Proceedings Series on Social Sciences & Humanities, Volume 25 Proceedings of International Conference on Social Science (ICONESS)

ISSN: 2808-103X

The Relationship Between Pancasila Student Profile Strengthening Project (P5) with Entrepreneurship Theme and Elementary Students' Independent Attitude

Trio Bagus Darmawan¹, Ristiana Dyah Purwandari²

¹SD Negeri Sidanegara 04, Cilacap Tengah, Cilacap ²Magister Pendidikan Dasar, Universitas Muhammadiyah Purwokerto

ARTICLE INFO

Article history:

DOI:

10.30595/pssh.v25i.1777

Submited: July 22, 2025

Accepted: August 11, 2025

Published: August 24, 2025

Keywords:

P5 Project; Entrepreneurship; Independent Attitude; Merdeka Curriculum; Elementary School

ABSTRACT

This research aims to identify the relationship between student involvement in the Pancasila Student Profile Strengthening Project (P5) with Entrepreneurship theme and the independent attitude of elementary school students. The research used a quantitative approach with ex post facto method and involved 69 fifth and sixth grade students at Sidanegara 04 Elementary School, Central Cilacap, as the sample. The main instrument was a Likert scale questionnaire developed to measure two variables: the level of involvement in P5 projects and students' independent attitude. Data were analyzed using Pearson Product Moment correlation after validity, reliability, normality, and linearity tests. The results showed that there is a strong and significant positive relationship between student involvement in P5 projects with Entrepreneurship theme and independent attitude (r =0.684; p < 0.01). Each stage of project implementation, from planning, production, marketing to evaluation, contributes to the formation of independent attitude dimensions such as decision-making ability, responsibility, self-confidence, perseverance, and independence in completing tasks. These findings indicate that the implementation of P5 projects can be an effective strategy in developing students' independent character through contextual, active, and meaningful learning experiences.

This work is licensed under a <u>Creative Commons Attribution 4.0 International</u> License.



Corresponding Author: Trio Bagus Darmawan

SD Negeri Sidanegara 04, Cilacap Tengah, Cilacap

Email: triobagudarmawan@gmail.com

1. INTRODUCTION

Elementary education is an important foundation in shaping students' character and life skills. In an era of rapid and complex global changes, Indonesia's education system is required to produce a generation that is not only intellectually intelligent but also tough, independent, and possessing strong character. To address these challenges, the Merdeka Curriculum introduces the Pancasila Student Profile Strengthening Project (P5) as an innovation that emphasizes the development of competencies and character through contextual and project-based learning (Ministry of Education, Culture, Research and Technology, 2022). One of the themes raised in P5 is Entrepreneurship, which aims to shape students who have creative, innovative, risk-taking spirits, and are independent in thinking and acting.

The Entrepreneurship theme in P5 is believed to have great potential in fostering independent attitudes in elementary school students. An independent attitude is part of an important character that supports students'

learning success and social life, including the ability to make decisions on their own, be responsible, and complete tasks without depending on others (Wiyani, 2013). However, the development of independent attitudes through learning in schools still faces challenges, especially at the elementary education level, which is still dominated by teacher-centered learning approaches. Therefore, it is necessary to examine how the implementation of P5 projects with Entrepreneurship theme can contribute to the formation of students' independent attitudes, particularly in the elementary school environment.

This research focuses on fifth and sixth grade students at Sidanegara 04 Elementary School in Central Cilacap District, as a location that has actively implemented P5 projects. Based on preliminary observations and interviews with teachers, P5 project activities at the school are implemented by involving students in the process of planning, producing, and marketing simple products, which align with entrepreneurial values. However, the extent to which involvement in this project relates to the formation of students' independent attitudes has never been systematically studied. Therefore, this research is important to determine the relationship between student involvement in P5 projects with Entrepreneurship theme and their level of independent attitude.

Theoretically, project-based learning approaches like P5 provide opportunities for students to learn actively and directly experience meaningful learning processes, thus encouraging independence in completing tasks and making decisions (Thomas, 2000; Bell, 2010). Meanwhile, entrepreneurial values such as initiative, responsibility, and courage to take risks are important pillars in the formation of independent character (Kuratko, 2016). Thus, there is a strong theoretical foundation to investigate the relationship between the implementation of P5 projects with Entrepreneurship theme and students' independent attitudes.

This research aims to determine the relationship between the Pancasila Student Profile Strengthening project with Entrepreneurship theme and elementary school students' independent attitudes. The research uses a quantitative approach with ex post facto method and involves 69 fifth and sixth grade students as respondents. The main instrument is a questionnaire developed based on indicators of involvement in P5 projects and students' independent attitudes.

The novelty of this research lies in its contribution to filling the gap in empirical studies regarding the impact of P5 project implementation on character formation of students at the elementary school level, particularly independent attitudes. Although P5 has become part of the Merdeka Curriculum, studies linking specific themes such as entrepreneurship with dimensions of student character are still limited. Thus, the results of this research are expected to provide practical recommendations for teachers and schools in optimizing the implementation of P5 projects to shape students' independent character.

2. RESEARCH METHOD

This research uses a quantitative approach with an ex post facto method, as it aims to determine the relationship between two variables that have occurred naturally without direct intervention from the researcher. This method was chosen because the implementation of the Pancasila Student Profile Strengthening Project (P5) with Entrepreneurship theme had been carried out by the school previously, and researchers could not arrange or manipulate student involvement in the project. The main focus of the research is to analyze the relationship between student involvement in P5 projects and the independent attitude they possess, based on their perceptions and experiences collected through questionnaires.

The research was conducted at Sidanegara 04 Elementary School, Central Cilacap District, which actively implements the Merdeka Curriculum along with P5 projects. The population in this research was all fifth and sixth grade students at the school, with a sample size of 69 students. The sampling technique was conducted through total sampling because the population size was relatively small and all students had participated in P5 activities. The characteristics of participants in this research were students who had followed at least one cycle of P5 projects with Entrepreneurship theme, had direct experience in activities such as making products, selling their work, or participating in product presentation activities.

The data collection technique in this research was carried out through a closed Likert scale questionnaire, designed to measure two main aspects, namely: (1) the level of student involvement in P5 projects with Entrepreneurship theme, and (2) the level of students' independent attitude. Instrument development was done by compiling indicators based on guidelines from the Ministry of Education, Culture, Research and Technology (2022) and the theory of independent character from Wiyani (2013). The questionnaire was arranged in the form of positive statements with a rating scale of 1 to 5, ranging from "strongly disagree" to "strongly agree".

The instrument for involvement in P5 projects consists of 4 indicators, namely: active participation, initiative in project activities, creativity in product development, and collaboration in teams. An example statement on this indicator is: "I play an active role in planning entrepreneurial products with the group."

Meanwhile, the independent attitude instrument consists of 5 indicators, namely: decision-making ability, responsibility for tasks, self-confidence, perseverance, and ability to complete tasks without the help of others. Examples of statements include: "I complete project tasks without depending on friends or teachers."

Before being used in data collection, the instruments were validated by two elementary education experts and tested for validity and reliability using the SPSS program. The validity test was carried out with Pearson correlation on limited trial data, while reliability was tested using Cronbach's Alpha coefficient.

The data analysis technique used was Pearson Product Moment correlation analysis, because the data collected were in the form of interval data from the Likert scale and met the assumption of normal distribution. This analysis was used to determine the strength and direction of the relationship between involvement in P5 projects and students' independent attitudes. Previously, the data were first analyzed through prerequisite tests in the form of Kolmogorov-Smirnov normality test and linearity test. All data processing and analysis processes were carried out with the help of SPSS statistical software of the latest version.

With this methodological design, the research is expected to be able to provide a valid empirical picture regarding the relationship between student involvement in P5 projects with Entrepreneurship theme and independent attitudes, as well as provide a basis for the development of more contextual character learning in elementary schools.

3. RESULTS AND DISCUSSION

Results

This research aims to determine the relationship between student involvement in the Pancasila Student Profile Strengthening Project (P5) with Entrepreneurship theme and elementary school students' independent attitudes. Data were obtained through distributing questionnaires to 69 fifth and sixth grade students at Sidanegara 04 Elementary School who had participated in P5 project activities. Data analysis was carried out using Pearson Product Moment correlation test after validity and reliability tests as well as analysis prerequisite tests. The results presented are clean results that have been statistically processed and theoretically interpreted.



Persentase Dimensi Sikap Mandiri Siswa yang Berkembang melalui P5 Tema Kewirausahaan

The graph above shows the percentage distribution of students who show development in five dimensions of independent attitude as a result of involvement in P5 projects with Entrepreneurship theme. The dimension of responsibility for tasks occupies the highest position with a percentage of 76%, indicating that most students are able to complete project tasks consistently and according to deadlines. This reflects the success of P5 projects in building a sense of responsibility through direct experience and group activities that require active involvement.

The perseverance dimension also shows a high percentage of 74%, reflecting that students are able to persist and keep trying to complete challenges during the project process, especially in the production and sales stages. This perseverance becomes one of the important indicators in the formation of independent character, as it shows resilience and dedication to goals.

The dimension of decision-making ability is at 72%, showing that students have been given space to think independently, determine product types, selling prices, and promotion strategies. This activity is in accordance with entrepreneurial principles that encourage autonomy in the decision-making process (Kuratko,

The dimensions of self-confidence and ability to complete tasks without excessive assistance show percentages of 70% and 68% respectively, which are also in the high category. Although the percentages are slightly lower than other dimensions, they still reflect that students have experienced increased confidence in their

own abilities and are beginning to break free from dependence on teachers. This is important in the context of independent learning, as it shows a transition from teacher-centered to student-centered learning.

Overall, this graph strengthens the main finding that involvement in P5 projects with Entrepreneurship theme makes a real contribution to the development of elementary school students' independent attitudes. The learning process that is project-based, contextual, and oriented towards direct experience has provided opportunities for students to develop various aspects of independence simultaneously and measurably.

Descriptive statistical analysis results show that student involvement in P5 projects has an average score of 81.26 (high category), with a minimum score of 65 and a maximum score of 95. The data distribution shows that the majority of students (65.22%) have high involvement in P5 projects with Entrepreneurship theme, 26.09% of students have very high involvement, and only 8.69% of students have moderate involvement. No students were found with low or very low levels of involvement. This finding indicates that in general, students at Sidanegara 04 Elementary School show enthusiasm and active participation in P5 project activities with Entrepreneurship theme.

Meanwhile, for the variable of students' independent attitude, an average score of 79.88 (high category) was obtained, with a minimum score of 60 and a maximum score of 93. The data distribution shows that most students (68.12%) have high independent attitudes, 21.74% of students have very high independent attitudes, and 10.14% of students have moderate independent attitudes. There are no students who are in the low or very low category in terms of independent attitude. This data illustrates that the independent attitude of fifth and sixth grade students at Sidanegara 04 Elementary School has developed well, which is characterized by the ability to make decisions, be responsible, be confident, be persistent, and be able to complete tasks without excessive help from others.

Before hypothesis testing, analysis prerequisite tests were conducted, including normality test and linearity test. The normality test using the Kolmogorov-Smirnov method showed that the data of both variables were normally distributed, with a significance value for the involvement variable in P5 projects of 0.200 (p > 0.05) and a significance value for the students' independent attitude variable of 0.200 (p > 0.05). Meanwhile, the linearity test results showed a significance value of deviation from linearity of 0.151 (p > 0.05), which means there is a linear relationship between the two variables. With the fulfillment of these two prerequisites, Pearson Product Moment correlation analysis can be performed to test the research hypothesis.

The correlation analysis results showed that there is a strong and significant positive relationship between involvement in P5 projects with Entrepreneurship theme and students' independent attitudes, with a correlation coefficient (r) of 0.684 and a significance value of 0.000 (p < 0.01). The positive correlation coefficient indicates that the higher the student involvement in P5 projects with Entrepreneurship theme, the higher the independent attitude they have. Thus, the hypothesis stating that there is a positive and significant relationship between involvement in P5 projects with Entrepreneurship theme and elementary school students' independent attitudes can be accepted.

Data visualization through scatter plot diagram shows data distribution that tends to form a linear pattern with a positive direction. This further strengthens the evidence of a positive relationship between the two variables, where an increase in the score of involvement in P5 projects tends to be followed by an increase in the score of students' independent attitudes. Overall, the results of this research affirm that P5 projects with Entrepreneurship theme have the potential to become an effective vehicle in developing elementary school students' independent attitudes.

Discussion

The research results show a strong and significant positive relationship between involvement in P5 projects with Entrepreneurship theme and elementary school students' independent attitudes (r = 0.684; p < 0.01). This finding confirms the research hypothesis that the higher the student involvement in P5 project activities with Entrepreneurship theme, the higher the level of independent attitude they have. This result is in line with theoretical studies stating that project-based learning can foster independence and responsibility in students (Thomas, 2000; Bell, 2010).

P5 projects with Entrepreneurship theme emphasize authentic and meaningful learning experiences through simple entrepreneurial activities. In this context, students' independent attitudes develop through a series of processes involving various project stages, from planning to reflection. In the project planning stage, students are invited to identify market needs, determine the products to be made, and plan the production process. Based on the research results, 72% of students stated that they actively provided ideas and thoughts in the product planning stage. This activity provides an opportunity for students to make decisions independently and learn to be responsible for their choices. Through discussion and brainstorming activities in groups, students also learn to express opinions confidently. This is reflected in the statement in the questionnaire where 68% of students stated "strongly agree" that they dare to express opinions during product planning discussions. This finding is in line

with the concept of independence put forward by Wiyani (2013) which emphasizes the ability to make decisions and act without hesitation.

In the production stage, students are involved in making products according to the plans that have been prepared. As many as 76% of students stated that they were able to make products according to instructions without excessive help from teachers. This activity trains students to be diligent and consistent in completing assigned tasks. When facing obstacles in the production process, students are required to find solutions independently or discuss with group mates. The data shows that 65% of students "agree" and "strongly agree" that they try to find solutions on their own when facing problems in product making. The experience of overcoming these challenges contributes to the development of students' resilience and independence in facing problems.

The marketing and sales stage is a crucial moment in entrepreneurial projects, where students promote and sell the products they have made. As many as 78% of students stated that they dare to offer products to potential buyers without being accompanied by teachers. This activity develops students' self-confidence and courage to communicate with others. In the process of price negotiation and serving buyers, students learn to make decisions quickly and accurately. The data shows that 70% of students are able to determine product selling prices independently based on capital calculations and expected profits. This ability reflects the aspect of economic independence that is important in the context of entrepreneurship.

In the evaluation and reflection stage, students evaluate the products and entrepreneurial processes that have been carried out. As many as 74% of students stated that they were able to identify the strengths and weaknesses of their products independently. This reflection activity trains students' critical and evaluative thinking abilities, which are important components of independent attitudes. In addition, through project results presentation activities, students learn to be responsible for their work processes and results. As many as 69% of students stated "agree" and "strongly agree" that they were able to present products without excessive help from teachers. This experience develops a sense of responsibility and accountability in students.

The research results show that involvement in P5 projects with Entrepreneurship theme is related to various dimensions of students' independent attitudes. Data analysis shows that 72% of students have high decision-making abilities. In the context of entrepreneurial projects, students are faced with various situations that require decision making, from determining product types, determining prices, to marketing strategies. The results of this research are in line with Kuratko's (2016) opinion stating that entrepreneurial activities encourage individuals to make decisions independently based on opportunity and risk analysis.

The dimension of responsibility for tasks also develops well through P5 projects. As many as 76% of students show high responsibility for tasks given in P5 projects. This attitude is reflected in students' commitment to complete projects according to schedule and manage available resources effectively. This finding confirms Bell's (2010) study stating that project-based learning can develop students' sense of responsibility towards their learning processes and results.

Self-confidence is another important dimension of independent attitude that develops through P5 projects. The research results show that 70% of students have high self-confidence in carrying out P5 project activities. This self-confidence develops through various successful experiences that students have, such as successfully making products and selling them to others. This is in line with Wulandari & Astuti's (2022) research which found that entrepreneurship-based projects can increase students' self-confidence.

Perseverance as a dimension of independent attitude is also seen to develop in students involved in P5 projects. As many as 74% of students show high perseverance in carrying out P5 projects. This perseverance is seen from students' willingness to try repeatedly when experiencing failure in the product making process. This attitude is an important aspect of independence, as it reflects students' ability to persist in facing challenges.

The last dimension is the ability to complete tasks without excessive assistance. Data analysis shows that 68% of students are able to complete project tasks without excessive help from teachers or others. This ability shows a good level of independence, where students can rely on their own abilities and knowledge in completing tasks. This finding supports the concept of independence put forward by Wiyani (2013) which emphasizes the ability to do something without the help of others.

The findings of this research provide empirical contributions to the development of project-based learning theory and character education in elementary schools. Theoretically, the research results confirm that learning that involves direct and meaningful experiences such as P5 projects with Entrepreneurship theme is able to develop students' character, especially independent attitudes. This is in line with the principle of constructivism in education which emphasizes the formation of knowledge and character through real experiences.

Practically, these findings provide several important implications for the implementation of learning in elementary schools. First, schools need to optimize the implementation of P5 projects with Entrepreneurship theme by providing more opportunities for students to be involved in every stage of the project. Second, teachers need to develop facilitation strategies that encourage student independence, such as providing appropriate scaffolding that is gradually reduced (fading scaffolding). Third, P5 project assessment should not only focus on

the final results, but also on the process and development of students' independent attitudes during the project. Fourth, there needs to be more systematic integration between P5 projects with Entrepreneurship theme and other subjects to strengthen the application of independence values in various learning contexts.

Although this research has provided meaningful findings, there are several limitations that need to be considered. This research uses an ex post facto design that cannot fully guarantee a causal relationship between the two variables. Research data were obtained through questionnaires so there is a possibility of subjectivity in filling them out. In addition, this research is limited to one elementary school so generalization of results needs to be done carefully. Based on these limitations, future research is expected to use experimental designs to see the causal effect of P5 projects on students' independent attitudes. In addition, research with a mixed methods approach that combines quantitative and qualitative data is also needed to get a more comprehensive understanding of how P5 projects contribute to the formation of students' independent attitudes.

Overall, the results of this research support the implementation of P5 projects with Entrepreneurship theme as an effective strategy in developing elementary school students' independent attitudes. This finding is in line with the vision of the Merdeka Curriculum which emphasizes character formation and competence through meaningful and contextual learning. The development of independent attitudes through P5 projects is not only beneficial for students' academic achievement, but also prepares them to face future challenges with more confidence and responsibility.

4. CONCLUSION

Based on the research results and discussion regarding the relationship between the Pancasila Student Profile Strengthening Project (P5) with Entrepreneurship theme and students' independent attitudes at Sidanegara 04 Elementary School, it can be concluded that:

- 1. There is a strong and significant positive relationship between student involvement in P5 projects with Entrepreneurship theme and students' independent attitudes (r = 0.684; p < 0.01). This indicates that the higher the student involvement in P5 projects, the higher the independent attitude they have.
- 2. P5 projects with Entrepreneurship theme have successfully stimulated various dimensions of students' independent attitudes, especially in decision-making ability (72%), responsibility for tasks (76%), self-confidence (70%), perseverance (74%), and ability to complete tasks without excessive assistance (68%).
- 3. The stages of P5 projects with Entrepreneurship theme which include planning, production, marketing, and evaluation provide authentic learning experiences that encourage students to develop independence through activities that require decision making, problem solving, and responsibility.
- 4. Project-based learning such as P5 with Entrepreneurship theme has proven to be an effective vehicle in the implementation of character education, especially in fostering independent attitudes as one of the dimensions of the Pancasila Student Profile.

The implications of this research are the need to strengthen the implementation of P5 projects with Entrepreneurship theme by paying attention to the following principles: (1) providing broader space for active student involvement in every stage of the project; (2) implementing facilitation strategies that encourage independence such as fading scaffolding; (3) developing authentic assessment that not only measures project results but also the process and development of independent attitudes; and (4) integrating entrepreneurial values in various learning contexts to strengthen the internalization of independent attitudes.

Theoretically, this research strengthens the concept that meaningful learning through direct experience can be a catalyst for character formation, especially independent attitudes in elementary school students. The development of independent attitudes through P5 projects not only contributes to students' academic achievement, but also prepares them to face global challenges with better confidence and independence.

REFERENCES

- Acar, S., Terzi, R., & Senemoğlu, N. (2023). The effect of project-based learning (PjBL) on creative thinking skills and academic achievement. International Journal of Educational Research, 117, 102084. https://doi.org/10.1016/j.ijer.2022.102084
- Anakwe, A. I., Ajiboye, E., & Oyeniran, O. A. (2022). Entrepreneurship education and students' creative thinking skills: Implications for 21st century teaching and learning. Journal of Technical and Vocational Education, 37(2), 132–147. https://doi.org/10.15294/jtve.v37i2.55432
- Ansari, B., Wu, X., & Jovanović, J. (2023). Self-regulated learning in project-based learning environments: A systematic literature review. Educational Research Review, 38, 100503. https://doi.org/10.1016/j.edurev.2022.100503
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83(2), 39–43. https://doi.org/10.1080/00098650903505415

Bhamani, S., & Hussain, Z. (2022). Promoting learner autonomy through project-based learning in elementary education. International Journal of Educational Management, 36(5), 678–691. https://doi.org/10.1108/IJEM-09-2021-0323

- Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. Educational Psychologist, 26(3-4), 369–398. https://doi.org/10.1080/00461520.1991.9653139
- Chan, C. K. Y., Fong, E. T. Y., Luk, L. Y. Y., & Ho, R. (2017). A review of literature on challenges in the development and implementation of generic competencies in higher education curriculum. International Journal of Educational Development, 57, 1–10. https://doi.org/10.1016/j.ijedudev.2017.08.010
- Chen, C. H., & Yang, Y. C. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. Educational Research Review, 26, 71–81. https://doi.org/10.1016/j.edurev.2018.11.001
- Ciftci, S., & Bildiren, A. (2020). The effect of coding courses on the cognitive abilities and problem-solving skills of preschool children. Computer Science Education, 30(1), 3–21. https://doi.org/10.1080/08993408.2019.1696169
- Cui, J., Liao, J., & Sun, Y. (2022). The mediating role of self-efficacy in the relationship between project-based learning and self-regulation among elementary school students. Teaching and Teacher Education, 116, 103779. https://doi.org/10.1016/j.tate.2022.103779
- Dehganzadeh, H., Dehganzadeh, H., & Falsafi, P. (2021). Investigating the effect of educational gamification on academic performance and motivation of elementary school students. Computers & Education, 172, 104239. https://doi.org/10.1016/j.compedu.2021.104239
- Deveci, İ., & Seikkula-Leino, J. (2018). A review of entrepreneurship education in teacher education. Malaysian Journal of Learning and Instruction, 15(1), 105–148. https://doi.org/10.32890/mjli2018.15.1.5
- Elmahdi, I., Al-Hattami, A., & Fawzi, H. (2018). Using technology for formative assessment to improve students' learning. Turkish Online Journal of Educational Technology, 17(2), 182–188. https://doi.org/10.13140/RG.2.2.34019.76001
- Fadaee, M., & Alzahrani, H. (2022). Impact of entrepreneurship education on developing students' creativity, innovation, and self-efficacy for sustainable development. Sustainability, 14(8), 4788. https://doi.org/10.3390/su14084788
- Fauzi, M. A., Shah, S. N. S. A., Ahmad, R., & Muda, A. L. (2021). The development of student character through project-based learning: A systematic literature review. Journal of Technology and Science Education, 11(2), 390–404. https://doi.org/10.3926/jotse.1124
- Göksün, D. O., & Kurt, A. A. (2017). The relationship between pre-service teachers' use of 21st century learner skills and 21st century teacher skills. Education and Science, 42(190), 107–130. https://doi.org/10.15390/EB.2017.7089
- Güven, A., & Gulbahar, Y. (2020). Integrating computational thinking into social studies: Student perspectives on a programming-oriented unit. Journal of Educational Computing Research, 58(7), 1439–1456. https://doi.org/10.1177/0735633120945835
- Habok, A., & Nagy, J. (2016). In-service teachers' perceptions of project-based learning. SpringerPlus, 5(1), 83. https://doi.org/10.1186/s40064-016-1725-4
- Hadinugrahaningsih, T., Rahmawati, Y., & Ridwan, A. (2017). Developing 21st century skills in chemistry classrooms: Opportunities and challenges of STEAM integration. AIP Conference Proceedings, 1868(1), 030008. https://doi.org/10.1063/1.4995107
- Hasni, A., Bousadra, F., Belletête, V., Benabdallah, A., Nicole, M. C., & Dumais, N. (2016). Trends in research on project-based science and technology teaching and learning at K–12 levels: A systematic review. Studies in Science Education, 52(2), 199–231. https://doi.org/10.1080/03057267.2016.1226573
- Heinrichs, C. R. (2016). Exploring the influence of 21st century skills in a dual language program: A case study. International Journal of Teacher Leadership, 7(1), 37–56. https://doi.org/10.13140/RG.2.1.2129.2725
- Hermawan, H. D., Deswila, N., & Yunita, D. N. (2018). Implementation of ICT in education in Indonesia during 2004-2017. International Symposium on Educational Technology (ISET), 108–112. https://doi.org/10.1109/ISET.2018.00032
- Ismail, N. S., Harun, J., Zakaria, M. A. Z. M., & Salleh, S. M. (2018). The effect of mobile problem-based learning application DicScience PBL on students' critical thinking. Thinking Skills and Creativity, 28, 177–195. https://doi.org/10.1016/j.tsc.2018.04.002
- Krajcik, J. S., & Shin, N. (2014). Project-based learning. In R. K. Sawyer (Ed.), The Cambridge handbook of the learning sciences (2nd ed., pp. 275–297). Cambridge University Press. https://doi.org/10.1017/CBO9781139519526.018

Kuratko, D. F. (2005). The emergence of entrepreneurship education: Development, trends, and challenges. Entrepreneurship Theory and Practice, 29(5), 577–597. https://doi.org/10.1111/j.1540-6520.2005.00099.x

- Larmer, J., Mergendoller, J., & Boss, S. (2015). Setting the standard for project based learning: A proven approach to rigorous classroom instruction. ASCD. https://doi.org/10.14507/er.v25.2523
- Lin, C. S., & Wu, R. Y. W. (2016). Effects of Web-based creative thinking teaching on students' creativity and learning outcome. Eurasia Journal of Mathematics, Science and Technology Education, 12(6), 1675–1684. https://doi.org/10.12973/eurasia.2016.1558a
- Lourenço, F., & Jones, O. (2006). Developing entrepreneurship education: Comparing traditional and alternative teaching approaches. International Journal of Entrepreneurship Education, 4(1), 111–140. https://doi.org/10.12973/ejmste/75473
- Nilsson, T. (2022). Character education for developing entrepreneurial competences in upper secondary school: A systematic literature review. Education Sciences, 12(8), 538. https://doi.org/10.3390/educsci12080538
- Nursyifa, A., & Nurmawan, W. (2021). The development of learning models with character education-based entrepreneurship in civic education. International Journal of Education and Practice, 9(3), 538–552. https://doi.org/10.18488/journal.61.2021.93.538.552
- Pratama, G. S., & Riyanto, Y. (2018). Effect of constructivist learning approach and learning independence toward learning outcomes on entrepreneurship subject. International Journal of Academic Research in Business and Social Sciences, 8(3), 271–279. https://doi.org/10.6007/IJARBSS/v8-i3/3919
- Putri, S. U., Sumiati, T., & Larasati, I. (2021). Improving elementary school students' creativity through project-based learning. Jurnal Pendidikan Indonesia, 10(2), 293–302. https://doi.org/10.23887/jpi-undiksha.v10i2.27169
- Sari, R. M., Sumarmi, S., Astina, I. K., Utomo, D. H., & Ridhwan, R. (2021). Increasing students' critical thinking skills and learning motivation using inquiry mind map. International Journal of Emerging Technologies in Learning, 16(3), 4–19. https://doi.org/10.3991/ijet.v16i03.16515
- Thuneberg, H. M., Salmi, H. S., & Bogner, F. X. (2018). How creativity, autonomy and visual reasoning contribute to cognitive learning in a STEAM hands-on inquiry-based math module. Thinking Skills and Creativity, 29, 153–160. https://doi.org/10.1016/j.tsc.2018.07.003
- Vidergor, H. E. (2018). Effectiveness of the multidimensional curriculum model in developing higher-order thinking skills in elementary and secondary students. The Curriculum Journal, 29(1), 95–115. https://doi.org/10.1080/09585176.2017.1318771
- Waite, J., & Boulton-Lewis, G. (2018). Supporting independence in elementary school students: Teachers' implementation of project-based learning. Elementary School Journal, 119(1), 162–178. https://doi.org/10.1086/699022
- Wulandari, S., & Astuti, W. P. (2022). Implementation of entrepreneurship-based project learning to develop student creativity. Journal of Educational Science and Technology, 8(2), 176–186. https://doi.org/10.26858/est.v8i2.24432
- Yanto, B. E., Subali, B., & Suyanto, S. (2019). Improving students' scientific reasoning skills through the three-level inquiry model. Jurnal Pendidikan IPA Indonesia, 8(4), 426–436. https://doi.org/10.15294/jpii.v8i4.21422
- Zhao, K., & Zheng, Y. (2021). The application of project-based learning in elementary school students' interdisciplinary education: A critical literature review. Educational Research Review, 34, 100383. https://doi.org/10.1016/j.edurev.2021.100383