

TEACHING ASSISTANCE FOR PHYSICS EDUCATION STUDENTS IN PHYSICS LEARNING

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Received: 09/02/2026

Revised: 16/03/2026

Accepted: 18/03/2026

Abstract. *Physics learning in senior high schools still faces various challenges, including low student participation, the perception that physics is a difficult subject, and limited variation in teaching methods and learning media. One effort to address these challenges is through teaching assistance activities involving physics education students. This activity aims to support physics teachers in the learning process while providing authentic teaching experience for pre-service physics teachers. The teaching assistance was implemented through three stages: preparation, implementation, and evaluation, carried out collaboratively by students and physics teachers at SMAN 1 Ende over one month. The results indicate that the presence of teaching assistant students increases student participation, fosters more enthusiastic learning attitudes, and supports students' conceptual understanding through direct assistance and group discussions. In addition, this activity provides valuable professional experience for physics education students in classroom management and reflective teaching practices with mentor teachers. Therefore, teaching assistance activities can be considered an effective strategy to enhance the quality of physics learning in senior high schools.*

Keywords: *physics education students, physics learning, teaching assistance*

Abstrak. Pembelajaran fisika di Sekolah Menengah Atas (SMA) masih menghadapi berbagai tantangan, antara lain rendahnya keaktifan siswa, anggapan bahwa fisika merupakan mata pelajaran yang sulit, serta keterbatasan variasi metode dan media pembelajaran. Salah satu upaya untuk mengatasi permasalahan tersebut adalah melalui kegiatan asistensi mengajar mahasiswa Pendidikan Fisika. Kegiatan ini bertujuan untuk mendukung guru dalam pelaksanaan pembelajaran fisika sekaligus memberikan pengalaman nyata bagi mahasiswa calon guru. Metode pelaksanaan kegiatan asistensi mengajar dilakukan melalui tahapan persiapan, pelaksanaan, dan evaluasi yang dilaksanakan secara kolaboratif antara mahasiswa dan guru fisika di SMAN 1 Ende selama satu bulan. Hasil kegiatan menunjukkan bahwa kehadiran mahasiswa asistensi mengajar mampu meningkatkan keaktifan siswa, mendorong sikap belajar yang lebih antusias, serta membantu pemahaman konsep fisika melalui pendampingan langsung dan diskusi kelompok. Selain itu, kegiatan ini juga memberikan pengalaman profesional bagi mahasiswa dalam mengelola kelas dan melakukan refleksi pembelajaran bersama guru pamong. Dengan demikian, asistensi mengajar menjadi strategi yang efektif dalam mendukung peningkatan kualitas pembelajaran fisika di SMA.

Kata Kunci: asistensi mengajar, mahasiswa pendidikan fisika, pembelajaran fisika

How to Cite: Nasar, A., Pau, M. E. & Boleng, A. (2026). TEACHING ASSISTANCE FOR PHYSICS EDUCATION STUDENTS IN PHYSICS LEARNING. *Mitra Mahajana: Jurnal Pengabdian Masyarakat*, 7(1) 116-123. doi: <https://doi.org/10.37478/mahajana.v7i1.7637>

INTRODUCTION

Physics instruction in high schools (SMA) plays a crucial role in developing students' logical thinking, analytical thinking, and problem-solving skills (Ma et al., 2023). Through the study of physics, students are expected to understand natural phenomena, apply scientific concepts in everyday life, and build a strong foundation for future education in science and technology. Physics education also contributes significantly to the development of 21st-century competencies, including critical thinking, creativity, collaboration, and communication, which are essential in navigating the demands of an increasingly complex and technology-driven world (Harso et al., 2025; Tijani et al., 2026). However, in practice, physics is often perceived as a difficult and uninteresting subject by students.

This perception stems from various factors, including the abstract nature of many physics' concepts, the heavy reliance on mathematical formulas, and the limited use of contextual and real-world applications in classroom instruction (Kotsis, 2025). As a result, this perception leads to low student interest and engagement in the learning process (Vreticia et al., 2025). This situation demands urgent innovation and meaningful support in the implementation of physics

instruction in schools, so that learning becomes more effective, engaging, and relevant to the needs of today's students (Verawati & Nisrina, 2025).

One form of support that can be provided is through teaching assistance activities for Physics Education students. Teaching assistance is a learning assistance activity that involves prospective student teachers to assist teachers in carrying out the teaching and learning process in the classroom (Harso et al., 2025). This activity not only serves as a means of community service but also as a vehicle for strengthening students' professional competencies (Sipayung et al., 2025). In this context, teaching assistance functions as a bridge between academic preparation and real-world classroom practice, allowing prospective teachers to develop the pedagogical skills, classroom management abilities, and subject matter confidence that are necessary for effective teaching (Riera et al., 2023). Teaching assistance activities also serve as a form of experiential learning for prospective student teachers (Permatasari & Astuti, 2025; Tanjung et al., 2025).

Through experiential learning, students are placed in authentic educational environments where they are required to make real-time instructional decisions, respond to diverse student needs, and reflect critically on their own teaching performance. Through teaching assistance, students can apply the learning theories they studied in college to real-world school practice, thereby deepening their understanding of both content knowledge and pedagogical approaches (Pawe et al., 2025). This direct engagement with the classroom environment is invaluable in shaping competent, reflective, and adaptive future physics teachers.

Physics learning in high schools, including at SMAN 1 Ende, still faces various challenges that hinder the quality of the educational process. These challenges include the dominance of lecture methods that position students as passive recipients of information, limited time allocated for practical and laboratory work, and the minimal use of innovative and technology-based learning media (Ghilay & Ghilay, 2015). The absence of varied instructional strategies and interactive learning experiences has led to low student participation and motivation during the learning process (Wahyuni et al., 2025). Students frequently find it difficult to connect abstract physics concepts with meaningful, real-life contexts, which further diminishes their interest in the subject (Pavkov-Hrvojević & Bogdanović, 2019). In this regard, the presence of student teaching assistants is expected to assist teachers in creating more varied, interactive, and contextual learning experiences that can better address the diverse needs and learning styles of students (Wadams & Schick-Makaroff, 2022). Teaching assistants can introduce fresh instructional approaches, facilitate more dynamic classroom interactions, and support the integration of creative learning media that enrich the overall quality of physics instruction (Kotsis, 2024).

Based on these conditions, teaching assistance activities for Physics Education students at SMAN 1 Ende were implemented as a concrete and structured form of support for the physics learning process at the school. These activities focused on several key areas, including direct classroom learning assistance, facilitating group discussions that encourage collaborative and active learning, supporting the use of varied instructional media, and conducting reflective discussions with mentor teachers to evaluate and improve instructional practices. By actively participating in the classroom learning environment, teaching assistants contributed to creating a more stimulating, inclusive, and student-centred atmosphere (Hill et al., 2024; Bhardwaj et al., 2025). These activities are expected to meaningfully increase student engagement, improve learning attitudes toward physics, and foster a more positive perception of the subject among high school students (Verawati et al., 2025). At the same time, these experiences provide invaluable professional development opportunities for students as prospective physics teachers, equipping them with the practical skills, reflective habits of mind, and professional dispositions necessary to navigate the complexities of the classroom, engage meaningfully with diverse learners, and ultimately become effective and responsive educators in their future teaching careers (Ogodo, 2025).

METHOD

The teaching assistance program is conducted for approximately four months during the odd semester of the 2025/2026 academic year. During the program, students participate in classroom observations, mentoring the learning process, and reflecting on learning with their mentor teachers in accordance with the provisions of the Flores University teaching assistance program. The teaching assistance program for Physics Education students is conducted at SMAN 1 Ende through several stages, namely preparation, implementation, and evaluation. The preparation stage begins with initial observations of the physics learning conditions at the school, which include the learning methods applied, student characteristics, and various problems faced by teachers in the learning process (Santoso et al., 2022). In addition, students hold discussions and coordinate with mentor teachers to develop learning tools and determine the learning strategies to be used.

The implementation phase involves students directly in the physics learning process in the classroom. Students assist teachers in delivering material, guiding group discussions, assisting students in completing practice questions, and supporting the use of simple learning media (Lubis et al., 2023). This approach aligns with research findings showing that student involvement in teaching assistance can improve the effectiveness of physics learning (Fraser et al., 2014; Simangunsong et al., 2025). The evaluation phase is conducted through joint reflection between students and mentor teachers, observations of student activity, and the results of student assignments and exercises (Duisenbayev et al., 2024). This evaluation serves as a basis for assessing the effectiveness of teaching assistance activities and formulating follow-up actions.

RESULTS AND DISCUSSION

The results of the teaching assistance program indicate that the presence of Physics Education students has a positive impact on the physics learning process at SMAN 1 Ende. Students appear more active in asking questions, discussing, and working on practice problems. This is in line with findings (Vreticia et al., 2025) which states that teaching assistance can improve the activeness and learning outcomes of physics students. In addition to increased student engagement, observations also indicated a shift in student learning attitudes, leading to greater enthusiasm for physics (Gaurina et al., 2025). Students expressed more confidence and showed interest when provided direct guidance by student teaching assistants (Smith et al., 2023). This finding aligns with the reflections on teaching assistantship activities documented in student activity reports.

Students also assist teachers in providing additional explanations using simpler and more communicative language (Lesiana et al., 2024). This assistance facilitates students' understanding of abstract physics concepts, enabling more intense interactions between students and educators, which impacts conceptual understanding and student confidence (Sembiring et al., 2025). Furthermore, the use of simple learning media and contextual examples helps students relate physics material to everyday life (Diquito et al., 2025).

From the student perspective, teaching assistantship activities provide real-world experience in managing classes, communicating with students, and implementing effective learning strategies (Riera et al., 2023). These hands-on experiences allow prospective teachers to develop a deeper understanding of classroom dynamics and the diverse learning needs of individual students, which cannot be fully acquired through theoretical study alone. The presence of student teaching assistants in the physics learning process is also directly visible through student mentoring activities in class (Sarvary et al., 2025). Students play a role in assisting students during the learning process, both in explaining the material and helping students solve physics problems posed by the teacher (Gumisirizah et al., 2024). In this role, teaching assistants serve as a bridge between the teacher and students, offering explanations in a more relatable and approachable manner that is often easier for peers to understand and connect with (Roshandel et al., 2025).

This mentoring allows for more intense and meaningful interaction between students and educators, creating a more open and supportive classroom atmosphere. As a result, students feel more comfortable asking questions, seeking clarification, and expressing any learning difficulties they are experiencing without the hesitation or anxiety that sometimes accompanies direct interaction with the teacher (Baeppler, 2021). The more relaxed and collaborative environment fostered by the presence of teaching assistants encourages greater student participation and reduces the psychological barriers that often prevent students from actively engaging in the learning process (Abidin & Muhammad, 2024). This situation has a significant impact on improving students' conceptual understanding and confidence in participating in physics learning, ultimately contributing to a more positive and productive learning experience for all students involved (Werth et al., 2024).



Figure 1. *Teaching assistant students accompany students during physics lessons*

Student group discussion activity also increased during the teaching assistance program. Group discussions provide opportunities for students to exchange opinions, express ideas, and solve physics problems collaboratively (Alsmadi et al., 2023). Students act as facilitators, helping direct discussions to ensure they remain aligned with learning objectives. This activity encourages students to be more active and directly involved in the learning process, in line with a student-centered learning approach (Woods & Copur-Gencturk, 2024).



Figure 2. *Student group discussion activities in physics learning*

In addition to its impact on students, teaching assistance activities also provide significant benefits for Physics Education students as prospective teachers. After each learning activity, students and their mentor teachers conduct a structured learning reflection session to evaluate the teaching and learning process that has been implemented (Zanting et al., 2001). This reflection serves as an important evaluation tool to examine the strengths and weaknesses of the learning implementation, identify aspects that went well, and formulate concrete

improvements and adjustments for the next meeting (Li, 2025). The reflective process encourages prospective teachers to think critically about their own instructional decisions, consider alternative approaches, and develop a habit of continuous self-improvement that is essential in the teaching profession (Li, 2025).

Through this reflection activity, students gain valuable professional experience in developing a range of competencies, including pedagogical skills, effective communication, adaptability in the classroom, and meaningful collaboration with experienced teachers at school (Suguraliyeva et al., 2026). Engaging in open and constructive dialogue with mentor teachers also exposes students to diverse professional perspectives and practical insights that enrich their understanding of the complexities involved in real-world teaching (Riera et al., 2023). Over time, these repeated cycles of planning, teaching, and reflecting contribute to the gradual formation of a confident, thoughtful, and professionally prepared educator. This is in line with the view of Permatasari & Astuti (2025), who stated that direct experience in school settings can significantly strengthen students' readiness as prospective professional physics teachers, equipping them not only with technical teaching skills but also with the professional attitudes and reflective dispositions needed to thrive in their future careers.



Figure 3. *Student learning reflection session with mentor teacher*

Figure 3 shows the learning reflection activity conducted by Physics Education students together with their mentor teacher after the completion of a classroom learning session. In the image, students and the mentor teacher are seen engaged in a focused and collaborative discussion, reviewing the teaching and learning process that had been carried out during the meeting. This reflection session took place in a relaxed yet professional atmosphere, allowing students to openly share their observations, express challenges encountered during instruction, and receive constructive feedback and guidance from the mentor teacher (Pawe et al., 2025).

During this activity, various aspects of the learning implementation were discussed, including the effectiveness of the instructional strategies used, the level of student engagement and participation, the clarity of material delivery, and the overall classroom management (Abidin & Muhammad, 2024). The mentor teacher provided direct input and suggestions based on their professional experience, helping students to identify areas for improvement and to refine their teaching approach for subsequent meetings (Keiler et al., 2023). This reflective dialogue not only strengthened the students' pedagogical understanding but also fostered a collaborative and supportive professional relationship between the prospective teachers and their mentor, which is an essential component of meaningful and effective teaching practice.

CONCLUSION

The teaching assistance activities of Physics Education students at SMAN 1 Ende have positively contributed to the physics learning process. The students' presence in learning

assistance activities, group discussions, and learning reflections has increased student engagement and enthusiasm for learning. Furthermore, the direct mentoring provided by the students helps them understand abstract physics concepts in a simpler and more contextual way. For students, teaching assistantships provide valuable professional experience in developing pedagogical competence, communication skills, and collaborative skills with teachers at school. Through direct involvement in learning and reflection activities with mentor teachers, students gain a more comprehensive understanding of physics teaching practices in schools. As a follow-up, teaching assistance activities need to be implemented sustainably with more systematic planning and stronger collaboration between universities and schools. Students are expected to be more involved in the development of innovative learning media and simple practical activities to make high school physics learning more meaningful and student-centred.

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