Nitikan Yogyakarta," *Pedagogia: Jurnal Pendidikan Dasar*, 2023, <https://jurnal.educ3.org/index.php/pedagogia/article/view/130>.

<sup>10</sup> VR Bulu, "Pengaruh Strategi Pembelajaran Diferensiasi Terhadap Hasil Belajar Matematika," *HINEF: Jurnal Rumpun Ilmu Pendidikan*, 2023, <https://ojs.cbn.ac.id/index.php/hinef/article/view/1011>.

<sup>11</sup> A. Sutisnawati et al., "Penerapan Pembelajaran Diferensiasi Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa Sekolah Dasar," *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 2024, <http://journal.unpas.ac.id/index.php/pendas/article/view/15842>.

<sup>12</sup> AS Wahyuni, "Literature Review: Pendekatan Berdiferensiasi Dalam Pembelajaran Ipa," *Jurnal Pendidikan Mipa*, 2022, <https://ejournal.tsb.ac.id/index.php/jpm/article/view/562>.

<sup>13</sup> SN Azizah and AP Astutik, "Diferensiasi Pembelajaran Pendidikan Agama Islam Dalam Meningkatkan Literasi Di Era Digital," *JIIP: Jurnal Ilmiah Ilmu Pendidikan*, 2025, <http://www.jiip.stkipyapisdmpu.ac.id/jiip/index.php/JIIP/article/view/7503>.

<sup>14</sup> Wahyuni, "Literature Review: Pendekatan Berdiferensiasi Dalam Pembelajaran Ipa."

<sup>15</sup> Zahro and Fauziah, "Peran Dan Tantangan Guru IPA Dalam Pengimplementasian Kurikulum Merdeka Untuk Konservasi Alam Dan Kearifan Lokal."

inseparable reciprocal interactions. An ecosystem can also be defined as a comprehensive and integrated whole between all components of the living environment that influence each other.<sup>16</sup> Skills in thinking or what is called critical thinking is a thinking process carried out by systematically describing problems which includes students, accurately recognizing problems, and verifying the information obtained to design problem-solving strategies.<sup>17</sup> Critical thinking skills are skills in processing, assessing, and utilizing information obtained to produce appropriate solutions.<sup>18</sup>

Students need to master critical thinking skills, such as asking questions, answering questions, drawing conclusions, expressing opinions or arguments, solving problems, and evaluating and assessing the results of the critical thinking process.<sup>19</sup> Critical thinking skills include all or part of processes such as asking questions, analyzing, synthesizing information, interpreting, drawing conclusions, using inductive and deductive reasoning, relying on intuition, applying knowledge, and being creative.<sup>20</sup> Angelo stated that indicators of critical thinking skills include: 1) skills in analyzing, 2) skills in compiling or combining information (synthesis), 3) skills in solving problems, 4) skills in drawing conclusions, and 5) skills in conducting evaluations.<sup>21</sup> According to Facione, critical thinking skills consist of six main components, namely the ability to understand meaning (interpretation), analyze, assess objectively (evaluation), draw conclusions (inference), provide explanations (explanation), and control one's own thought processes (self-regulation).<sup>22</sup> Critical thinking skills include skills in categorizing, organizing, recalling, and evaluating information that has been obtained.<sup>23</sup> This ability includes the skills to analyze and assess a problem

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<sup>16</sup> MHI Rais, *Pengaruh Ekosistem Pendidikan Terhadap Motivasi Belajar Peserta Didik Kelas X SMAN 1 Jetis Ponorogo Tahun Pelajaran 2019–2020* (etheses.iainponorogo.ac.id, 2020), <https://etheses.iainponorogo.ac.id/id/eprint/11058>.

<sup>17</sup> MA Syakira, *Pengaruh Model Pembelajaran Problem Based Learning Berbantuan Media Quizizz Terhadap Kemampuan Berpikir Kritis Mata* (repository.unissula.ac.id, 2025), <http://repository.unissula.ac.id/40460/>.

<sup>18</sup> Elisabeth Theresia Tambunan and Ali Mahmudi, "The Improvement of Students' Mathematical Critical Thinking Skills and Learning Motivation Through Contextual Teaching and Learning," *Formatif: Jurnal Ilmiah Pendidikan MIPA* 14, no. 1 (2024), <https://doi.org/10.30998/formatif.v14i1.21634>.

<sup>19</sup> Sutisnawati et al., "Penerapan Pembelajaran Diferensiasi Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa Sekolah Dasar."

<sup>20</sup> Novita Resti et al., "The Effect of STEM on Class X Students' Learning Achievement and Critical Thinking Skills on Environmental Pollution Material," *Jurnal IPA & Pembelajaran IPA* 8, no. 1 (2024): 14–28, <https://doi.org/10.24815/jipi.v8i1.36731>.

<sup>21</sup> Nurul Huda Ramadhan and Wirawan Fadly, "The Effect of Using Quizizz Application in Learning with Science Education for Sustainable Development Approach on Students' Critical Thinking Ability," *Jurnal IPA & Pembelajaran IPA* 8, no. 1 (2024): 94–102, <https://doi.org/10.24815/jipi.v8i1.37751>.

<sup>22</sup> H. Tusyadiyah, *Pengaruh Model Pembelajaran Carousel Feedback Terhadap Kemampuan Berpikir Kritis Siswa Kelas V SDN Kamal 09 Pagi Jakarta Barat* (repository.uinjkt.ac.id, 2022), <https://repository.uinjkt.ac.id/dspace/handle/123456789/61297>.

<sup>23</sup> Sintha Sih Dewanti, "Profil Berpikir Kritis Mahasiswa PGMI dalam Memecahkan Masalah Matematika Dasar," *Jurnal Matematika dan Pembelajaran* 6, no. 1 (2018): 11–22, <https://doi.org/10.33477/mp.v6i1.451>.

in depth, in order to determine the appropriate steps for solving it.<sup>24</sup> Therefore, the delivery of material in Natural Science learning actively and relevantly using appropriate and creative strategies, as well as flexible ones that are related to the context of daily life in the context of Elementary Schools or Madrasah Ibtidaiyah, is very beneficial which is able to build the concept of critical thinking skills in students on the theme of ecosystems.

To support the successful development of students in terms of critical thinking skills, especially in learning, educators or teachers are required to use media in teaching for the learning process in students in learning, choosing the right ones so that learning in the classroom can run more effectively.<sup>25</sup> Student learning motivation is a crucial element in the success of the learning process. Students with high levels of learning motivation typically demonstrate active participation during learning activities and are able to complete assignments with optimal results.<sup>26</sup> Motivation is an internal drive that drives someone to act. In the learning process, student motivation is formed through the influence of internal factors, such as interests and potential, as well as external factors, such as parental support, teacher guidance, and the educational environment.<sup>27</sup> Abraham Maslow's motivational theory, known as the hierarchy of needs, states that an individual's enthusiasm for learning is influenced by a number of factors, including the desire to actualize oneself and develop potential optimally.<sup>28</sup> Low levels of learning motivation can be seen from a lack of enthusiasm in following lessons, frequently being absent from class, easily losing interest, feeling sleepy, and being passive during the learning process.<sup>29</sup> One thing that can be seen is that students who have certain motivations, for example a strong drive to complete assignments, tend to show perseverance in achieving good results on every assignment they undertake.<sup>30</sup>

Previous research by Ermawati et al. showed that the implementation of differentiated learning through learning models such as Problem Based Learning conducted at the school, showed that this model was proven effective when applied in learning, thereby improving the scientific

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<sup>24</sup> Sutisnawati et al., "Penerapan Pembelajaran Diferensiasi Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa Sekolah Dasar."

<sup>25</sup> Stefanie Marla Laudia et al., "SSI-Based WebQuest: Instructional Media for Improving Critical Thinking Skills of Alpha Generation in Science," *Jurnal Inovasi Pendidikan IPA* 11, no. 1 (2025): 335–51, <https://doi.org/10.21831/jipi.v11i1.78093>.

<sup>26</sup> I. Yulinda, "Menjelajahi Dampak Teknologi Apple Terhadap Efektivitas Pembelajaran: Analisis Tematik Tentang Motivasi, Kolaborasi, Dan Produktivitas," *Jurnal Syntax Admiration*, 2025, <https://www.journalsyntaxadmiration.com/index.php/jurnal/article/view/2120>.

<sup>27</sup> R. Riki and K. Kusno, "Analisis Motivasi Belajar Siswa Terhadap Prestasi Belajar Matematika," *PHI: Jurnal Pendidikan Matematika*, 2023, <http://phi.unbari.ac.id/index.php/phi/article/view/269>.

<sup>28</sup> Aulia Azmi Alkhairi et al., *The Influence of PAI Learning Outcomes and Learning Motivation on Students' Honesty Character*, 12, no. 2 (2024).

<sup>29</sup> Anggun Rachmawati Putri and Sintha Sih Dewanti, "Pengaruh Gaya Belajar Terhadap Motivasi Belajar Siswa Pada Pembelajaran Matematika," *JP2M (Jurnal Pendidikan dan Pembelajaran Matematika)* 9, no. 1 (2023): 66–76, <https://doi.org/10.29100/jp2m.v9i1.3676>.

<sup>30</sup> Alkhairi et al., *The Influence of PAI Learning Outcomes and Learning Motivation on Students' Honesty Character*.

literacy skills of class X2 students at SMAN Rambipuji. Through two cycles of classroom action research, the average scientific literacy score of students increased from 69.11 initially to 79.11 after the intervention. The implementation of this strategy has been proven to be able to accommodate differences in student characteristics and encourage active participation in learning, so that students are successful and able to have a deeper understanding, especially in the material of basic scientific concepts.<sup>31</sup> Furthermore, the research results of Annisa Aprilia et al. show that the application of differentiation strategies in the process aspects aligned with students' learning styles, including auditory, visual, and kinesthetic aspects, can have a positive impact on the level of student activity and participation in learning activities. Providing stimuli tailored to each student's learning style can increase their interest, activity, and creativity in participating in the learning process.<sup>32</sup> Likewise, research by Shafira Nisaul Azizah, on learning with differentiation strategies and other learning models, shows that learning that applies learning with differentiation strategies shows results that are able to improve digital literacy for students in the school, and this means that the application of learning strategies that adjust learning based on each individual's abilities and needs has been proven effective, thus providing a more optimal learning experience.<sup>33</sup> Adapting methods to students' learning styles makes the learning process more active, creative, and maximizes understanding of the material.

In Islamic elementary schools, ecosystems learning focuses not only on mastering concepts but also on developing students' critical thinking skills, enabling them to understand the relationships between ecosystem components and their impacts. However, in practice, the critical thinking skills of fifth-grade students in Islamic elementary schools, as well as in elementary schools, are still not optimally developed. This may be influenced by a less varied learning approach and low levels of student motivation. Therefore, it is crucial to implement appropriate learning strategies that understand the needs and differences of each student and enhance their motivation. This includes differentiation strategies, which adapt the content, process, and learning outcomes based on the interests, readiness, and needs of each student. The core goal of implementing differentiated learning is to create an equitable learning process by adapting content, teaching methods, and evaluations, making them more adaptive to each student's individual abilities and

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<sup>31</sup> E. Ermawati et al., "Implementasi Pembelajaran Diferensiasi Dengan Model PBL Untuk Meningkatkan Literasi Sains Siswa Kelas X. 2 SMAN Rambipuji," *Jurnal Biologi*, 2024, <https://journal.pubmedia.id/index.php/biology/article/view/1957>.

<sup>32</sup> AA Fitri and N. Solihati, "Analisis Penerapan Pembelajaran Diferensiasi Proses Melalui Gaya Belajar Siswa Pada Materi Menulis Laporan Hasil Observasi," *Semantik*, 2023, <http://e-journal.stkipsiliwangi.ac.id/index.php/semantik/article/view/3865>.

<sup>33</sup> Azizah and Astutik, "Diferensiasi Pembelajaran Pendidikan Agama Islam Dalam Meningkatkan Literasi Di Era Digital."

characteristics.<sup>34</sup> The most important thing in the learning process is also learning motivation, because this is able to encourage students to be more active, dynamic and able to have a good attitude of critical thinking skills, both during the learning process or from the expected learning objectives. Therefore, the formulation of the problem in this study is focused on three things, namely: 1) whether the differentiation strategy has an influence on students' critical thinking skills in the ecosystem theme, 2) whether learning motivation also influences students' critical thinking skills, and 3) whether there is an interaction between the differentiation strategy and learning motivation in influencing students' critical thinking skills. Thus again, it can be explained that the purpose of this article is to analyze the findings of the influence of each variable individually and whether there is an interaction between the two in the learning process, especially the ecosystem theme in class V of Madrasah Ibtidaiyah.

## RESEARCH METHODS

This study uses a quantitative method with an ex post facto approach. The goal is to determine the extent to which differentiation strategies and learning motivation influence students' critical thinking skills. This approach is applied because the independent variable is not manipulated directly, but rather observed based on existing conditions. The population in this study includes all fifth-grade students at one of the State Islamic Elementary Schools in Hulu Sungai Tengah Regency, South Kalimantan, who have received learning on the theme of ecosystems. In the study, fifth-grade students were taken as research subjects, consisting of class A and B, with a total sample of 41 students, separately the number of students per class is 20 students in class 5A and 21 students in class 5B. This class was chosen because the school has implemented differentiation strategies, especially in class V and has studied ecosystems material in the Natural Sciences subject, so that data collection can be carried out.

The data collection technique was carried out by utilizing facilities that allow for flexible distribution and filling of instruments that are easily accessible to students, namely by distributing questionnaires containing questionnaires and test questions to 5th grade MI students. In this study, a random sampling method was used to determine the selection of research samples. The use of this technique is to provide everyone with the same thing for each part of the total population available in the field so that it is selected as a research sample. With this approach, the research results become more representative and can be trusted in drawing conclusions about the population as a whole.<sup>35</sup>

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<sup>34</sup> Laila Hidayatul Amin et al., "Innovation Of Differentiation Learning Strategies In Science Learning For Students With Special Needs," *JMIE (Journal of Madrasah Ibtidaiyah Education)* 8, no. 2 (2024): 172, <https://doi.org/10.32934/jmie.v8i2.690>.

<sup>35</sup> IY Nabila, "Pengaruh Model Problem Based Learning Berbantuan Media Diorama Terhadap Kemampuan Berpikir Kritis Siswa SD," *Jurnal Penelitian Pendidikan IPA*, 2024, <https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/60925/46762>.

The research instrument was conducted by distributing questionnaires and test questions. The differentiated learning questionnaire given to students contained 10 statements, and the student learning motivation questionnaire contained 10 statements. The statements in the instrument were arranged in the form of answer choices assessed using a Likert scale, with a score of 1 being the lowest and a score of 4 being the highest. The determination of score categories started from the level of strongly disagree, disagree, agree, to strongly agree. In addition, the measurement of students' critical thinking abilities was not only carried out through multiple-choice questions, but also supplemented with an essay test. The scores from both types of tests were then combined, with the questions consisting of 10 multiple-choice items and 3 essay items. The instrument development aimed to determine the extent of students' understanding and aspects of critical thinking skills, as well as to examine whether there was an influence or interaction between the two variables on critical thinking abilities.

**Table 1.** Differentiation Strategy Instrument, Motivation and Critical Thinking

No	Variables	Instrument	Number of Grains	Objective
1	Differentiation Strategy	Likert scale questionnaire	10 Statements	Measuring the implementation of differentiation of content, process, product and learning environment
2	Motivation to learn	Likert scale questionnaire	10 Statements	Measuring intrinsic and extrinsic motivation, learning goals and persistence
3	Critical thinking	Multiple Choice and Essay Tests	10 Multiple Choice and 3 Essays	Assess students' analytical, evaluation and explanation skills

Testing of research instruments needs to be carried out to ensure that each question item has an adequate level of validity and reliability. Based on the results of the Pearson correlation test on the learning motivation questionnaire items, the results showed that most of the items had a significant correlation at the 5% and 1% levels, which means that all the instrument items were declared valid. This fact is supported by the Cronbach's Alpha reliability value of 0.803, which exceeds the minimum standard limit of 0.7, indicating that the learning motivation instrument has a good level of internal consistency. Meanwhile, for the differentiation strategy instrument, the analysis results show that each statement item has a significant correlation with the total score,

where most of the correlation values are at 0.05 and 0.01 as a significance value. The instrument's reliability was recorded at 0.619. Although this value has not reached 0.7, it is still considered appropriate in the context of exploratory research in the educational realm. Therefore, the instrument can be said to be appropriate, so it can be used as a tool to collect any data from the instrument in field research.

The collected data were analyzed using a two-way Analysis of Variance (ANOVA) statistical test using SPSS version 25 statistical software. This method was used to identify the extent to which each independent variable influences the dependent variable, as well as the interaction between them. Prior to this, normality and homogeneity assumptions were tested to ensure the data's suitability for statistical analysis.

The collected data was first analyzed using a validity test, after which the instrument reliability test was conducted as a preliminary requirement for ANOVA. Subsequent testing after the validity and reliability stages required further normality and homogeneity tests as a preliminary step before conducting further analysis tests. After all test assumptions were met properly, the data could be declared normally distributed and homogeneous. Next, a two-way ANOVA test was conducted to analyze the effect of each independent variable and their interaction on the dependent variable, as well as to interpret the data results obtained in the test into a descriptive form for drawing conclusions.

## **RESULTS AND DISCUSSION**

### **Prerequisite Test for Data Analysis and ANOVA Test**

Raw data processing as a preliminary step before further testing is carried out, namely the normality test, so that the classical assumptions in ANOVA research are met. This test aims to ensure whether the students' critical thinking skills score data have a normal distribution, because ANOVA analysis requires the data to meet this assumption for valid results. In this article, the normality test analysis is taken using the Shapiro-Wilk assumption, which is considered more sensitive and suitable for small sample sizes of less than 50.

**Table 2.** Normality Test Results

<b>Tests of Normality</b>						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
	s			s		
Standardized Residual for Students' Critical Thinking Test Scores	.075	41	.200*	.966	41	.255

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Referring to the analysis results, the Shapiro-Wilk test yielded a significance value of 0.255 for the standardized residual of the critical thinking ability test. Because this figure is above the 0.05 significance level ( $p > 0.05$ ), it can be concluded that the assumptions of the normality test are met. This data normality provides a strong basis that the data meets one of the main requirements for proceeding to the analysis of variance (ANOVA) stage. The normality test also shows that the data distribution is unbiased, and the measurement process has been carried out proportionally between groups.

**Table 3.** Homogeneity Test

<b>Levene's Test of Equality of Error Variances a,b</b>					
		Levene Statistics	df1	df2	Sig.
Total Test Score	Based on Mean	1,217	3	37	.317
	Based on Median	1,040	3	37	.386
	Based on Median and with adjusted df	1,040	3	34,635	.387
	Based on trimmed mean	1,182	3	37	.330

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Total Test Score

b. Design: Intercept + Differentiation Strategy + Student Learning Motivation + Differentiation Strategy \* Student Learning Motivation

Meanwhile, the homogeneity test can be seen from the analysis results using Levene's Test of Equality of Error Variances, which functions to identify whether there is equality of variance between groups or if the difference is not statistically significant. Homogeneity of variance is carried out to ensure that the differences in results that arise from the treatment are not caused by differences in data distribution, but are purely due to the influence of the independent variable treatment. The results of the Levene test show a significance value of 0.317 when viewed based on the average value (mean), 0.386 (based on the median), and 0.330 (based on the trimmed mean), all of which exceed 0.05. This finding indicates that the data variance between groups is homogeneous, or in other words, the distribution of scores in each group shows uniformity. By fulfilling this homogeneity assumption, a two-way ANOVA analysis can be carried out with results that can be interpreted correctly.

The analysis of the results of the Two-Way ANOVA test in this study can be seen in the table below, which tests two independent variables and one dependent variable. The results of the ANOVA data test can be explained as follows:

**Table 4.** Two-Way ANOVA Test

<b>Tests of Between-Subjects Effects</b>					
Dependent Variable: Total Test Score					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	772.546a	3	257,515	1,923	.143
Intercept	220641.025	1	220641.025	1647,940	.000
Differentiation Strategy	685,114	1	685,114	5.117	.030
Student Learning Motivation	7,653	1	7,653	.057	.812
Differentiation Strategy * Student Learning Motivation	4,254	1	4,254	.032	.859
Error	4953.893	37	133,889		
Total	266848.000	41			
Corrected Total	5726.439	40			

a. R Squared = .135 (Adjusted R Squared = .065)

### The Influence of Differentiation Strategy on Students' Critical Thinking Skills

When implementing differentiated learning strategies, teachers don't rely solely on a single method or approach. They play a crucial role in designing daily assignments, planning student activities, and compiling diverse teaching materials to support the learning process.<sup>36</sup> In this context, teachers implement learning in schools by adapting the learning process and outcomes to align with the characteristics of each student. Differentiated learning aims to build an inclusive and diverse classroom environment by providing various opportunities for students to understand material, process ideas, and optimize their learning outcomes, thereby making the learning process more effective for each individual.<sup>37</sup> For example, a teacher might ask students to create a mind map on the theme of ecosystems and work on it in groups, so they can discuss, exchange ideas, and support each other in the process of understanding the lesson. In addition, the teacher also presents images of ecosystems for students to observe and analyze together. Through this activity, students are encouraged to think critically, such as identifying ecosystem components, understanding the relationships between living things, and assessing the impact of environmental change. With this kind of learning, students are encouraged to be active, think deeply, and engage according to their respective abilities and learning styles. In the study, a questionnaire containing statements about differentiated learning was given to students, and students were asked to answer it according to their beliefs and understanding in the learning that had been carried out. The questionnaire contained statements about content, process, and product differentiation strategies.

**Table 5.** Differentiation Questionnaire Results Categories

Between-Subjects Factors			
		Value	
		Label	N
Differentiation	1	low	16
Strategy	2	tall	25

From the data obtained after the distribution, there were 25 students who had a high interest category in differentiation strategies, this means that many students were interested in the learning, and there were 16 students who had a low interest category in differentiation strategies, this is because the teacher was less able to apply learning with differentiation strategies optimally and

<sup>36</sup> K. Kumalasari and IQ Barriyah, "Strategi Diferensiasi Dalam Mengembangkan Kreativitas Siswa Kelas 1 Melalui Seni Rupa," *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 2024, <http://journal.unpas.ac.id/index.php/pendas/article/view/12019>.

<sup>37</sup> P. Rintayani, *Buku Referensi Strategi Pembelajaran Berdiferensiasi* (repository.penerbiteureka.com, 2022), <https://repository.penerbiteureka.com/id/publications/560115/buku-referensi-strategi-pembelajaran-berdiferensiasi>.

maximally in the ecosystem theme material. If it is applied continuously by adjusting to the needs of students, as well as their learning styles, it can be ensured that the learning objectives will be achieved. The expected goal for students is to be able to think critically after studying the material on the surrounding environmental ecosystem. Because remembering the importance of cultivating critical thinking skills from the elementary school level lies in its broad benefits, such as increasing comprehension, practicing problem solving, fostering creativity, strengthening self-confidence, supporting decision-making skills, and contributing to academic progress and personal development of children.<sup>38</sup>

The results of the analysis using a two-way ANOVA test can be concluded that the application of the differentiation strategy has a significant influence on the dependent variable, namely the aspect of critical thinking skills of fifth-grade students of Madrasah Ibtidayah on the ecosystem theme, this is indicated by the results of the ANOVA test stated with an F value of 5.117 and a significance value of 0.030 ( $p < 0.05$ ). This finding indicates that the learning strategy with a differentiation strategy has a good impact and provides positive results on improving students' critical thinking skills and supports the achievement of learning objectives more optimally. The average critical thinking score for students with a high differentiation strategy was 83,272, while students with a low differentiation strategy only achieved 74,482. This nearly 9-point difference indicates that differences in treatment during the learning process significantly impact the quality of students' critical thinking.

The implementation of differentiation strategies by teachers provides students with opportunities to learn based on their personal styles, needs, and interests. The success of differentiated learning depends on careful planning from the outset. The first step in implementing it is mapping students' learning needs. These needs are generally divided into three aspects: learning readiness, interests, and talents. In terms of learning readiness, teachers are required to encourage students to be able to participate in learning processes outside their comfort zones, but still in a supportive environment equipped with adequate facilities, so that students can optimally understand new material. Meanwhile, recognizing students' interests and talents aims to increase learning motivation, as each student has different tendencies, such as in art, sports, mathematics, or science.<sup>39</sup> It's important to emphasize that differentiation is one approach that can address the challenges of differing student abilities within a class. This approach creates a fun learning environment through

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<sup>38</sup> A. Rahman, "Meningkatkan Aktivitas Dan Keterampilan Berpikir Kritis Menggunakan Model Panting Pada Siswa Kelas V," *Scholastica Journal*, 2022, <https://jurnal.univpgri-palembang.ac.id/index.php/scholastica/article/view/13034>.

<sup>39</sup> Rintayani, *Buku Referensi Strategi Pembelajaran Berdiferensiasi*.

activities such as speaking practice, collaborative learning, and adapting materials and learning processes. The goal is to determine students' level of readiness to receive learning materials.<sup>40</sup>

Through this approach, student participation in learning activities becomes more dynamic and has a deeper meaning, which ultimately encourages them to think critically about the material presented. Individuals who have critical thinking skills tend to display distinctive characteristics when facing problems, such as explaining the problem clearly, seeking relevant information, using logical criteria, systematically developing steps to solve complex problems, focusing on the core of the problem, remaining persistent in facing challenges, and being careful in assessing existing situations and conditions.<sup>41</sup> In the context of the ecosystem theme, students who receive a differentiated approach can explore broader environmental phenomena, the impacts caused by not maintaining ecosystems, through discussions, experiments, and direct observations that require analytical and reflective skills.

### **The Influence of Learning Motivation on Students' Critical Thinking Skills**

Mc. Donald explains that motivation is a change in energy within an individual, accompanied by a specific feeling and arising as a reaction to achieving a specific goal. In learning, motivation plays a crucial role in stimulating the learning process. Achieving excellent learning outcomes is strongly influenced by motivation. When motivation is provided appropriately, learning success will increase. Motivation is also a determining factor in encouraging a person's efforts and enthusiasm for learning.<sup>42</sup> There are five important aspects that play a role in determining student learning success, namely: active student involvement, interest and attention to learning, motivation to learn, recognition of individual differences, and the use of visual aids in the teaching process.<sup>43</sup> Meanwhile, critical thinking skills observed in the learning process include several indicators, including the ability to identify problems, collect data or information, design various alternative solutions, draw conclusions, express opinions, and analyze existing views.<sup>44</sup>

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<sup>40</sup> M. Handiyani and T. Muhtar, "Mengembangkan Motivasi Belajar Siswa Melalui Strategi Pembelajaran Berdiferensiasi: Sebuah Kajian Pembelajaran Dalam Perspektif Pedagogik-Filosofis," *Jurnal Basicedu*, 2022, <https://www.neliti.com/publications/449572/mengembangkan-motivasi-belajar-siswa-melalui-strategi-pembelajaran-berdiferensia>.

<sup>41</sup> Tussyadiyah, *Pengaruh Model Pembelajaran Carousel Feedback Terhadap Kemampuan Berpikir Kritis Siswa Kelas V SDN Kamal 09 Pagi Jakarta Barat*.

<sup>42</sup> Rais, *Pengaruh Ekosistem Pendidikan Terhadap Motivasi Belajar Peserta Didik Kelas X SMAN 1 Jetis Ponorogo Tahun Pelajaran 2019–2020*.

<sup>43</sup> Tussyadiyah, *Pengaruh Model Pembelajaran Carousel Feedback Terhadap Kemampuan Berpikir Kritis Siswa Kelas V SDN Kamal 09 Pagi Jakarta Barat*.

<sup>44</sup> A. Fadhilah and A. Suriansyah, "Meningkatkan Aktivitas Belajar, Motivasi Dan Keterampilan Berpikir Kritis Siswa Muatan IPA Menggunakan Model Panting Memakai Media Lilin Siswa Sekolah Dasar," *AR-RIAYAH: Jurnal Pendidikan Dasar*, 2024, <https://journal.iaincurup.ac.id/index.php/JPD/article/view/8809>.

This study categorizes students' learning motivation into two levels: high motivation and low motivation. Of the 41 students, 24 (58.5%) had high learning motivation, while 17 (41.5%) were in the low category. The data indicates that most students exhibited positive levels of motivation in participating in the learning process, as reflected in their active involvement and commitment during the learning activities.

Based on the results of the test data analysis, it was found that students' learning motivation did not significantly impact their critical thinking skills. This is evident from the F value of 0.057 with a significance value of 0.812 ( $p > 0.05$ ). showed that the level of student learning motivation did not statistically affect the difference in critical thinking scores. In fact, descriptively, students with low motivation had an average score of 79.342, slightly higher than students with high motivation with an average of 78.413. This phenomenon can be explained by the fact that students' learning motivation does not always translate into critical thinking skills. This contrasts with the results of Handayani's research, which explains Differentiated learning strategies contribute positively to increasing student learning motivation. This is because students engage in varied learning activities tailored to their needs, making the learning process more enjoyable and less monotonous.<sup>45</sup> This can happen because the learning is varied and tailored to students' learning styles, thus achieving the goal of differentiated learning.

Factor This can lead to learning outcomes with differentiation and learning motivation levels not running as expected. It could be that students with high motivation are actually focused on achieving grades or complying with assignments, rather than on the critical thinking process itself from taking the test. Conversely, students who appear less motivated may demonstrate natural critical thinking skills when interested in certain topics such as in questions about caring for plants and animals in the material on maintaining environmental ecosystems, or receive an appropriate learning approach. In other words, learning motivation is internal and does not necessarily guarantee high critical thinking performance without stimulation from appropriate learning strategies. The current learning environment tends to lack variety, as it is still dominated by the use of textbooks as the sole source, without the application of various teaching models. As a result, students' understanding of the material is low, as evidenced by inappropriate answers when asked questions, indicating their weak critical thinking skills, making it difficult for them to solve problems related to the Natural Sciences material.<sup>46</sup>

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<sup>45</sup> Handiyani and Muhtar, "Mengembangkan Motivasi Belajar Siswa Melalui Strategi Pembelajaran Berdiferensiasi: Sebuah Kajian Pembelajaran Dalam Perspektif Pedagogik-Filosofis."

<sup>46</sup> Rahman, "Meningkatkan Aktivitas Dan Keterampilan Berpikir Kritis Menggunakan Model Panting Pada Siswa Kelas V."

### **The Interaction of Differentiation Strategy and Learning Motivation on Critical Thinking Skills**

Students' critical thinking skills are also assessed through several indicators, including a series of tests. These tests have five main indicators: analysis, evaluation, inference, explanation, and reflection.<sup>47</sup> In this study, the analytical aspect is evident when students are able to describe the relationships between components in an ecosystem, such as the roles of plants and animals. Evaluation is evident in students' ability to assess the impact of human actions on the environment. Inference is demonstrated when students draw logical conclusions from a situation, such as the consequences of littering. Explanation emerges when students provide coherent and logical reasons for their answers. Meanwhile, reflection is evident when students recognize the importance of preserving the ecosystem and relate it to personal experiences or moral values. In general, individuals with critical thinking skills do not immediately agree or reject information. They tend to carefully observe, analyze, and evaluate before deciding to accept or reject it.<sup>48</sup> This is one of the desired expectations for students' success in having critical thinking skills.

In the ecosystem theme, the assessment of students' critical thinking skills was carried out using a systematic method, which included two forms of assessment. To measure the students' abilities, a multiple-choice test and an essay test were conducted. The questions contained questions about evaluation, analysis, inference, explanation, and reflection for the ecosystem theme. The multiple-choice questions contained questions representing the five aspects of critical thinking: analysis, evaluation, inference, explanation, and reflection, with each question carrying a weight of 10 points if answered correctly, so that the total maximum score was 100. Meanwhile, the essay questions were scored on a scale of 0-5 points per question with a total maximum score of 15 points. Essay assessment used a rubric that considered logical clarity, in-depth reasoning, and the student's ability to explain or conclude a situation critically. The essay score was then converted to a 100-point scale, then combined with the multiple-choice score using a weighting composition: 30% of the essay score and 70% of the multiple-choice score.

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<sup>47</sup> Tusyadiyah, *Pengaruh Model Pembelajaran Carousel Feedback Terhadap Kemampuan Berpikir Kritis Siswa Kelas V SDN Kamal 09 Pagi Jakarta Barat.*

<sup>48</sup> Tusyadiyah, *Pengaruh Model Pembelajaran Carousel Feedback Terhadap Kemampuan Berpikir Kritis Siswa Kelas V SDN Kamal 09 Pagi Jakarta Barat.*

**Table 6.** Categorization of Student Scores

Statistics		
Critical Thinking Test Score		
N	Valid	41
	Missing	0
Median	80.00	

The results of the critical thinking skills test carried out by students from answering multiple choice questions and essays, showed the results of the student's score range between 53 to 100, with a median value of 80. Based on the median, it can be explained that 21 students were categorized as having a low score ( $\leq 80$ ) and there were 20 students classified as high ( $\geq 80$ ). Thus, most of the students' understanding was categorized as good in answering multiple choice questions, especially the analysis and inference aspects. Meanwhile, the essay answers reflected critical thinking skills in the form of logical and reflective explanations, such as explaining the relationship between living things, suggesting solutions to environmental problems, and demonstrating awareness in maintaining the ecosystem. Expressions such as "reprimanding friends who litter," "looking after animals," "watering plants," and "maintaining the balance of nature" indicate that students are starting to be able to link scientific concepts with real actions. This finding is in line with the results of the ANOVA test which indicates that the differentiation strategy has a significant effect on students' critical thinking skills ( $p = 0.030$ ). Thus, it can be concluded that learning that applies an adaptive approach strategy has proven to be effective in improving students' critical thinking skills in ecosystem material.

It's important to note that the material on ecosystems includes a discussion of the definition of an ecosystem, the elements that make it up, and the types of ecosystems. An ecosystem itself is a mutually influencing interaction between living things and their environment.<sup>49</sup> In this case, the material presented is about the relationship between living things and their environment, both from animals and plants, the benefits of maintaining the environmental ecosystem, the impact of actions that do not maintain the ecosystem, caring for surrounding plants and caring for animals as a form of mutual care for the ecosystem in the surrounding environment, as well as how students' attitudes when given story problems containing friends who behave badly towards the environment, this aspect will determine students who understand the problem in the form of analyzing and responding to the self-reflection section on what was done and how they responded to the action, the goal is so

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<sup>49</sup> K. Kumalasari and D. Hasanah, "Evaluasi Pelaksanaan PjBL Berbasis STEAM Dalam Pembelajaran IPAS SD Kelas V," *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 2023, <http://journal.unpas.ac.id/index.php/pendas/article/view/10626>.

that they can protect the surrounding plants. As research by Kumalasari, et al (2023), in the ecosystem material applied through the Project Based Learning learning model, students are assigned to search for information and determine the theme of one of the sub-materials, which is then poured into the form of a poster. Students process the material creatively by adding interesting text and images as a form of visual presentation. Based on the learning outcomes, 81 students achieved a good category by applying the product differentiation strategy.<sup>50</sup>

The two-way ANOVA test showed that there was no significant interaction between differentiation strategies and learning motivation on students' critical thinking skills. This means that the two independent variables do not influence each other in providing an impact on the dependent variable. The F value obtained was 0.032 with a significance level of 0.859 ( $p > 0.05$ ), indicating that there was no combined effect between differentiation strategies and learning motivation on the critical thinking skills of fifth-grade students. Therefore, each variable works separately and does not show a reciprocal relationship on the dependent variable that is able to increase the dependent variable, thus influencing the aspect of critical thinking skills on the ecosystem theme in this study.

Although there was no significant interaction, further analysis using Estimated Marginal Means showed that the combination of a high differentiation strategy and low learning motivation resulted in the highest critical thinking score, namely 84.083, while the combination of a low differentiation strategy and high learning motivation actually resulted in the lowest score, namely 74.364. This further strengthens the fact that the influence of the differentiation strategy is more dominant than student learning motivation in improving critical thinking skills. It also shows that the teacher's approach in designing differentiated learning can be an effective stimulus for students to think more critically, even when the students do not have high learning motivation. In contrast to the results of research by Putri which showed a positive impact of implementing a differentiation strategy, and increased student learning motivation and critical thinking skills, which stated that the implementation of a learning model that combines problem-solving activities, experiments, and collaborative games has been proven to encourage increased learning motivation, active student involvement in the learning process, and their critical thinking skills. This model also supports the achievement of maximum student learning outcomes, with the majority of students successfully achieving scores above the specified completion standard.<sup>51</sup> This means that if flexible learning strategies are applied to students, implemented in a structured manner that adapts to their interests

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<sup>50</sup> Kumalasari and Hasanah, "Evaluasi Pelaksanaan PjBL Berbasis STEAM Dalam Pembelajaran IPAS SD Kelas V."

<sup>51</sup> TAS Putri et al., "Meningkatkan Motivasi Belajar Dan Keterampilan Berpikir Kritis Siswa Menggunakan Model Peta Pintar Pada Siswa Sekolah Dasar," *PENDASI: Jurnal Pendidikan Dasar Indonesia*, 2023, [https://ejournal2.undiksha.ac.id/index.php/jurnal\\_pendas/article/view/2632](https://ejournal2.undiksha.ac.id/index.php/jurnal_pendas/article/view/2632).

and learning styles, this can increase their enthusiasm for learning and improve their critical thinking skills, thus creating an interaction between the two variables. Conversely, inappropriate and suboptimal implementation of the strategies or teachers' lack of optimal mastery can cause failure in achieving the desired learning objectives, especially in the critical thinking aspect.

Considering that each student's learning style is unique, teachers need to implement a variety of learning strategies and methods to be more effective. Teachers are encouraged to be creative in designing learning materials, learning processes, learning outcomes, and learning environments tailored to the needs of students in the field. Through the application of differentiated learning, teachers can provide learning services tailored to the characteristics and conditions of each student.<sup>52</sup> The results of previous research also explain about differentiation strategies, such as research by Ayu Sri Wahyuni, the differentiation approach can be combined with various learning models such as problem-based learning, station rotation in blended learning, project-based learning, and adapted to students' learning styles, then, the application of this approach has proven effective in improving student learning outcomes, and Natural Sciences learning is suitable for using the differentiation approach because it is able to adjust students' learning needs by considering the interests, profiles, styles, and learning readiness of each individual.<sup>53</sup> By adjusting learning styles and learning models, learning will appear more active.

## CONCLUSION

Based on the research results, it can be seen that the differentiation approach in learning has a significant impact on the development of students' critical thinking skills in learning the theme of ecosystems in grade V of Madrasah Ibtidaiyah. The implementation of this strategy, supported by the encouragement of student learning motivation, indirectly helps hone their critical thinking skills. This is reflected in how students are able to solve essay questions well and express opinions using their own words. Not only understand the basic concepts, they are also able to analyze, draw conclusions, and provide relevant responses to environmental issues that occur in everyday life. These findings indicate that learning designed by considering the content, process, and learning outcomes according to student characteristics can create a learning environment that encourages the development of critical thinking patterns. The role of teachers in developing responsive learning and adapting to students' needs has been shown to have a greater influence on students' critical thinking skills than relying solely on internal motivation. This is supported by the results of statistical analysis through the ANOVA test which showed a significance value of 0.030 ( $p < 0.05$ ).

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<sup>52</sup> Rintayani, *Buku Referensi Strategi Pembelajaran Berdiferensiasi*.

<sup>53</sup> Wahyuni, "Literature Review: Pendekatan Berdiferensiasi Dalam Pembelajaran Ipa."

Thus, the differentiation strategy has been proven to be able to make a real contribution to developing students' critical thinking skills.

On the other hand, students' learning motivation does not show a statistically significant influence on critical thinking skills, this is proven by the valuesignificance of 0.812 ( $p > 0.05$ ), indicating that the level of student learning motivation does not statistically affect the difference in critical thinking scores. However, qualitative findings show that students with high motivation tend to structure their essay answers more logically, coherently, and reflectively. This suggests that motivation remains a significant contributor to deepening the learning process, especially when supported by flexible and adaptive learning strategies tailored to student needs. Meanwhile, the interaction between differentiation strategies and learning motivation also showed no significant effect, as evidenced by the scoressignificance of 0.859 ( $p > 0.05$ ) this indicates that there is no interactive influence between the two independent variables, namely differentiation strategy and learning motivation on students' critical thinking skills variables.

These results also show that although learning motivation is important, to encourage critical thinking, concrete and challenging differentiation strategies are more effective. These findings indicate that the success of learning that encourages critical thinking is more influenced by appropriate differentiation strategies, rather than solely by students' internal motivation. Therefore, it is crucial for teachers to consistently design responsive learning strategies that address student diversity, so that each student has a fair opportunity to hone their critical thinking skills. This underscores the importance of teacher training and competency development in implementing a differentiated approach, particularly in the era of the independent curriculum, which emphasizes student-centered learning. Likewise, these findings can serve as a basis for educators and education policymakers to review the learning strategies used in Islamic elementary schools (Madrasah Ibtidaiyah) or elementary schools, particularly in thematic learning.

## BIBLIOGRAPHY

- Alkhairi, Aulia Azmi, Sofwatun Nida, and Sintha Sih Dewanti. *The Influence of PAI Learning Outcomes and Learning Motivation on Students' Honesty Character*. 12, no. 2 (2024).
- Amin, Lailla Hidayatul, Na'imah Na'imah, Sintha Sih Dewanti, et al. "Innovation Of Differentiation Learning Strategies In Science Learning For Students With Special Needs." *JMIE (Journal of Madrasah Ibtidaiyah Education)* 8, no. 2 (2024): 172. <https://doi.org/10.32934/jmie.v8i2.690>.
- Azizah, SN, and AP Astutik. "Diferensiasi Pembelajaran Pendidikan Agama Islam Dalam Meningkatkan Literasi Di Era Digital." *JIIP: Jurnal Ilmiah Ilmu Pendidikan*, 2025. <http://www.jiip.stkipyapisdompu.ac.id/jiip/index.php/JIIP/article/view/7503>.
- Bulu, VR. "Pengaruh Strategi Pembelajaran Diferensiasi Terhadap Hasil Belajar Matematika." *HINEF: Jurnal Rumpun Ilmu Pendidikan*, 2023. <https://ojs.cbn.ac.id/index.php/hinef/article/view/1011>.

- Dewanti, Sintha Sih. "Profil Berpikir Kritis Mahasiswa PGMI dalam Memecahkan Masalah Matematika Dasar." *Jurnal Matematika dan Pembelajaran* 6, no. 1 (2018): 11–22. <https://doi.org/10.33477/mp.v6i1.451>.
- Ermawati, E., S. Komarayanti, and S. Purwaningsih. "Implementasi Pembelajaran Diferensiasi Dengan Model PBL Untuk Meningkatkan Literasi Sains Siswa Kelas X. 2 SMAN Rambipuji." *Jurnal Biologi*, 2024. <https://journal.pubmedia.id/index.php/biologi/article/view/1957>.
- Fadhilah, A., and A. Suriansyah. "Meningkatkan Aktivitas Belajar, Motivasi Dan Keterampilan Berpikir Kritis Siswa Muatan IPA Menggunakan Model Panting Memakai Media Lilin Siswa Sekolah Dasar." *AR-RIAYAH: Jurnal Pendidikan Dasar*, 2024. <https://journal.iaincurup.ac.id/index.php/JPD/article/view/8809>.
- Fatimah, S., and R. Mashar. "Peran Guru Dalam Pembelajaran Berdiferensiasi Di Taman Kanak-Kanak Aba al-Furqon Nitikan Yogyakarta." *Pedagogia: Jurnal Pendidikan Dasar*, 2023. <https://jurnal.educ3.org/index.php/pedagogia/article/view/130>.
- Fauzia, R., and ZH Ramadan. "Implementasi Pembelajaran Berdiferensiasi Dalam Kurikulum Merdeka." *Jurnal Educatio FKIP UNMA*, 2023. <https://ejournal.unma.ac.id/index.php/educatio/article/view/5323>.
- Fitri, AA, and N. Solihati. "Analisis Penerapan Pembelajaran Diferensiasi Proses Melalui Gaya Belajar Siswa Pada Materi Menulis Laporan Hasil Observasi." *Semantik*, 2023. <http://ejournal.stkipsiliwangi.ac.id/index.php/semantik/article/view/3865>.
- Handiyani, M., and T. Muhtar. "Mengembangkan Motivasi Belajar Siswa Melalui Strategi Pembelajaran Berdiferensiasi: Sebuah Kajian Pembelajaran Dalam Perspektif Pedagogik-Filosofis." *Jurnal Basicedu*, 2022. <https://www.neliti.com/publications/449572/mengembangkan-motivasi-belajar-siswa-melalui-strategi-pembelajaran-berdiferensia>.
- Herwina, W. "Optimalisasi Kebutuhan Murid Dan Hasil Belajar Dengan Pembelajaran Berdiferensiasi." *Perspektif Ilmu Pendidikan*, 2021. <https://www.neliti.com/publications/521293/optimalisasi-kebutuhan-murid-dan-hasil-belajar-dengan-pembelajaran-berdiferensia>.
- Kumalasari, K., and IQ Barriyah. "Strategi Diferensiasi Dalam Mengembangkan Kreativitas Siswa Kelas 1 Melalui Seni Rupa." *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 2024. <http://journal.unpas.ac.id/index.php/pendas/article/view/12019>.
- Kumalasari, K., and D. Hasanah. "Evaluasi Pelaksanaan PjBL Berbasis STEAM Dalam Pembelajaran IPAS SD Kelas V." *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 2023. <http://journal.unpas.ac.id/index.php/pendas/article/view/10626>.
- Laudia, Stefanie Marla, Wahono Widodo, Elok Sudiby, Ahmad Fauzi Hendratmoko, and Mario R. Obra Jr. "SSI-Based WebQuest: Instructional Media for Improving Critical Thinking Skills of Alpha Generation in Science." *Jurnal Inovasi Pendidikan IPA* 11, no. 1 (2025): 335–51. <https://doi.org/10.21831/jipi.v11i1.78093>.
- Marta, Yonira Mike Vindi, Astrizal, and Ramli. *Development of Physics E-Module Integrated with STEM Approach to Promote Students' Critical and Creative Thinking Skills*. 2024. <https://doi.org/10.29303/jppipa.v11i1.4829>.
- Nabila, IY. "Pengaruh Model Problem Based Learning Berbantuan Media Diorama Terhadap Kemampuan Berpikir Kritis Siswa SD." *Jurnal Penelitian Pendidikan IPA*, 2024. <https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/60925/46762>.
- Putri, Anggun Rachmawati, and Sintha Sih Dewanti. "Pengaruh Gaya Belajar Terhadap Motivasi Belajar Siswa Pada Pembelajaran Matematika." *JP2M (Jurnal Pendidikan dan*

- Pembelajaran Matematika*) 9, no. 1 (2023): 66–76.  
<https://doi.org/10.29100/jp2m.v9i1.3676>.
- Putri, TAS, A. Suriansyah, and R. Purwanti. “Meningkatkan Motivasi Belajar Dan Keterampilan Berpikir Kritis Siswa Menggunakan Model Peta Pintar Pada Siswa Sekolah Dasar.” *PENDASI: Jurnal Pendidikan Dasar Indonesia*, 2023.  
[https://ejournal2.undiksha.ac.id/index.php/jurnal\\_pendas/article/view/2632](https://ejournal2.undiksha.ac.id/index.php/jurnal_pendas/article/view/2632).
- Rahman, A. “Meningkatkan Aktivitas Dan Keterampilan Berpikir Kritis Menggunakan Model Panting Pada Siswa Kelas V.” *Scholastica Journal*, 2022. <https://jurnal.univpgri-palembang.ac.id/index.php/scholastica/article/view/13034>.
- Rais, MHI. *Pengaruh Ekosistem Pendidikan Terhadap Motivasi Belajar Peserta Didik Kelas X SMAN 1 Jetis Ponorogo Tahun Pelajaran 2019–2020*. Etheses.iainponorogo.ac.id, 2020.  
<https://etheses.iainponorogo.ac.id/id/eprint/11058>.
- Ramadhan, Nurul Huda, and Wirawan Fadly. “The Effect of Using Quizizz Application in Learning with Science Education for Sustainable Development Approach on Students’ Critical Thinking Ability.” *Jurnal IPA & Pembelajaran IPA* 8, no. 1 (2024): 94–102.  
<https://doi.org/10.24815/jipi.v8i1.37751>.
- Resti, Novita, Wahyu Surakusumah, and Yayan Sanjaya. “The Effect of STEM on Class X Students’ Learning Achievement and Critical Thinking Skills on Environmental Pollution Material.” *Jurnal IPA & Pembelajaran IPA* 8, no. 1 (2024): 14–28.  
<https://doi.org/10.24815/jipi.v8i1.36731>.
- Riki, R., and K. Kusno. “Analisis Motivasi Belajar Siswa Terhadap Prestasi Belajar Matematika.” *PHI: Jurnal Pendidikan Matematika*, 2023.  
<http://phi.unbari.ac.id/index.php/phi/article/view/269>.
- Rintayani, P. *Buku Referensi Strategi Pembelajaran Berdiferensiasi*. Repository.penerbiteureka.com, 2022.  
<https://repository.penerbiteureka.com/id/publications/560115/buku-referensi-strategi-pembelajaran-berdiferensiasi>.
- Sutisnawati, A., GGF Rakhman, and Muhammad Syarif Sumantri. “Penerapan Pembelajaran Diferensiasi Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa Sekolah Dasar.” *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 2024.  
<http://journal.unpas.ac.id/index.php/pendas/article/view/15842>.
- Swandewi, NP. “Implementasi Strategi Pembelajaran Berdiferensiasi Dalam Pembelajaran Teks Fabel Pada Siswa Kelas Vii h Smp Negeri 3 Denpasar.” *Jurnal Pendidikan Deiksis*, 2021.  
<https://www.jurnal.markandeyabali.ac.id/index.php/deiksis/article/view/54>.
- Syakira, MA. *Pengaruh Model Pembelajaran Problem Based Learning Berbantuan Media Quizizz Terhadap Kemampuan Berpikir Kritis Mata*. Repository.unissula.ac.id, 2025.  
<http://repository.unissula.ac.id/40460/>.
- Tambunan, Elisabeth Theresia, and Ali Mahmudi. “The Improvement of Students’ Mathematical Critical Thinking Skills and Learning Motivation Through Contextual Teaching and Learning.” *Formatif: Jurnal Ilmiah Pendidikan MIPA* 14, no. 1 (2024).  
<https://doi.org/10.30998/formatif.v14i1.21634>.
- Tusyadiyah, H. *Pengaruh Model Pembelajaran Carousel Feedback Terhadap Kemampuan Berpikir Kritis Siswa Kelas V SDN Kamal 09 Pagi Jakarta Barat*. Repository.uinjkt.ac.id, 2022. <https://repository.uinjkt.ac.id/dspace/handle/123456789/61297>.
- Ummah, I. “Pengaruh Pendekatan Science, Environment, Technology, and Society (SETS) Terhadap Kemampuan Berpikir Kritis Siswa Pada Materi Pemanasan Global.”

- Repository.Uinjkt.Ac.Id*, 2024.  
<https://repository.uinjkt.ac.id/dspace/handle/123456789/83611>.
- Utami, PR, L. Rahmawati, and M. Nektaria. "Pengembangan Kompetensi Dan Soft Skill Dalam Implementasi Kurikulum Merdeka: Tinjauan Literatur." *MANAJERIAL: Jurnal Inovasi Manajemen Dan Supervisi Pendidikan*, 2025. <https://www.jurnalp4i.com/index.php/manajerial/article/view/4734>.
- Wahyuni, AS. "Literature Review: Pendekatan Berdiferensiasi Dalam Pembelajaran Ipa." *Jurnal Pendidikan Mipa*, 2022. <https://ejournal.tsb.ac.id/index.php/jpm/article/view/562>.
- Wijayanti, DA, and DR Prihandini. "Realisasi Merdeka Belajar Dengan Menggunakan Strategi Pembelajaran Diferensiasi Proses Pada Siswa SMA Kelas X." *Pubmedia Jurnal Penelitian Tindakan Kelas*, 2024. <https://edu.pubmedia.id/index.php/ptk/article/view/55>.
- Yulinda, I. "Menjelajahi Dampak Teknologi Apple Terhadap Efektivitas Pembelajaran: Analisis Tematik Tentang Motivasi, Kolaborasi, Dan Produktivitas." *Jurnal Syntax Admiration*, 2025. <https://www.jurnalsyntaxadmiration.com/index.php/jurnal/article/view/2120>.
- Zahro, F., and ANM Fauziah. "Peran Dan Tantangan Guru IPA Dalam Pengimplementasian Kurikulum Merdeka Untuk Konservasi Alam Dan Kearifan Lokal." *Prosiding Seminar Nasional*, 2024. <https://proceeding.unesa.ac.id/index.php/semnasipa/article/view/729>.