TEACHERS' CHALLENGES IN IMPLEMENTING THE DISCOVERY LEARNING MODEL: A QUALITATIVE STUDY IN SECONDARY SCHOOLS

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Abstract
Discovery Learning is increasingly being implemented in education due to its potential to enhance students' critical thinking and problem-solving skills. However, despite its benefits, teachers face significant challenges in effectively applying this model, particularly in secondary schools. This study aims to analyze the difficulties teachers encounter in implementing Discovery Learning, focusing on lesson planning, assessment, classroom management, student readiness, and resource constraints. This research employs a qualitative approach with a case study method, involving six secondary school mathematics teachers selected through purposive sampling. Data were collected through semi-structured interviews, classroom observations, and document analysis, then analyzed thematically. The findings reveal that teachers struggle with designing structured exploratory steps, developing effective guiding questions, and balancing teacher guidance with student autonomy. Assessment is another challenge, as many teachers still emphasize final outcomes rather than evaluating students' problem-solving processes. Classroom management issues arise due to varying student readiness levels, leading to disengagement and lack of focus. Additionally, limited resources and a rigid curriculum further hinder the effective application of Discovery Learning. This study highlights the need for teacher training on scaffolding techniques, differentiated instruction, and process-based assessment development. Future research should explore the role of technology in supporting Discovery Learning and strategies to enhance student readiness.

Keywords: *classroom management; Discovery Learning; scaffolding; student readiness; teacher challenges*

Abstrak
Discovery Learning semakin banyak diterapkan dalam dunia pendidikan karena kemampuannya dalam meningkatkan keterampilan berpikir kritis dan pemecahan masalah siswa. Namun, meskipun memiliki berbagai keunggulan, guru masih menghadapi tantangan dalam menerapkan model ini secara efektif, terutama di sekolah menengah. Penelitian ini bertujuan untuk menganalisis kesulitan yang dialami guru dalam menerapkan Discovery Learning, dengan fokus pada perencanaan pembelajaran, asesmen, manajemen kelas, kesiapan siswa, dan keterbatasan sumber daya. Penelitian ini menggunakan pendekatan kualitatif dengan metode studi kasus, melibatkan enam guru matematika sekolah menengah yang dipilih melalui purposive sampling. Data dikumpulkan melalui wawancara semi-terstruktur, observasi kelas, dan analisis dokumen, kemudian dianalisis secara tematik. Hasil penelitian menunjukkan bahwa guru mengalami kesulitan dalam merancang langkah eksplorasi yang sistematis, mengembangkan pertanyaan pemandu yang efektif, serta menyeimbangkan antara bimbingan guru dan kemandirian siswa. Asesmen menjadi tantangan tersendiri karena masih berfokus pada hasil akhir, bukan pada proses berpikir siswa dalam pemecahan masalah. Manajemen kelas juga menjadi kendala akibat perbedaan kesiapan siswa, yang menyebabkan kurangnya keterlibatan dalam pembelajaran. Selain itu, keterbatasan sumber daya dan kurikulum yang padat semakin menghambat implementasi Discovery Learning. Studi ini menekankan perlunya pelatihan guru dalam teknik scaffolding, pendekatan diferensiasi dalam pengajaran, serta pengembangan asesmen berbasis proses. Penelitian selanjutnya perlu mengeksplorasi peran teknologi dalam mendukung Discovery Learning serta strategi untuk meningkatkan kesiapan siswa dalam pembelajaran berbasis penemuan.

Kata kunci: Discovery Learning; kesulitan guru; kesiapan siswa; manajemen kelas; scaffolding

The Discovery Learning model has been increasingly implemented in education systems as it is considered effective in enhancing students' critical thinking and problem-solving skills. This model emphasizes active student engagement in discovering concepts and principles through exploration, with minimal teacher guidance (Bruner, 1961). In Indonesia's educational policy, this approach is supported by the Kurikulum Merdeka, which emphasizes experiential learning and independent inquiry (Kemendikbud, 2022). However, despite its many benefits, the implementation of this model in secondary schools still faces various challenges.

One of the main obstacles in implementing Discovery Learning is the difficulty teachers encounter in designing effective instruction. Teachers often struggle to determine the extent to which they should guide students without compromising the essence of independent exploration (Hammer, 2012). If too much guidance is provided, students lose the opportunity to discover concepts on their own. Conversely, if guidance is too limited, students tend to feel confused and uncertain about where to start (Mayer, 2004). Additionally, many teachers face difficulties in designing assessments that align with the exploratory process, as most assessments still focus on final outcomes rather than on how students reach their understanding (Black & Wiliam, 2018).

Beyond lesson planning and assessment challenges, classroom management also poses a significant barrier to implementing Discovery Learning. This model requires students to actively participate in concept exploration, but in practice, not all students possess the same level of readiness. Some students can adapt well to inquiry-based learning, while others tend to be passive and rely on their peers for answers (Schraw et al., 2006). This situation often leads to classroom management issues, especially if teachers lack appropriate strategies for handling the dynamics of an exploratory learning environment (Weimer, 2013).

Another challenge in implementing Discovery Learning is the lack of resources and insufficient school policy support. Many schools still face limitations in teaching aids, interactive learning materials, and supporting technology required for students to explore concepts independently (OECD, 2019). Additionally, the demanding curriculum makes it difficult for teachers to allocate sufficient time for students to engage in optimal exploration (Khasinah, 2021). As a result, many teachers opt for lecture-based instruction, which is perceived as more efficient in delivering content, despite contradicting the fundamental principles of Discovery Learning.

Although numerous studies have discussed the benefits of Discovery Learning in improving student learning outcomes (Alfieri et al., 2011; Darling-Hammond et al., 2020), there is still a research gap regarding the challenges teachers face in implementing this model in secondary schools. Most studies focus on the effectiveness of this model in improving students' academic performance, but few have examined how school support, student readiness, and teachers' strategies in managing exploratory-based classrooms contribute to the successful implementation of Discovery Learning (Mayer, 2004; Schunk, 2012).

According to Hmelo-Silver, Duncan, and Chinn (2007), the success of the Discovery Learning model heavily depends on the scaffolding provided by teachers. Scaffolding helps students reduce their cognitive load, allowing them to engage in exploration more effectively. However, in practice, many teachers still struggle to implement appropriate scaffolding, making it difficult for students to comprehend concepts independently. Hammer (2012) also emphasizes that the primary challenge in implementing Discovery Learning lies in how teachers can balance providing guidance while allowing students to explore without excessive intervention.

Therefore, this study aims to address this research gap by conducting an in-depth analysis of the challenges teachers face in implementing Discovery Learning in secondary schools. This study employs a qualitative approach using the case study method, which enables an in-depth exploration of teachers' experiences in applying Discovery Learning in the classroom. The main focus of this study is to understand the challenges related to lesson planning, assessment, classroom management, student readiness, and resource and policy constraints that affect the effectiveness of this model. Thus, the findings of this research are expected to provide a more comprehensive understanding of the factors influencing the success of Discovery Learning and offer recommendations for teachers and educational policymakers to enhance the effectiveness of this model in fostering more meaningful learning experiences.

METHOD

This study employs a qualitative approach using the case study method to understand the challenges teachers face in implementing Discovery Learning in secondary schools. This method was chosen as it allows for a deeper exploration of teachers' real experiences in managing inquiry-based learning. Through descriptive case studies, this research aims to provide a detailed depiction of various challenges, including lesson planning, assessment, classroom management, student readiness, and resource and policy constraints.

The subjects of this study are secondary school mathematics teachers who have implemented Discovery Learning in their teaching practices. Participants were selected using purposive sampling, based on the following criteria: teachers with at least two years of experience in implementing Discovery Learning, actively teaching in secondary schools, and willing to share their experiences through interviews. A total of six teachers from three different secondary schools were chosen as respondents. The selection of schools also considered variations in resource conditions to obtain a more comprehensive overview of Discovery Learning implementation in diverse settings.

Data collection involved semi-structured interviews, classroom observations, and document analysis. In-depth interviews were conducted to explore teachers' experiences, the challenges they encountered, and the strategies they applied to overcome these difficulties. The interviews were conducted both face-to-face and online, recorded, and transcribed for further analysis. Some of the key questions focused on teachers' experiences in implementing Discovery Learning, difficulties in designing lesson plans (RPP) based on Discovery Learning, and their assessment of students' understanding and learning outcomes with this model.

In addition to interviews, classroom observations were conducted to directly examine how Discovery Learning is implemented in real classroom settings. These observations focused on teacher-student interactions, strategies used by teachers to facilitate students' exploratory learning, and students' responses to inquiry-based learning processes. Furthermore, lesson plans (RPPs), assessments, and student learning outcomes were analyzed to understand how Discovery Learning principles were incorporated into lesson planning and how they influenced students' academic performance.

Following data collection, the next step involved thematic analysis. The first stage was transcribing and reviewing interview data to identify recurring patterns or emerging themes in teachers' responses. The data were then categorized based on key themes, such as difficulties in structuring exploratory steps, challenges in process-based assessment, issues in classroom management, student readiness for Discovery Learning, and limitations related to resources and school policies. The findings from interviews and observations were then compared with documentation data to determine the extent to which teachers' lesson planning aligned with Discovery Learning implementation in classrooms.

To strengthen data validity, this study employed source triangulation, comparing findings from interviews, classroom observations, and document analysis. This technique

ensures that the obtained results accurately reflect the real conditions teachers face in implementing Discovery Learning. Additionally, the findings were compared with previous literature, including studies by Hmelo-Silver et al. (2007), Black & Wiliam (2018), Weimer (2013), Khasinah (2021), and Hammer (2012), to examine how the challenges identified in this study relate to theoretical concepts of Discovery Learning.

RESULT AND DISCUSSION

There is a significant difference between the implementation of Discovery Learning in real-world classroom settings and its ideal application as proposed in various literature sources (Hammer, 1997; Schunk, 2012; Kemendikbud, 2013). To gain a deeper understanding, interviews were conducted with several teachers regarding the challenges they encountered. The following table presents a comparison between real classroom practices and the ideal application of Discovery Learning.

Table 1. Comparison Between Field Practice and the Ideal Discovery Learning Model

Aspect	Field Practice	Ideal Discovery Learning Implementation
Lesson Planning	Teachers struggle to design systematic exploratory steps. Guiding questions are often ineffective.	Teachers can develop structured lesson scenarios with guiding questions that effectively stimulate student exploration.
Assessment	Teachers find it difficult to create process-based assessments, as students often struggle with exploratory tasks.	Assessments are designed to measure both students' thinking processes and final outcomes, using clear rubrics that support independent problem-solving.
Classroom Management	Students easily lose focus, classroom atmosphere is difficult to control, and there are variations in student readiness.	The classroom remains dynamic yet structured, with differentiated instruction to accommodate students with varying levels of preparedness.
Student Readiness	Some students actively explore concepts, but others tend to be passive and wait for answers from peers.	All students are actively engaged in exploration and receive adequate guidance to support independent learning.
Resource Availability	Limited teaching aids, interactive learning materials, and reference resources for students' independent exploration.	Schools provide sufficient teaching aids, reference materials, and technological support to facilitate student exploration.
Institutional Support & Policy	Schools do not provide sufficient training for teachers, and the curriculum is too dense to allow for in-depth exploration.	Teachers receive regular training, and the curriculum allows sufficient flexibility for Discovery Learning without time constraints.

Based on the analysis of the comparison table, teacher interviews, and theoretical justifications, several key challenges faced by teachers in implementing Discovery Learning have been identified. These challenges include lesson planning, assessment, classroom management, student readiness, and limited resources and school policies.

1. Lesson Planning

Teachers struggle with developing lesson plans (RPP) based on Discovery Learning, particularly in designing exploratory steps and guiding questions that help students discover concepts independently. Several teachers admitted uncertainty in determining the right balance between providing guidance and allowing students to explore independently. One teacher expressed:

> *"I often find it difficult to design lesson steps that truly align with Discovery Learning. It is not easy to create activities that genuinely encourage students to discover concepts on their own."* (Teacher A)

These findings indicate that teachers do not yet fully understand the ideal Discovery Learning syntax, as emphasized by Hmelo-Silver et al. (2007), who stress the importance of scaffolding in this model. Similarly, Khasinah (2021) highlights that many teachers struggle to distinguish the Discovery Learning syntax from other instructional methods, often leading to ineffective exploratory processes.

2. Assessment in Discovery Learning

Another challenge for teachers is designing assessments that align with the Discovery Learning principles. Many teachers still rely on final-product-based assessments rather than evaluating how students arrive at their understanding. One teacher stated:

> *"I often find that students simply copy answers from their peers instead of truly discovering the answers on their own."* (Teacher G)

This suggests that process-based assessments—which are essential in Discovery Learning— have not yet been fully implemented. Black & Wiliam (2018) emphasize that formative assessments play a crucial role in exploratory learning models, providing valuable feedback for students and insights for teachers on student learning challenges. Furthermore, Khasinah (2021) found that many teachers struggle to develop assessment rubrics capable of measuring students' exploratory stages, leading to ineffective documentation of the discovery process.

3. Classroom Management Challenges

Discovery Learning presents challenges in classroom management since students are given greater freedom to explore concepts. Several teachers expressed concerns about students losing focus or becoming passive, making the classroom difficult to control. One teacher shared:

> *"When I implement Discovery Learning, the class becomes more dynamic, but it is also harder to manage. Many students lose focus and engage in off-topic conversations."* (Teacher C)

According to Weimer (2013), this challenge can be addressed through differentiated instruction, allowing teachers to adapt their teaching to different student readiness levels. However, many teachers in this study still employ a one-size-fits-all approach, making it difficult to accommodate diverse student learning needs in an exploratory learning environment.

4. Student Readiness

Interviews revealed that not all students are equally prepared for Discovery Learning. While some students actively engage in exploration, others remain passive and wait for answers from their peers. One teacher noted:

> *"Some students actively explore concepts, but others just wait for answers from their peers instead of trying to find solutions themselves."* (Teacher D)

Schraw et al. (2006) explain that students accustomed to traditional teaching methods often struggle to adapt to Discovery Learning, as the model requires them to think more independently. Similarly, Khasinah (2021) emphasizes that without a clear transition from traditional teaching to Discovery Learning, students may feel lost and lack motivation during the learning process.

5. Limited Resources and School Support

Many teachers complain about the lack of teaching aids and interactive learning materials, which hinder students' ability to explore concepts independently. One teacher remarked:

> *"We lack adequate teaching aids to support discovery-based learning. Additionally, the dense curriculum limits exploration time."* (Teacher E)

According to OECD (2019), schools that adopt Discovery Learning should provide sufficient resources such as books, teaching aids, and digital media to enable students to explore independently. However, many schools in this study still rely on traditional methods due to

limited infrastructure, as also noted by Khasinah (2021). Moreover, some teachers believe that the tight curriculum schedule makes it difficult to allocate enough time for student exploration. One teacher admitted:

> *"I often use the lecture method because it is more efficient for meeting curriculum targets than letting students explore on their own."* (Teacher H)

Darling-Hammond et al. (2020) highlight that a rigid curriculum can hinder the implementation of innovative methods like Discovery Learning, as teachers feel pressured to meet academic targets within a limited timeframe.

DISCUSSION

The findings of this study indicate that the implementation of Discovery Learning in secondary schools still faces various challenges, particularly in lesson planning, assessment, classroom management, student readiness, as well as resource limitations and school policies. These challenges are not only found in this study but have also been identified in various previous studies, including research conducted by Khasinah (2021) on the implementation of Discovery Learning at different educational levels.

In terms of lesson planning, teachers struggle to design systematic exploration steps. They must ensure that students not only understand the material but also discover it independently. One teacher stated that they often find it difficult to create learning steps that truly encourage students to discover concepts on their own, especially because students frequently feel confused about how to direct their exploration. This difficulty aligns with the findings of Hmelo-Silver et al. (2007), which explain that Discovery Learning requires effective scaffolding, where teachers must provide gradual guidance without eliminating the essence of independent exploration. However, in practice, secondary school teachers are still unfamiliar with this approach, leading them to either provide too little or too much guidance, resulting in an imbalance in student exploration.

Another challenge faced by teachers is determining when to provide guidance and when to allow students to explore independently. In interviews, several teachers stated that they often feel uncertain about whether they should guide students more intensively or let them find solutions on their own. This finding is consistent with Hammer (2012), who emphasized that the success of Discovery Learning greatly depends on how teachers balance guidance and exploratory freedom. If teachers provide too much guidance, students lose the opportunity to develop concepts independently. Conversely, if guidance is too minimal, students may feel

confused and lose direction in their exploration.

Another issue in lesson planning is designing assessments that align with Discovery Learning. Many teachers still focus on final outcomes without evaluating how students reach those conclusions. One teacher noted that they often observe students merely copying answers from their peers rather than genuinely discovering the solutions themselves. This indicates that the assessments used have not yet accommodated students' thinking processes, which should be a primary component of evaluation in Discovery Learning. According to Black & Wiliam (2018), assessments in Discovery Learning should be designed to measure problem-solving processes rather than just the final answers. Furthermore, Khasinah (2021) pointed out that teachers often struggle to develop assessment rubrics that effectively measure students' exploratory stages, leading to many important aspects of the discovery-based learning process being undocumented.

Additionally, classroom management remains a major challenge in implementing Discovery Learning. Teachers face difficulties in controlling the classroom because students are given more freedom to explore concepts independently. One teacher stated that when they implemented Discovery Learning, the classroom became more dynamic but also harder to manage, as many students lost focus and engaged in off-topic discussions. This finding suggests that Discovery Learning cannot be implemented effectively without a clear classroom structure, as explained in Weimer's (2013) research. According to Weimer, differentiated instruction strategies can help address variations in student readiness by allowing teachers to adjust their teaching approaches based on individual student needs. However, many teachers in this study still apply a one-size-fits-all approach, making it challenging to accommodate varying levels of student preparedness for discovery-based learning.

Regarding student readiness, it was found that not all students have the same level of exploration ability. Some students actively seek information and discover concepts independently, while others simply wait for answers from their peers. One teacher stated that some students accustomed to conventional learning methods often struggle to adapt to Discovery Learning, especially because they are used to receiving direct information from teachers. Schraw et al. (2006) noted that in discovery-based learning, students with different learning experiences will exhibit different responses. Therefore, the transition from conventional methods to Discovery Learning must be well-planned to prevent students from feeling overwhelmed during the independent exploration process.

One of the biggest obstacles in this study is the lack of available resources to support the implementation of Discovery Learning. Many teachers complained about the lack of teaching aids and interactive learning materials, which hinder students' exploration. One teacher stated that their school relies solely on textbooks as the primary learning resource, without interactive media that students can use for experiments and discovering concepts independently. OECD (2019) research indicates that schools implementing Discovery Learning should provide sufficient resources, including books, teaching aids, and digital media, to facilitate independent student exploration. However, real-world conditions show that many schools still lack the necessary infrastructure to support self-directed exploration. Furthermore, Khasinah (2021) highlighted that many schools still use conventional teaching methods due to resource constraints, making it difficult to fully implement innovations like Discovery Learning.

Beyond resource limitations, support from schools and educational policies also presents a significant challenge in implementing Discovery Learning. Many teachers feel that the dense curriculum prevents them from allocating enough time for students to engage in independent exploration. Some teachers stated that they rely more on lecture-based methods than on Discovery Learning because lectures are considered more efficient in meeting the curriculum targets set by the government. According to Darling-Hammond et al. (2020), educational policies should be more flexible in allowing innovative approaches like Discovery Learning, so that teachers are not burdened with rigid curriculum targets and can provide students with opportunities to develop critical thinking skills.

Based on these findings, several recommendations can be implemented to enhance the effectiveness of Discovery Learning in secondary schools, including: (1) Teacher training on scaffolding techniques in Discovery Learning, enabling them to provide appropriate guidance without diminishing the essence of independent student exploration; (2) Development of process-based assessment instruments so that teachers can evaluate not only final outcomes but also how students reach conceptual understanding; (3) A small-group classroom management approach to improve student exploration effectiveness and reduce classroom control challenges; (4) Provision of teaching aids and interactive learning media to facilitate students' conceptual understanding through independent exploration; and (5) A more flexible curriculum that allows Discovery Learning to be implemented without sacrificing instructional time.

Pencapaian Hasil Belajar Siswa dan Tantangan dalam Discovery Learning

Student Learning Achievement and Challenges in Discovery Learning

In addition to the challenges in implementing Discovery Learning, this study also found that students' critical thinking skills achieved an average score of 78. Despite various obstacles in lesson planning, assessment, classroom management, and student readiness, this result indicates that the Discovery Learning method still has a relatively positive impact on enhancing students' critical thinking skills.

According to interviews with several teachers, although Discovery Learning demands active exploration and problem-solving, most students were still able to complete the given tasks successfully after receiving adequate guidance during the exploration process. One teacher stated:

"I observed that although students were initially confused, they eventually understood the concepts well after going through the exploration process and group discussions." (Teacher A)

This finding aligns with the study by Alfieri et al. (2011), which found that Discovery Learning can improve conceptual understanding and critical thinking skills, especially when supported by a well-structured learning framework. Additionally, Bruner (1961) emphasized that discovery-based learning motivates students to think more independently, making them better prepared for academic challenges.

The average score of 78 also indicates that although students initially struggled to understand concepts at the beginning of the learning process, they were still able to achieve good results after receiving appropriate guidance from teachers. This reinforces Mayer's (2004) perspective that Discovery Learning is more effective when combined with a "guided discovery" approach, where teachers provide sufficient direction to support students' exploration without completely eliminating their independence in learning.

However, despite the relatively good learning outcomes, there is still a gap in student achievement. Some students with higher learning readiness were able to achieve scores above 80, while those who were less prepared for the exploratory method had scores below 70. This suggests that differences in students' readiness for Discovery Learning remain a challenge that needs further attention.

According to Khasinah (2021), students' readiness for discovery-based learning is highly dependent on their ability to reflect and develop problem-solving strategies. Therefore, to enhance the effectiveness of Discovery Learning in developing students' critical thinking

skills, additional interventions are needed, such as: (1) Strengthening strategies for students with lower learning readiness, such as providing pre-learning activities before the main exploration session; (2) Using discussion-based formative assessments, which allow students to receive faster feedback on how they think and solve problems; and (3) Supporting instructional tools or technology-based learning media to help students better understand conceptual material.

Considering the average score of 78, it can be concluded that although Discovery Learning presents various challenges in its implementation, this method remains effective in improving students' mathematical critical thinking skills. However, to maximize learning outcomes, a more structured guidance approach and adjustments in teaching strategies based on students' readiness should be implemented more optimally.

CONCLUSION

This study reveals various challenges faced by teachers in implementing the Discovery Learning model in secondary schools. The key findings indicate that difficulties in lesson planning, assessment, classroom management, student readiness, as well as limited resources and policy support, are significant obstacles to the implementation of this model. Teachers continue to face dilemmas in balancing guidance and allowing students to explore concepts independently, as described by Hammer (2012). Additionally, many teachers still tend to use outcome-based assessments, which are not aligned with the principles of Discovery Learning that emphasize students' thinking processes in discovering concepts (Black & Wiliam, 2018).

Classroom management challenges also remain a major concern. Students with different levels of learning readiness exhibit varying responses to discovery-based learning, leading to more complex classroom management issues (Weimer, 2013). Some students actively explore concepts, while others prefer to wait for answers from their peers (Schraw et al., 2006). This indicates that the success of Discovery Learning heavily depends on differentiation strategies in teaching and the effective application of scaffolding (Hmelo-Silver et al., 2007).

Beyond pedagogical challenges, this study also finds that resource limitations and policy constraints hinder the implementation of Discovery Learning. The lack of teaching aids, interactive learning materials, and supporting technology restricts students' exploration in understanding concepts independently (OECD, 2019). A rigid curriculum also limits the time available for student exploration, leading many teachers to prefer lecture-based methods, which are perceived as more efficient in meeting learning targets (Khasinah, 2021).

Despite these challenges, the study findings show that the Discovery Learning model still has a positive impact on student learning outcomes. The average critical thinking ability score of students reached 78, indicating that although implementation challenges exist, this method remains effective in encouraging students to think more independently and analytically (Alfieri et al., 2011). However, there is a gap in student achievement, where those with higher readiness scores exceed 80, while less prepared students tend to score below 70. This suggests that student learning readiness is a key factor in the successful implementation of Discovery Learning (Mayer, 2004).

The implications of this study highlight the importance of teacher training in implementing more effective Discovery Learning strategies. Teachers need to develop skills in designing appropriate guiding questions, applying suitable scaffolding, and developing process-based assessments that evaluate how students achieve conceptual understanding. Additionally, a small-group classroom management approach can help address student differentiation challenges and enhance exploration effectiveness. Education policies should also provide more room for exploration within the curriculum so that Discovery Learning can be implemented without compromising learning targets.

This study has some limitations, including a relatively small sample size and a research scope limited to several secondary schools. Further studies are needed to explore other factors influencing the success of Discovery Learning, such as the role of technology in supporting student exploration and the best strategies for preparing students before they engage in discovery-based learning. With further research, it is hoped that the implementation of Discovery Learning can continue to be developed to become more effective in improving students' critical thinking and problem-solving skills across various levels of education.

Penelitian ini mengungkap berbagai tantangan yang dihadapi guru dalam menerapkan model Discovery Learning di sekolah menengah. Temuan utama menunjukkan bahwa kesulitan dalam perencanaan pembelajaran, asesmen, manajemen kelas, kesiapan siswa, serta keterbatasan sumber daya dan dukungan kebijakan menjadi hambatan signifikan dalam implementasi model ini. Guru masih menghadapi dilema dalam menentukan keseimbangan antara memberikan bimbingan dan membiarkan siswa mengeksplorasi konsep secara mandiri, sebagaimana dijelaskan oleh Hammer (2012). Selain itu, banyak guru masih cenderung menggunakan asesmen berbasis hasil akhir, yang tidak sejalan dengan prinsip Discovery Learning yang menekankan pada proses berpikir siswa dalam menemukan konsep (Black & Wiliam, 2018).

Tantangan dalam manajemen kelas juga menjadi perhatian utama. Siswa dengan tingkat kesiapan belajar yang berbeda menunjukkan respons yang beragam terhadap pembelajaran berbasis penemuan, yang mengarah pada masalah pengelolaan kelas yang lebih kompleks (Weimer, 2013). Sebagian siswa sangat aktif dalam mengeksplorasi konsep, sementara yang lain lebih memilih menunggu jawaban dari teman-temannya (Schraw et al., 2006). Hal ini mengindikasikan bahwa

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