

Project-Based Blended Learning Model: Innovative Solution to Improve Students' Scientific Article Writing Skills

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Abstract: Scientific writing skills are essential for students in higher education, particularly in preparing them to contribute to academic publications. However, many students still face difficulties in composing scientific articles that meet academic standards. This study aims to develop a Project-based Blended Learning (PjB2L) model to improve the ability of IAIN Ambon students to write scientific articles. The research employed a Research and Development (R&D) approach using the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation. The participants were 24 students from Mathematics Education, PGMI, and MPI study programs who had previously conducted research. Data were collected through a media validity questionnaire, a scientific article writing ability test, and a scientific article writing rubric. The results indicate that the developed PjB2L model is both valid and effective in enhancing students' scientific writing skills, as evidenced by a significant increase in pretest and posttest scores after the learning intervention. In conclusion, the PjB2L model serves as a viable alternative learning approach that leverages information and communication technology (ICT) to facilitate both independent and collaborative learning in scientific writing.

Keywords: ADDIE model, Project-based Blended Learning (PjB2L), Scientific writing.

INTRODUCTION

Writing scientific articles is a key competency that must be mastered by lecturers and students. For lecturers, writing scientific articles is part of their main task, namely carrying out the tri-dharma of higher education, namely as a researcher. As researchers, lecturers have an obligation to openly publish the results of their research to the public (Gunawan et al., 2019). Apart from that, writing scientific articles or lecturers is a means of developing or expressing ideas in academic work (Juniarti, 2019). Meanwhile, for students, with the ability to write scientific articles, students' imagination can be sharper, their self-confidence will grow and their language vocabulary will increase. Furthermore, writing scientific articles is also useful for training the reasoning or intellect given by Allah SWT to make it sharper. Reason is likened to a knife, if it is not sharpened it will become dull, and vice versa, if it is often sharpened it will become sharp. When writing scientific articles, reason works to organize or manage information from the abstract to the concrete (Sutady, n.d.).

One learning model that can train students' reasoning or thinking skills is project-based blended learning (PjB2L). This learning model is one of the blended learning models. The PjB2L model is a project-based learning model or certain tasks that are designed, repeated and completed by students through face-to-face and online (Sevima, n.d.). Therefore, this learning model is very suitable to be applied to students, especially in giving assignments for scientific article writing projects.

But in fact, the ability to write scientific articles for Indonesian students is still considered low (Al-Amien et al., 2022). Students consider writing scientific articles not something easy, so they consider it unimportant (Saman & Ilham Bakhtiar, n.d.). Other causes are not talented, lack of motivation, lack of confidence, lack of focus, lack of insight, and language barriers (An Nisa, 2018). In addition, the lack of time to write student scientific articles is caused by lecture time while working (Parhusip et al., 2021). At IAIN Ambon, especially the Faculty of Tarbiyah and Teacher Training, based on observations, learning about writing scientific articles has

never been or may rarely be done. So far, students only get theories about scientific articles they get in research methodology courses. But in practice they have never written a scientific article.

Various studies that analyze the ability to write scientific articles have been conducted. Several studies were conducted in Indonesia, such as (Permana et al., 2021; Burhannuddin, 2021; Septafi, 2021). However, analysis of the ability to write scientific articles, implementation methods tend to use conventional face-to-face. On the other hand, the application of project-based learning models is rarely implemented in the form of blended learning. This kind of research needs to be done because it can make an important contribution on how to develop an optimal PjB2L model to improve students' scientific article writing skills. In addition, the findings obtained can be a reference for the development of teaching materials in the ability to write scientific articles. The results of the research can be used as a reference on how to compile good and correct scientific articles. Therefore, the purpose of this study is to develop a feasible Pj2BL model to improve students' scientific article writing skills.

METHODS

This research was conducted from June to August 2023 at the Faculty of Tarbiyah and Teacher Training (FITK), Institut Agama Islam Negeri (IAIN) Ambon. The population in this study consisted of all students of the Faculty of Tarbiyah and Teacher Training, IAIN Ambon, who had conducted research and taken part in the scientific article writing course. The sample was selected using purposive sampling, resulting in 24 students from the Mathematics Education, PGMI, and MPI study programs. These students had previously completed research projects and were directly involved in the learning process of writing scientific articles. This study employed the Research and Development (R&D) method (Borg & Gall, 1983) using the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation) (Branch, 2009). The procedure was as follows:

- Analysis: Identifying students' needs, learning objectives, and constraints in writing scientific articles.
- Design: Developing a blueprint for the Project-based Blended Learning (PjB2L)

model and determining learning materials, media, and assessment instruments.

- Development: Creating web-based learning media and instructional materials for PjB2L.
- Implementation: Applying the developed model in a scientific article writing course with the selected participants.
- Evaluation: Assessing the validity, practicality, and effectiveness of the model through expert validation, pretest-posttest design, and students' performance analysis.

The instruments used in this study were:

- Media validity questionnaire – to assess the feasibility of the developed learning media.
- Scientific article writing ability test – to measure students' abilities before and after the intervention.
- Scientific article writing rubric – to assess the quality of students' scientific articles.

Data analysis consisted of:

- Descriptive statistics: Used to describe sample characteristics (frequency, mean, median, mode, standard deviation).
- Inferential statistics: Paired sample *t*-test or Wilcoxon test was used to determine the significance of differences in pretest and posttest scores. The *n*-gain score was calculated to measure the improvement in students' scientific writing skills. Data were analyzed using SPSS 20 software.

FINDINGS AND DISCUSSION

Media validation results. The learning media developed were validated by two media experts and one material expert. The validation results show that web-based learning media has a very high level of validity, with an average score of 3.6 out of a scale of 4. This shows that learning media are in accordance with the criteria of content relevance, media design and navigation, and media effectiveness in facilitating the learning process.

Results of media trials. Learning media was tested on 24 IAIN Ambon students who took the course of writing scientific articles. The results of the trial showed that the learning media received a positive response from students, with an average score of 3.7 out of a scale of 4. This shows that learning media is interesting, easy to

use, and useful for improving the ability to write scientific articles.

Test results of scientific article writing skills.

The ability to write scientific articles of students is measured before and after using learning media using scientific article writing tests. The test results showed that there was a significant improvement between the ability to write scientific articles before and after using learning media, with an average score before 64.5 and after 78.3. The paired sample t-test statistical test showed that the calculated t value of 7.2 was greater than the table t value of 2.06 at a significance level of 0.05. This shows that learning media has a positive effect on students' ability to write scientific articles.

Discussion

This study aims to investigate the development of a feasible and effective project-based blended learning (PjB2L) method on the ability to write scientific articles for IAIN Ambon students. The main finding of this study is the development of feasible PjB2L and has a significant effect in improving students' scientific article writing skills. Unlike the traditional learning approach, the Project Based Blended Learning method involves a combination of project-based learning and the use of technology. Through projects relevant to the learning context and technology integration, students can develop better article writing skills. This finding is supported by the results of the Wilcoxon test analysis, which showed a significant improvement in article writing ability from pre-test to post-test. These results provide strong evidence that the use of the Project Based Blended Learning method is effective in improving students' article writing skills.

The results of this study are consistent with previous research showing that the Project Based Learning approach improves students' creative thinking skills (Hera Erisa et al., 2021). In addition, research by Shima et al., (2021) shows that the application of PjB2L can improve psychomotor learning outcomes and student attitude scores. Furthermore, Utomo & Wihartanti's research, (2019) shows that the application of blended learning strategies can improve students' critical thinking skills and learning outcomes in the 4.0 era. Thus, the application of PjB2L and the use of technology can have a positive impact on students' writing

skills. However, our research makes a new contribution by integrating both approaches in the form of *Blended Learning*, which combines face-to-face learning and online learning.

Nonetheless, our study also has some limitations to note. First, we took a limited sample from a single higher education institution, so generalizing our findings should be done with caution. In addition, this study only focused on the ability to write articles and did not discuss other aspects of writing. For future studies, it is recommended to replicate this study with a larger sample and involve different educational institutions to improve the generalization of the findings. In addition, advanced research can delve deeper into other aspects of writing, such as writing essays or research reports, to gain a more comprehensive understanding of the effectiveness of Project Based Blended Learning methods.

Overall, the findings of this study provide strong evidence that the development of *Project Based Blended Learning* methods can be an effective alternative in improving students' article writing skills. The practical implication of this research is that educators can consider the application of this method in their learning strategies to improve students' writing skills. Hopefully with this research, the discussion on the use of *the Project Based Blended Learning* method in improving students' article writing skills will grow and have a positive impact on learning in the future.

CONCLUSION

Based on the results of the research, we can conclude that the development of *project based blended learning* (PjB2L) is feasible to be used based on the validation of media experts and material experts to improve the ability to write scientific articles for IAIN Ambon students. In addition, the results of the study also showed that the application of PjB2L had a significant effect in improving the ability to write scientific articles for IAIN Ambon students.

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