



Improving Learning Outcomes through Innovative Pedagogical Approaches in Modern Education

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ABSTRACT

This study evaluates the effectiveness of innovative teaching methods in enhancing student learning outcomes at SMAN 1 Sindangkasih Ciamis. Driven by the need to modernise conventional teaching approaches, the research employs a mixed-methods design, incorporating surveys, interviews, and classroom observations with grade X and XI students and teachers. Findings indicate that project-based learning and information technology integration enhance both academic performance and student engagement. Thematic analysis further highlights improvements in motivation and social skills. However, challenges such as insufficient teacher training and inadequate facilities persist. To address these issues, the study recommends ongoing professional development, strengthened collaboration with parents, and curriculum adjustments to align with modern educational demands.

Keywords: *Innovative Teaching Methods, Pedagogical Approach, Modern Education, Learning Outcomes.*

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INTRODUCTION

Based on the contemporary educational landscape, efforts to optimise learning outcomes have become a major concern for educators and institutions. The rapid evolution of technology and pedagogical theories has ushered in innovative teaching methods that promise to improve student engagement and learning effectiveness. This article focuses on the pedagogical strategies used at SMAN 1 Sindangkasih Ciamis, aiming to explore how these innovative approaches can significantly improve educational outcomes. The pressing issue at hand is the need to adapt traditional teaching methodologies to meet the diverse needs of students in the modern era, especially an era characterised by digital transformation and a paradigm shift in education (Hanan et al., 2023).

Data from various studies show that innovative pedagogical approaches, such as the use of interactive learning media and discussion methods, can create a more dynamic and interesting learning environment for students (Mulyati & Nafisyah, 2021; Rohmah, 2023). Research also reveals that teachers who have competence in developing creative and innovative teaching methods can contribute significantly to improving student learning outcomes (Chasanah, 2023). Therefore, it is important for educators to continue to adapt and apply teaching methods that suit the needs and characteristics of students in this digital era (Oktavianus, 2023). Other data shows that innovative teaching methods, such as project-based learning and collaborative activities, have been associated with increased student motivation and improved academic achievement (Joensuu-Salo et al., 2020). For example, research shows that when educators implement interactive and student-centred teaching strategies, there is a marked improvement in students' learning experiences and outcomes.

('Innovative Research on Teaching Methods of Polymer Materials Processing Technology', 2023). Experts in the field advocate a paradigm shift towards more dynamic and engaging teaching methods, emphasising the importance of fostering learning environments that encourage creativity, collaboration and critical thinking (Kim, 2020).

In modern education, innovations in teaching methods play an important role in improving student learning outcomes. Various recent studies have shown that the application of Information and Communication Technology (ICT) in the educational process can not only accelerate learning, but also increase student engagement. Mulyana & Saepudin (2019) for example, state that the utilisation of ICT in distance education is not only effective, but also in line with the characteristics of innovation needed in education. In addition, Pahira (2023) emphasises that the use of ICT has changed the way education is delivered, both in terms of curriculum content and learning approaches. Similarly, Pahira (2023) found that educational innovation in the information technology era has a positive impact on students' ability to find and utilise the information they need.

Based on the existing literature, it is clear that although many studies have explored various innovative teaching methods, there is still a gap in comprehensive analyses that specifically address the context of secondary education in Indonesia. Previous research has largely focussed on higher education settings or specific subjects, leaving a void in understanding how such methods can be effectively applied in secondary schools such as SMAN 1 Sindangkasih Ciamis. This article seeks to fill that void by positioning itself within the broader discourse on innovative pedagogy, contributing valuable insights into the practical application of these methods in a secondary education context. By examining the unique challenges and opportunities faced by educators in this context, this research aims to provide a deeper understanding of how innovative teaching approaches can be customised to improve learning outcomes.

The position of this article within existing research is critical to advancing the discourse of educational innovation. As educational institutions grapple with the implications of the Covid-19 pandemic, there is an urgent need to reassess traditional teaching practices and embrace innovative strategies that can better prepare students to deal with the complexities of the modern world (Zuccherro & Gibson, 2019). This study not only aligns with the ongoing discussions around education reform, but also seeks to contribute to the development of a framework for implementing innovative teaching methods in secondary education. By synthesising insights from various studies, this article aims to provide a comprehensive overview of pedagogical approaches that can optimise learning outcomes in the context of SMAN 1 Sindangkasih Ciamis.

To critically address this topic, this article poses several questions, namely; a) how can innovative teaching methods be effectively integrated into the existing curriculum at SMAN 1 Sindangkasih Ciamis? b) what pedagogical strategies have proven successful in improving student engagement and learning outcomes? In addition, c) how can educators assess the impact of these innovative approaches on students' academic achievement and overall development? By answering these questions, this research aims to foster a deeper understanding of the relationship between teaching methods and learning outcomes, which will ultimately contribute to the ongoing dialogue on educational innovation in Indonesia.

The integration of innovative teaching methods in educational settings has attracted significant attention in recent years, especially as educators strive to improve student engagement and learning outcomes. Research shows that innovative pedagogical approaches, such as project-based learning and flipped classrooms, can promote deeper understanding and knowledge retention among students. Yilmaz (2021) emphasises the importance of systematically designing educational programmes that incorporate innovation and entrepreneurship, highlighting the need for a holistic approach that includes teaching, management and student engagement. This is in line with findings from Yilmaz (2021), who notes that teachers' perceptions of innovation are often shaped by the systemic integration of

these methods within an educational framework, indicating that a cohesive strategy is essential for effective implementation.

Moreover, the role of educators in facilitating innovative learning environments cannot be overstated. Honcharuk et al. (2021) argue that teachers must possess innovative competencies to effectively guide students through the complexities of modern education). This perspective is echoed by Zheng(2022) who highlights the importance of developing an entrepreneurial mindset among students, which is critical to navigating the challenges of the contemporary labour market. Collectively, these studies underscore the transformative potential of innovative teaching methods in fostering more engaging and effective learning experiences, thus addressing the urgent need for educational reform in the face of evolving societal demands.

In assessing the impact of innovative teaching methods on student learning outcomes, it is important to consider the broader educational context. Research has shown that the application of innovative pedagogical strategies can result in significant improvements in student performance and motivation (Klucznik-Törő, 2021). For example, Eshbayev(2023) discusses how the integration of educational technology and expert systems can revolutionise traditional teaching approaches, thereby improving the overall learning experience. This is particularly relevant in the context of higher education, where the demand for skilled graduates equipped with innovative thinking and problem-solving abilities is increasing.

In addition, the concept of social innovation in education has emerged as an important area of exploration. Studies show that innovative educational practices, driven by social needs and community engagement, can result in more meaningful learning experiences for students (Schröder & Kruger, 2019). This is in line with the findings of Zhao(2023), who emphasises the importance of adapting teaching methods to foster an entrepreneurial spirit among students, thus preparing them to deal with the complexities of the modern world of work. By placing innovative teaching methods within the framework of social innovation, educators can create a more dynamic and responsive educational environment that meets the diverse needs of students.

The exploration of innovative teaching methods also requires a critical examination of the existing barriers to their implementation. Research shows that despite growing recognition of the importance of innovation in education, several challenges remain, including resistance to change among educators and inadequate institutional support (Rahmat, 2020). This is in line with the opinion of Liu et al., (2021), which states that the successful integration of innovation in education requires a supportive ecosystem that encourages collaboration among various stakeholders.

Despite the growing body of literature on innovative teaching methods, there is still a notable gap in research that specifically focuses on the application of these methods in the context of secondary education, particularly in Indonesia. While many studies have explored innovative practices in higher education, little attention has been paid to how these strategies can be effectively adapted to younger students in secondary schools (Jia, 2024). This gap is particularly significant given the unique challenges faced by educators in these environments, including varying levels of student engagement and different educational resources.

In addition, existing research often lacks a comprehensive analysis of the contextual factors that influence the successful implementation of innovative teaching methods in secondary education. For example, while research by Lv et al., (2022) highlighted the importance of fostering an entrepreneurial mindset among students, they did not investigate specific pedagogical strategies that can be used to achieve this goal in secondary schools. By addressing this gap, this study aims to provide valuable insights into the practical application of innovative teaching methods in the context of SMAN 1 Sindangkasih Ciamis, so as to contribute to the wider discourse on education reform in Indonesia.

The main objective of this research is to explore how innovative teaching methods can optimise learning outcomes in secondary education. This objective is based on the recognition that traditional pedagogical approaches often fail to engage students and foster critical thinking skills. By investigating the specific strategies used at SMAN 1 Sindangkasih Ciamis, this research aims to identify best practices that can be replicated in similar educational contexts. In addition, this study also aims to evaluate the impact of these innovative methods on student engagement and academic performance, thus providing empirical evidence to support the adoption of such practices in secondary education.

In addition, this research aims to contribute to the ongoing discourse on educational innovation by highlighting the importance of contextual factors in the successful implementation of innovative teaching methods. By examining the unique challenges and opportunities faced by educators in Indonesian secondary schools, this research seeks to provide a better understanding of how such methods can be customised to meet the needs of diverse students. Ultimately, the findings of this research are expected to inform educational policy and practice, encouraging a more dynamic and responsive approach to teaching and learning in secondary education.

METHOD

SMAN 1 Sindangkasih Ciamis was selected as the research site due to the pressing need to improve student learning outcomes through innovative teaching methods. The school's diverse student population and the unique challenges it faces in the learning process necessitate adaptive and responsive pedagogical approaches. This study aimed to explore and evaluate the effectiveness of such methods in enhancing student engagement and academic achievement. To gain a comprehensive understanding, the study involved students from grades X and XI and teachers who implemented innovative teaching methods in their classrooms. The selection process for participants followed a purposive sampling approach, ensuring that students and teachers directly involved in project-based learning and technology-integrated teaching were included. This approach allowed the research to focus on those with firsthand experience with the teaching strategies being examined.

The study employed multiple data collection techniques, including surveys, interviews, and classroom observations. Surveys were distributed to students to gather quantitative data on their perceptions of the teaching methods and their impact on learning. The survey questions focused on students' engagement, motivation, and challenges in adapting to new pedagogical approaches. Students were asked to reflect on their experiences with project-based learning, collaborative activities, and using educational technology in the classroom.

To complement the survey data, semi-structured interviews were conducted with students and teachers. The student interviews aimed to explore their learning experiences in greater depth, including how innovative methods influenced their academic performance and motivation. They were encouraged to share specific aspects of these methods that they found beneficial or challenging. Similarly, teachers were interviewed to understand their perspectives on the effectiveness of these approaches, the difficulties they encountered in implementation, and the support they required to enhance their teaching practices.

Classroom observations provided further insights into the interaction between teachers and students and the practical application of innovative teaching strategies. Observers focused on student engagement, classroom dynamics, and how teachers facilitated learning. Particular attention was given to students' participation in discussions, their ability to collaborate with peers, and their level of critical thinking during project-based activities. The observations also documented challenges, such as difficulties in classroom management or the accessibility of technological resources.

The collected data were analysed using both quantitative and qualitative methods. Survey responses were processed using descriptive statistical analysis to identify patterns in

student perceptions and learning outcomes. Meanwhile, interview transcripts and observation notes were examined through thematic analysis to uncover recurring themes related to motivation, engagement, and the effectiveness of different teaching strategies.

By integrating these diverse data sources, the study evaluated how innovative pedagogical approaches influenced learning outcomes at SMAN 1 Sindangkasih Ciamis. The findings highlighted the benefits of such methods in enhancing student performance. They revealed the challenges that needed to be addressed, such as the lack of teacher training and limited resources. These insights formed the basis for recommendations to strengthen professional development, foster collaboration between teachers and parents, and refine the curriculum to better align with modern educational needs.

FINDINGS AND DISCUSSION

Integration of Innovative Teaching Methods in the Curriculum

The results showed that the integration of innovative teaching methods at SMAN 1 Sindangkasih Ciamis had a significant positive impact on students' learning outcomes. In the application of project-based learning methods, students showed increased engagement and higher motivation. Through classroom observations, it was seen that students were more actively participating in discussions and collaboration, which contributed to a deeper understanding of concepts. In addition, the use of electronic modules in learning also proved effective in enhancing students' learning independence, allowing them to organise their own learning process and build better concepts.

The following table shows the survey results regarding the effectiveness of innovative teaching methods at SMAN 1 Sindangkasih Ciamis:

Table 1. Survey Results on the Effectiveness of Innovative Teaching Methods

| No | Indicator | Percentage of Respondents Agree (%) |
|----|----------------------------------------------------------------------------------------------------------|-------------------------------------|
| 1 | Project-based learning increases student engagement in lessons | 82% |
| 2 | The use of electronic modules helps improve learning independence | 76% |
| 3 | Information and communication technology (ICT) enhances understanding of concepts | 88% |
| 4 | Project-based learning improves critical thinking and problem-solving skills | 80% |
| 5 | Students are more motivated to learn with innovative teaching methods than with conventional methods | 85% |
| 6 | Peer interaction in collaborative learning enhances conceptual understanding | 78% |
| 7 | Technology-based teaching methods make learning more flexible and accessible | 83% |
| 8 | The main challenge in implementing innovative methods is the lack of facilities and access to technology | 69% |
| 9 | Teachers require further training to optimise the use of innovative methods | 74% |

The survey results indicate that most students perceive increased engagement, motivation, independence, and conceptual understanding as benefits of innovative teaching methods. However, key challenges identified include limited access to technology and the need for further teacher training to maximise the effectiveness of these approaches.

Interviews with both students and teachers provided deeper insights into how these methods influenced learning experiences. Many students reported that project-based

learning encouraged them to take a more active role in their education, improving their critical thinking and problem-solving skills. One student noted:

"Before, I memorised information for exams, but now I understand how to apply concepts in real-world situations. Working on projects with my classmates has helped me think more critically and communicate better."

Teachers also highlighted the benefits of these innovative approaches, particularly in fostering collaboration and student autonomy. One teacher stated:

"Students are more engaged when they work on real-world problems. They ask more questions, explore different solutions, and take ownership of their learning. However, the challenge is ensuring that all students have access to the necessary resources, especially technological tools."

One important aspect of the integration of innovative teaching methods is the enhancement of students' critical thinking skills. Through learning approaches that emphasise problem solving and exploration, students not only learn to recall information, but also to analyse and apply knowledge in different contexts. This is in line with previous research findings which show that learning methods that encourage students' active involvement can improve their critical thinking skills and creativity (Schmidt et al., 2020). The use of information and communication technology (ICT) in learning also contributes to improving learning outcomes. By utilising online learning platforms and visual aids, students can access learning materials more easily and flexibly. The study found that students who used ICT in their learning process showed better results compared to students who only relied on traditional methods. This shows that the integration of ICT in the curriculum can be an effective tool to improve the quality of education.

Although the research results show the positive impact of integrating innovative teaching methods, there are still challenges in implementation. Some teachers reported difficulties in adapting these new methods into the existing curriculum, as well as a lack of adequate training to use technology effectively. It is therefore important for schools to provide teachers with the necessary training and support so that they can better implement innovative teaching methods. In addition, the study also found that parents' involvement in students' learning process plays a crucial role in supporting the successful integration of innovative teaching methods. When parents are actively involved in their children's education, students tend to show higher motivation and better learning outcomes (Habicht et al., 2021). Therefore, it is important for schools to build strong partnerships with parents in supporting the learning process.

This discussion will address the implications of the research results regarding the integration of innovative teaching methods in the curriculum. Firstly, it is important to emphasise that the implementation of innovative teaching methods focuses not only on improving academic learning outcomes, but also on developing students' social and emotional skills. By creating a collaborative learning environment, students can learn to work together, communicate and solve problems effectively, which are essential skills in today's working world. Therefore, schools need to consider a holistic approach to education that includes both academic and non-academic aspects. Secondly, the challenges faced in implementing innovative teaching methods should be addressed through teacher training and professional development. Research shows that teachers who feel confident and trained in using new methods tend to be more successful in implementing them in the classroom. Therefore, it is important for schools to provide ongoing training programmes and support teachers in adopting technology and innovative teaching methods.

Collaboration between schools, parents and communities is essential to support the successful integration of innovative teaching methods. By building strong partnerships, all parties can contribute to creating a supportive learning environment and motivate students to achieve optimal learning outcomes (Wang & Wang, 2023). Therefore, this study not only

provides insight into the effectiveness of innovative teaching methods, but also highlights the importance of collaboration in education to achieve greater goals.

Effective Pedagogical Strategies for Student Engagement and Learning Outcomes

The results show that the implementation of effective pedagogical strategies at SMAN 1 Sindangkasih Ciamis has contributed significantly to students' engagement and their learning outcomes. One of the most successful strategies is differentiated learning, where teachers tailor teaching methods to the needs and abilities of individual students. With this approach, students feel more cared for and motivated to actively participate in the learning process.

The following table shows the survey results regarding effective pedagogical strategies for student engagement and learning outcomes

Table 2. Effective Pedagogical Strategies for Student Engagement and Learning Outcomes

| Pedagogical Approach | Student Engagement (%) | Impact on Learning Outcomes |
|------------------------------|-----------------------------------------|---------------------------------------------------------------------|
| Differentiated Learning | 85% reported increased engagement | Personalised instruction led to better motivation and participation |
| ICT Integration | 78% preferred technology-based learning | Improved comprehension and self-paced learning |
| Project-Based Learning (PBL) | High level of active participation | 15% higher average scores in assessments |

Data shows that 85% of students feel more engaged in learning when they are given choices in how to learn, either through group projects or individual tasks. In addition, the use of information and communication technology (ICT) in learning has also proven effective in increasing student engagement. Research shows that students who use digital tools, such as interactive learning applications, show significant improvements in motivation and learning outcomes. Survey results show that 78% of students prefer learning that involves technology, as they feel more connected to the material being taught and can learn in a more enjoyable way.

Project-based learning methods are also identified as an effective strategy in improving student learning outcomes. In this project, students work in groups to complete tasks relevant to real life, which not only improves collaborative skills but also their understanding of the subject matter. Evaluation results showed that students who engaged in project-based learning had a 15% higher average score compared to students who followed traditional learning.

Strengthening character education through the integration of moral values in learning is also an important focus in this research. By integrating character education into the curriculum, students learn not only academic material but also values such as co-operation, responsibility and empathy. The results showed that students involved in the character education programme had more positive attitudes and better learning outcomes, with 90% of them reporting that they felt better prepared to face challenges at school and beyond.

Parental involvement in the learning process also plays an important role in improving student learning outcomes. Research shows that when parents are actively involved in their children's education, students tend to show higher motivation and better learning outcomes. Survey results show that 75% of students feel more motivated when they know that their parents support their education, either through communication with teachers or involvement in school activities. While there are many strategies that have been proven effective, there are still challenges in implementation. Some teachers report difficulties in adapting these new methods into the existing curriculum, as well as a lack of adequate training to use technology effectively. Therefore, it is important for schools to provide the

necessary training and support for teachers so that they can better implement these pedagogical strategies.

This discussion will address the implications of research results on effective pedagogical strategies for student engagement and learning outcomes. It is important to emphasise that implementing strategies that focus on students' needs can create a more inclusive and responsive learning environment. By paying attention to differences in individual abilities and interests, teachers can create more relevant and interesting learning experiences for students (Purhanudin & Nugroho, 2021). This is in line with the principles of 21st century education which emphasise the importance of developing critical thinking, collaboration and creativity (Anwar & Umam, 2020).

The challenges faced in implementing pedagogical strategies should be addressed through teacher training and professional development. Research shows that teachers who feel confident and trained in using new methods tend to be more successful in implementing them in the classroom (Rahayu et al., 2022). Therefore, it is important for schools to provide ongoing training programmes and support teachers in adopting technology and innovative teaching methods. Collaboration between schools, parents and communities is essential to support the successful implementation of effective pedagogical strategies. By building strong partnerships, all parties can contribute to creating a supportive learning environment and motivating students to achieve optimal learning outcomes. Therefore, this study not only provides insights into the effectiveness of pedagogical strategies but also highlights the importance of collaboration in education to achieve greater goals.

Impact Assessment of Innovative Approaches

The results showed that the implementation of innovative approaches in learning at SMAN 1 Sindangkasih Ciamis had a significant positive impact on student engagement and learning outcomes. One of the approaches adopted is project-based learning, where students are directly involved in activities relevant to real life.

The following is a structured table of the innovative approach impact assessment

Table 3. Innovative Approach Impact Assessment

| Aspect | Findings | Statistical Results |
|----------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Student Engagement | Project-based learning (PBL) increases student interest and motivation. | 80% of students reported higher engagement compared to traditional methods. |
| Impact of Technology in Learning | Use of digital tools enhances accessibility and flexibility in learning. | 75% of students feel more confident in using technology for learning. Students using technology scored 10% higher on average. |
| Authentic Assessment | Assessment methods focusing on real-world applications improve comprehension. | 85% of students feel better prepared for real-world applications of their knowledge. |
| Social & Emotional Development | Collaborative methods enhance communication and teamwork skills. | 90% of students feel more confident in interacting with peers and teachers. |
| Challenges in Implementation | Teachers face difficulties in integrating new methods due to curriculum constraints and lack of training. | A significant proportion of teachers reported needing additional training and resources. |

Data shows that 80% of students feel more motivated and engaged when learning through projects, compared to traditional methods. This shows that innovative approaches can increase students' interest in the subject matter.

In addition, the use of technology in learning has also proven to be effective. By integrating digital tools such as learning apps and online platforms, students can access learning materials more easily and flexibly. The survey results show that 75% of students feel more comfortable and confident in using technology for learning, which contributes to the improvement of their academic results. The study also found that students who use technology in learning have 10% higher average grades compared to those who do not use technology.

The implementation of authentic assessment is also one of the important aspects in assessing the impact of innovative approaches. Authentic assessment measures students' abilities in real contexts, not just based on written exams. The results showed that students who were assessed using authentic methods demonstrated a better understanding of the subject matter and were able to apply their knowledge in practical situations. As many as 85% of students reported that they felt better prepared for real-world exams and challenges after participating in authentic assessment.

Another positive impact is seen in the development of students' social and emotional skills. Through an innovative approach that emphasizes collaboration and communication, students learn to work together in groups and develop important interpersonal skills. Interview results with students show that 90% of them feel more confident in interacting with peers and teachers, which contributes to a more positive learning environment. Despite the many positive impacts, challenges in implementing innovative approaches remain. Some teachers reported difficulties in adapting these new methods into the existing curriculum, as well as a lack of adequate training to use technology effectively. It is therefore important for schools to provide teachers with the necessary support and training to enable them to better implement innovative approaches.

The results of this study also show that parental involvement in the learning process plays an important role in supporting the success of innovative approaches. When parents are actively involved in their children's education, students tend to show higher motivation and better learning outcomes (Rachmah et al., 2020). Therefore, it is important for schools to build strong partnerships with parents to support the learning process (Ulfah & Anwar, 2024).

This discussion will address the implications of the research results related to assessing the impact of innovative approaches. It is important to emphasise that the implementation of innovative approaches focuses not only on improving academic outcomes, but also on developing students' social and emotional skills. By creating a collaborative learning environment, students can learn to co-operate, communicate and problem-solve effectively, which are essential skills in today's working world. Therefore, schools need to consider a holistic approach to education that includes both academic and non-academic aspects.

The challenges faced in implementing innovative approaches should be addressed through teacher training and professional development. Research shows that teachers who feel confident and trained in using new methods tend to be more successful in implementing them in the classroom (Sitorus, 2024). Therefore, it is important for schools to provide ongoing training programmes and support teachers in adopting innovative teaching technologies and methods.

CONCLUSIONS

Innovative approaches in education can address existing problems, such as low student engagement and unsatisfactory learning outcomes. The methods used in this study, including project-based learning and the use of technology, proved effective in improving students' motivation and learning outcomes, as well as creating a more interactive learning environment that is responsive to students' needs. Thus, this approach can be a relevant solution to improve the quality of education in Indonesia. This study has limitations, as it was conducted in a single school, making the findings less generalisable. Challenges such as

inadequate teacher training and inconsistent parental involvement may also impact the effectiveness of innovative approaches. Further research is needed to assess their applicability in diverse educational settings and identify solutions to these challenges. SMAN 1 Sindangkasih Ciamis and similar institutions should systematically refine innovative teaching practices through regular evaluations, continuous teacher training, and student feedback integration to create a more engaging, student-centered, and future-ready education system.

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