EduStream : Jurnal Pendidikan Dasar

Volume 9, Number 2, 2025 pp. 128-140
E-ISSN : 2614-4417
Open Access: https://journal.unesa.ac.id/index.php/jpd/index

Transformation of student's self-efficacy in science learning through the discovery learning model

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ARTICLE INFO

Article history:
Received 21 May 2025
Accepted 12 November 2025
Published 28 November 2025

Keywords:
Discovery learning, Self-Efficacy, Science learning

DOI:
https://doi.org/10.26740/eds.v9n2.p128-140

ABSTRACK

A decline in elementary student's self-efficacy has become increasingly visible in recent years, which caused learning loss and reduced student's confidence in completing academic tasks independently. Strengthening self-efficacy is essential because it influences participation, persistence, and achievement. This study investigates the effectiveness of the Discovery Learning model in improving student's self-efficacy in elementary science learning. A descriptive qualitative approach supported by descriptive quantitative data was employed, involving 47 sixth-grade students across three learning sessions designed according to the Discovery Learning stages. Data were collected through participatory classroom observation, a Likert-scale self-efficacy questionnaire administered before and after learning, unstructured interviews, and field notes. Observation results showed a progressive increase in self-efficacy across learning stages, particularly during phases requiring investigation, discussion, verification, and presentation. Questionnaire results indicated an average improvement of 23 percentage points across five self-efficacy indicators, with the highest gains in social interaction ability and willingness to take risks. Interview data confirmed that students felt more confident due to meaningful field experiences, peer support, and opportunities to present findings. Triangulated data suggest that Discovery Learning effectively enhances elementary student's self-efficacy by providing direct and socially interactive learning experiences. These findings highlight the potential of Discovery Learning as a pedagogical model to reinforce confidence and independence in science learning.

INTRODUCTION

Today's reality that cannot be denied shows a decline in children's self-efficacy along with their knowledge and abilities in the Alpha generation. In this era of continuous development, the next generation is gradually showing a decline in the quality of its human resources (Indriyani et al. 2023). The situation becomes even more concerning when moral, material, and intellectual degradation occurs simultaneously, while the 21st-century challenges require students to be proactive in mastering scientific, social, reading, and mathematical literacy to survive and compete in the future (Masfufah and Afriansyah 2021). This condition indicates that children are not only experiencing a cognitive setback but also a psychological decline, particularly in the aspect of self-belief and confidence to complete academic tasks independently.

Self-efficacy is a person's belief in doing something because he believes his abilities and capacities can lead to success (Ningrum and Rahmawati 2022). Self-efficacy influences decision-making, persistence, and academic performance. Individuals who believe in their capability tend

to participate actively and confidently in learning activities, while low self-efficacy leads to avoidance, hesitation, and fear of failure (Karmila and Raudhoh 2021). Students with low self-efficacy often experience difficulty in problem-solving and understanding new concepts because they lack sufficient knowledge and direct experience to support their learning (Nurfadhilla 2020). The challenge becomes even greater for elementary-level students, whose sense of confidence and academic independence is still in the early phases of development.

Problems related to low self-efficacy have increasingly surfaced since the Covid-19 pandemic, which caused widespread learning loss and motivation loss in students. Online learning during the pandemic did not fully meet student's needs because it required strong readiness from teachers, students, and parents, which in reality was not evenly distributed across families (Teristonia et al. 2022). Many students did not receive equal learning opportunities due to limited supporting devices, unstable internet connections, and lack of parental assistance. As a result, after the pandemic ended, a significant number of students became unfamiliar with active and independent learning, displaying decreased engagement and lower confidence in solving academic challenges (Hadiati et al. 2024). Even after returning to face-to-face learning, many students still experience hesitation when speaking, presenting ideas, and responding to teacher questions in class.

In response to these problems, the Merdeka Curriculum places strong emphasis on student-centered learning. Teachers are positioned not as the main source of knowledge but as facilitators who guide students to construct knowledge through direct observation, experience, and discussion (Ridwan et al. 2025). This curriculum aims to restore student's academic and psychological readiness by providing sufficient time for in-depth learning, allowing students to build concepts meaningfully and according to their readiness level (Sandria et al. 2022). Student-centered learning aligns with the constructivist view which states that knowledge must be actively built by students, not merely transferred from teacher to student. According to Piaget, learning becomes deeply embedded when students experience events directly rather than through passive listening (Astutiek et al. 2024). Direct experience creates meaningful learning that is stored longer in long-term memory and contributes to student's confidence in engaging with cognitive tasks (Nasir 2022).

One learning model rooted in constructivism and strongly supported by the Merdeka Curriculum is Discovery Learning. According to Bruner, discovery learning requires students to discover and verify a theory by investigating real phenomena around them (Khoiriyah and Murni 2021). Through this process, students explore evidence, analyze findings, and formulate conclusions independently instead of receiving information directly from the teacher (Nasir 2022). Meaningful learning emerges because students acquire knowledge through firsthand experience, making concepts easier to understand and remember (Kurniarahman 2023). More importantly, Discovery Learning provides opportunities for students to present arguments, collaborate, evaluate peers' ideas, and defend their findings, activities that contribute to developing a strong sense of confidence in their academic capability (Ningsih et al. 2025).

Several researchers have proven that Discovery Learning contributes positively to increasing student's self-efficacy. Faoziyah et al. (2024) found that students who were taught using discovery learning had higher problem-solving ability and self-efficacy than those taught conventionally.

Febriana et al. (2023) also showed that applying discovery learning resulted in a moderate improvement in student self-efficacy and better learning outcomes compared to the scientific approach. However, previous studies were mostly conducted in mathematics learning and at higher education levels such as junior and senior high school. Research applying Discovery Learning specifically in elementary science learning to improve self-efficacy remains limited. Based on this research gap, this study aims to analyze the effect of the discovery learning model on student's self-efficacy in elementary science learning through field observation, discussion, and presentation activities.

Based on this research gap, this study aims to analyze the effect of the Discovery Learning model on student's self-efficacy in elementary science learning through field observation, discussion, and presentation activities. The formulation of the research problem is directed at explaining how student's self-efficacy is formed and develops during the application of Discovery Learning. This includes three perspectives: (1) how self-efficacy emerges during the learning process based on classroom observations, (2) how student's self-efficacy improves before and after learning based on questionnaire results, and (3) how students respond to Discovery Learning in relation to their confidence as reflected in interviews and reflections. Consequently, this study is expected to offer meaningful insights to support efforts to strengthen elementary student's self-efficacy through learning that actively engages them in discovering knowledge directly from their environment.

METHOD

This study employed a descriptive qualitative approach supported by descriptive quantitative data (Sugiyono 2023), aiming to portray the natural transformation of student's self-efficacy within the context of science learning using the Discovery Learning model on the topic of symbiosis. The qualitative approach was used to capture the dynamics of student's behaviors and confidence during the learning process, while quantification was conducted to map the percentage of self-efficacy development based on behavioral indicators.

The research subjects consisted of 47 students in a final-grade elementary class who served as participants and primary informants. The study was carried out over three meetings, each implementing the stages of Discovery Learning (stimulation, problem statement, data collection, data processing, verification, and generalization) (Paramitha et al. 2023), which were intentionally designed to facilitate the improvement of self-efficacy.

The main instrument in this study was the researcher, who directly observed classroom phenomena. Supporting instruments included a self-efficacy observation sheet, a Likert-scale self-efficacy questionnaire, unstructured interviews, and field notes. The observation sheet was developed based on self-efficacy indicators and aligned with the Discovery Learning syntax so that each stage of instruction provided measurable opportunities for the emergence of confident behavior.

Tabel 1. Aspects and Indicators of Student's Self-Efficacy

No	Indikator Self-Efficacy	Example of Manifestation in Learning
1	Belief in personal success	Delivering conclusions confidently and clearly.
2	Courage to face challenges	Actively engaging in learning activities without fear of making mistakes or feeling confused.
3	Willingness to take risks	Raising hands to answer or counter an argument.
4	Kemampuan berinteraksi	Proposing ideas during discussions or leading the group.
5	Ketangguhan	Re-explaining concepts in a different way when corrected or questioned.

(Damianti & Afriansyah 2022)

Data collection was carried out in stages through participatory observation of self-efficacy indicators, completion of the self-efficacy questionnaire after the learning activities, unstructured interviews to further explore student's perceptions of their self-confidence, and documentation of important occurrences during the learning process using field notes. Data validity was ensured through technique triangulation, namely by comparing and confirming the findings from observations, questionnaires, interviews, and field notes. Data analysis followed the (Huberman and Miles 2002) model, consisting of: (1) data reduction, (2) data display, and (3) conclusion drawing. Quantitative data obtained from the questionnaire were analyzed using descriptive statistics in the form of percentage scores for each self-efficacy indicator before and after the implementation of the Discovery Learning model.

RESULTS

1. Observation Results

The learning session began with an apperception activity about ecosystems and interactions among living organisms. Students were asked to explain their daily experiences related to interactions between organisms in their home environment, rice fields, riverbanks, and the areas surrounding the school. From the very beginning, student engagement appeared high, as many of them raised their hands and competed to answer the questions. The learning continued with the formation of eight groups to conduct field observations, group discussions, and presentations on the types of symbiosis which are mutualism, commensalism, and parasitism. The explanation provided by the researcher before the field activity helped students understand the workflow, ensuring that they were not confused when determining the observation objects.

As the learning progressed, student's behaviors were monitored using a self-efficacy observation sheet with a scale of 1–4. The observations were carried out across three Discovery Learning-based sessions. For each learning phase, student's behaviors were recorded and assigned a score from 1 to 4, with the following criteria, 1 = very low, 2 = low, 3 = good, 4 = very good.

Table 2. Observation Results of Student's Self-Efficacy

No	Discovery Learning Syntax	Description of Findings	Score
1	Stimulation	Many students voluntarily raised their hands to answer apperception questions about interactions among living things; enthusiasm was visible from the beginning	3
2	Problem Statement	Students actively asked questions about the procedures for field observation; they showed courage to take risks by asking before receiving directions	3
3	Data Collection	Almost all students participated in field observation; they worked without fear of making mistakes and were able to interact positively within their groups	4
4	Data Processing	Group discussions took place intensely; students responded confidently to each other's arguments and did not easily give up when their answers were corrected by peers	4
5	Verification	During inter-group questioning, students confidently challenged other groups' findings and defended their arguments	4
6	Generalization	During the presentation session, students delivered conclusions confidently and clearly, without signs of shyness, and were able to answer questions accurately	4

Based on the score calculations across the six learning syntax stages, the total self-efficacy observation score reached 22 out of a maximum of 24, placing it in the high category. The highest scores appeared in the Data Collection, Data Processing, Verification, and Generalization stages, while the lowest scores were observed at the beginning of the learning process, Stimulation and Problem Statement. Overall interpretation indicates a progressive increase in student's courage to face challenges, willingness to take risks, and confidence in expressing opinions, particularly from the Data Collection stage through the Generalization stage.

2. Self-Efficacy Questionnaire Results

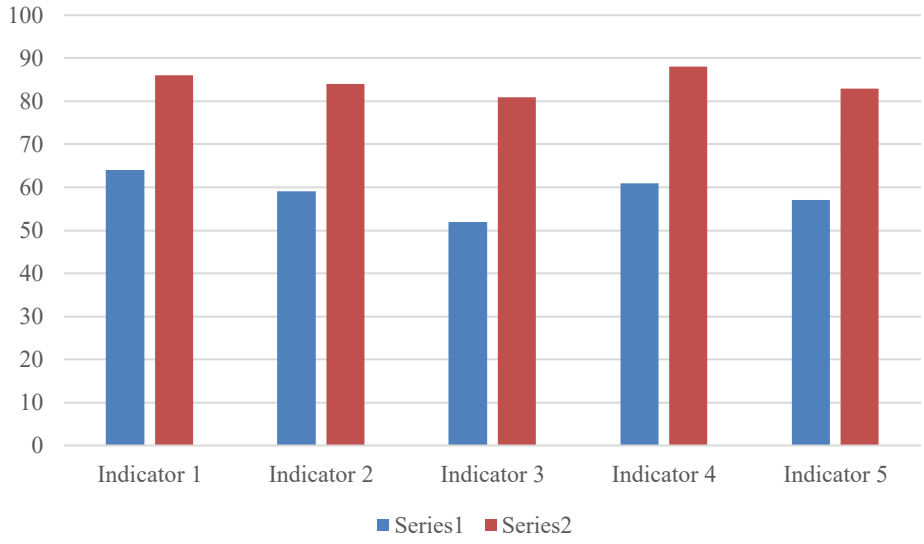
The self-efficacy questionnaire was given to obtain a quantitative description of student's confidence levels before and after the implementation of the Discovery Learning model. The questionnaire was developed based on five self-efficacy indicators and used a 4 point Likert scale, where higher scores indicated stronger confidence in dealing with learning activities. The questionnaire was administered twice, once before learning began (pre) and once after the learning series was completed (post). The comparison of each indicator is shown in the table 3.

Table 3. Percentage of Student's Self-Efficacy Before and After Learning

No.	Self-Efficacy Indicator	Pre (%)	Post (%)
1	Belief in personal success	64	86
2	Courage to face challenges	59	84
3	Courage to take risks	52	81
4	Ability to interact with others	61	88
5	Resilience (not giving up easily)	57	83

The increase in achievements across all indicators is clearly visible through the comparison of pre- and post-percentages. To provide a more concrete picture of the score differences before and after learning, these percentages were then converted into a bar chart so that the trend of change could be seen directly across indicators.

Figure 1. Bar Chart of Student Self-Efficacy Comparison



Overall, the questionnaire results show that Discovery Learning had a positive impact on student's self-efficacy, with an average improvement of 23 percentage points. The most prominent increases were found in the indicators of interaction ability and courage to take risks, indicating that collaborative activities, discussions, debates on observation results, and group presentations played a major role in building student's confidence. Meanwhile, the increases in belief in personal success, courage to face challenges, and resilience show that students are becoming more assured of their own ability to complete academic tasks even when facing pressure or uncertainty.

3. Student's Responses to Learning

Reflections and unstructured interviews were carried out at the end of the lesson to evaluate student's perceptions of enjoyment, confidence, and ease of understanding the material through group work and field observation activities. The distribution of student responses is presented below:

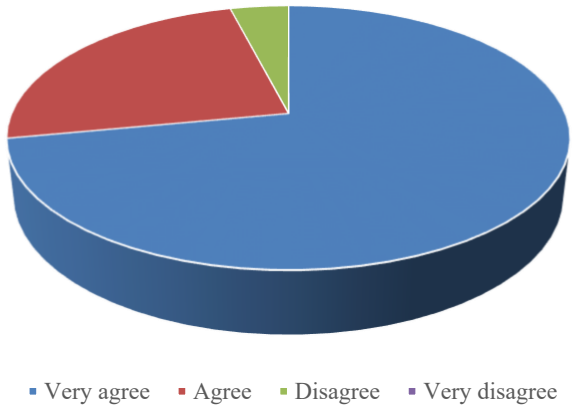


Figure 2. Bar Chart of Student's Responses to Learning

The results of the reflections and unstructured interviews show that most students experienced positive changes in their confidence throughout the Discovery Learning–based lessons. Exploratory activities outside the classroom, collaborative work in small groups, and opportunities to openly present findings were the factors most frequently mentioned as triggers for their increased willingness to participate actively. Students stated that learning situations that allowed them to ask questions, debate, and present ideas made them feel more confident than teacher-centered instructional methods.

Experiences from two student profiles with different academic abilities further illustrate how Discovery Learning affects self-efficacy. A high-achieving student admitted that in previous lessons she often felt embarrassed when presenting group work in front of the class. However, in this lesson, she felt that group support and the excitement during the field observation encouraged her to dare to speak up. She expressed, *"Before, I was shy when presenting, but because the field observation was fun and the group helped each other, I felt brave. When I was asked earlier, I was sure my answer was correct."* This statement reflects an increase in belief in personal success and the courage to take risks when speaking in front of the class.

A similar finding was also seen in a low-achieving student. In previous lessons, this student tended to be passive and avoided discussion for fear of being wrong. In this activity, however, he gained confidence after realizing that his opinions were listened to and appreciated by his group members. He shared, *"At first I was afraid of being wrong, but during the discussion my friends listened to my opinion, so I became brave to talk more."* This statement demonstrates an increase in the courage to face challenges, social interaction skills, and resilience when required to defend arguments in front of the class.

DISCUSSION

The increase in student's self-efficacy in science learning through the Discovery Learning model was consistently reflected in the results of observations, questionnaires, and interviews. In the observations, self-efficacy scores increased gradually along with the progress of the learning

syntax, starting from Stimulation to Generalization. The Data Collection, Data Processing, Verification, and Generalization stages obtained the highest score (4), showing that these activities contributed significantly to the growth of risk-taking courage, confidence in social interaction, and resilience when defending arguments (Junça-Silva et al. 2024). The questionnaire results supported this finding, where all self-efficacy indicators increased in the posttest percentage, especially the ability to interact with others (88%) and the courage to take risks (81%). The interview data confirmed that this improvement occurred because students felt supported by their group peers, gained meaningful direct experiences, and achieved real success when they were able to complete investigative tasks (Aikens and Kulacki 2023). The consistency of these findings proves that the transformation of student's self-efficacy is not a temporary change, but a behavioral change that is visible and experienced by the students themselves (Schweder and Raufelder 2022).

The finding that social interaction and presentation experiences became the key factors for the highest improvement is in line with Bandura (1977) self-efficacy theory, which emphasizes that two main sources of self-efficacy are mastery experience and social persuasion (Hartono et al. 2023). In the Data Collection phase, students experienced concrete success in independently discovering symbiotic phenomena, while in the Data Processing and Verification phases they received social reinforcement through discussions and responses from classmates. This condition provided repeated successful experiences, thereby increasing confidence to complete the next task (Imawan and Ismail 2022). This was reflected in the statement of a low-achieving student who indirectly expressed that he continued speaking because his opinions were appreciated by the group.

The questionnaire and observation results also showed improvement in the indicators of courage to face challenges and resilience/not giving up, although the increase was not as high as the interaction and risk-taking indicators. This finding can be explained by the Stimulation and Problem Statement phases, where some students still waited for the teacher's direction and were not yet brave enough to take initiative at the beginning of learning (Helm et al. 2023). This condition is reasonable because students had not yet gained an understanding of the target and learning strategies (Hendriks et al. 2024). However, as students gained clarity on the task, understanding of investigative steps, and peer support, they began to dare to confront more complex academic problems without fear of being wrong (Namaziandost and Çelik 2025). This finding is in line with the studies of Siregar (2025) and Huda and Marzal (2023) which found that discovery-based learning increases academic resilience and problem-solving confidence in elementary school students.

The indicator of belief in personal success also increased significantly from 64% in the pretest to 86% in the posttest. This increase was influenced by the student's success in presenting the identified types of symbiosis according to the categories in the final presentation stage (de Tantillo and Holloway 2025). The successful experience of answering questions clearly in front of their peers triggered the formation of self-confirmation, an internal belief that they are capable of succeeding in the next academic task (Liao et al. 2025). This was reinforced by the statement from the high-achieving student who said that she felt confident that her answer was correct during the presentation. The study of Astaneh et al. (2024) supports this phenomenon by showing that opportunities to speak in public preceded by hands-on learning experiences can build academic self-confidence in elementary students.

The interview findings indicating that students enjoyed the learning process not only describe the learning atmosphere, but also indicate a positive affective condition that supports the development of self-efficacy (Dehbozorgi et al. 2021). Furthermore, the emergence of student's self-efficacy in this study was supported by an active, enjoyable learning atmosphere that did not create pressure (Aulia and Surawan 2025). Previous literature shows that a learning atmosphere that makes students feel happy, enthusiastic, and comfortable directly contributes to teachers' success in building student's self-confidence during learning activities (Adha and Ulpa 2022; Louis and Pamela 2024). In the context of this study, student's enthusiasm was reflected in their eagerness to raise their hands during the aperception stage, their smiles and excitement during field observation, and their visible confidence during presentations. Such positive emotional conditions act as a positive physiological state, one of the sources of self-efficacy formation, because feelings of joy and safety reduce performance anxiety and encourage the courage to take new academic steps (Ma 2022).

The enjoyable learning atmosphere in Discovery Learning remained within the corridor of structured pedagogy and did not lose teacher control (Fisher & Frey 2021). The teacher as a facilitator was able to ensure that the active atmosphere did not turn into noise and disorder, while still giving students the freedom to construct their own knowledge (Alrabai 2021). When students could explore findings independently while still receiving guidance when needed, this stage created an important balance, active learning that stimulates learning motivation while simultaneously building academic self-confidence (Merdiaty & Sulistiasih 2024). This aligns with the findings of Fatimah et al. (2023) and Usman et al. (2022) which emphasize that active learning produces optimal affective and cognitive performance when students are given space to discover, while the teacher maintains the lesson flow to remain effective.

CONCLUSION

The findings of this study demonstrate that Discovery Learning is an effective pedagogical approach for enhancing students' self-efficacy in elementary science education. Evidence from classroom observations, questionnaires, and interviews consistently shows that students developed greater confidence, particularly through activities that required investigation, collaboration, verification, and presentation. These learning experiences allowed students to engage directly with scientific concepts while simultaneously strengthening their interpersonal skills and willingness to take academic risks. Although the scope of this study was limited to a single class and a relatively short implementation period, the results offer meaningful insights for educators, schools, and curriculum designers seeking to foster student confidence and independence in inquiry-based learning environments. Future research should consider extending the duration of the intervention, involving multiple grade levels or school settings, and incorporating additional data sources such as video analysis or longitudinal tracking. Such expansions would provide a deeper and more comprehensive understanding of how Discovery Learning can sustainably support the development of self-efficacy across diverse educational contexts.

REFERENCES

Adha, Muhammad Mona, and Eska Prawisudawati Ulpa. 2022. "Joyfull Learning Activities in Open Classroom Climate to Reduce Students Academic Stress." *Jurnal Pendidikan Kewarganegaraan* 12(2):11–17.

Aikens, Melissa L., and Alexander R. Kulacki. 2023. "Identifying Group Work Experiences That Increase Student's Self-Efficacy for Quantitative Biology Tasks." *CBE—Life Sciences Education* 22(2):ar19.

Alrabai, Fakieh. 2021. "The Influence of Autonomy-Supportive Teaching on EFL Student's Classroom Autonomy: An Experimental Intervention." *Frontiers in Psychology* 12:728657.

Astaneh, Behrooz et al. 2024. "Effective Hands-on Teaching Strategy on Participants' Confidence in Medical Writing and Publishing: A before-after Study." *Plos One* 19(7):e0307681.

Astutiek, Dwi et al. 2024. *Manajemen Sdm Sektor Publik (Teori dan Praktik)*. Penerbit Widina.

Aulia, Norheni, and Surawan Surawan. 2025. "Joyful Learning as a Method in Improving Student's Self-Efficacy in the Learning Process of Islamic Education at SMPN 2 Palangka Raya." *Indonesian Journal of Islamic Education and Learning* 1(1):9–21.

Bandura, Albert. 1977. "Self-Efficacy: Toward a Unifying Theory of Behavioral Change." *Psychological Review* 84(2):191.

Damianti, Dea, and Ekasatya Aldila Afriansyah. 2022. "Analisis Kemampuan Pemecahan Masalah Matematis Dan Self-Efficacy Siswa SMP." *INSPIRAMATIKA* 8(1):21–30.

Dehbozorgi, Nasrin et al. 2021. "Does Self-Efficacy Correlate with Positive Emotion and Academic Performance in Collaborative Learning?" Pp. 1–8 in *2021 IEEE Frontiers in Education Conference (FIE)*. IEEE.

Faoziyah, Nina et al. 2024. "Discovery Learning for Problem-Solving Ability and Self- Efficacy." *Pasundan Journal of Mathematics Education* 14(1):35–44. doi:http://doi.org/10.23969/pjme.v14i1.13308.

Fatimah, Fahmi Siti et al. 2023. "Learning Fiqh Based on the TAPPS (Think Aloud Pair Problem Solving) Method in Improving Student Learning Outcomes." *At-Tadzkir: Islamic Education Journal* 2(1):1–15.

Febriana, Rina et al. 2023. "The Effect of Model Discovery Learning on Student's Self-Efficacy and Student Learning Outcomes." *Journal of Mathematics Education* 9(November):119–27.

Fisher, Douglas, and Nancy Frey. 2021. *Better Learning through Structured Teaching: A Framework for the Gradual Release of Responsibility*. ASCD.

Hadiati, Eti et al. 2024. "Menelisik Fenomena Learning Loss Dalam Konteks Pendidikan Tinggi Di Provinsi Lampung." *Instructional Development Journal* 7(2):393–411.

Hartono, Hartono et al. 2023. "English Presentation Self-Efficacy Development of Indonesian ESP

Students: The Effects of Individual versus Group Presentation Tasks." *International Journal of Language Education* 7(3):361–76.

Helm, Judy Harris et al. 2023. *Young Investigators: The Project Approach in the Early Years*. Teachers College Press.

Hendriks, Renée A. et al. 2024. "Motivation for Learning in Campus-Integrated MOOCs: Self-Determined Students, Grade Hunters and Teacher Trusters." *Computers and Education Open* 6:100158.

Huberman, Michael, and Matthew B. Miles. 2002. *The Qualitative Researcher's Companion*. sage.

Huda, Nizlel, and Jefri Marzal. 2023. "Problem-Based Learning and Discovery-Based Learning Models on Student's Metacognitive Ability Based on Self-Efficacy." Pp. 523–35 in *4th Annual International Conference on Language, Literature and Media (AICOLLIM 2022)*. Atlantis Press.

Imawan, Okky Riswandha, and Raoda Ismail. 2022. "Student's Self-Confidence Change through the Application of the Guided Discovery Learning Model." Pp. 347–51 in *5th International Conference on Current Issues in Education (ICCIE 2021)*. Atlantis Press.

Indriyani, Riska Anisa et al. 2023. "Urgensi Manajemen Pendidikan Dalam Pembentukan Karakter Siswa." *Jurnal Pendidikan, Bahasa Dan Budaya* 2(1):63–70.

Junça-Silva, Ana et al. 2024. "Personal Initiative, Risk-Taking, Creativity and Opportunity Discovery among Students." *Journal of Enterprising Communities: People and Places in the Global Economy* 18(1):49–71.

Karmila, Nita, and Siti Raudhoh. 2021. "Pengaruh Efikasi Diri Terhadap Kemandirian Belajar Siswa." *Pedagonal: Jurnal Ilmiah Pendidikan* 5(1):36–39.

Khoiriyah, Binti Khoiriyah, and Murniyati Murni. 2021. "Peran Teori" Discovery Learning" Jerome Bruner Dalam Pembelajaran Pendidikan Agama Islam." *Thawalib: Jurnal Kependidikan Islam* 2(2):67–80.

Kurniarahman, Iwan. 2023. "Mnemonics and Their Effect on Student's Vocabulary Memorization and Recall: A Quantitative Study." *BATARA DIDI: English Language Journal* 2(1):10–24.

Liao, Jingxian et al. 2025. "Signals Beyond Text: Understanding How Accessing Peer Concept Mapping and Commenting Augments Reflective Mind for High-Stake Videos." Pp. 1–21 in *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*.

Louis, John, and Alma Juliet Pamela. 2024. "A Study of Happiness, Self-Confidence, and Classroom Climate Among The Ninth Standard Students." *International Journal of Cultural Studies and Social Sciences* 20(2347–4777):108–15.

Ma, Yuxia. 2022. "The Triarchy of L2 Learners' Emotion, Cognition, and Language Performance: Anxiety, Self-Efficacy, and Speaking Skill in Lights of the Emerging Theories in SLA." *Frontiers in Psychology* 13:1002492.

Masfufah, Risma, and Ekasatya Aldila Afriansyah. 2021. "Analisis Kemampuan Literasi Matematis Siswa Melalui Soal PISA." *Mosharafa: Jurnal Pendidikan Matematika* 10(2):291–300.

Merdiaty, Netty, and Sulistiasih Sulistiasih. 2024. "Empowering Learning: The Mediating Role of Teachers in Enhancing Student's Intrinsic Motivation." *Al-Ishlah: Jurnal Pendidikan* 16(4):5163–72.

Namaziandost, Ehsan, and Ferdi Çelik. 2025. "Simulated Uncertainty in Gamified Language Learning: Investigating Resilience, Academic Buoyancy, and on-Task Focus through the Lens of Expectancy-Value Theory and Operant Conditioning." *Learning and Motivation* 92:102196. doi:https://doi.org/10.1016/j.lmot.2025.102196.

Nasir, Muhammad Asri. 2022. "Teori Konstruktivisme Piaget: Implementasi Dalam Pembelajaran Al-Qur'an Hadis." *JSG: Jurnal Sang Guru* 1(3):215–23.

Ningrum, Pramesthi, and Rina Dyah Rahmawati. 2022. "Pengaruh Self Efficacy Terhadap Prestasi Belajar Matematika Siswa SD Dalam Pembelajaran Daring." *Prima Magistra: Jurnal Ilmiah Kependidikan* 3(1):41–47.

Ningsih, Tri Zahra et al. 2025. "Enhancing Communication and Collaboration Skills through Discovery, Cooperative and Problem-Based Learning Models in Social Studies Education." *Cogent Education* 12(1):2500110.

Nurfadhilla, Nona. 2020. "Upaya Meningkatkan Efikasi Diri Melalui Layanan Bimbingan Konseling." *ENLIGHTEN: Jurnal Bimbingan Konseling Islam* 3(1):48–59.

Paramitha, Ardia Puti et al. 2023. "The Influence of Problem-Based Learning and Discovery Learning Models on Learning Outcomes." *Jurnal Penelitian Ilmu Pendidikan* 16(1):22–34.

Ridwan, Ridwan et al. 2025. "Application of Gibbs Framework Reflection Method in Elementary School Sports Teachers Community." *Journal of Education Review Provision* 5(1):1–13.

Sandria, Anis et al. 2022. "Pembentukan Karakter Religius Melalui Pembelajaran Berpusat Pada Siswa Madrasah Aliyah Negeri." *At-Tadzkir: Islamic Education Journal* 1(1):63–75.

Schweder, Sabine, and Diana Raufelder. 2022. "Student's Interest and Self-Efficacy and the Impact of Changing Learning Environments." *Contemporary Educational Psychology* 70:102082.

Siregar, Torang. 2025. "The Effectiveness of the Discovery Learning Model in Enhancing Student's Mathematical Problem-Solving Skills."

Sugiyono. 2023. *Metode Penelitian Kuantitatif Kualitatif Dan R&D*. Vol. 11. 5th ed. edited by Sutopo. Bandung: ALFABETA.

de Tantillo, Lila, and Lauren Holloway. 2025. "A Multifaceted Innovation to Support Student Nurse Writing Self-Efficacy." *Teaching and Learning in Nursing*. doi:https://doi.org/10.1016/j.teln.2025.07.018.

Teristonia, Ni Luh Pegy et al. 2022. "Fenomena Learning Loss Pada Siswa Sekolah Dasar Pasca Pandemi Covid-19." *Jurnal Ilmiah Pendidikan Dan Pembelajaran* 6(3):477–87.

Usman, Muhammad et al. 2022. "The Influence of JIGSAW Learning Model and Discovery Learning on Learning Discipline and Learning Outcomes." *Pegem Journal of Education and Instruction* 12(2):166–78.