

PROJECT-BASED ENTREPRENEURSHIP LEARNING DESIGN TO IMPROVE STUDENTS' ENTREPRENEURSHIP SKILLS AT THE TUNAS HARAPAN COMMUNITY LEARNING CENTER IN SALATIGA CITY

Ilyas Ilyas¹, Imam Shofwan^{2*}, Amin Yusuf³, Sulaeman Fityan Saputra⁴

Universitas Negeri Semarang, Indonesia.

***Corresponding Author**
Imam Shofwan

Universitas Negeri
Semarang, Indonesia.

Article History

Received: 14.08.2025
Accepted: 12.09.2025
Published: 28.09.2025

Abstract: Entrepreneurship education in the digital age requires an approach that is not only theoretical, but also practical and relevant to market needs. Non-formal education, such as Community Learning Centers (PKBM), plays a strategic role in equipping students with applicable skills, but often faces challenges in delivering effective learning. This study aims to design, develop, and evaluate a project-based learning (PjBL) model specifically designed for students at the Tunas Harapan PKBM in Salatiga City. This study uses the Research and Development (R&D) method by adopting the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The research subjects included students in the Package C program, and the model was validated by subject matter experts and media experts. The resulting product was a PjBL-KWU model integrated with an interactive multimodal e-module called "Entrepreneur's Toolkit." The results of the study show that: (1) The developed learning model was declared "very feasible" by experts with an average validation score above 85%; (2) This model was proven to be "very practical" and interesting according to the student response questionnaire, with an average score above 83%; (3) This model has been proven effective in improving students' entrepreneurial competencies, as indicated by a significant difference between pre-test and post-test results ($p < 0.05$) with an N-Gain score in the "moderate" category. In conclusion, the project-based entrepreneurship learning model developed is a valid, practical, and effective solution for fostering an entrepreneurial spirit in non-formal education settings and can serve as a blueprint for similar institutions.

Keywords: Entrepreneurship, Non-Formal Education, PKBM, Project-Based Learning.

Cite this article:

Ilyas, I; Shofwan, I; Yusuf, A; Saputra, S. F., (2025). PROJECT-BASED ENTREPRENEURSHIP LEARNING DESIGN TO IMPROVE STUDENTS' ENTREPRENEURSHIP SKILLS AT THE TUNAS HARAPAN COMMUNITY LEARNING CENTER IN SALATIGA CITY. *ISAR Journal of Arts, Humanities and Social Sciences*, 3(9), 98-104.

Introduction

Digital transformation has fundamentally changed the global economic landscape, giving rise to new business models and positioning entrepreneurship as one of the main pillars of national economic resilience. In this era, digital entrepreneurship entrepreneurial activities that utilize or are influenced by digital transformation in business is no longer an option, but a necessity (Jafari-Sadeghi et al., 2021). The ability to innovate, identify online market opportunities, and utilize digital platforms has become a crucial competency for individuals to compete and thrive (Wu & Li, 2024).

This phenomenon underscores the urgency of adaptive and relevant entrepreneurship education, which can equip young

people with the skills needed to become job creators, rather than just job seekers (Antonizzi & Smuts, 2020). Governments and intellectuals in various countries, including Indonesia and Malaysia, are increasingly aware of the importance of instilling an entrepreneurial mindset from an early age (Handayati et al., 2020). Policies such as the Entrepreneurship Action Plan for Higher Education Institutions (EAP-HEIs) in Malaysia and various government programs in Indonesia demonstrate a commitment to integrating entrepreneurship education into the curriculum at all levels.

The goal is to create a generation that is innovative, independent, and capable of contributing to sustainable economic growth amid challenges such as high unemployment rates (Pidduck et al., 2023). Education is seen as the most strategic vehicle for

changing the mentality of the community from employees to empowered entrepreneurs (Wardana et al., 2020). In the national education ecosystem, non-formal education plays a unique and strategic role. Institutions such as Community Learning Centers (PKBM) are present to serve diverse groups of learners who, for various reasons, cannot access or continue their education in formal settings (Apriliani & Riyanto, 2025)

PKBM not only functions as a provider of equivalency certificates (such as Package C), but also as a center for developing life and vocational skills that are directly relevant to the needs of the community (Yulianti et al., 2024). Therefore, PKBM is a very potential arena for implementing effective entrepreneurship education, due to its flexible nature and focus on the practical needs of students (Soraya Grabiella Dinamika & Dewi Shinta Wulandari Lubis, 2021). However, this potential is often hampered by pedagogical challenges. Conventional learning models, which tend to be theoretical and one-way, often fail to maximize interest and entrepreneurial competence (Tuz Sa'diyah et al., 2021)

Students at PKBM, the majority of whom are young adults, require a learning approach that suits their characteristics: problem-solving oriented, relevant to life experiences, and providing results that can be applied directly (Rosita et al., 2022). The failure of many entrepreneurship education programs often lies in the gap between the theory taught in the classroom and the complex and dynamic realities of the business world (Febriani & Jamaris, 2022). To address this challenge, this study proposes the implementation of a Project-Based Learning (PjBL) model. PjBL is an in-depth instructional approach in which students acquire knowledge and skills by working over a long period of time to investigate and respond to an authentic, interesting, and complex question, problem, or challenge (Almulla, 2020).

In the context of entrepreneurship, PjBL simulates the actual business process, from ideation to product launch, making learning more meaningful and relevant. The suitability of PjBL for this context is based on two strong learning theories (Mohd Hawari & Mohd Noor, 2020). First, Constructivism, which states that knowledge is not passively received, but actively constructed by learners through interaction with their experiences (Paleenud et al., 2024). In PjBL, students actively "build" their understanding of entrepreneurship by "doing" entrepreneurship themselves. Second, andragogy or adult learning theory, pioneered by Malcolm Knowles (Almulla, 2020).

Andragogy emphasizes that adults learn most effectively when learning is problem-centered, relevant to their lives, allows them to be self-directed, and utilizes their experience as a source of learning. The combination of PKBM student characteristics (adult learners), digital entrepreneurship requirements (practical skills), and PjBL methodology (authentic and student-centered learning) creates a very strong synergy (Anwika et al., 2021). PjBL is not just a method, but a pedagogical framework that is inherently aligned with how adults learn. This model addresses the needs of PKBM learners for learning that is not abstract, but grounded in real projects that have the potential to generate income (Mulyasari et al., 2023)

Thus, PjBL not only teaches entrepreneurship, but also guides learners to become entrepreneurs (Iskandar, 2023). This study was conducted at PKBM Tunas Harapan, Salatiga City, an institution that represents these challenges and opportunities. As a community learning center, PKBM strives to empower its citizens

to learn through equivalency programs and various skills courses. However, a structured, innovative, and proven effective entrepreneurship learning design is needed to truly transform students' interests into real entrepreneurial action (Achdiat et al., 2025).

Based on the background described above, this study was designed to (1) describe a valid, practical, and effective project-based entrepreneurship learning model to improve the entrepreneurial competencies of students at the Tunas Harapan Community Learning Center in Salatiga, (2) determine whether the application of the developed project-based entrepreneurship learning model can significantly improve the entrepreneurial competence and interest of students at PKBM Tunas Harapan. The objective of this study is to produce and test a product in the form of a project-based entrepreneurship learning model integrated with digital teaching tools.

The significance of this study lies in its contribution in several aspects. In practical terms, this study produces a blueprint for learning that has been tested and is ready to be implemented by PKBM Tunas Harapan and other non-formal educational institutions in Indonesia to improve the quality of their entrepreneurship programs. Theoretically, this research enriches the scientific literature on the application of PjBL in the context of entrepreneurship education in non-formal settings, an area that still requires much exploration.

Research Method

This study uses a Research and Development (R&D) approach. The R&D method was chosen because its objective is to produce a new product—in this case, a learning model and its supporting tools—and to test the validity, practicality, and effectiveness of the product in the field (Sugiyono, 2020). The R&D process allows for a systematic cycle of design, development, and evaluation to ensure that the final product truly meets the needs and solves the existing problems (Sugiyono, 2020).

To guide the development process, this study adopts the ADDIE model, which is an acronym for five systematic stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was chosen because of its flexible, logical framework, which has been proven effective in the development of various instructional products, including modules and e-modules (OMOREGIE et al., 2025). The use of this model ensures that each step of development is based on careful data and analysis, from the identification of needs to the evaluation of impact.

Data collection instruments used (1) Expert validation using a validation questionnaire with a Likert scale to measure the suitability of the content, language, presentation, and graphics of the e-module and learning model. (2) Observation using structured observation sheets to record the implementation of each phase in the PjBL syntax and observe the dynamics of collaboration within the group (3) Project Assessment using a holistic assessment rubric to objectively evaluate the quality of the final product of the students' entrepreneurial projects. Data analysis was conducted using a mixed-method approach, combining qualitative and quantitative analysis.

This study was conducted at the Tunas Harapan Community Learning Center (PKBM) in Salatiga City. This location was chosen because it represents the non-formal education

environment that is the main focus of the study. The research subjects consisted of several groups. The main subjects were students of the Package C program (equivalent to high school) at the PKBM who were taking the entrepreneurship skills program. The model implementation trial involved a small group of 20 students selected through purposive sampling. In addition, this study also involved a panel of experts for the product validation stage, consisting of 1 subject matter expert (entrepreneurship lecturer), 1 media expert (instructional design practitioner), and 1 learning design expert (educational technology academic).

Result and Discussion

The development that has been carried out is the result of implementing the development steps of the ADDIE model with the stages of (1) Analysis, (2) Design, (3) Development, (4) Implementation, (5) Evaluation.

ADDIE Analysis on Project-Based Entrepreneurship Learning Design to Improve Students' Entrepreneurship Skills

a. Analysis

The process begins with a very important analysis stage to understand student needs and learning objectives (S. Zhang et al., 2023). At this stage, various factors that influence learning design are analyzed, ranging from the entrepreneurial skills that need to be developed, student characteristics, to the resources available at Tunas Harapan (Doanh, 2021). It is important to identify what entrepreneurial skills students should learn. Here, basic skills such as how to design a business plan, financial management, market analysis, and marketing are the main focus (Markova et al., 2025). In addition, it is also important to understand the students' backgrounds ranging from their age, educational experience, to their learning styles.

Most students may come from backgrounds that do not have direct experience in the business world, so the learning material must be tailored to their level of understanding (Łacka-Badura, 2021). Furthermore, an analysis is also conducted on the resources available at the learning center, including physical facilities such as classrooms and digital tools that can be used (Ismail et al., 2025). The management also considers external needs, such as entrepreneurial trends in local industries or business opportunities that students can access after completing this program (del Olmo-García et al., 2023). Through a comprehensive analysis, the next step is to design effective learning to meet all these needs.

b. Design

Once the needs have been identified, the next step is to design the learning process. At this stage, the focus is on how to design project-based learning that is not only interesting but also in-depth and applicable (L. Zhang & Ma, 2023). Project-based learning (PBL) was chosen as the approach because it allows students to be directly involved in creating business plans and implementing them in groups (Hidayat et al., 2024). The learning design begins with setting clear and measurable learning objectives. For example, the objectives of this program are for students to be able to design a business plan for a small business, understand the concept of product marketing, manage business finances, and present their project results in front of an audience. Each learning objective is linked to practical activities that will be carried out by students, such as market analysis or budget planning (Susilowati et al., 2024).

One important aspect of this design is ensuring that the learning materials used are relevant and applicable. Learning modules covering topics such as business plan development, marketing strategies, and business financial management were developed (Kravchyk, 2022). Each module not only explains the theory but also includes practical activities that guide students to apply what they have learned in real projects. The teaching methods are also designed so that students can work in teams, learn to collaborate, and help each other in overcoming problems that arise in their projects (Do Thi Quynh & Tran Thi Lan, 2020). In addition, technology will also be used to support learning, such as business planning applications or digital marketing platforms.

c. Development

During the development stage, the design that has been prepared is now put into practice by creating all the necessary teaching materials and tools. The learning modules that were designed in the design stage are now developed into materials that can be used directly by students (Pratama & Handayani, 2025). Each module includes in-depth theoretical explanations, relevant case studies, and clear instructions on how students can apply this knowledge in their projects (Lopez-Gazpio, 2022). In addition, project guidelines for students are also created. These guidelines provide detailed steps on how students should manage their entrepreneurial projects, from planning business ideas and determining budgets to marketing products (Tafahomi, 2021).

These guidelines serve as an orientation tool to ensure that students understand the project objectives and how to achieve them. An evaluation tool was also created at this stage to assess students' ability to complete their entrepreneurial projects (Manzi-Puertas et al., 2024). A detailed evaluation rubric was developed to measure important aspects of the project, such as the quality of the business idea, creativity, business feasibility, and presentation skills (Lee et al., 2025). This rubric provides clear guidance to teachers and students on what will be evaluated and how student achievement will be measured (Reynders et al., 2020). Before the materials and projects were widely implemented, a prototype learning trial was conducted. A small group of students was tested with the developed materials and projects to obtain feedback. This trial provided an opportunity to refine and improve the teaching materials and project guidelines based on real-world experience in the field.

d. Implementation

Once all learning materials have been prepared, the next stage is implementation. At this stage, the project-based learning program is carried out at Tunas Harapan. Students are divided into small groups and given the task of designing and running their entrepreneurial projects (Stamm & Gutzeit, 2022). Learning begins with an introduction that familiarizes students with the objectives and steps of an entrepreneurial project. Each group then selects a business idea they want to develop and begins to design a comprehensive business plan (Baldassarre et al., 2020). During the project, mentors and facilitators play an active role in monitoring the project's progress. They provide guidance to students, direct them when they encounter problems, and give constructive feedback (Gyamfi et al., 2024).

Mentors also help students use various digital tools that support their projects, such as applications for financial planning or platforms for online marketing (Uribe-Flórez & Trespalacios,

2024). In addition, to enhance the learning experience, external stakeholders such as local entrepreneurs, alumni, or industry experts are also involved. They can serve as additional mentors, provide real-world insights, or even be judges in the final presentations made by students (Damnjanovic et al., 2021). This involvement provides students with opportunities to develop networks and gain deeper insights into the real business world.

e. Evaluation

Evaluation is the final stage in the ADDIE cycle, which aims to assess the success of this learning program (Vebrina & Putra, 2024). Evaluation is carried out in two forms: formative evaluation during project implementation and summative evaluation after the project is completed. Formative evaluation is conducted continuously throughout the project (Setiawan et al., 2024). Mentors and facilitators provide regular feedback to students, monitor their progress, and help them overcome any difficulties they encounter. This evaluation also involves group discussions and self-reflection, where students can share the challenges they face and the solutions they have found (Wei et al., 2024).

After the project is completed, a summative evaluation is conducted to assess the final results of each project. The

assessment is carried out using a pre-prepared rubric, which covers aspects such as the quality of the business plan, product creativity, the ability to present ideas, and the extent to which the project is acceptable in the business world (Lloyd-Cox et al., 2022). The results of this evaluation provide an overview of whether the learning objectives have been achieved. In addition to formal assessment, student self-reflection is also an important part of the evaluation (HANNACHE, 2024). Students are asked to reflect on the process they went through during the entrepreneurship project, the challenges they faced, and what they have learned (Prihanti et al., 2024). This process provides insight into how students view their learning and how they have developed throughout the project.

1. Data Presentation on Project-Based Entrepreneurship Learning Design To Improve Students' Entrepreneurship Skills

a. Expert Validation Results

The learning tools that were developed were then validated by a panel of experts. The quantitative assessment by the experts is presented in Table 1.

Table 1. Results of Expert Validation of Learning Tools

Aspects Assessed	Validator	Average Score	Percentage (%)	Eligibility Category
Content Suitability	Subject Matter Expert	4.5	90%	Highly Recommended
Language Suitability	Subject Matter Expert	4.3	86%	Highly Recommended
Presentation Feasibility (Model & E-Module)	Learning Design Specialist	4.4	88%	Highly Recommended
Graphic Design Suitability (E-Module)	Media Expert	4.6	92%	Highly Recommended
Overall Average		4.45	89%	Highly Recommended

The validation results show that all aspects of the learning tools received a percentage above 85%, with an overall average of 89%. In accordance with the score interpretation criteria, these results indicate that the PjBL-KWU learning model and the “Entrepreneur's Toolkit” e-module are deemed highly suitable for use in learning without requiring major revisions. Qualitative input from experts, such as the addition of local case study examples, has been accommodated in the final revision of the product.

b. Improvement of Entrepreneurship Competence

The effectiveness of the model in improving entrepreneurial competence was measured by comparing the pre-test and post-test results. The data were analyzed using a paired sample t-test and N-Gain calculation, which are presented in Table 2.

Table 2. Comparison of Pre-test and Post-test Results for Entrepreneurship Competency

Competency Aspects	Pre-test Average Score	Post-test Average Score	N-Gain value	N-Gain Category
Conceptual Knowledge	55.2	80.5	0.56	Currently
Practical Skills (Marketing & Finance)	40.8	75.3	0.58	Currently
Creative Thinking (Fluency & Originality)	48.5	78.9	0.59	Currently
Average Total Score	48.17	78.23	0.58	Currently
<i>The results of the paired sample t-test show a significance value of $p=0.000$ ($p<0.05$), which means that there is a very significant difference between the scores before and after treatment.</i>				

The results of the analysis in Table 2 show a significant increase in all aspects of competence measured. The average N-Gain score of 0.58 is in the “Moderate” category, indicating that the PjBL-KWU model is effective in improving students' entrepreneurial competence.⁵⁴ The highest increase was seen in the aspects of creative thinking and practical skills, which were directly trained through project work.

Conclusion

This study has successfully designed, developed, and evaluated a project-based learning model for entrepreneurship (PjBL-KWU) specifically aimed at students in non-formal education settings, with a case study at PKBM Tunas Harapan in Salatiga City. The resulting model, supported by the interactive multimodal e-module “Entrepreneur's Toolkit,” has been proven valid based on expert assessment, practical according to student perception, and effective in significantly improving entrepreneurial competencies.

The success of this model is rooted in the strong synergy between the student-centered PjBL approach, andragogical principles that value the experience and independence of adult learners, and the relevance of digital entrepreneurship content that responds to the demands of the times. This model not only equips students with the technical skills needed to start an online business, but also systematically trains creative thinking (divergent-convergent) and builds self-efficacy, which is crucial for entrepreneurial courage. Thus, the PjBL-KWU model offers a comprehensive and empirically tested blueprint that can be adopted and adapted by non-formal education practitioners throughout Indonesia to empower communities through meaningful and impactful entrepreneurship education.

References

- Achdiat, M., Liberna, H., Rizkiyah, N., Nurisman, H., Widiyarto, S., Suprpto, H. A., Vernia, D. M., & Saring, S. (2025). Integrating Design Thinking into Entrepreneurship Education: A Learning Framework for Vocational High School Students. *AL-ISHLAH: Jurnal Pendidikan*, 17(1). <https://doi.org/10.35445/alishlah.v17i1.5986>
- Almulla, M. A. (2020). The Effectiveness of the Project-Based Learning (PBL) Approach as a Way to Engage Students in Learning. *Sage Open*, 10(3). <https://doi.org/10.1177/2158244020938702>
- Antonizzi, J., & Smuts, H. (2020). *The Characteristics of Digital Entrepreneurship and Digital Transformation: A Systematic Literature Review* (pp. 239–251). https://doi.org/10.1007/978-3-030-44999-5_20
- Anwika, Y. M., Maemunaty, T., Wilson, W., & Bahar, A. (2021). Implementation of the Andragogy Learning Model in Andragogy Competency Training for PKBM Tutors. *SPEKTRUM: Jurnal Pendidikan Luar Sekolah (PLS)*, 9(4), 627. <https://doi.org/10.24036/spektrumpls.v9i4.115447>
- Apriliani, V., & Riyanto. (2025). Implementation of E-Modules to Support the Teaching and Learning Process at PKBM Sarana Maju, Tegal City. *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 4(2), 1386–1392. <https://doi.org/10.59934/jaiea.v4i2.913>
- Baldassarre, B., Konietzko, J., Brown, P., Calabretta, G., Bocken, N., Karpen, I. O., & Hultink, E. J. (2020). Addressing the design-implementation gap of sustainable business models by prototyping: A tool for planning and executing small-scale pilots. *Journal of Cleaner Production*, 255, 120295. <https://doi.org/10.1016/j.jclepro.2020.120295>
- Damjanovic, V., Proud, W., & Milosavljevic, M. (2021). Mentoring development at student international business case competitions. *EuroMed Journal of Business*, 16(2), 154–170. <https://doi.org/10.1108/EMJB-12-2018-0092>
- del Olmo-García, F., Domínguez-Fabián, I., Crecente-Romero, F. J., & del Val-Núñez, M. T. (2023). Determinant factors for the development of rural entrepreneurship. *Technological Forecasting and Social Change*, 191, 122487. <https://doi.org/10.1016/j.techfore.2023.122487>
- Do Thi Quynh, M., & Tran Thi Lan, A. (2020). Development Of Collaborative Problem-Solving Competency For Students Through Teaching Method Of Working In Corners In

- Teaching Chemistry At High Schools. *Journal of Science Educational Science*, 65(12), 190–200. <https://doi.org/10.18173/2354-1075.2020-0123>
10. Doanh, D. C. (2021). The role of contextual factors on predicting entrepreneurial intention among Vietnamese students. *Entrepreneurial Business and Economics Review*, 9(1), 169–188. <https://doi.org/10.15678/EBER.2021.090111>
11. Febriani, W., & Jamaris, J. (2022). The Relationship Between The Tutor'S Learning Method With The Activity Of The Learners Package C In Pkbm Pratama, Pancung Soal District, Pesisir Selatan. *SPEKTRUM: Jurnal Pendidikan Luar Sekolah (PLS)*, 10(2), 197. <https://doi.org/10.24036/spektrumpls.v10i2.115025>
12. Gyamfi, G., Hanna, B. E., & Khosravi, H. (2024). Impact of an instructional guide and examples on the quality of feedback: insights from a randomised controlled study. *Educational Technology Research and Development*, 72(3), 1419–1437. <https://doi.org/10.1007/s11423-024-10346-0>
13. Handayati, P., Wulandari, D., Soetjipto, B. E., Wibowo, A., & Narmaditya, B. S. (2020). Does entrepreneurship education promote vocational students' entrepreneurial mindset? *Heliyon*, 6(11), e05426. <https://doi.org/10.1016/j.heliyon.2020.e05426>
14. HANNACHE, M. (2024). The Use of Online Self-Reflection to Teach Writing: The Case of Second Year ENSC Students. *Journal of Languages and Translation*, 4(1), 89–99. <https://doi.org/10.70204/jlt.v4i1.311>
15. Hidayat, R., Suharsono, N., Hari, M., Martha, J. A., Mala, I. K., Pratiwi, T. P., & Imania, E. (2024). Implementation Of Project Based Learning To Improve Ability To Develop Learning Strategies Ict Based. *Nusantara Economics and Entrepreneurships Journals*, 670–682. <https://doi.org/10.59971/necent.v2i3.62>
16. Iskandar, I. (2023). Empowering Student Entrepreneurship: A 21st Century Learning Approach using TPACK Integrated PjBL Model. *Utamax: Journal of Ultimate Research and Trends in Education*, 5(2). <https://doi.org/10.31849/utamax.v5i2.13116>
17. Ismail, S., Bakar, M. A., Mohamad Akhir, N. S., & Noor, A. M. (2025). Enhancing Educational Access through the Digitalization of Learning Resources: Insights from the CTU-Easy Access Center. *International Journal of Research and Innovation in Social Science*, IX(IIIS), 841–849. <https://doi.org/10.47772/IJRISS.2025.903SEDU0057>
18. Jafari-Sadeghi, V., Garcia-Perez, A., Candelo, E., & Couturier, J. (2021). Exploring the impact of digital transformation on technology entrepreneurship and technological market expansion: The role of technology readiness, exploration and exploitation. *Journal of Business Research*, 124, 100–111. <https://doi.org/10.1016/j.jbusres.2020.11.020>
19. KRAVCHYK, Y. (2022). Justification of the Marketing Strategy of the Business Plan of the Enterprise. *Scientific Bulletin of the National Academy of Statistics, Accounting and Audit*, 3–4, 66–78. <https://doi.org/10.31767/nasoa.3-4-2022.07>
20. Łacka-Badura, J. (2021). Acquiring business knowledge through Business English reading materials: pre-experience students' perspective. *Language Learning in Higher Education*, 11(2), 433–451. <https://doi.org/10.1515/cercles-2021-2030>
21. Lee, M. T., Kachen, S., Krishen, A. S., & Raschke, R. L. (2025). Creativity ambidexterity and sustainable business: Taking advantage of creative thinking techniques. *Technological Forecasting and Social Change*, 213, 123993. <https://doi.org/10.1016/j.techfore.2025.123993>
22. Lloyd-Cox, J., Pickering, A., & Bhattacharya, J. (2022). Evaluating Creativity: How Idea Context and Rater Personality Affect Considerations of Novelty and Usefulness. *Creativity Research Journal*, 34(4), 373–390. <https://doi.org/10.1080/10400419.2022.2125721>
23. Lopez-Gazpio, I. (2022). Gaining Student Engagement Through Project-Based Learning: A Competitive 2D Game Construction Case Study. *IEEE Access*, 10, 1881–1892. <https://doi.org/10.1109/ACCESS.2021.3139764>
24. Manzi-Puertas, M. A., Agirre-Aramburu, I., & López-Pérez, S. (2024). Navigating the student entrepreneurial journey: Dynamics and interplay of resourceful and innovative behavior. *Journal of Business Research*, 174, 114524. <https://doi.org/10.1016/j.jbusres.2024.114524>
25. Markova, S., Holovan, O., & Puchkov, O. (2025). The impact of marketing, management and accounting on strategic management of enterprise potential in different business sectors. *Galician Economic Journal*, 92(1), 133–141. https://doi.org/10.33108/galicianvisnyk_tntu2025.01.133
26. Mohd Hawari, A. D., & Mohd Noor, A. I. (2020). Project Based Learning Pedagogical Design in STEAM Art Education. *Asian Journal of University Education*, 16(3), 102. <https://doi.org/10.24191/ajue.v16i3.11072>
27. Mulyasari, D., Murwani, F. D., & Wardana, L. W. (2023). The Impact of Non-Formal Entrepreneurship Education on Entrepreneurial Motivation among PKBM Learners in Banyuwangi: Exploring Entrepreneurial Attitude as a Mediating Variable. *Journal of Educational Analytics*, 2(4), 475–494. <https://doi.org/10.55927/jeda.v2i4.6934>
28. Omoregie, I., Anthony, H., & Braimoh, J. J. (2025). Comparative Analysis of Instructional Models for Designing Effective Online Courses: ADDIE, SAM, and Dick & Carey Approaches. *Journal of Languages and Translation*, 5(1), 33–45. <https://doi.org/10.70204/jlt.v5i1.428>
29. Paleenud, I., Tanprasert, K., & Waleeittipat, S. (2024). Lecture-Based and Project-Based Approaches to Instruction, Classroom Learning Environment, and Deep Learning. *European Journal of Educational Research*, volume-13-(volume-13-issue-2-april-2024), 531–539. <https://doi.org/10.12973/eu-jer.13.2.531>
30. Pidduck, R. J., Clark, D. R., & Lumpkin, G. T. (2023). Entrepreneurial mindset: Dispositional beliefs, opportunity beliefs, and entrepreneurial behavior. *Journal of Small Business Management*, 61(1), 45–79. <https://doi.org/10.1080/00472778.2021.1907582>
31. Pratama, D. O., & Handayani, A. N. (2025). Development of Embedded System Learning Module Using Project-based Learning Method for Industrial Electronics Department. *Lectura: Jurnal Pendidikan*, 16(1), 225–238. <https://doi.org/10.31849/lectura.v16i1.25415>
32. Prihanti, G. S., Soemantri, D., Findyartini, A., Widaty, S., Werdhani, R. A., Rasmin, M., & Kristina, T. N. (2024). Development of Questionnaire for Students' Self-Reflection Abilities in Interprofessional Education. *Education in Medicine Journal*, 16(4), 65–87. <https://doi.org/10.21315/eimj2024.16.4.5>
33. Reynders, G., Lantz, J., Ruder, S. M., Stanford, C. L., & Cole, R. S. (2020). Rubrics to assess critical thinking and information processing in undergraduate STEM courses.

- International Journal of STEM Education*, 7(1), 9. <https://doi.org/10.1186/s40594-020-00208-5>
34. Rosita, E., Irfan Hilmi, M., & Imsiyah, N. (2022). "Setara Daring" Learning Management on Learning Results In Package C at PKBM Lestari Banyuwangi. *SPEKTRUM: Jurnal Pendidikan Luar Sekolah (PLS)*, 10(2), 349. <https://doi.org/10.24036/spektrumpls.v10i2.116829>
 35. Setiawan, A. P., Amalia, A. M., Hildayanti, D., Maghfiroh, I., & Salsabila, S. (2024). Evaluasi Model Formatif Pada Suatu Program Kesetaraan di PKBM Saffari Flexi School Kota Serang Banten. *Transformasi: Jurnal Penelitian Dan Pengembangan Pendidikan Non Formal Informal*, 10(1), 29. <https://doi.org/10.33394/jtni.v10i1.9802>
 36. Soraya Grabiella Dinamika, & Dewi Shinta Wulandari Lubis. (2021). Pengembangan Kemampuan Mengajar Tutor dengan Metode Student Centered Learning Pada PKBM Bumi Literasi. *JPM: Jurnal Pengabdian Masyarakat*, 2(2), 73–76. <https://doi.org/10.47065/jpm.v2i2.259>
 37. Stamm, I., & Gutzeit, M. (2022). Group conditions for entrepreneurial visions: role confidence, hierarchical congruences, and the imagining of future in entrepreneurial groups. *Small Business Economics*, 59(3), 1023–1041. <https://doi.org/10.1007/s11187-021-00566-6>
 38. Sugiyono. (2020). *Metodologi Penelitian Kuantitatif, Kualitatif dan R & D*.
 39. Susilowati, S., Evawati, D., Nurasiyah, U., & Halimah, S. (2024). Improving Workshop Learning Outcomes With Practical Learning Methods. *Edunity Kajian Ilmu Sosial Dan Pendidikan*, 3(4), 260–267. <https://doi.org/10.57096/edunity.v3i4.238>
 40. Tafahomi, R. (2021). An Attempt to Fill the Gap between the Architectural Studies and Conceptualization in Architectural Thesis Design Studio. *Journal of Design Studio*, 3(2), 175–190. <https://doi.org/10.46474/jds.1012778>
 41. Tuz Sa'diyah, D. M., Ahmad, A., & Sa'adayah, N. (2021). Ketahananmalangan Pengelola PKBM Dalam Mengembangkan Inovasi Pendidikan Nonformal. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, 7(3), 987. <https://doi.org/10.37905/aksara.7.3.987-998.2021>
 42. Uribe-Flórez, L. J., & Trespalacios, J. (2024). Strategies Used by Educational Technology Faculty to Mentor Online Doctoral Students in Research Experiences. *American Journal of Distance Education*, 38(4), 359–373. <https://doi.org/10.1080/08923647.2024.2405235>
 43. Vebriana, D., & Putra, E. (2024). Development of Economics Textbooks with a Constructivist Approach Based on the 7E Learning Cycle to Improve High School Students' Critical Thinking and Collaboration Skills. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, 10(4), 1440. <https://doi.org/10.33394/jk.v10i4.13198>
 44. Wardana, L. W., Narmaditya, B. S., Wibowo, A., Mahendra, A. M., Wibowo, N. A., Harwida, G., & Rohman, A. N. (2020). The impact of entrepreneurship education and students' entrepreneurial mindset: the mediating role of attitude and self-efficacy. *Heliyon*, 6(9), e04922. <https://doi.org/10.1016/j.heliyon.2020.e04922>
 45. Wei, W., Cheong, C. M., Zhu, X., & Lu, Q. (2024). Comparing self-reflection and peer feedback practices in an academic writing task: a student self-efficacy perspective. *Teaching in Higher Education*, 29(4), 896–912. <https://doi.org/10.1080/13562517.2022.2042242>
 46. Wu, Y., & Li, Z. (2024). Digital transformation, entrepreneurship, and disruptive innovation: evidence of corporate digitalization in China from 2010 to 2021. *Humanities and Social Sciences Communications*, 11(1), 163. <https://doi.org/10.1057/s41599-023-02378-3>
 47. Yulianti, S. D., Rosmiati, N., & Septiana, T. (2024). Strategi Pemerintah Kabupaten Sukabumi dalam Penguatan Peran Pusat Kegiatan Belajar Masyarakat (PKBM) Untuk Meningkatkan Capaian Pendidikan Masyarakat. *Jurnal Indragiri Penelitian Multidisiplin*, 5(1), 43–49. <https://doi.org/10.58707/jipm.v5i1.1092>
 48. Zhang, L., & Ma, Y. (2023). A study of the impact of project-based learning on student learning effects: a meta-analysis study. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1202728>
 49. Zhang, S., Ma, H., Zhu, X., Niu, A., & Luo, Y. (2023). Learning needs of nursing postgraduates in Southwest China based on Hutchinson's learning needs theory: a qualitative research. *BMC Medical Education*, 23(1), 223. <https://doi.org/10.1186/s12909-023-04217-0>

Corresponding Author: **Imam Shofwan**

Email: ishofwan@mail.unnes.ac.id