Jurnal Inovasi dan Pengembangan Hasil Pengabdian Masyarakat

Jurnal Inovasi dan Pengembangan Hasil Pengabdian Masyarakat
e-ISSN 3025-2334
Vol 1(2), December 2023, 115-121
DOI: https://doi.org/10.61650/jip-dimas.v1i2 .237

Project-Based Learning Training and Assistance for Prospective High School Teachers

Umy Zahroh [1], Rani Darmayanti [2], Choirudin [3], Raden Imam Soebagyo [4], and Retno Tri Nalarsih [5]

[1] Sayyid Ali Rahmatullah State Islamic University Tulungagung, Indonesia
[2] Muhammadiyah University of Malang, Indonesia
[3] Ma'arif University Lampung, Indonesia
[4] Pasuruan 2 Public High School, Indonesia
[5] Veteran Bangun Nusantara University, Indonesia
* Corresponding author: umy.z@uinsatu.ac.id

KEYWORDS
High School Teacher Students, Project-Based Learning, Training, Mentoring

SUBMITTED: 09/28/2023
REVISED: 10/15/2023
ACCEPTED: 10/28/2023

ABSTRACT: Project-based learning (PBL) provides students with a more real and applicable learning experience by connecting academic learning to real-world contexts. Through PBL, students can work on projects relevant to everyday life or the world of work, which helps them understand the relationship between academic concepts and practical applications. This approach improves conceptual understanding and develops critical thinking, creative, collaborative, and problem-solving skills. Teachers play an essential role as effective facilitators in implementing PBL, which can increase student motivation and involvement in the learning process. This research aims to provide training and mentoring in the private sector in East Java in implementing PBL as a learning strategy that encourages student creativity. This activity involves a series of workshops and mentoring sessions designed to equip prospective teachers with the knowledge and skills needed to design, manage, and evaluate learning projects. This activity significantly increased participants' knowledge and skills in developing and implementing PBL in the classroom. With this training and mentoring, it is hoped that prospective teachers will be better prepared to implement PBL effectively to create an innovative and inspiring learning environment for students. Improving the quality of teaching through PBL is expected to contribute to achieving more holistic educational goals and prepare students to face future challenges with more comprehensive skills.

1. INTRODUCTION

Project-based learning (PBL) has been proven to be a practical approach to increasing student engagement and understanding (Avidov-Ungar & Tsybulsky, 2021; Vasconcelos, 2012). PBL allows students to work on real-life relevant projects (Guerra et al., 2017; Roche III et al., 2003), which not only improves conceptual understanding but also develops critical thinking (Ribeiro et al., 2023), creative (Lee et al., 2006), collaborative skills and problem-solving abilities (Morgan, 2018). In Indonesia's education context (Memon et al., 2023; Zhao et al., 2023), the implementation of PBL still requires support and assistance, especially for prospective teachers who will act as facilitators in implementing this method in the classroom.

This training and mentoring program aims to provide comprehensive support to prospective teachers in implementing Project-Based Learning (PBL). In this program, prospective teachers will be equipped with in-depth knowledge of the basic concepts of PBL and various techniques for integrating this method into the existing curriculum (Putra et al., 2023). The program includes a series of intensive workshops designed to introduce participants to various aspects of PBL (Triono et al., 2023), including planning, managing, and

evaluating learning projects.

In addition to workshops, the program also emphasizes the importance of ongoing mentoring sessions (Annum, 2020; Azer, 2005; Muhammad et al., 2023). Through mentoring, participants will receive practical guidance and feedback to improve and perfect their teaching methods. This mentoring also aims to assist participants in developing effective assessment strategies to measure project success and its impact on student learning

By participating in this program, prospective teachers are expected to increase their readiness to implement PBL effectively in the classroom (Ahmed et al., 2021; Silva et al., 2018; Zhang & Lin, 2018). This will create a more innovative and inspiring learning environment and help students develop the critical skills needed to face future challenges (Utomo et al., 2023). Improving the quality of teaching through PBL is expected to contribute significantly to achieving more holistic educational goals, which emphasize developing critical thinking skills, collaboration, and creativity among students.

This research aims to provide training and assistance for prospective high school teachers at a private school in East Java in implementing PBL as a learning strategy. Based on previous research, such as that conducted by Thomas (2000) and Bell (2010), PBL has shown positive results in increasing students' motivation and involvement and their ability to apply knowledge in a broader context. In addition, research by Krajcik and Blumenfeld (2006) shows that teachers trained in PBL can create a more dynamic and productive learning environment.

2. METHOD

This research uses action research methods with quantitative and qualitative approaches. Activities were carried out collaboratively between Sayyid Ali Rahmatullah Tulungagung State Islamic University, Muhammadiyah University of Malang, Ma'arif University of Lampung, SMA Negeri 2 Pasuruan, and Veteran Bangun Nusantara University to increase the competency of prospective teachers through training and mentoring in implementing project-based learning (PBL). This method was chosen because it allows researchers to observe changes that occur directly and provide immediate feedback to participants. It illustrates six distinct stages in Figure 1.

Figure 1. is designed for training and mentoring in implementing project-based learning (PBL)

Figure 1 depicts the Implementation of Training and Mentoring: 1) Workshop: Held over eight sessions, each 2 hours long, conducted virtually. Each session involves lectures, interactive discussions, and questions and answers regarding basic PBL concepts, project design, classroom management, and learning evaluation; 2) Mentoring Session: Conducted six weeks after the workshop, where participants are tasked with designing and implementing a project in their classroom. Every week, participants receive feedback from the facilitator through a 1-hour virtual consultation session.

Research Instruments (Schabas, 2023; Winson et al., 2024): 1) Questionnaire: Used to measure participants' knowledge and skills before and after training. The questionnaire consists of 25 closed questions and five open questions designed to assess understanding of PBL concepts, ability to design projects, and evaluation of learning; 2) Observation: Carried out during mentoring sessions, where the facilitator observes the implementation of PBL in the classroom and notes various aspects such as student engagement, creativity, and teaching effectiveness; 3) Interviews: Conducted with ten selected participants to obtain in-depth information regarding their experiences during training and mentoring, as well as the challenges they faced in implementing PBL.

Data Analysis Procedure (Arifin et al., 2024; Nursaid et al., 2023): 1) Quantitative Analysis: Data from the questionnaire was analyzed using descriptive statistics to see changes in the average score of participants' knowledge and skills before and after training. Paired t-tests were used to determine the significance of these differences; 2) Qualitative Analysis: Data from observations and interviews were analyzed using coding techniques to identify main themes related to PBL implementation and its impact on student creativity and motivation.

With this approach, research can provide a comprehensive picture of the effectiveness of PBL training and mentoring for prospective teachers. The research results can become a reference for educational institutions in developing similar training programs to improve the quality of teaching and learning in schools. (Examples: Boud & Felleti, 1991; Blumenfeld et al., 1991)

3. RESULTS AND DISCUSSION

The training and mentoring carried out in this research have shown encouraging results. Based on the results of evaluations conducted through questionnaires and interviews, prospective teachers' understanding and skills significantly increased in implementing Project Based Learning (PBL). Before the training, many participants felt less confident in designing and managing learning projects. However, after attending workshops and mentoring sessions, they felt more prepared and able to implement PBL in the classroom. The following is a description of the results of the training and mentoring activities in this research:

A. Increasing the Knowledge and Skills of Prospective Teachers

Quantitative analysis of questionnaires administered before and after the training showed a significant increase in participants' knowledge and skills regarding PBL (Project Based Learning). The paired t-test indicated that participants' average knowledge and skills scores increased significantly after training and mentoring. The following is a table showing the change in average scores:

Table 1. Increasing the Knowledge and Skills of Prospective Teachers

Aspect	Before Training	After Training	Enhancement (%)
Understanding PBL Concepts	64	85	32.81
Project Design Ability	58	82	41.38
Classroom Management	62	80	29.03
Learning Evaluation	60	78	30.00
Total Average	**61**	**81.25**	**33.33**

The data in Table 1 above shows a significant increase in all aspects measured, with a total average increase of 33.33%. Previous research supports these findings. For example, Boud & Felleti (1991) and Blumenfeld et al. (1991) found that PBL-based training can significantly improve teachers' pedagogical competence. PBL training helps teachers develop skills in designing relevant and applicable projects, managing classes more effectively, and conducting comprehensive learning evaluations.

Interviews with participants also revealed they felt more confident and competent in implementing PBL in their classrooms. Participants reported increased student motivation and higher engagement in the learning process. Observations during mentoring sessions showed that students were more active and creative in completing projects, which aligns with findings from Blumenfeld et al. (1991) regarding the positive impact of PBL on student motivation and creativity.

Training and mentoring are essential in improving the quality of teaching. It is hoped that the results

of this research can become a reference for other educational institutions in similar developing programs aimed at increasing the competency of prospective teachers in implementing PBL to create a more innovative and inspiring learning environment for students.

B. Implementing PBL in the Classroom

Implementing Project Based Learning (PBL) in the classroom has shown many significant benefits based on the results of observations and interviews with participants. One of the key findings was increased student engagement. When using the PBL method, students become more active and involved in the learning process. They show great enthusiasm when working on projects, and there has been a marked improvement in their collaborative skills. These data are from previous research showing that PBL can increase student engagement and learning motivation, as shown by Blumenfeld et al. (1991).

Apart from student involvement, PBL also encourages increased creativity and innovation. Students who participate in PBL are able to demonstrate better critical thinking skills and generate innovative solutions to problems given in the project. Facilitators noted an increase in the quality of projects produced by students, indicating that this method was effective in encouraging students to think outside the box and develop creative ideas.

Teachers who have received training in PBL also show improvements in the effectiveness of their teaching. They become more confident in designing and managing PBL projects and can provide constructive feedback to students. This training allows teachers to facilitate project-based learning more effectively, creating a more dynamic and interactive learning environment. All these findings indicate that implementing PBL in the classroom increases student engagement and creativity and improves the quality of teaching provided by teachers.

C. Challenges and Weaknesses in Training and Mentoring

During training and mentoring, there were several challenges and weaknesses experienced by participants, as summarized in the following table:

Table 2. Challenges and Weaknesses of PBL Training

Challenges and Weaknesses	Description	Empirical Evidence
Limited time	Teachers find it difficult to manage time between teaching and completing PBL projects.	Boud & Felleti's (1991) research shows that PBL requires quite a long time for planning and implementation.
Technology Support	Not all schools have adequate technological facilities to support PBL.	Blumenfeld et al. (1991) stated that technology can increase the effectiveness of PBL, but limited access can be an obstacle.
Classroom Management Skills	Some teachers experience difficulties in managing the class during PBL implementation, especially in maintaining student involvement.	Research by Blumenfeld et al. (1991) suggests that effective classroom management is the key to successful PBL.

Empirical evidence from research conducted by Blumenfeld et al. (1991) and Boud & Felleti (1991) provide valuable insights into understanding the benefits and challenges of implementing Project Based Learning (PBL). Research by Blumenfeld et al. (1991) shows that PBL can significantly increase student motivation and involvement in the learning process. They found that students who engaged in PBL demonstrated improved critical thinking skills and problem-solving abilities, essential skills in supporting future academic and professional success (Nurhaliza et al., 2024; Wibawa & Situmorang, 2020).

Meanwhile, research conducted by Boud and Felleti (1991) highlighted the importance of adequate time allocation for planning and implementing PBL (Winson et al., 2023; Zamzam et al., 2023). They found that one of the main challenges in implementing PBL was the need for more time compared to traditional learning methods. This challenge requires special attention from teachers and educational administrators to implement PBL effectively without sacrificing important curriculum content.

With the results of this research, it is hoped that prospective teachers will be better prepared to

implement PBL effectively (Hudha & Edema, 2024). Improving the quality of teaching through PBL can create a more innovative and inspiring learning environment for students. In addition, PBL can contribute to achieving more holistic educational goals, preparing students to face future challenges with more comprehensive and relevant skills. Thus, effective implementation of PBL can be essential in creating a highly competitive generation ready to face the dynamics of a world that continues to develop.

This research examines the experiences and challenges in implementing Project-Based Learning (PBL) through in-depth interviews with ten selected participants (Darmayanti, 2024). The interview results revealed various challenges faced by participants, such as time management and adaptation to the existing curriculum. These findings align with empirical evidence from previous studies that show similar challenges in implementing PBL in various educational contexts. In addition, qualitative analysis from interviews and observations shows that the implementation of PBL positively impacts student creativity and motivation. Previous research, such as that conducted by Blumenfeld et al. (1991), supports these findings by showing that PBL can encourage students to think creatively and increase their motivation in learning.

As an implication of the results of this research, recommendations are provided for educational institutions to develop similar training programs. These recommendations include the importance of ongoing support and adapting training programs to the local context to ensure successful implementation. By presenting comprehensive results and discussions, it is hoped that this research can significantly contribute to developing prospective teachers' competency in implementing PBL, as well as creating a more innovative and inspiring learning environment for students.

4. CONCLUSION

Training and mentoring in implementing Project Based Learning (PBL) for prospective teachers at a private school in East Java has shown positive results. This activity succeeded in increasing the knowledge and skills of prospective teachers in designing, managing, and evaluating learning projects. The participants demonstrated significant improvements in their understanding of PBL concepts and their ability to implement these strategies in the classroom. PBL has been proven to increase student motivation and engagement and develop critical thinking, creative, collaborative, and problem-solving skills. In addition, prospective teachers who have participated in this training feel more confident and ready to create an innovative and inspiring learning environment.

It is recommended that this kind of training and mentoring continue to ensure that prospective teachers can continue to develop and perfect their skills in implementing PBL. Teachers can get updates on the latest PBL techniques and methods relevant to student needs through ongoing training programs. In addition, the formation of collaborative networks between teachers is also highly recommended to share experiences, resources, and best practices in implementing PBL. Discussion forums, working groups, or online platforms can be used as a medium for the efficient exchange of information and ideas.

Regular evaluation of the implementation of PBL in the classroom and providing constructive feedback to teachers are also critical. This evaluation aims to identify strengths and weaknesses in the implementation of PBL and provide recommendations for improvements needed to increase learning effectiveness. In addition, it is essential to ensure that schools provide adequate infrastructure support, such as access to technology, teaching materials, and other resources needed to support PBL implementation. This support is essential to create a conducive learning environment for students and teachers. By implementing these suggestions, it is hoped that PBL training and mentoring for prospective teachers can continue to develop and provide a sustainable positive impact in the world of education.

5. REFERENCES

Ahmed, M., Usmiyatun, U., Nurhidayah, N., Darmayanti, R., & Azizah, I. N. (2021). PDKT: Introducing numbers 1-10 for kindergarten students using card media, does It improve? *AMCA Journal of Education and Behavioral Change*, *2*, 69–73.

Annum, G. Y. (2020). The impact of e-learning in the running of laboratory-based programmes in higher

educational institutions. A case study of the department of fisheries and watershed management, knust, kumasi, ghana. *International Research Symposium on PBL*, 23–29.

Arifin, Z., Saputra, A. B., & Jaenullah, J. (2024). Model Pembelajaran Berbasis Web (E Learning) Pada Pembelajaran PAI. *Assyfa Journal of Multidisciplinary Education*, *2*.

Avidov-Ungar, O., & Tsybulsky, D. (2021). Shaping teachers' perceptions of their role in the digital age through participation in an online pbl-based course. *Electronic Journal of E-Learning*, *19*(3), 186–198. https://doi.org/10.34190/ejel.19.3.2300

Azer, S. A. (2005). A multimedia CD-ROM tool to improve student understanding of bile salts and bilirubin metabolism: Evaluation of its use in a medical hybrid PBL course. *American Journal of Physiology - Advances in Physiology Education*, *29*(1), 40–50. https://doi.org/10.1152/advan.00015.2004

Darmayanti, R. (2024). Programmed learning in mathematics education before and after the pandemic: Academics Integrate technology. *Assyfa Learning Journal*, *1*.

Guerra, A., Ulseth, R., & Kolmos, A. (2017). PBL in engineering education: International perspectives on curriculum change. In *PBL in Engineering Education: International Perspectives on Curriculum Change*. Sense Publishers. https://doi.org/10.1007/978-94-6300-905-8

Hudha, A. M., & Edema, W. (2024). Edmodo learning media and meeting room help grasp simple and significant ones: Circulatory System. *Assyfa Learning Journal*, *1*, 10–18.

Lee, M.-C., Yang, J.-H., Lee, S.-H., Lai, T.-J., Huang, C.-C., Ueng, K.-C., Jan, M.-S., Lee, J., Lin, C.-C., Lin, L.-Y., Chou, M.-C., Lin, C.-S., Tsai, T.-P., Chou, M.-J., & Chen, J.-Y. (2006). Adoption of PBL in medical education: Experience at Chung Shan Medical University. *Chinese Journal of Evidence-Based Medicine*, *6*(10), 699–704. https://www.scopus.com/inward/record.uri?eid=2-s2.0-33750898600&partnerID=40&md5=e9821cdf8c1fb1fa0c1017a7bcd9d979

Memon, I., Alrayani, Y. H., Akhund, S., Feroz, Z., Rohra, D. K., Alkushi, A., Alrashid, A. A., & Anjum, I. (2023). University Pre-Professional Program: A Transitional Phase from Didactic to PBL Pedagogy. *Advances in Medical Education and Practice*, *14*, 1299–1307. https://doi.org/10.2147/AMEP.S421180

Morgan, T. (2018). Philosophy of design: Enabling reflection within PBL contexts in engineering design education. In S. Green, L. Buck, A. Dasan, E. Bohemia, A. Kovacevic, P. Childs, & A. Hall (Eds.), *Proceedings of the 20th International Conference on Engineering and Product Design Education, E and PDE 2018*. Institution of Engineering Designers, The Design Society. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057727387&partnerID=40&md5=5682a343d6fd4ecdff630c32c54aadb3

Muhammad, I., Angraini, L. M., Darmayanti, R., Sugianto, R., Usmiyatun, U., & ... (2023). Students' Interest in Learning Mathematics Using Augmented Reality: Rasch Model Analysis. *Edutechnium Journal of Educational Technology*, *1*(1), 89–99.

Nurhaliza, S., Sueb, S., & Ibrohim, I. (2024). Development of ecosystem and environmental change e-modules based on PBL to improve high school student's critical thinking. In H. Habiddin & T. Ronceviv (Eds.), *AIP Conference Proceedings* (Vol. 3106, Issue 1). American Institute of Physics. https://doi.org/10.1063/5.0215340

Nursaid, N., Haanurat, A. I., & Rahman, A. (2023). Exploring the Shari'ah economic learning model through virtual learning: Initiatives and challenges. *Assyfa Journal of Islamic Studies*, *2*.

Putra, F. G., Sari, A. P., Qurotunnisa, A., Rukmana, A., Darmayanti, R., & ... (2023). What are the advantages of using leftover cooking oil waste as an aromatherapy candle to prevent pollution? *Jurnal Inovasi Dan Pengembangan Hasil Pengabdian Masyarakat*, *1*(2), 59–63.

Ribeiro, S., Tavares, C., Lopes, C., & Chorão, G. (2023). Competence Development Strategies after COVID-19: Using PBL in Translation Courses. *Education Sciences*, *13*(3). https://doi.org/10.3390/educsci13030283

Roche III, W. P., Scheetz, A. P., Dane, F. C., Parish, D. C., & O'Shea, J. T. (2003). Medical students' attitudes in a PBL curriculum: Trust, altruism, and cynicism. *Academic Medicine*, *78*(4), 398–402. https://doi.org/10.1097/00001888-200304000-00017

Schabas, A. (2023). Game-Based Science Learning: What are the Problems with Teachers Practicing It in Class? *Assyfa Learning Journal*, *2*, 89–103.

Silva, A. B. D., Bispo, A. C. K. A., Rodriguez, D. G., & Vasquez, F. I. F. (2018). Problem-based learning: A

proposal for structuring PBL and its implications for learning among students in an undergraduate management degree program. *Revista de Gestao*, *25*(2), 160–177. https://doi.org/10.1108/REGE-03-2018-030

Triono, T., Darmayanti, R., & Saputra, N. D. (2023). Vos Viewer and Publish or Perish: Instruction and assistance in using both applications to enable the development of research mapping. *Jurnal Dedikasi*, *2*.

Utomo, D. P., Amaliyah, T. Z., Darmayanti, R., Usmiyatun, U., & Choirudin, C. (2023). Students' Intuitive Thinking Process in Solving Geometry Tasks from the Van Hiele Level. *JTAM (Jurnal Teori Dan Aplikasi Matematika)*, *7*(1), 139–149.

Vasconcelos, C. (2012). Teaching Environmental Education through PBL: Evaluation of a Teaching Intervention Program. *Research in Science Education*, *42*(2), 219–232. https://doi.org/10.1007/s11165-010-9192-3

Wibawa, B., & Situmorang, R. (2020). Development of Instructional Design Models Based on PBL Model for Software Modeling Course at the Information Technology College in Indonesia. *Universal Journal of Educational Research*, *8*(9 A), 1–9. https://doi.org/10.13189/ujer.2020.082001

Winson, V. R. V, Arunkumar, V., & Rao, D. P. (2023). Exploring the Landscape of Teaching and Learning English as a Second Language in India. *Assyfa Learning Journal*, *2*, 104–111.

Winson, V. R. V, Narayana, S. T. V, Sailaja, S. V, & Kashyap, A. M. N. (2024). Augmentation of Collaborative Learning for Design (Engineering) Subjects in Remote Learning. *Assyfa Learning Journal*, *1*, 1–9.

Zamzam, R., Usmiyatun, U., Suharsiwi, S., & Olawale, L. S. (2023). Helping young children believe by exposing Asmaul Husna through learning media. *Assyfa Journal of Islamic Studies*, *2*.

Zhang, J., & Lin, H. (2018). An empirical study on the influence of pbl teaching model on the critical thinking ability of non-english majors. *Journal of Language Teaching and Research*, *9*(6), 1293–1300. https://doi.org/10.17507/jltr.0906.19

Zhao, X., Narasuman, S., & Ismail, I. S. (2023). Effect of Integrating PBL in BL on Student Engagement in an EFL Course and Students' Perceptions. *Journal of Language Teaching and Research*, *14*(6), 1569–1580. https://doi.org/10.17507/jltr.1406.15