



STUDENTS' HABITS OF MIND IN BIOLOGY LEARNING AS A REPRESENTATION DEEP LEARNING PREPARATION

Dina Alfiyana, Muhammad Syaipul Hayat*, Praptining Rahayu

Biology Education Study Program, PGRI Semarang University

Jl. Sidodadi Timur No. 24, Semarang City, Central Java Province, Indonesia, 50232

*Corresponding author: m.syaipulhayat@upgris.ac.id

ARTICLE INFO

Article history

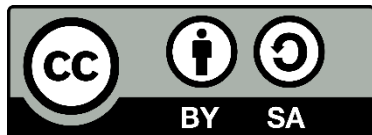
| | |
|------------|------------|
| Submission | 2025-01-30 |
| Revision | 2026-04-02 |
| Accepted | 2026-04-26 |

Keywords:

Habits of Mind
Self Regulation
Critical Thinking
Creative Thinking
Deep Learning

ABSTRACT

This study aims to determine students' readiness and thinking habits in deep learning-based biology instruction, based on this premise. This research was conducted using descriptive qualitative and quantitative methods, in which data were collected through questionnaires and observations during the learning process, with interviews to support students' opinions. This study involved 103 students from grade X digital media at SMA Islam Sultan Agung 1 Semarang, who were studying biology material on environmental change. The research collected through the questionnaire showed that the self-regulation score was 82 (good), the critical thinking score was 80 (good), while the creative thinking score was 68.50 (enough). The observation results showed that the self-regulation score was 80.56 (good), the critical thinking score was 62.50 (enough), and the creative thinking score was 69.44 (enough). Interview data corroborate that self-regulation is optimal, but critical and creative thinking have not become a habit in students' thinking. Therefore, the thinking habits of class X students at SMA Islam Sultan Agung 1 Semarang still need improvement, especially in creativity and critical thinking.



Copyright (c) 2026: Author(s)

INTRODUCTION

Students' thinking abilities are influenced by how they construct knowledge and apply it appropriately to the problems they face (Siswati & Suratno, 2023). Learning processes that support social interaction among students provide opportunities for the development of habits of mind in students (Casriati & Gazali, 2022). Marzano originally

developed habits of Mind in the learning dimension, namely "one dimension of learning outcomes that plays a crucial role in every learning process." Marzano divides thinking into three parts, namely self-regulation, critical thinking, and creative thinking (Suryani, 2023). These aspects of habits of mind are important for developing students' ability to engage in in-depth learning (Primahardani et al., 2023). This fact highlights how low students' readiness to engage in deep learning is from the perspective of habits of mind.

Further research suggests that students' learning processes are inseparable from their thinking habits (Nurmala et al., 2017; Yulianto, 2021). To ensure that students can adapt to various situations based on their thinking skills, their learning process should focus on understanding effective thinking patterns. Biology learning is a type of learning activity that requires habits of mind. Biology learning emphasizes mastery of material concepts, principles, facts, and evidence (Winoto, 2024). The importance of developing habits of mind in biology learning lies in fostering students' ability to construct and apply their knowledge effectively, enabling them to think critically during the learning process. Habits of Mind are very important for the learning process, which is integrated in all activities and learning (Bariroh et al., 2025; Nanda, 2019).

Biology learning highlights the relationship between living things and their environment (Subrata & Rai, 2023; Tammu, 2018). According to the National Education Standards Agency, biology is a subject rooted in the process of discovery, aiming to develop analytical, deductive, and inductive thinking skills in solving various problems related to nature or the environment. This is because learning biology encourages students to interact directly with the environment, so they become accustomed to thinking critically and creatively and can understand and apply biological concepts in everyday life (Nisa, 2022). Research (Casriati & Gazali, 2022; Nurmala et al., 2017; Yulianto, 2021) shows that analysis of the habits of mind aspect, specifically self-regulation, critical thinking, and creative thinking, has not been a primary focus. Previous research has emphasized more on students' thinking habits in terms of self-regulation, critical thinking, and creative thinking, but has nothing to do with in-depth learning. Meanwhile, the habits-of-mind aspect as the foundation of deep learning is still rarely explored, creating a gap in analysing students' readiness for deep learning from the perspective of their habits of mind.

Habits of mind really help students apply deep learning. Deep learning emphasizes a deep, meaningful understanding of concepts that foster critical, analytical, and creative thinking (Akmal et al., 2025; Diputera, 2024). Students' readiness to face the complexities of the modern world is the primary reason for implementing deep learning. Students must have a foundation of higher-order thinking habits, which are essential for supporting an effective deep learning process (Bariroh et al., 2025; Hayat et al., 2025). Therefore, this research is novel in focusing on student preparation for deep learning-based biology learning from the perspective of students' habits of mind.

Based on this thinking, preparing students to face global challenges is the foundation for implementing deep learning at SMA Islam Sultan Agung 1 Semarang. This enables research into students' habits of mind at Sultan Agung 1 Islamic High School in Semarang to prepare for the implementation of deep learning in biology. This research also supports the global challenge of using digital media in learning, which is already partially used in grade 10. The purpose of this study is to determine students' readiness and thinking habits for implementing higher-order thinking skills to engage in deep learning-based biology learning.

MATERIALS AND METHODS

This research was conducted using descriptive qualitative and quantitative methods, in which data were collected through questionnaires and observations during the learning process, supplemented by interviews to elicit students' opinions. This study involved 103 students from grade X digital media at SMA Islam Sultan Agung 1 Semarang, who were studying biology material on environmental change. The research was carried out in February–April 2025. The research instruments used include a questionnaire containing closed-ended statements with a rubric-based scale, and a Likert-scale questionnaire, with 4 being the ideal answer and 1 requiring follow-up. In addition, using observation sheets to take pictures as a whole by observing and recording students' thinking habits during the learning process. The research data was corroborated by conducting direct interviews with five selected students through *purposive sampling* to observe how to communicate the answers to students' thinking habits experienced

during the learning process. The indicators on each aspect of habits of mind are in Table 1.

Table 1. Indicators on the Aspects of Habits of Mind

| Habits of Mind Aspects | Indicators |
|-------------------------------|--|
| Self Regulation | a. Create an effective plan b. Consciously use the necessary resources c. Sensitive to feedback |
| Critical Thinking | a. Overcoming impulsivity b. Sensitive to the feelings and level of knowledge of others |
| Creative Thinking | a. Carrying out tasks tenaciously despite many obstacles b. Thinking to the maximum limit of self-knowledge and ability c. Produce new ways so that creative ways are obtained in completing a job |

Data were analysed using a mixed-methods approach, meaning both quantitative and qualitative data were collected. Quantitative data were collected using descriptive statistics and comparative tests based on questionnaire results and observations of thinking habits. Interview data is processed by detailing the results of students' interview responses. The data is analyzed by collecting all student answers by scoring criteria using the formula:

$$\text{Final score results} : \frac{\text{total score}}{\text{highest score}} \times 100$$

To facilitate interpretation of the research results from the instrument's responses to each indicator, the researcher refers to the interpretation criteria for the habits of mind classification score *among* students, as outlined in Table 2 by Listianingsih (2022).

Table 2. Habits of Mind Classification Score Criteria

| Average | Level |
|----------------|--------------|
| 86-100 | Excellent |
| 76-85 | Good |
| 60-75 | Enough |
| 55-59 | Less |
| <55 | Very less |

RESULTS AND DISCUSSION

The research results were obtained from data on the Habits of Mind instruments, consisting of three aspects: self-regulation, critical thinking, and creative thinking. The three aspects that contain indicators related to habits of mind are applied in research

instruments as habits-of-mind questionnaires, classroom observations, and direct interviews with students about habits-of-mind indicators.

Analysis of Questionnaire Results

Data on students' habits of mind from the questionnaire were collected for all three aspects and for each indicator in Table 3.

Table 3. Results of the Student Habits of Mind Questionnaire

| Aspects Habits Of Mind | Questionnaire Result Score | Criterion |
|------------------------|----------------------------|-----------|
| Self regulation | 82 | Good |
| Critical thinking | 80 | Good |
| Creative thinking | 68.50 | Enough |
| Average | 77 | Good |

Research on thinking habits, including self-regulation, critical thinking, and creative thinking, shows that students exhibit a good level of these habits across all three aspects. Data on self-regulation obtained a score of 82, indicating good criteria. Student indicators of self-regulation show that students can make effective plans, identify necessary resources, and be sensitive to job evaluations in biology learning. In the critical thinking aspect, students scored 80, meeting the criteria. Students show they can overcome impulsivity and sensitivity to others' feelings and knowledge levels.

Furthermore, in the aspect of creative thinking, the score is 68.50, which is classified as sufficient. Indicators show students carrying out tasks at their own pace, producing work that only meets the standards. Students will also look for alternative ways to achieve more creative results than the standards require. A comparative analysis of the questionnaire results on aspects of habits of mind is presented in Table 4

Table 4. Post Hoc Test Results One Way Anova Questionnaire Habits Of Mind

Multiple Comparisons

Dependent Variable: Habits Of Mind

LSD

| (I) Angket | Indikator (J) Indikator | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|-------------------|-------------------------|-----------------------|------------|------|-------------------------|-------------|
| | | | | | Lower Bound | Upper Bound |
| Self Regulation | Critical Thinking | -.42000 | .29543 | .214 | -1.1794 | .3394 |
| | Creative Thinking | .68667* | .26424 | .048 | .0074 | 1.3659 |
| Critical Thinking | Self Regulation | .42000 | .29543 | .214 | -.3394 | 1.1794 |
| | Creative Thinking | 1.10667* | .29543 | .013 | .3472 | 1.8661 |
| Creative Thinking | Self Regulation | -.68667* | .26424 | .048 | -1.3659 | -.0074 |
| | Critical Thinking | -1.10667* | .29543 | .013 | -1.8661 | -.3472 |

*. The mean difference is significant at the 0.05 level.

The results of the follow-up questionnaire test using Post Hoc One-Way ANOVA at a significance level of 0.05 showed that *the creative thinking* aspect had a significantly lower score than self-regulation ($p = 0.048$) and *critical thinking* ($p = 0.013$). No significant difference was found between *self-regulation* and *critical thinking* ($p = 0.214$). The aspects of self-regulation and critical thinking have developed more than students' creative thinking; this shows that students' creative thinking abilities still require attention and strengthening in the learning process. The self-regulation component of the Habits of Mind questionnaire data is shown in Figure 1.

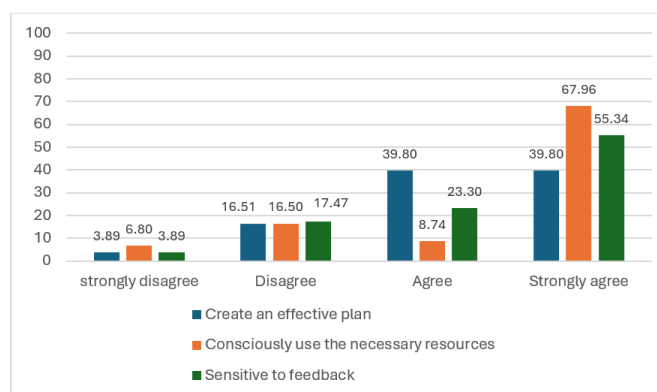


Figure 1. Questionnaire Data on Students' Self-Regulation Aspects

The results of the students' habits of mind questionnaire show their self-regulation abilities in biology learning, as indicated by the indicator of making effective plans. Most students chose the answers "strongly agree" and "agree," with a score of 39.80, indicating the ability to determine goals, implement all the rules (although some implement only some), and make a detailed schedule before doing biology assignments or experiments. In research (Gunur et al., 2023; Zetina, 2021), learning self-regulation refers to students' ability to process their learning activities using strategies to regulate their cognition.

In the resource identification indicator, the highest number of students responded strongly to the statement "strongly agree" (67.96), explaining that students were able to identify and consider the need for alternative tools and materials in biology learning, supported by the digital class program in grade 10, which facilitates access to learning resources. However, some students were not yet able to do so accurately. Research (Nahdi, 2021) shows that students with good Self-Regulated Learning take the initiative to search for the digital information they need. This is in accordance with the learning needs at Sultan Agung Islamic High School, which applies digital media in learning.

The student indicator regarding sensitivity to the evaluation of the work done received the highest response in the statement, "strongly agree," with a score of 55.34, indicating sensitivity to evaluation by responding immediately to feedback and seeking advice from those knowledgeable about the student's work. Previous research (Etty et al., 2020; Nurmaliza, 2022) shows that interdependent thinking reflects the social nature of humans who need each other, give and receive, and prioritize togetherness, and is supported by teacher actions such as providing feedback on the learning process and results to motivate student success.

The data from the Habits of Mind questionnaire on the critical-thinking aspect are shown in Figure 2.

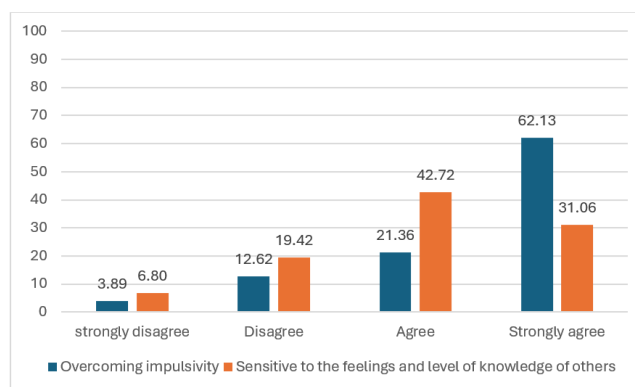


Figure 2. Questionnaire Data on Students' Critical Thinking Aspects

The standard for habits of mind in the critical thinking aspect of the first indicator, namely overcoming student impulsiveness, obtained the highest answer, namely strongly agree, with a score of 62.13. Students can make decisions carefully based on facts and data and understand the consequences before acting in biology lessons. The study (Ma'sumah & Nurwahyunani, 2024; Rukmi et al., 2025) states that students with critical thinking skills can explain concepts accurately and answer factual questions.

The second indicator of students' critical thinking is sensitivity to others' feelings and knowledge levels, with the highest number of agreeing responses at 42.72, indicating a communicative attitude by accommodating the feelings and knowledge levels of more sensitive people, even though they are more relaxed with other friends in learning. This finding shows that some students already understand differences in abilities and feelings among individuals, in line with Daryanes & Putra (2021) and Hundial et al. (2020), who argue that everyone has different abilities.

The data from the Habits of Mind questionnaire on the creative thinking aspect are shown in Figure 3.

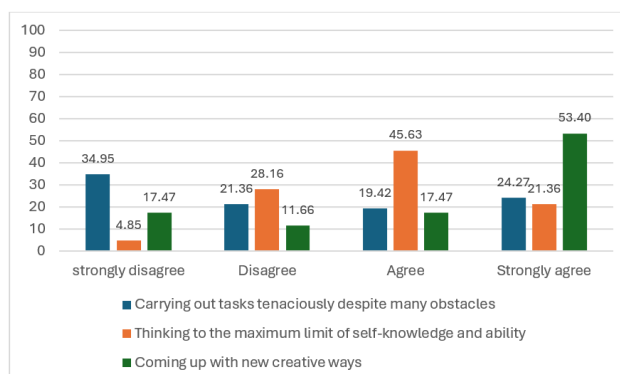


Figure 3. Questionnaire Data on Students' Creative Thinking Aspects

Students' creative thinking ability, based on the indicator of carrying out tasks persistently despite encountering many obstacles, had the highest percentage, with 34.95% of students choosing to disagree strongly, indicating that students carry out tasks at their own pace as long as the group task is completed. Some students showed strong determination, were collaborative, and used strategies to complete tasks during biology lessons. In this study, Ramadhani & Suriani (2024) and Sari et al. (2020) state that learning success is achieved when students are persistent and do not give up easily in the face of difficulties.

Furthermore, the student thinking indicator reached its maximum, with the highest value of 45.63 students able to complete challenging tasks with a good understanding and work results that meet standards in biology learning. This study (Wulandari & Astuti, 2023) examines students' attitudes towards indicators of thinking carefully and accurately, and of achieving goals according to strong standards.

When faced with a method/strategy to complete a learning task, students obtained the highest response rate of 53.40%, indicating the ability to find alternative strategies by considering tools and materials, resulting in a more creative method than the standard in biology learning. Students who think creatively can see situations from various angles, formulate new ideas, and integrate knowledge for innovative solutions. In fact, students need greater empowerment given their limited creative abilities (Firdaus & Nisa, 2019; Kurnia & Sunarno, 2021).

Analysis of Observation Results

The observation results were compiled from quantitative data for each indicator, using the descriptive analysis criteria in Table 5.

Table 5. Observation Results of Students Habits Of Mind

| Aspects Habits Of Mind | Observation Result Score | Level |
|------------------------|--------------------------|--------|
| Self regulation | 80.56 | Good |
| Critical thinking | 62.50 | Enough |
| Creative thinking | 69.44 | Enough |
| Average | 70.83 | Enough |

The Observation results show that students' habits of mind, from the teacher's perspective, have an average score of 70.83, placing them in the sufficient category. This is identified in the self-regulation aspect with a score of 80.56 (good category), marked by the ability to design learning plans, identify resources, and respond to evaluations. However, the plan's implementation is not optimal. Data on students' critical thinking is categorized as sufficient, with a score of 62.50, indicating that students are less careful in their decision-making and are more sensitive to other people's feelings and knowledge. However, some of them do not yet respect other people's opinions. In the creative thinking aspect, students obtained a score of 69.44 (sufficient category), indicating that they appear to be tenacious and able to produce creative solutions. However, some still rely on practical methods, such as AI (Artificial Intelligence).

Observation data on habits of mind aspects of self-regulation are shown in Figure 4

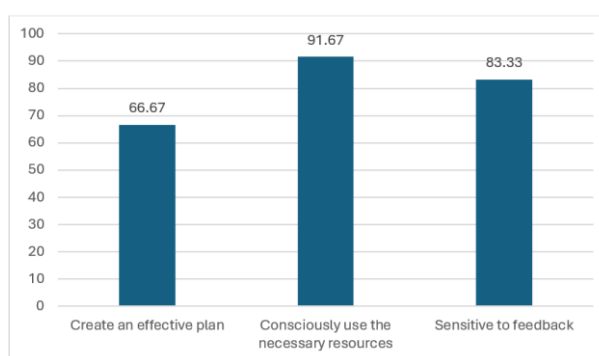


Figure 4. Observation Data on Students' Habits of Mind Self-Regulation Aspect

Based on observations of habits of mind in self-regulation, the indicator for making effective plans scored 66.67, indicating that students can plan but are not yet optimal at managing their time, resulting in a tendency to procrastinate. For the resource utilization indicator, a score of 91.67 indicates that students can identify and maximize the use of

learning resources, especially digital media, despite the potential for misuse. Meanwhile, for the sensitivity to work evaluation indicator, a score of 83.33 indicates that students actively seek feedback to improve their learning. Overall, these findings align with research emphasizing the importance of time management, the use of learning resources, and feedback for successful learning (Bintoro, 2021; Ety Sofyatiningrum et al., 2020; Setiawan & Mamahit, 2020).

The data from the Habits of Mind questionnaire on the critical-thinking aspect are shown in Figure 5

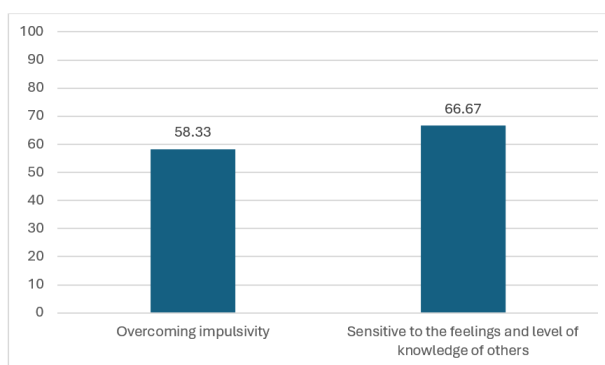


Figure 5. Observation Data on Students' Habits of Mind Critical Thinking Aspect

Based on observations of students' critical-thinking habits, the indicator for overcoming impulsiveness received a score of 58.33, suggesting that students still tend to be impulsive in decision-making and do not consider the consequences. The indicator for sensitivity to others' feelings and knowledge received a score of 66.67, indicating that students can express their opinions and respect others. However, there is still a tendency to ostracize certain friends. Previous research has shown the importance of strengthening critical thinking skills and social sensitivity in learning to support more mature decision-making and constructive interactions (Rasihun, K. Suma, 2025; Siswanto, 2025).

Observation data on habits of mind in the creative thinking aspect are shown in Figure 6.

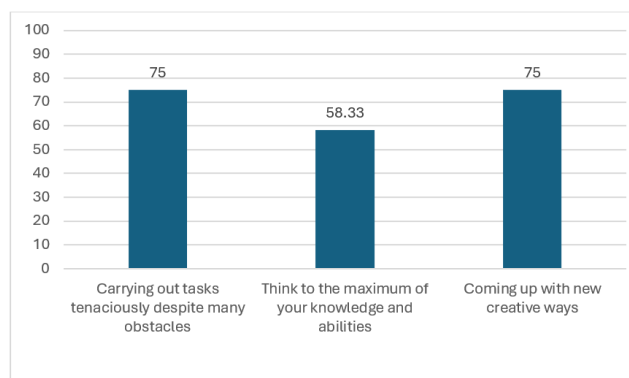


Figure 6. Observation Data on Students' Habits of Mind Creative Thinking Aspect

In the creative thinking aspect, the tenacity indicator obtained a score of 75, indicating that students actively seek solutions by asking questions and utilizing various learning resources. However, they still lack discipline in punctuality. The indicator of thinking to the maximum limit of ability, with a score of 58.33, indicates that students tend to rely on digitalization, so that their independent thinking ability is not optimal. Meanwhile, the indicator for producing creative methods received a score of 75, indicating that students can generate ideas through digital media but tend to rely on practical methods, such as AI. Hence, the originality of their ideas remains limited. These findings indicate the need to strengthen independent thinking, time management, and the development of greater originality in learning (Aulia et al., 2025; Harahap, 2023; Khamdiyah et al., 2024).

Analysis of Interview Results

Questionnaire and observation data are supported by interview results with a sample of 5 students regarding thinking habits. In biology learning, self-regulation suggests that students can plan their learning and manage their time, although they still tend to procrastinate on assignments. Students can also identify learning resources, especially through digital media. They are open to criticism, as expressed in "I usually create a flexible schedule, choose learning resources according to my needs, and accept criticism." This is in line with research that self-regulation reflects the ability to manage oneself through thinking, active behavior, and motivation (Chrestella et al., 2021; Kusumawati, 2024).

In terms of critical thinking, students tend to use various sources in making decisions, but do not fully consider the consequences. When disagreeing, students are more comfortable with certain friends and tend to be neutral, as evidenced by the

statement, "I often make decisions based on instinct and internet sources without considering the impact." This condition indicates a tendency to accept information without in-depth analysis, in line with findings that technological advances can reduce critical thinking (Ibtidaiyah, 2023).

Students' creative thinking skills demonstrate tenacity in completing assignments by seeking solutions from various sources and beginning to apply creative learning methods, even when some are still conventional, as expressed: "the important thing is that the assignment is completed even without a unique learning method". As stated in research (Pisaba, 2018; Rouf, 2019), Students will be creative by generating new combinations based on existing data, information, or elements. This is similar to how students find solutions when they encounter difficulties with the help of teachers, friends, and existing references.

The results of the questionnaire analysis, observations, and interviews show differences in *critical* and *creative thinking*. The questionnaire showed that *self-regulation* and *critical thinking* were good, while *creative thinking* was sufficient. Meanwhile, teachers' observations show that *self-regulation* is good, but *critical and creative thinking* are not enough. The interview corroborated that self-regulation is optimal, while *critical and creative thinking* has not become a student's habit of thinking. This discrepancy is between the questionnaire answers and the students' actual behavior. In research (Gunur et al., 2023; Rosi Yulita, 2025), efficacy is a person's belief in their abilities. A student who is efficacious will feel confident in his abilities. The reality is that students' thinking habits do not align with the critical and creative indicators.

CONCLUSION

Based on the research, it can be concluded that the habits of mind of class X students at SMA Islam Sultan Agung 1 Semarang are generally categorized as good in the self-regulation indicator. Still, the critical thinking and creative thinking indicators need to be optimized. This indicates that students' readiness to support the implementation of deep learning from a habits-of-mind perspective is good, as evidenced by more developed self-regulation. At the same time, critical and creative thinking still need improvement. The results of this study have implications for biology teachers to design

more student-centered learning through case analysis activities, argumentative discussions, learning reflections, and contextual problem-solving to optimize students' habits of mind in support of deep learning. The results of this study encourage further research to develop and test biology learning interventions that can directly improve habits of mind, namely critical thinking, creative thinking, and self-regulation, to support deep learning-based learning.

REFERENCES

- Akmal, A. N., Maelasari, N., & Lusiana. (2025). Pemahaman *Deep Learning* dalam pendidikan : analisis literatur melalui metode *Systematic Literature Review* (SLR). *Jurnal Ilmiah Ilmu Pendidikan*, 8(3), 3229–3236. DOI: <https://doi.org/10.54371/jiip.v8i3.7442>
- Bariroh, G., Rochintaniawati, D., Nuraeni, E., & Kusumastuti, M. N. (2025). The urgency of developing student's habits of mind in high school biology learning in bandung. *Bioma: Jurnal Ilmiah Biologi*, 13(April 2023), 84–97. <https://doi.org/https://doi.org/10.26877/bioma.v13i1.660>
- Casriati, & Gazali, S. (2022). Implementasi media pembelajaran berbasis blog dalam meningkatkan *habits of mind*. *Darul Ulum : Jurnal Ilmiah Keagamaan, Pendidikan dan Kemasyarakatan*, 13 (2), 159–177. DOI: <https://doi.org/10.62815/darululum.v13i2.85>
- Chrestella, D., Haka, N. B., & Supriyadi. (2021). Analisis kemampuan berpikir kritis dan self regulation peserta didik melalui pembelajaran menggunakan model multipel representasi. *BIO EDUCATIO*, 6(1), 27–43. DOI: [10.31949/be.v6i2.3363](https://doi.org/10.31949/be.v6i2.3363)
- Daryanes, F., & Apriyandi, R. (2021). Tingkat kemampuan berpikir kritis guru biologi kota Pekanbaru. *JOBE: Journal of Biology Education*, 4(2), 138–149. DOI: [10.21043/jobv4i2.11660](https://doi.org/10.21043/jobv4i2.11660)
- Diputera, A.M., Zulpan, & Eza, G.N. (2024). Memahami konsep pendekatan *Deep Learning* dalam pembelajaran anak usia memahami konsep pendekatan *Deep Learning* dalam pembelajaran anak usia dini yang *meaningful*, *mindful* dan *joyful* : kajian melalui filsafat pendidikan. *Jurnal Bunga Rampai Emas*, 10 (2), 108-120. DOI: <https://doi.org/10.24114/jbrue.v10i2.65978>
- Firdaus, A., Nisa, L.C., & Nadhifah. (2019). Kemampuan berpikir kritis siswa pada materi barisan dan deret berdasarkan gaya berpikir. *Kreano : Jurnal Matematika Kreatif-Inovatif*, 10(1), 68–77. DOI: <https://doi.org/10.15294/kreano.v10i1.17822>
- Gunur, B., Ramda, A. H., Ningsi, G. P., Pantaleon, K.V., & Sugiarti, L. (2023). Dampak *self-regulation* dan *self-efficacy* terhadap kemampuan komunikasi matematis siswa. *RANGE : Jurnal Pendidikan Matematika*, 5, 132–142. DOI: [10.32938/jpm.v5i1.4763](https://doi.org/10.32938/jpm.v5i1.4763)

- Harahap, D. P. (2023). Meningkatkan *self regulated learning* pada siswa melalui strategi belajar berdasar regulasi diri. *Journal on Education*, 05(03), 7056–7068. DOI:[10.31004/joe.v5i3.1494](https://doi.org/10.31004/joe.v5i3.1494)
- Hasanah, S.A.A., Yani, E., & Ramadana, M.A.N. (2025). Pemanfaatan sumber belajar elektronik dan lingkungan untuk mendukung pembelajaran. *Jurnal Ilmiah Research Student*, 2(1), 506–519. DOI: <https://doi.org/10.61722/jirs.v2i1.3725>
- Hayat, M. S., Siswanto, J., Murtianto, Y. H., & Khoiri, N. (2025). Integrasi literasi numerasi dalam pembelajaran melalui pelatihan *Deep Learning* bagi guru SMP di Kota Semarang. *E-DIMAS: Jurnal Pengabdian Kepada Masyarakat*, 16(4), 924–933. DOI: <https://doi.org/10.26877/e-dimas.v16i4.26315>
- Hundial, H. (2020). The safe care framework : a practical tool for critical thinking. *Nurse Education in Practice*, 48, 1-9. DOI: [10.1016/j.nepr.2020.102852](https://doi.org/10.1016/j.nepr.2020.102852)
- Khamdiah, L. (2024). Upaya guru BK dalam meningkatkan motivasi belajar siswa pada era digital di MTS Negeri 2 Purbalingga. Skripsi. Universitas Islam Negeri Prof. K.H. Saifuddin Zuhri Purwokerto.
- Khairun, N. (2022). Pengaruh model pembelajaran *creative problem solving* dengan teknik *mind mapping* terhadap *habits of mind* dan *emotional quotient* peserta didik kelas X pada mata pelajaran biologi. Tesis. UIN Raden Intan Lampung.
- Kurnia, A., Sukarmin, & Sunarno, W. (2021). Profil kemampuan berpikir kreatif siswa menggunakan soal tes pilihan ganda pada pembelajaran ilmu pengetahuan alam. *Indonesian Journal of Educational Science (IJES)*, 4 (1), 27–32. DOI:[10.31605/ijes.v4i1.1147](https://doi.org/10.31605/ijes.v4i1.1147)
- Kusumawati, A. A. (2024). *Self regulation* dalam meningkatkan motivasi belajar peserta didik. *Jurnal Empati*, 13 (3), 242–247. <https://doi.org/10.14710/empati.2024.45013>
- Listianingsih, A. (2022). Analisis *habits of mind* dengan *visual thinking* dalam pemahaman konsep matematis siswa di SMAN 2 Tulang Bawang Tengah. Tesis. UIN Raden Intan Lampung.
- Ma'sumah, D. K., & Nurwahyunani, A. (2024). Implementation of Tpack approach toward critical thinking ability and cognitive learning outcomes of students of SMA Negeri 1 Jakenan on environmental change material. *Bioma: Jurnal Ilmiah Biologi*, 13 (2), 94–112. <https://doi.org/10.26877/bioma.v13i2.356>
- Nanda, R. P. (2019). Pengembangan media pembelajaran berbantuan blog untuk meningkatkan *habits of mind* pada materi sistem gerak pada manusia. Tesis. UIN Raden Intan Lampung.
- Nikmawati, Bintoro, H.S., & Santoso. (2021). Dampak penggunaan gadget terhadap hasil belajar dan minat belajar siswa Sekolah Dasar. *Jurnal Edutech Undiksha*, 9(2), 254–259. DOI: <https://doi.org/10.23887/jeu.v9i2.38975>
- Ningsih, S., & Shanie, A. (2023). Pengaruh penggunaan gadget terhadap kemampuan berpikir kritis peserta didik Sekolah Dasar. *Muallimuna: Jurnal Madrasah*

Ibtidaiyah, 8 (2), 52–61. DOI:[10.31602/muallimuna.v8i2.10126](https://doi.org/10.31602/muallimuna.v8i2.10126)

- Nurmaliza. (2022). Analisis kemampuan berpikir kritis matematis siswa ditinjau dari *habits of mind* siswa SMAN 1 Tembilahan Hulu. Tesis. Universitas Islam Riau.
- Pisaba, M. D. (2018). Pengaruh metode *problem solving* terhadap kemampuan pemecahan masalah dan keterampilan berfikir kreatif peserta didik SMK SMTI Bandar Lampung. Tesis. UIN Raden Intan Lampung.
- Primahardani, I., Isjoni, M. Y. R., & Sari, F. A. (2023). Habits of mind: a study in anticipating learning loss at state universities in Riau Province. *Jurnal Iqra': Kajian Ilmu Pendidikan*, 8(2), 429–442. DOI: <https://doi.org/10.25217/ji.v8i2.2740>
- Ramadhani, D., Suriani, A., & Nisa, S. (2024). Hubungan antara motivasi belajar dan prestasi akademik dalam mata pelajaran IPA di Sekolah Dasar. *Jurnal Bintang Pendidikan Indonesia (JUBPI)*, 2(3), 249-254. DOI: <https://doi.org/10.55606/jubpi.v2i3.3108>
- Rasihun. (2025). Pengaruh model pembelajaran *Problem Based Learning* (PBL) dalam meningkatkan kemampuan berpikir kritis dan kepekaan sosial pada pelajaran IPS siswa kelas V Sekolah Dasar Kecamatan Wanasaba. Tesis. Universitas Pendidikan Ganesha
- Renita, W.A.W. (2024). Pengaruh model pembelajaran *project based learning* terhadap kemampuan *self regulation* dan *habits of mind* peserta didik pada materi sistem pencernaan manusia. Skripsi. Universitas Islam Negeri Raden Intan Lampung.
- Rouf, A. (2019). Pengembangan kreativitas belajar guru akidah akhlak. *Elementary*, 7(1), 1–20.
- Rukmi, P. A., Hayat, M. S., & Novita, M. (2025). 4Cs skills in ecology and biodiversity learning : a study of junior high school students' profiles in the digital era. *Unnes Science Education Journal*, 14(1), 99–109. DOI:[10.15294/usej.v14i1.19574](https://doi.org/10.15294/usej.v14i1.19574)
- Sari, D. A., Misbah, H., & Ridwan, I. Q. (2020). Peran guru dalam membuat model pembelajaran daring yang inovatif dan kreatif terhadap motivasi belajar siswa. Prosiding SEMNASKAT LPPM UMJ. <https://jurnal.umj.ac.id/index.php/semnaskat/article/view/8056>
- Setiawan, A. D., & Mamahit, H. C. (2020). Hubungan antara kemampuan mengelola waktu dan prokrastinasi akademik siswa kelas VIII SMP Kritoforus 1 Jelambar tahun ajaran 2018/2019. *JURNAL PSIKO-EDUKASI Jurnal Pendidikan, Psikolog, dan Konseling*, 18(2), 121–136. https://www.academia.edu/110768630/Hubungan_Antara_Kemampuan_Mengelola_a_Waktu_Dan_Prokrastinasi_Akademik_Siswa_Kelas_VIII_SMP_Kristoforus_1_Jelambar_Tahun_Ajaran_2018_2019
- Siswanto, J. (2025). Strategi meningkatkan keterampilan pemecahan masalah menggunakan e-worksheets dalam pembelajaran IPA. *Media Penelitian Pendidikan: Jurnal Penelitian dalam Bidang Pendidikan dan Pengajaran*, 19(2), 475-460. DOI: <https://doi.org/10.26877/mpp.v19i2.26159>

- Siswati, B. H., & Suratno. (2023). The contribution of cognitive ability and critical thinking skills on the problem solving skills of biology education profession students using case method learning. *Biosfer : Jurnal Pendidikan Biologi*, 16(2), 419–426. <https://doi.org/https://doi.org/10.21009/biosferjpb.34633>
- Sofyatiningrum, E., Sisdiana, E., Ikhya, U., Nur'aini, F., & Sugilar, H. (2020). *Bunga rampai umpan balik guru terhadap proses dan hasil pembelajaran siswa*. Pusat Penelitian Kebijakan, Badan Penelitian dan Pengembangan dan Perbukuan, Kementerian Pendidikan dan Kebudayaan.
- Subrata, I. M., & Rai, I. G. A. (2023). Pembelajaran biologi berbasis etnopedagogi dalam peningkatan literasi sains dan karakter peserta didik. Prosiding Seminar Nasional Penelitian dan Pengabdian kepada Masyarakat Universitas PGRI Mahadewa Indonesia.
- Suryani, Y., Sapriya, & Malihah, E. (2020). The effectiveness of investigation group learning model based on Marzano's instructional framework in improving students' higher order thinking skill. *EDUSENTRIS : Jurnal Ilmu Pendidikan dan Pengajaran*, 7 (3), 1-16. <https://ejournal.upi.edu/index.php/edusentris/article/view/73801>
- Tammu, R. M. (2018). Keterkaitan metode dan media bervariasi dengan minat siswa dalam pembelajaran biologi tingkat SMP. *Jurnal Pendidikan (Teori dan Praktik)*, 2(2), 134-142. DOI: <https://doi.org/10.26740/jp.v2n2.p134-142>
- Wulandari, R., Astuti, I., & Afandi. (2023). Analisis *habits of mind* pada pelajaran matematika siswa SMA di Kabupaten Sambas Kalimantan Barat. *Jurnal Ilmiah Ilmu Pendidikan*, 6 (7), 4944–4951. DOI: <https://doi.org/10.54371/jiip.v6i7.2383>
- Yulianto, D. (2021). Pengaruh pembelajaran *rigorous mathematical thinking* (RMT) terhadap peningkatan kemampuan berpikir kreatif siswa ditinjau dari tingkat *habit of mind* (HOM). *MUDIMA : Jurnal Multidisiplin Madani*, 1(3), 249–268. DOI: <https://doi.org/10.55927/mudima.v1i3.51>
- Yulita, R., & Defrinal. (2025). Peranan *self efficacy* dalam meningkatkan minat belajar. *Journal of Learning and Teaching*, 2(1), 9–15. DOI: <https://doi.org/10.70692/p1a0zq35>
- Zetina, E. (2021). Strategi guru dalam mengembangkan *self efficacy* dan *self regulation* siswa untuk menghafal Al-Qur'an di SMKIT Khoiru Ummah. Skripsi. Institut Agama Islam Negeri Curup