


Teachers' Strategies for Implementing Biology Instruction Based on Educational Psychology at Permata Kasih Private High School

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Abstract: Biology instruction not only emphasizes conceptual mastery but also requires attention to students' psychological aspects to ensure an effective learning process. This study aims to describe the strategies teachers use in implementing biology instruction based on educational psychology at Permata Kasih Private High School. The study employed a qualitative method with a descriptive approach. Data were collected through interviews with biology teachers as the primary informants and were then analyzed descriptively to interpret the teaching strategies implemented. The results showed that teachers applied Problem-Based Learning (PBL) and Cooperative Learning strategies to enhance students' critical thinking skills, collaboration, and participation. Teachers also integrate psychological aspects by providing motivation, using individualized approaches, managing students' emotions, creating a comfortable learning environment, utilizing learning media and technology, and conducting evaluations accompanied by constructive feedback. Although there are challenges such as low interest in learning, lack of concentration, and low self-confidence among some students, teachers strive to overcome these through guidance, effective communication, and varied learning strategies. It is concluded that the implementation of biology instruction grounded in educational psychology creates a positive learning environment, enhances student motivation and engagement, and supports the optimal achievement of learning objectives.

Keywords: teacher strategies, biology instruction, educational psychology, learning motivation, learning environment.

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Introduction

Education is a process aimed at developing students' potential so that they acquire the knowledge, skills, attitudes, and character necessary to succeed in life (Pristiwanti et al., 2022). In the educational process, teachers serve not only as conveyors of information but also as facilitators who help students achieve optimal cognitive, affective, and psychomotor development (Basyori, 2025). Therefore, the success of learning is determined not only by mastery of the subject matter but also by the teacher's ability to understand students' characteristics and psychological needs.

Biology is a subject that explores various phenomena of life through a scientific approach. The complex, conceptual, and often abstract nature of biology content frequently poses challenges for students in understanding the material (Davlia et al., 2025). This situation can lead to low motivation, reduced interest in learning, limited participation, and poor academic performance if not supported by appropriate instructional strategies. Therefore, teachers need to implement learning strategies that are not only focused on delivering content but also take into account aspects of educational psychology, including learning motivation, interest, cognitive development, emotional development, and differences in students' individual characteristics (Puteri & Dewi, 2020).

Educational psychology is a branch of science that studies individual behavior in the context of education and the learning process. According to Syah, M. (2020), educational psychology plays a role in helping teachers understand the characteristics of students so that the learning process can take place more effectively. Applying the principles of educational psychology enables teachers to create a comfortable, safe, interactive, and meaningful learning environment, thereby increasing student engagement in the learning process. Furthermore, Sanjaya, W. (2020) states that a learning strategy is an action plan that encompasses the selection of methods, techniques, and media, as well as the management of the learning process, to achieve predetermined objectives. Thus, learning strategies that take students' psychological aspects into account are a crucial factor in improving the quality of biology instruction.

Various studies have shown that the implementation of learning strategies grounded in educational psychology can enhance students' motivation to learn, active participation, and learning outcomes (Puteri & Dewi, 2020). However, the implementation of Biology instruction grounded in educational psychology at the school level still requires more in-depth study, particularly regarding the strategies teachers employ to address differences in student characteristics, foster learning motivation, manage emotional states, and create a conducive learning environment

(Ainsiyah et al., 2020). Therefore, it is important to conduct a study on the strategies teachers use in implementing biology instruction based on educational psychology.

The objectives of this study are to describe teachers' strategies in implementing biology instruction based on educational psychology, to identify teachers' efforts to address students' psychological needs during instruction, and to analyze the role of these strategies in supporting the effectiveness of biology instruction at Permata Kasih Private High School. This study is of significant relevance as it can provide theoretical contributions to the development of educational psychology and Biology teaching strategies, as well as practical contributions to teachers, schools, and educational stakeholders in designing more humanistic, effective, and student-centered instruction (Afif et al., 2020). The research findings are expected to serve as a reference for improving the quality of biology instruction through the implementation of strategies tailored to students' psychological needs, thereby ensuring that learning objectives are optimally achieved (Puteri & Dewi, 2020).

Methods

This study employed a qualitative approach using a descriptive method (Sugiyono, 2021). The qualitative approach was chosen because the study aimed to gain an in-depth understanding of teachers' strategies in implementing biology instruction based on aspects of educational psychology (Creswell & Poth, 2018). The descriptive method was used to systematically describe the phenomena observed in the field based on data obtained from research informants (Moleong, 2021).

The study was conducted at Permata Kasih Private High School in May 2026. The research subject was a biology teacher who served as the primary informant. The informant was selected through purposive sampling, taking into account that the teacher had experience and was directly involved in the biology learning process as well as the application of educational psychology in the classroom (Sugiyono, 2021). The research focus was on the teacher's strategies for implementing biology instruction that took educational psychology into account, including instructional strategies, learning motivation, management of students' emotions, differences in student characteristics, the use of instructional media, and learning assessment.

Data collection was conducted through semi-structured interviews. The interviews were conducted in person with biology teachers using an interview guide developed based on the research focus (Creswell & Poth, 2018). The interview questions covered the learning strategies used, efforts to improve student motivation, management of students' psychological well-being, the use of learning media and technology, and the forms of assessment applied in biology instruction.

The data obtained from the interviews were analyzed descriptively by grouping the information based on the research themes, namely learning strategies, learning motivation, students' emotional regulation, the use of learning media, learning assessment, and differences in student characteristics. The data were then interpreted in accordance with the research objectives and presented in the form of a narrative description to provide an overview of teachers' strategies in implementing biology instruction based on educational psychology.

Results and Discussion

The results of the study show that biology teachers at Permata Kasih Private High School implement teaching strategies that are not only focused on mastery of the subject matter but also take into account the psychological aspects of the students. The dominant strategies used are Problem-Based Learning (PBL) and Cooperative Learning. Through PBL, teachers present problems related to biology material so that students are encouraged to think critically, analyze situations, and find solutions independently. Meanwhile, Cooperative Learning is implemented through discussions and group work, which allow students to interact, exchange ideas, and develop communication and collaboration skills. These findings indicate that the teaching has adopted a student-centered learning approach that positions students as active participants in the learning process (Hidayat & Suryani, 2021).

According to Nugraha et al. (2022), learning strategies that actively engage students can increase their involvement and sense of responsibility in learning. The results of this study are also consistent with the findings of Wulandari & Lestari (2023), who stated that cooperative learning can improve students' social interaction, participation, and critical thinking skills. From the researcher's perspective, the application of PBL and Cooperative Learning is an effective form of educational psychology implementation because it can accommodate students' cognitive and social needs simultaneously.

The integration of educational psychology is also evident in the way teachers relate biology concepts to students' psychological states and everyday experiences. Topics such as the nervous and endocrine systems are not only explained from a biological perspective but are also linked to students' emotional and mental states. This

approach helps students understand the connection between biological concepts and their real-life experiences, thereby making learning more meaningful. This finding supports the view (Rahman, 2020) that an understanding of students' psychological aspects can enhance the effectiveness of learning. Contextual learning allows students to develop a deeper understanding because the material is linked to real-life experiences (Kurniawan et al., 2021). According to Setiawan & Putri (2024), integrating psychological aspects into biology curriculum is a relevant strategy for improving conceptual understanding while also raising students' awareness of the importance of physical and mental health.

In addition, motivation and interest in learning are psychological aspects that receive special attention in the learning process. The research findings indicate that teachers strive to enhance student motivation through the use of engaging teaching methods, the provision of ongoing encouragement, and the creation of an active and enjoyable classroom atmosphere. Teachers also offer praise to students as a form of positive reinforcement for good learning behavior. These findings align with learning motivation theory, which emphasizes that teacher support and a positive learning environment play a crucial role in boosting students' enthusiasm for learning (Putra & Handayani, 2020). Research (Yuliana & Fitri, 2023) also indicates that instructional strategies that address students' psychological needs contribute to increased motivation and engagement in learning. Based on the research results, the researchers conclude that learning motivation is influenced not only by students' internal factors but also by teachers' ability to create meaningful and enjoyable learning experiences (Gulo et al., 2025).

In practice, teachers also take into account the differences in students' individual characteristics and emotional states. The research findings indicate that teachers strive to understand the diversity of students' abilities, learning styles, and personalities through individualized approaches, effective communication, and providing guidance tailored to each student's needs. Teachers also work to manage various emotional states among students—such as boredom, anxiety, and low self-confidence—by offering motivation and psychological support throughout the learning process. These findings indicate that teachers have applied principles of educational psychology that view each student as a unique individual. The theory of individual differences in educational psychology states that learning success is greatly influenced by a teacher's ability to adapt teaching strategies to students' characteristics. According to the researchers, attention to students' emotional aspects is a crucial factor in creating a learning environment that is safe, comfortable, and supportive of students' academic and social development (Halawa et al., 2026).

The use of learning media and technology is also a key component of the strategies implemented by teachers. Research findings indicate that teachers utilize various media, such as Smart TVs, projectors, PowerPoint, educational videos, and other supporting applications to make learning more engaging and help students understand the material more easily and systematically. Additionally, learning assessment is conducted not only through written tests but also through oral questions, group discussions, and project-based assignments. The use of diverse learning media supports modern learning theories that emphasize the importance of utilizing technology to improve learning effectiveness. Research (Sari et al., 2022) shows that the use of digital media can increase students' interest in learning and their understanding of the material. According to the researchers, the use of technology combined with authentic assessment provides students with the opportunity to develop critical thinking, creativity, communication, and problem-solving skills that are essential in biology education (Hulu et al., 2025).

Overall, the research findings indicate that teachers' strategies in implementing biology instruction based on educational psychology principles have been effective. The application of Problem-Based Learning, Cooperative Learning, motivation techniques, management of students' emotions, the use of educational technology, and the use of diverse assessment methods have succeeded in creating a positive learning environment that supports students' active engagement. These findings indicate that the success of biology learning is determined not only by mastery of the subject matter but also by teachers' ability to understand, pay attention to, and accommodate students' psychological needs (Yuliana & Fitri, 2023). Therefore, the integration of educational psychology aspects into biology instruction needs to be continuously developed as an effort to improve the quality of learning and optimally support students' development.

Conclusion

This study shows that teachers' strategies for implementing biology instruction based on educational psychology at Permata Kasih Private High School involve the use of the Problem-Based Learning (PBL) and Cooperative Learning models, combined with a psychological approach toward students. Teachers integrated aspects of motivation, interest in learning, emotional development, individual characteristics, and social interaction into the learning process, thereby creating a conducive, participatory, and student-centered learning environment.

Teachers relate Biology material to students' psychological conditions through contextualized instruction, continuous motivation, the use of individualized approaches for students facing learning difficulties, and the utilization of educational media and technology to enhance student engagement. Although there were challenges-such as low interest in learning, difficulty understanding certain topics, lack of concentration, and low self-confidence among some students-teachers were able to overcome them through varied teaching strategies, effective communication, constructive feedback, and personalized guidance. These strategies were proven to increase student engagement, conceptual understanding, motivation, and participation in Biology lessons.

The implications of this study suggest that success in biology learning depends not only on mastery of the subject matter and teaching methods, but also on teachers' ability to understand and accommodate students' psychological needs. Therefore, the implementation of teaching strategies that take students' psychological aspects into account can be an effective alternative for improving the quality of learning, creating meaningful learning experiences, and supporting students' cognitive, affective, and social development in a sustainable manner.

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