International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 09 Issue 07 July 2026
DOI: 10.47191/ijcsrr/V9-i7-49, Impact Factor: 8.048
IJCSRR @ 2026
www.ijcsrr.org

Development of Outdoor Learning Mathematics Project Based Learning Tools on Simple and Compound Interest to Improve Students' Critical Thinking Ability

Dian Indriani[1*], Didik Sugeng Pambudi[2], Dian Kurniati[3], Nurcholif Diah Sri Lestari[4], Susanto[5]
[1,2,3,4,5]Department of Mathematics Education, Faculty of Teacher Training and Education,
University of Jember, East Java, Indonesia

ABSTRACT: This research is motivated by the continued dominance of conventional mathematics learning in vocational high schools, which rarely incorporates practical and contextual activities. Consequently, students' critical thinking skills remain suboptimal, and learning tools based on the Outdoor Learning Mathematics Project (OLMP) are not yet available. This study aims to describe the process and results of developing OLMP-based learning tools for the topic of simple and compound interest that are valid, practical, and effective in improving vocational high school students' critical thinking skills. This Research and Development (R&D) study adopted the 4D model (Define, Design, Develop, Disseminate). The subjects were 11th-grade students at SMKS 1 Pancasila Ambulu Jember. The developed tools included a Teaching Module, Student Worksheets (LKM), a FRISCO-oriented Critical Thinking Skills Test Package, and a User Manual. The results indicated that the learning tools met the validity criteria, with an average expert validity score (V_a) ranging from 3.68 to 3.78 (valid category). The practicality criteria were also met, evidenced by an average learning implementation score of 3.78 (high category), a student activity rate of 91.35% (very active category), and a positive student response rate of 96.19%. Furthermore, the effectiveness criteria were achieved with a learning mastery rate of 85% (exceeding the 70% threshold), a moderate-to-high increase in the average N-Gain score, and an independent sample t-test showing a statistically significant difference compared to the control class ($p < 0.05$). Based on these findings, it is concluded that the OLMP-based learning tools for simple and compound interest are valid, practical, and effective in enhancing the critical thinking skills of vocational high school students.

KEYWORDS: Critical thinking, Outdoor Learning Mathematics Project, Simple and Compound Interest, Learning Tools

INTRODUCTION

In the era of globalisation and rapid growth of information technology, critical thinking has become one of the essential competencies that students must possess (Fitri et al., 2025). The Merdeka Curriculum likewise emphasises the development of student competencies encompassing character, citizenship, collaboration, communication, creativity, and critical thinking (Fullan et al., 2018). Critical thinking needs to be developed in every individual because the problems encountered in daily life are increasingly complex (Rizky & Sritresna, 2021). In many classrooms, however, learning still relies heavily on the direct application of ready-made formulas, so that students are not accustomed to constructing understanding independently and tend not to develop their critical thinking (Kurniati et al., 2022). Critical thinking is an important ability to nurture because it trains students to analyse, evaluate, and solve mathematical problems (Kurniasih & Hakim, 2019).

Field indications suggest that students' critical thinking is not yet optimal. The 2022 PISA study reported that the average mathematics score of Indonesian students was 366, whereas the average score of OECD countries reached 472 (OECD, 2023). This position has not exceeded the OECD average and does not differ substantially from the 2018 results, in which Indonesia remained in the low-performing category with high equity (Kurniati et al., 2024). Indonesia is regarded as possessing capacity and potential that have not yet been optimally used to improve critical thinking (Monrat et al., 2022). Observations and interviews with a mathematics teacher at SMKS 1 Pancasila Ambulu revealed that conventional, teacher centered instructiondirect teaching, lecturing, and assigning routine exercises still dominates. This makes students less actively involved, easily bored, and limited in the space to reason critically.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 09 Issue 07 July 2026
DOI: 10.47191/ijcsrr/V9-i7-49, Impact Factor: 8.048
IJCSRR @ 2026
www.ijcsrr.org

Vocational high schools (SMK) demand a larger proportion of practice than theory, which opens wide opportunities to integrate contextual material for training critical thinking. One relevant topic is simple and compound interest, which is highly applicable in real life and can transform abstract mathematical concepts into more concrete ones (Handayani & Hasanah, 2024). Outdoor Learning in Mathematics (OLM) is a suitable approach for guiding students to learn mathematics by doing it directly discovering mathematical concepts and applying them to solve problems outside the classroom (Pambudi et al., 2023). Through this approach, students interact with real objects and situations, making learning more contextual and meaningful; earlier research shows that outdoor learning can transform students' initially negative attitudes into positive ones and thereby increase motivation and learning outcomes (Pambudi, 2022; Crismono, 2023).

The Project Based Learning (PjBL) model, whose main activity involves working on a project that yields a product, fosters decision-making, problem-solving, and creativity (Sulastri & Cahyani, 2021; Sudjimat et al., 2021). Combining PjBL with the OLM approach forms the Outdoor Learning Mathematics Project (OLMP) model, which directs students to learn collaboratively in solving contextual problems through project activities (Pambudi et al., 2023). Besides an appropriate model, the quality of learning tools is a key factor in determining the success of learning, because systematically designed tools guide teachers and help students develop independent and reflective learning (Husna & Pritasari, 2024). In practice, however, OLMP-based tools that are specifically oriented toward critical thinking indicators are not yet available; the student worksheets in use are dominated by routine problems, and existing modules are often taken from the internet without being adapted to students' characteristics.

Based on these conditions, this study developed OLMP-based learning tools on simple and compound interest to improve students' critical thinking. Its novelty lies in integrating the OLMP model on simple and compound interest for SMK students and in employing the FRISCO (Focus, Reason, Inference, Situation, Clarity, Overview) critical thinking indicators, which had not previously been applied within an OLMP context on this material, together with an integrated Merdeka Curriculum based package comprising a teaching module, student worksheets, a critical thinking test package, and a usage guidebook. Accordingly, the study addressed two questions: (1) what is the process of developing the OLMP based learning tools, and (2) what are the results of that development in terms of validity, practicality, and effectiveness?

MATERIALS AND METHODS

This study employed a Research and Development (R&D) design to develop project-based learning tools integrated with outdoor learning on simple and compound interest for improving the critical thinking of SMK students. The development referred to Thiagarajan's four-dimensional (4D) model, consisting of four sequential stages: define, design, develop, and disseminate (Thiagarajan et al., 1974). The products developed were a teaching module, student worksheets (LKM), a critical thinking test package, and a usage guidebook, all designed to meet the criteria of validity, practicality, and effectiveness.

The population comprised all grade XI students of SMKS 1 Pancasila Ambulu, Jember. Using random sampling, three classes were selected: a trial class (XI AKN, 40 students), an experimental class (XI AKN 2, 41 students), and a control class (XI AKN 4, 39 students). The experimental and control classes were taught by the same teacher with different treatments; the experimental class received the developed OLMP based tools, whereas the control class used the conventional tools already available at the school. The study was carried out in the even semester of the 2025/2026 academic year.

At the define stage, front-end, learner, concept, and task analyses were conducted, followed by the specification of learning objectives aligned with the Phase F learning outcomes of the Merdeka Curriculum. At the design stage, test construction, media selection, format selection, and the initial design (Draft 1) were carried out. At the develop stage, Draft 1 was validated by three experts two mathematics education lecturers and one qualified SMK mathematics teacher using Likert scale validation sheets; the draft was then revised according to expert suggestions into Draft 2, tested for readability by six students of differing ability levels, and subsequently trialled in the field. At the disseminate stage, the validated, practical, and effective tools were packaged and distributed both offline at the school and online.

Data were collected through observation (learning implementation and student activity), tests (critical thinking pre-test and post-test consisting of three essay items at cognitive levels C4-C5), interviews with the model teacher, and a student response questionnaire. Product and instrument validity were determined from the average validity score (V) across all aspects, with the tools regarded as valid when Va ≥ 3.00 (Pambudi et al., 2025). Practicality was assessed from learning-implementation observation (practical when at least in the high category), student activity (practical when ≥ 80%, i.e. the active category; Isroaty et al., 2023),

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 09 Issue 07 July 2026
DOI: 10.47191/ijcsrr/V9-i7-49, Impact Factor: 8.048
IJCSRR @ 2026
www.ijcsrr.org

and positive student response (practical when ≥ 70%). Effectiveness was evaluated from classical learning mastery (effective when at least 70% of students reached a score of ≥ 75), the N-Gain category (effective when the average N-Gain was at least 0.30, i.e. the moderate category), and inferential statistical testing. Prerequisite tests of normality (Shapiro–Wilk) and homogeneity (Levene) preceded hypothesis testing; an independent-samples t-test was planned for normally distributed and homogeneous data, with the Mann–Whitney test used as the non-parametric alternative when the homogeneity assumption was not met. All quantitative analyses were performed using IBM SPSS Statistics 25.

RESULTS

Development Process and Products

The define stage identified that mathematics instruction at SMKS 1 Pancasila Ambulu remained conventional and teacher-centred, that most students lacked enthusiasm because the material felt abstract and was delivered in a non-contextual way, and that the available teaching tools were general in nature and not yet oriented toward critical thinking. The concept analysis focused the material on simple and compound interest within the Phase F learning outcome on modelling loans and investments with compound interest and annuities. Five learning objectives were formulated, ranging from distinguishing the two interest concepts to presenting the analysis of financial products in the form of an informative flyer.

The design stage produced Draft 1 of the four products. Each product was structured around the OLMP syntax and the FRISCO critical thinking indicators. The learning scenario spanned four meetings: a pre-test; an in-class introduction of the simple interest formula $M_n = M_0 (1+n.i)$ and the compound interest formula $M_n = M_0 (1+i)^n$ followed by an outdoor field study to a school Mini Bank and nearby financial institutions to collect real product data; an in-class "doing mathematics" session in which students modelled and compared account growth and produced a promotional financial-product flyer using design applications; and a post-test. The develop stage yielded valid, practical, and effective tools after expert validation, revision, readability testing, and field trials, while the disseminate stage packaged and distributed the final products.

Table 1. Expert Validation Results for Products and Research Instruments

Product / Instrument	Va	Category
Learning Tools		
Teaching module	3.78	Valid
Student worksheets (LKM)	3.72	Valid
Critical thinking test package	3.68	Valid
Usage guidebook	3.72	Valid
Research Instruments		
Learning-implementation observation sheet	3.92	Valid
Student-activity observation sheet	3.82	Valid
Student response questionnaire	3.76	Valid
Readability test sheet	3.79	Valid
Interview guide	4.00	Valid

As shown in Table 1, all products and instruments obtained validity scores within the interval $3.00 \leq Va \leq 4.00$, so the developed tools were declared valid and ready to be trialled. A readability test involving six students of high, medium, and low ability further confirmed that the language, instructions, and appearance of the tools were clearly understood.

Practicality of the Learning Tools

Practicality was examined from learning implementation observation, student activity, and the student response questionnaire. The learning implementation observation produced scores of 3.72 at the first meeting and 3.83 at the second, giving an average of 3.78 in the high category. Student activity across the two meetings averaged 91.35%, which falls in the very active category, and the student response questionnaire yielded a positive response of 96.19%. The summary is presented in Table 2.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 09 Issue 07 July 2026
DOI: 10.47191/ijcsrr/V9-i7-49, Impact Factor: 8.048
IJCSRR @ 2026
www.ijcsrr.org

Table 2. Summary of Practicality Results

Aspect	Result	Category
Learning implementation	3.78	High
Student activity	91.35%	Very active
Student response	96.19%	Positive

Because all three aspects exceeded their respective thresholds, the developed OLMP based tools met the practicality criteria.

Effectiveness of the Learning Tools

Effectiveness was evaluated through classical learning mastery, the N-Gain category, and inferential statistical testing. Based on the post-test in the trial class, the classical mastery reached 85%, exceeding the minimum criterion of 70%, as summarised in Table 3.

Table 3. Learning Outcomes in the Trial Class

Criterion	Result
Highest score	96
Lowest score	60
Mean score	82
Students reaching ≥ 75 (mastered)	34
Students scoring < 75 (not mastered)	6
Classical mastery percentage	85%

Analysis of the normalised gain (N-Gain) in the trial class showed that 95% of students were in the moderate category and 5% in the high category, so that the average N-Gain met the moderate criterion (Table 4).

Table 4. N-Gain Categories in the Trial Class

Category	Students	Percentage	Total
Low	0	0%	
Moderate	38	95%	40 students (100%)
High	2	5%	

For the inferential analysis, the Shapiro–Wilk normality test showed that the pre-test and post-test data of both the experimental and control classes were normally distributed, as were the N-Gain data (all significance values > 0.05; Table 5).

Table 5. Normality Test Results (Shapiro–Wilk)

Data	Sig.	Decision
Pre-test, experimental class	0.321	Normal
Post-test, experimental class	0.536	Normal
Pre-test, control class	0.085	Normal
Post-test, control class	0.159	Normal
N-Gain, experimental class	0.784	Normal
N-Gain, control class	0.186	Normal

The Levene homogeneity test indicated that the pre-test and post-test variances were homogeneous (sig. = 0.853 and 0.877, respectively), whereas the N-Gain variance was not homogeneous (sig. = 0.019 < 0.05), as shown in Table 6.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 09 Issue 07 July 2026
DOI: 10.47191/ijcsrr/V9-i7-49, Impact Factor: 8.048
IJCSRR @ 2026
www.ijcsrr.org

Table 6. Homogeneity Test Results (Levene, Based on Mean)

Data	Sig.	Decision
Pre-test	0.853	Homogeneous
Post-test	0.877	Homogeneous
N-Gain	0.019	Not homogeneous

Because the N-Gain data were normally distributed but not homogeneous, the difference between classes was tested using the Mann Whitney test as the non-parametric alternative to the independent samples t-test. The results are presented in Table 7.

Table 7. Mann–Whitney Test Results for N-Gain

Statistic	N-Gain
Mann–Whitney U	240.000
Wilcoxon W	1020.000
Z	−5.390
Asymp. Sig. (2-tailed)	0.000

The Mann–Whitney test yielded Z = −5.390 with a significance value of 0.000 (< 0.05), so H0 was rejected and H1 accepted. This indicates a significant difference in the improvement (N-Gain) of critical thinking between the experimental class, which used the OLMP-based tools, and the control class, which did not. The developed tools therefore had a significant effect on improving students' critical thinking.

DISCUSSION

The findings demonstrate that OLMP based learning tools on simple and compound interest are valid, practical, and effective for improving the critical thinking of SMK students. The validity scores (3.68–4.00) show that the products are consistent in content, construct, and language, which is consistent with the view that systematically designed tools function as a structured guide for teaching and support students' independent and reflective learning (Husna & Pritasari, 2024). The integration of the OLMP syntax with the FRISCO indicators in every product appears to be the main reason the experts judged the tools as valid, because it explicitly links each learning phasefrom outdoor field study to in-class doing mathematics to the components of critical thinking.

The high practicality is reflected in the very active student participation (91.35%) and the strongly positive response (96.19%). These results are in line with earlier reports that outdoor learning can shift students' attitudes from negative to positive and thereby raise motivation and engagement (Pambudi, 2022; Crismono, 2023). Learning directly from real objects collecting authentic interest rate data at a school Mini Bank and nearby banks made abstract concepts more concrete, which is consistent with the argument that simple and compound interest is highly applicable and can transform abstract mathematics into something tangible (Handayani & Hasanah, 2024). Presenting the analysis as a promotional flyer added a creative, product-oriented dimension typical of project-based learning, which is known to foster decision making, problem solving, and creativity (Sudjimat et al., 2021; Sulastri & Cahyani, 2021).

The effectiveness results reinforce these interpretations. The trial class reached 85% classical mastery and an N-Gain in the moderate category, while the Mann Whitney test confirmed a significant difference in critical thinking improvement between the experimental and control classes (Z = −5.390; p = 0.000). Qualitative observations support this: experimental class students increasingly wrote their solutions in a structured way following the FRISCO indicators, whereas control class students improved procedurally but reasoned less deeply when comparing the efficiency of the two interest systems. This pattern is coherent with prior development studies reporting that project based and outdoor mathematics tools enhance higher order abilities such as critical thinking and mathematical connection (Kurniati et al., 2022; Pambudi et al., 2023; Isroaty et al., 2023).

The main strength of this study is the coherent alignment of an outdoor project based model with an explicit critical thinking framework on a contextual SMK-relevant topic, delivered as a complete and adaptable package. Several limitations should be noted. The study was conducted at a single school with accountancy track students, so the results should be generalised with caution; the outdoor activities depended on the availability of nearby financial institutions and adequate time, and one meeting ran about twenty

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 09 Issue 07 July 2026
DOI: 10.47191/ijcsrr/V9-i7-49, Impact Factor: 8.048
IJCSRR @ 2026
www.ijcsrr.org

minutes over the allocation; and the effectiveness test relied on a three-item essay instrument. Future research could implement the tools across more schools and expertise programmes, extend the material, and examine longer term retention as well as other competencies such as mathematical communication and creativity.

CONCLUSION

This study produced Outdoor Learning Mathematics Project (OLMP) based learning tools on simple and compound interest comprising a teaching module, student worksheets, a critical thinking test package, and a usage guidebook developed through Thiagarajan's 4D model (define, design, develop, and disseminate) and integrating the OLMP syntax with the FRISCO critical thinking indicators. The developed tools met all three quality criteria: they were valid, with average validity scores of 3.68–4.00; practical, with a learning-implementation score of 3.78 (high), student activity of 91.35% (very active), and a positive response of 96.19%; and effective, with 85% classical mastery, an average N-Gain in the moderate category, and a significant difference in critical thinking improvement between the experimental and control classes (Mann Whitney $Z = -5.390$; $p = 0.000$). The OLMP based tools are therefore suitable for use in improving the critical thinking of vocational high school students and can serve as a reference for teachers and researchers developing contextual, project-based learning tools.

REFERENCES

1. Agitsna, L. D., Wahyuni, R., & Friansah, D. (2019). Pengembangan Lembar Kerja Murid Berbasis Problem Based Learning pada Materi Bangun Ruang Sisi Datar. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 8(3), 429–437. https://doi.org/10.24127/ajpm.v8i3.2360
2. Crismono, P. C. (2023). The Effect of Outdoor Learning on Students' Attitudes in Mathematics Learning. Jurnal Axioma: Jurnal Matematika dan Pembelajaran, 8(2), 135–143. https://doi.org/10.36526/jax.v8i2.2882
3. Fitri, M., Mujahidawati, & Falani, I. (2025). Pengembangan E-Modul Etnomatematika 3D Terintegrasi Virtual Reality Berbasis TPACK untuk Meningkatkan Kemampuan Berpikir Kritis Murid. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 14(2), 368–380. https://doi.org/10.24127/ajpm.v14i2.10191
4. Fridanianti, A., Purwati, H., & Murtianto, Y. H. (2018). Analisis Kemampuan Berpikir Kritis dalam Menyelesaikan Soal Aljabar Kelas VII SMP Negeri 2 Pangkah Ditinjau dari Gaya Kognitif Reflektif dan Kognitif Impulsif. Aksioma, 9(1), 11–20. https://doi.org/10.26877/aks.v9i1.2221
5. Handayani, U., & Hasanah, R. (2024). Kategori Kemampuan Berpikir Kreatif Murid dalam Menyelesaikan Soal Bunga Tunggal dan Majemuk. Circle: Jurnal Pendidikan Matematika, 4(1), 25–41. https://doi.org/10.28918/circle.v4i1.6866
6. Isroaty, A., Sunardi, Lestari, N. D. S., Pambudi, D. S., & Kurniati, D. (2023). Pengembangan Perangkat Pembelajaran Model CORE dengan Pendekatan RME untuk Meningkatkan Kemampuan Koneksi Matematis. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 12(1), 1141–1154. https://doi.org/10.24127/ajpm.v12i1.6732
7. Khoeriah, N., Mahmudi, A., & Sudrajat. (2024). Pengembangan LKS Berbasis PBL Berbantuan Geogebra untuk Meningkatkan Kemampuan Pemecahan Masalah dan Kesadaran Metakognitif Murid. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 13(1), 65–75. https://doi.org/10.24127/ajpm.v13i1.8534
8. Kurniasih, R., & Hakim, D. L. (2019). Berpikir Kritis Murid dalam Materi Segiempat. Sesiomadika, 1135–1145.
9. Kurniati, D., Pambudi, D. S., & Hakiki, F. N. (2022). Pengembangan Perangkat Pembelajaran Matematika Model Project Based Learning Terintegrasi STEM untuk Meningkatkan Kemampuan Berpikir Kritis. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 11(4), 2579–2592.
10. Kurniati, D., Wahyuna, I., Sepeng, P., & Osman, S. (2024). Development of Numeracy Problems Based on Education for Sustainable Development (ESD) to Measure Critical Thinking Ability. TEM Journal, 13(3), 1916–1926. https://doi.org/10.18421/TEM133-19
11. Maisya, R., Hermita, N., Noviana, E., & Alpusari, M. (2020). Implementasi Metode Outdoor Learning terhadap Complex Problem Solving Skills pada Mata Pelajaran IPA Murid Kelas V SDN 56 Pekanbaru. Jurnal Penelitian Ilmu Pendidikan, 3(1), 22–32. https://doi.org/10.31258/jta.v3i1.13-23
12. Marudut, M. R. H., Bachtiar, I. G., Kadir, & Iasha, V. (2020). Peningkatan Kemampuan Berpikir Kritis dalam Pembelajaran IPA melalui Pendekatan Keterampilan Proses. Jurnal Basicedu, 4(3), 577–585.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 09 Issue 07 July 2026
DOI: 10.47191/ijcsrr/V9-i7-49, Impact Factor: 8.048
IJCSRR @ 2026
www.ijcsrr.org

13. Maulida, U. (2022). Pengembangan Modul Ajar Berbasis Kurikulum Merdeka. Tarbawi, 5(2), 130–138. https://doi.org/10.51476/tarbawi.v5i2.392
14. Monrat, N., Phaksunchai, M., & Chonchaiya, R. (2022). Developing Students' Mathematical Critical Thinking Skills Using Open-Ended Questions and Activities Based on Student Learning Preferences. Education Research International, 2022. https://doi.org/10.1155/2022/3300363
15. Nufus, H., & Kusaeri, A. (2020). Analisis Tingkat Kemampuan Berpikir Kritis Murid dalam Memecahkan Masalah Geometri. Jurnal Pendidikan Matematika Indonesia, 5(2), 49–55.
16. OECD. (2023). PISA 2022 Results Learning During and from Disruption (Vol. II). OECD Publishing. https://doi.org/10.1787/a97db61c-en
17. Pambudi, D. S., Fiqhi, A. S. R., & Hadi, A. F. (2023). Pengembangan Perangkat Pembelajaran Model PBL Berbasis Outdoor Learning Mathematics dan Pengaruhnya terhadap Kemampuan Berpikir Kritis. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 12(1), 123–133. https://doi.org/10.24127/ajpm.v12i1.6442
18. Pambudi, D. S., Kurniati, D., & Lestari, N. D. S. (2025). Development of a Mathematical Cognitive Test with an Agricultural Context to Improve Students' Mathematical Connection Ability. Journal of Mathematics Education, 17(2), 169–192.
19. Pambudi, D. S., Lestari, N. D. S., & Rikna, S. T. S. (2022). Pengembangan Perangkat Pembelajaran Barisan dan Deret Menggunakan Outdoor Learning untuk Meningkatkan Kemampuan Komunikasi Matematis. AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 11(4), 2666–2677. https://doi.org/10.24127/ajpm.v11i4.6185
20. Pambudi, D. S., Sunardi, Kurniati, D., & Lestari, N. D. S. (2023). The Mathematics Prospective Teachers' Activities when Solving Outdoor Learning Mathematics Projects in the Campus Garden. Mathematics Teaching Research Journal, 15(3). https://doi.org/10.5888/mtrj.2023.15.3.19
21. Prasasti, D. E., Koeswanti, H. D., & Giarti, S. (2019). Peningkatan Keterampilan Berpikir Kritis dan Hasil Belajar Matematika melalui Model Discovery di Kelas IV SD. Jurnal Basicedu, 3(1), 174–179. https://doi.org/10.31004/basicedu.v3i1.98
22. Rahayu, P., & Kholilullah. (2004). Validitas dan Praktikalitas Lembar Kerja Murid Berbasis Pendekatan Kontekstual Materi Bangun Ruang Sisi Datar pada Murid SMP. Jurnal Ilmiah Pendidikan Matematika, 3(2), 126–133. https://doi.org/10.26877/jipmat.v3i2.2805
23. Ratinen, I., Sarivaara, E., & Kuukkanen, P. (2023). Finnish Student Teachers' Ideas of Outdoor Learning. Journal of Adventure Education and Outdoor Learning, 23(2), 146–157. https://doi.org/10.1080/14729679.2021.1984962
24. Rizky, E. N. F., & Sritresna, T. (2021). Peningkatan Kemampuan Berpikir Kritis dan Disposisi Matematis Murid antara Guided Inquiry dan Problem Posing. PLUSMINUS: Jurnal Pendidikan Matematika, 1(1), 33–46. https://doi.org/10.31980/plusminus.v1i1.1024
25. Samsudin, S., Kamalden, T. F. T., Aziz, A., & Ismail, M. H. (2021). The Impact of Outdoor Education Camp Program in Building Resilience among University Students. Asian Journal of University Education, 17(4). https://doi.org/10.24191/ajue.v17i4.16185
26. Sudjimat, D. A., Nyoto, A., & Romlie, M. (2021). Implementation of Project-Based Learning Model and Workforce Character Development for the 21st Century in Vocational High School. International Journal of Instruction, 14(1), 181–198. https://doi.org/10.29333/iji.2021.14111a
27. Sulastri, & Cahyani, G. P. (2021). Pengaruh Project Based Learning dengan Pendekatan STEAM terhadap Kemampuan Berpikir Kritis pada Pembelajaran Online di SMK Negeri 12 Malang. Jurnal Pendidikan Akuntansi (JPAK), 9(3), 372–379. https://doi.org/10.26740/jpak.v9n3.p372-379
28. Thiagarajan, S., Semmel, D. S., & Semmel, M. I. (1974). Instructional Development for Training Teachers of Exceptional Children: A Sourcebook. Indiana University, Center for Innovation in Teaching the Handicapped.
29. Widayanti, M. D., & Abidin, M. Z. (2020). Pengembangan Buku Panduan Pembelajaran Metode Proyek untuk Guru TK. Thufula, 8(2), 164. https://doi.org/10.21043/thufula.v8i2.7222

Cite this Article: Indriani, D., Pambudi, D.S., Kurniati, D., Sri Lestari, N.D., Susanto (2026). Development of Outdoor Learning Mathematics Project Based Learning Tools on Simple and Compound Interest to Improve Students' Critical Thinking Ability. International Journal of Current Science Research and Review, 9(7), pp. 4073-4079. DOI: https://doi.org/10.47191/ijcsrr/V9-i7-49