

Comparison of the Effectiveness of Microteaching and School Environmental Introduction (PLP 2) in Developing Teaching Skills for Biology Education Students

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Abstract: The research presented a comparison analysis of the effectiveness of microteaching and PLP 2 in developing teaching skills for biology education students. Microteaching, a commonly used method in higher education, involves simulated teaching sessions where students receive feedback from peers and instructors. On the other hand, PLP 2 offers practical teaching experience in a school environment, providing real challenges and interaction with students in the classroom. This research evaluates and compares how both methods contribute to improving teaching competencies. The main findings indicate that while microteaching focuses on pedagogical techniques and classroom management, PLP 2 emphasizes adaptability to various learning environments and student engagement strategies. The study concludes that integrating both approaches into teacher education programs can better prepare aspiring educators with the comprehensive skills to teach in diverse educational contexts.

Keywords: Biology Education Students; Comparative Analysis; Microteaching; PLP 2 (School Environment Introduction)

Introduction

This research aims to compare the effectiveness of the microteaching method and Scholl Environmental introduction (PLP) 2 in developing teaching skills for biology education students. The background of this research is based on the urgent need to prepare biology education students with solid teaching skills before they enter the workforce as teachers. Microteaching has long been a standard approach in universities to training students in teaching. However, PLP 2 offers direct experience in a school environment that can provide a context and challenges similar to real-life situations in the field.

According (Yustiana & Afandi, 2018) to every teacher must master the basic skills of teaching. Good

teaching skills will affect the quality of learning that is done. There are 8 basic teaching skills as mentioned by Farida (2022) (1) questioning skills, (2) reinforcement skills, (3) variety skills, (4) explaining skills, (5) opening and closing skills, (6) small group discussion skills, (7) classroom management skills and (8) small group and individual teaching skills. Mastering these basic skills is essential for students in developing effective teaching abilities. Each skill complements the other and helps educators to create better learning experiences for students (Lutfiyah & Nurhayati, 2023).

Teaching skills are a crucial aspect of the teaching profession, especially for students in the biology education program preparing to teach at the high school level. According (Arsana, 2019) teaching skills are the foundation of a teacher's implementation of learning

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activities. The development of these skills involves not only understanding the theory but also effective field practice. Another opinion expressed by (Farida, 2022) Teaching skills are a fairly complex competency of teacher professional competence, because it is an integration of various teacher competencies as a whole and as a whole. Mastering these skills allows a teacher to be an effective and inspiring educator. With the right skills, teachers can help students reach their full potential and create rewarding learning experiences (Firdaus, 2019) Therefore, various training methods have been applied to facilitate students' acquire adequate and relevant teaching skills.

Microteaching is a popular training method for developing teaching skills (Shofiyah, 2024). This method provides opportunities for students to teach on a small scale, often in front of their peers or instructors, and receive direct feedback for improvement. (Annisa, 2023) revealed that micro teaching is designed to help students focus on specific aspects of teaching, such as lesson planning, delivery techniques, and classroom management. The microteaching course will equip educators with primary teaching and learning skills (Ambarawati, 2016). As aspiring teachers, students can develop essential teaching skills before becoming educators. In addition, students are expected to have pedagogical competence.

On the other hand, PLP 2 (Field School Introduction) is a program designed to give students direct experience in a school environment. This program allows students to observe and participate in school activities and understand the dynamics of the educational environment. PLP 2 often involves longer field practices than microteaching and provides a broader context regarding the school environment (Agustina & Saputra, 2017). In addition, PLP 2 also trains students to understand the characteristics of students so that they have a professional attitude in dealing with each student's characteristics (Saputra *et al.*, 2023). Thus, through Field School Introduction (PLP) 2, students will gain opportunities and learning experiences and acquire new knowledge not obtained in class. Through PLP 2, it is hoped the knowledge, skills, and attitudes needed will be formed through experiences in completing structured activities, including addressing problems faced in the field (Putra, 2023). Although both methods aim to improve student's teaching skills, their approaches and implementations are quite different. Microteaching offers a more structured approach focused on simulation, while PLP 2 provides direct experience in a natural school setting. These differences raise questions about the effectiveness of each method in developing teaching skills (Isnaniah & Imamuddin, 2022).

Previous studies have shown that microteaching can enhance teaching skills among students in a

particular and targeted manner. However, the effectiveness of microteaching may be limited by its ability to replicate the more complex and dynamic teaching contexts found in actual schools. On the other hand, PLP 2 allows students to interact directly with pupils and face challenges in a natural school environment (Sahira & Herianto, 2023). This experience can provide deeper insights into how theory and practice interrelate within a broader educational context.

It is essential to evaluate the effectiveness of both methods comprehensively to understand which is more effective in developing teaching skills. Such evaluation can aid in designing better training curricula and provide data-driven recommendations for the future development of teaching skills among students.

Furthermore, this comparison can also provide helpful information for educational institutions and policymakers to adapt training methods to meet the needs of students and the demands of the current educational landscape. By understanding the strengths and weaknesses of each technique, educators can design more effective training strategies.

Practical teaching skills are crucial in biology education as the material often involves complex scientific concepts. The quality of the learning process can also be enhanced when various resources and learning facilities are utilized effectively (Indah & Fadilah, 2024). (Supiyanto & Sulistyningrum, 2019) revealed that therefore, training methods that equip students with the ability to explain these concepts clearly and engagingly are essential.

This study aims to analyze and compare the effectiveness of microteaching and PLP 2 in developing teaching skills among biology education students. By conducting this comparative analysis, it is hoped that new insights will be gained on the best ways to prepare students to become competent educators ready to face challenges in the educational field.

Method

In this study, the research design employed is a comparative experimental design utilizing t-tests and F-tests with the aid of SPSS software. This design allows us to compare the effectiveness of the teaching methods of microteaching and Scholl Environmental introduction (PLP) 2 in developing teaching skills among biology education students.

Our research methodology includes selecting student samples, implementing microteaching and PLP 2 sessions, measuring teaching outcomes using pre-prepared instruments, and conducting statistical analysis using t-tests to compare means between groups and F-tests to examine significant differences between

different groups. These statistical techniques are performed using SPSS software, ensuring accurate data analysis and interpretation of the results.

This study involves a population and sample of 34 students distributed across 16 schools in East Sumba. The schools include SMP Negeri 2 Waingapu, SMP Negeri 1 Waingapu, SMA Kristen Payeti, SMP Kristen Nasional Kasih Agape, SMA Negeri 1 Kambera, SMP Negeri 1 Kambera, SMP Katolik Andaluri, SMP Muhammadiyah, SMA Negeri 3 Waingapu, SMP Negeri 2 Kanatang, SMA PGRI, SMA Muhammadiyah, SMP Negeri 3 Waingapu, SMP Kristen Payeti, SMA Negeri 2 Waingapu, and SMA Negeri 1 Waingapu.

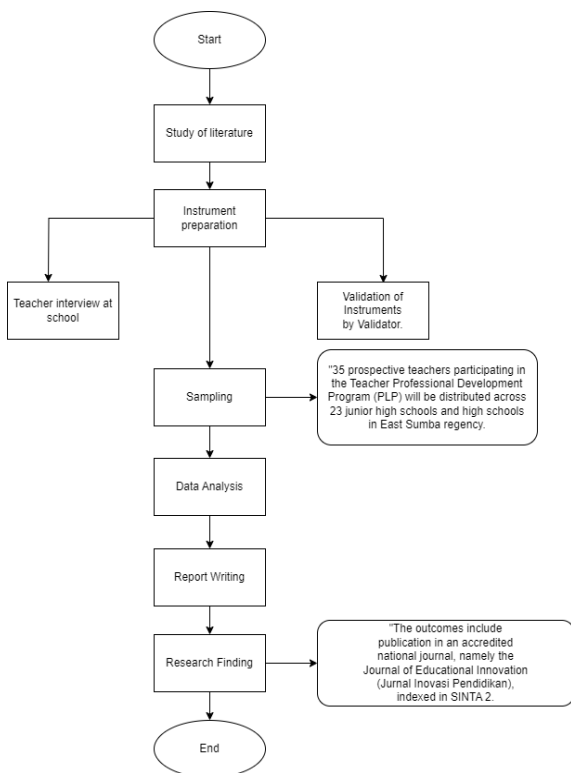


Image 1. Research Flow Diagram

Result and Discussion

Developing teaching skills is critical to preparing competent and effective future educators. Various training methods have been implemented to achieve this goal, including microteaching and Scholl Environmental introduction (PLP 2) program. These two methods offer different approaches to training biology education students, and understanding the effectiveness of each technique is crucial for improving and innovating training curricula.

This section will discuss the results and analysis of the comparison between microteaching and PLP 2 in the context of developing teaching skills among biology education students. The findings of this research are

expected to provide in-depth insights into the strengths and weaknesses of each method and their impact on students' teaching abilities.

F-Test

An F-test (F-test) is conducted to determine whether the independent variables collectively explain the dependent variable effectively or whether the multiple regression model is suitable for this study. The F-test is a statistical method used to compare the variances of two or more groups (Qurnia Sari, 2017). It is often used in analysis of variance (ANOVA) to determine if there is a significant difference between the means of several groups (Baharev, 2017). To verify this, one can refer to the F-test results by examining the following ANOVA table (Table 1).

Table 1. F-Test Result

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.019	1	.019	.000	.983 ^b
	Residual	1337.981	32	41.812		
	Total	1338.000	33			

a. Dependent Variable: MICROTTEACHING

b. Predictors: (Constant), PLP

The SPSS data processing results for the F-test are used to determine whether the model is appropriate. The benchmark for this test is to compare the obtained significance value with $\alpha = 0.05$. The regression equation obtained is considered reliable if the F-significance value is less than 0.05. Based on the table above, the significance value is 0.983, greater than 0.05, indicating that the regression equation is unreliable and the model cannot be used

T-Test

Hypothesis testing is conducted using the T-test to test the proposed hypotheses. (Montolalu & Langi, 2018) stated that the t-test is a statistical method used to compare means between two groups. It is useful to determine if the difference between the two groups is statistically significant. According to (Amanda, 2019) the T-test assesses the partial effect of each independent variable on the dependent variable by comparing the significance level obtained from the data processing for each variable. The benchmark used is a significance level of sig. < 0.05, in which case the null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. Conversely, if the significance value is ≥ 0.05 , H0 is accepted, and Ha is rejected. Based on the analysis results, the findings are as follows (Table 2).

Table 2. T-Test Result

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	80.613	18.041		4.468	<.001
	PLP	.005	.225	.004	.021	.983

a. Dependent Variable: MICROTEACHING

Based on the data processing results, the first hypothesis in this study indicates that PLP does not have a significant effect on microteaching, as the significance level is 0.983, which is greater than 0.05.

In this study, data indicate a significant change in the results of the t-test and F-test after students completed the Field Experience Practice (PLP) 2 at schools. Before the PLP 2 implementation, the t-test value was recorded at 4.468. However, after students completed PLP 2, the F-test value significantly increased to 41.812. This increase reflects a substantial development in students' teaching abilities following their direct experience in the school environment. (Hidayat, 2021). Hands-on experience allows students to put the theories learned in class into practice, thus enhancing their understanding. Students also interact with students and co-teachers helping students develop important communication and classroom management skills (Nugraheni, 2021). Furthermore, according to (Gordisona, 2021), this improvement in results shows the importance of practical experience in teacher education. It can be proposed that more PLP programs be integrated in the curriculum to better prepare prospective teachers.

The observed changes in these test values indicate that students achieved substantial progress in their teaching skills after participating in PLP 2 (Meirani & Prawati, 2022). In line with (Kresensiana *et al.*, 2023) field experience encourages students to reflect on their teaching practice, identifying strengths and areas for improvement. By practicing in a real environment, students tend to feel more confident in their teaching abilities. According to (Wulandari, 2018), positive changes in test scores show that students not only understand the theory, but are also able to apply it in a teaching context. Through PLP 2, students are directly involved in teaching activities, which allows them to hone the practical skills needed in the classroom. (Lestari, 2022) this increase in values indicates that students are becoming more adept at applying the teaching techniques and methods they learned during their training. Although the p-value > 0.05 suggests that

the changes are not statistically significant, the results still reflect a positive trend in improving students' teaching abilities. (M, 2022).

As an evaluation, direct experience in schools allows students to apply their teaching methods more freely (Andriani & Rasto, 2019). Teaching methods are ways or strategies used by teachers to deliver material to students. Here are some commonly used teaching methods (Nurlaeliyah, 2020). Students on campus may feel pressured or awkward when teaching material, which can affect their performance (Dwita & Rian, 2024).

The presence of students in schools allows them to understand the dynamics and needs of students better and adapt to actual teaching situations. This experience helps them refine their teaching skills in a context more aligned with the real world, reflected in the improvement in scores obtained after completing PLP 2. (Hidayat, 2021). Thus, the practical experience gained during PLP 2 has a positive impact on students' teaching skills and confidence in carrying out their teaching duties (Nurhayati, 2018).

Conclusion

This study analyzes and compares the effectiveness of two training methods, namely microteaching and PLP 2, in developing teaching skills among biology education students. Microteaching has proven effective in enhancing specific skills such as lesson planning and classroom management, but it needs to be adjusted to reflect the dynamics of real school environments. On the other hand, PLP 2 provides direct experience that deepens students' understanding of the educational context and helps them apply theory in practice. Each method has its strengths and weaknesses, so combining both can offer optimal benefits. Therefore, it is recommended that educational institutions and educators consider integrating these two methods into their training curriculum to prepare students to become competent educators ready to face challenges in teaching. This research provides valuable insights for designing more effective training programs in biology education.

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Conflicts of Interest

There are no conflicts of interest.

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