Implementation of Differentiated Instruction in Realizing Inclusive Learning in Primary Schools

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ARTICLE INFO	ABSTRACT
	Inclusive learning in elementary schools emphasizes accessibility and diversity in education, ensuring that all students can learn without discrimination. Differentiated Instruction (DI) is an important approach in supporting inclusive learning by adjusting teaching methods based on students' needs, interests, and learning styles. However, the implementation of DI still faces various challenges, such as lack of teacher understanding, limited resources, and education policies that do not support curriculum flexibility. This study uses a literature study method to analyze the implementation of DI in inclusive learning in elementary schools. The results of the analysis show that the implementation of DI can improve student motivation and academic outcomes, but requires teacher readiness through ongoing training and more flexible policy support. In addition, the integration of learning technology can help overcome the constraints of differentiation in heterogeneous classes. Therefore, synergy is needed between the government, schools, and the education community in providing resources and regulations that support the success of DI. With the right strategy, DI has the potential to create a more inclusive, adaptive, and effective learning environment in improving the quality of elementary education.

INTRODUCTION

Inclusive learning in elementary schools is an approach that emphasizes accessibility and diversity in the educational process. According to Budianto (2023), inclusive education aims to ensure that all students, including those with special needs or learning style differences, can fully participate in the learning environment without discrimination. At the elementary school level, this phase is crucial because it is the foundation for children's academic and socio-emotional development. If access to equitable education is not guaranteed from an early age, the learning gap will widen at the next level of education. Therefore, education policies must accommodate the needs of diverse students by adopting more flexible strategies, such as the Differentiated Instruction approach, to create a more equitable and effective learning experience for all learners.

Fuji Lestari[1], Nurul Fadhilah[2], Amalia Tasya[3]

However, the implementation of inclusive learning in elementary schools still faces various challenges, both in terms of policy, teacher readiness, and limited facilities and infrastructure. A study conducted by Lindner & Schwab (2020) shows that many teachers still feel less confident in implementing strategies that can accommodate student diversity, especially in classes with a large number of students. In addition, the curriculum that tends to be uniform often hinders flexibility in adapting learning methods according to student needs. Therefore, intensive training is needed for educators and support from various parties, including the government and school communities, so that the principle of inclusivity is not just a discourse but is truly implemented in learning practices at the elementary school level.

In addition, the lack of in-depth understanding of Differentiated Instruction (DI) is also a major obstacle in its implementation in elementary schools. According to Himmah & Nugraheni (2023), DI requires teachers to adjust the curriculum based on differences in students' abilities, interests, and learning styles. However, in many countries, the education system is still dominated by a uniform teaching approach, where students are expected to learn at the same level and pace. This often leads to gaps in academic achievement, especially for students with special needs or less supportive socio-economic backgrounds. If DI is not implemented properly, students with slower levels of understanding can fall behind, while more advanced students do not get enough challenges to develop their potential optimally.

In addition, limited educational resources are also a inhibiting factor in implementing DI effectively. A study conducted by Fauzi (2023) showed that teachers often face constraints in terms of time, workload, and access to learning materials that can be adapted to the diverse needs of students. Without adequate support, such as reducing the teacher-student ratio, developing a flexible curriculum, and providing supporting technology, it is difficult for teachers to manage inclusive classes with different approaches. Therefore, the government and education policy makers need to provide greater training and resources for educators so that they can implement DI more effectively in realizing quality inclusive learning in elementary schools.

The lack of effective implementation of Differentiated Instruction (DI) in inclusive education is also related to the low level of education policies that specifically support this approach. Many education systems still focus on uniform curriculum standards and standardized test-based assessments, which do not provide room for teachers to adjust learning methods according to the diverse needs of students (Purwowidodo & Zaini, 2023). In this context, teachers are faced with a dilemma between meeting the demands of a strict curriculum and providing more individualized learning for their students. Without flexibility in curriculum policies and evaluation systems, the DI approach tends to be just a theory without real implementation in the classroom. Therefore, education policy reform is needed that not only encourages the implementation of DI but also provides technical guidance and evaluation that is in accordance with the principles of differentiated learning.

In addition to policy reform, the involvement of various parties such as schools, parents, and the education community is also an important factor in supporting the success of DI. According to Hanipah's research (2023), support from a collaborative and open school environment to innovation plays a major role in the success of DI implementation. Teachers need the opportunity to share best practices, participate in

ongoing training, and receive guidance from educators who are more experienced in implementing DI. In addition, parental participation in understanding and supporting varied learning methods for their children can increase the effectiveness of this approach. By building a holistic education ecosystem, where all stakeholders understand and support differentiated learning, schools can be more optimal in creating an inclusive learning environment that is responsive to the needs of each student.

Although the urgency of implementing Differentiated Instruction (DI) in inclusive education is increasingly recognized, its realization at the elementary school level still faces complex structural and pedagogical obstacles. One of the main challenges is the lack of integration of the DI approach in pre-service teacher training and continuing professional development. According to research by Imran et al (2024), most teacher education programs still emphasize traditional, homogeneous teaching methods, with little emphasis on strategies that can accommodate student diversity. As a result, many teachers enter the workforce without having sufficient understanding of how to implement DI effectively in everyday learning contexts. In addition, teacher supervision and evaluation systems often still prioritize achieving uniform academic standards, so that teachers focus more on meeting curriculum targets than innovating in more inclusive and differentiated learning strategies. Therefore, overhauling the teacher education curriculum and in-service training programs based on real practice are crucial in equipping educators with the skills needed to implement DI optimally.

In addition to pedagogical aspects, the availability of educational resources and infrastructure is also a crucial factor in the implementation of DI in elementary schools. In many cases, schools in areas with limited budgets have difficulty in providing learning facilities that allow for differentiation of learning strategies, such as supporting technology, diverse teaching materials, and flexible learning environments (Dewi et al, 2024). The lack of teaching staff is also an obstacle, especially in classes with a large number of students, where teachers have difficulty adapting appropriate learning approaches for each individual. As a solution, there needs to be a policy that allocates education funds more proportionally, especially to increase the number of teaching staff, provide access to adaptive learning technology, and develop class models that are more flexible and responsive to student needs. With adequate resource support, schools can be more effective in implementing DI to ensure that every student, without exception, gets a learning experience that suits their potential and needs.

METHODOLOGY

This study uses a qualitative approach with a literature review method to analyze the implementation of Differentiated Instruction (DI) in inclusive learning in elementary schools. This method was chosen to examine theories, policies, and previous research results in order to gain a deeper understanding of the challenges and opportunities for implementing DI.

The data sources used are academic journals, reference books, education policy reports, and relevant scientific articles obtained from reputable databases such as Scopus, Web of Science, and Google Scholar. Literature selection is based on relevance, credibility, and time span (mainly from 2013 and above).

Data analysis was conducted using the thematic analysis method, which includes theme identification, data synthesis, and critical interpretation. This stage aims to group

Fuji Lestari[1], Nurul Fadhilah[2], Amalia Tasya[3]

key findings, compare research results, and evaluate gaps and implications for education policy.

Through this method, the research is expected to provide academic insights and evidence-based recommendations for policy makers and education practitioners in optimizing the implementation of DI to support more effective inclusive learning in elementary schools.

RESULTS AND DISCUSSION

Implementation of Differentiated Instruction in Inclusive Learning in Elementary Schools

1. Principles and Strategies of Differentiated Instruction in Inclusive Learning

Differentiated Instruction (DI) in inclusive learning is based on the principle that each student has unique learning needs, so teachers need to adjust teaching strategies to accommodate these differences. According to Koimah et al (2024), DI is a pedagogical approach designed to ensure that each student gets a learning experience that suits their readiness, interests, and learning styles. The main principles of DI include a student-centered approach, flexibility in learning, equal access to education, the use of various learning methods and resources, and the application of diverse assessments. By implementing these principles, teachers can create a more inclusive and effective learning environment, where each student has an equal opportunity to understand and master learning materials according to their abilities and needs. Research conducted by Ainayya (2025) also shows that DI can significantly increase student motivation and academic achievement, especially in heterogeneous classroom contexts.

To implement DI, teachers can differentiate in four main aspects, namely content, process, product, and learning environment. Content differentiation is done by presenting materials in various formats such as text, video, or infographics to suit students' learning styles. In addition, materials can be adjusted to students' readiness levels, either by simplifying concepts for those who need them or providing additional challenges for more advanced students. According to a study conducted by Almujab (2023), the use of varied materials in learning can increase student engagement and help them understand concepts more deeply. Meanwhile, process differentiation focuses on variations in learning methods, such as group discussions, project-based learning, or independent exploration. Teachers can also use tools such as mind maps and concrete manipulatives to help students understand the material better and provide scaffolding for those who need more support. A study conducted by Wahyuni (2022) revealed that when teachers apply the process differentiation method, students are more active in participating in learning and experience better conceptual understanding compared to the traditional approach.

In addition, product differentiation allows students to demonstrate their understanding in various forms, such as through presentations, writing, videos, or creative projects, according to their respective abilities and interests. A study by Gymnastiar (2024) found that students who are given the freedom to choose how they demonstrate their learning outcomes tend to be more confident and motivated in completing their academic tasks. In this way, students have the opportunity to express their understanding in the way that suits them best. Finally, differentiation of the learning environment aims to create a space that supports student diversity, such as providing quieter areas for students who are easily distracted, providing access to assistive technology, and creating an inclusive classroom atmosphere that respects differences. According to research

conducted by Marpaung (2024), a learning environment that is flexible and responsive to students' needs can improve learning outcomes and build their confidence in actively participating in the classroom.

By implementing these strategies, teachers can ensure that all students, including those with special needs, receive optimal learning experiences. The implementation of DI not only increases student engagement in learning but also helps them achieve better academic outcomes in a supportive environment. Classes that implement DI consistently have higher levels of student engagement and more significant improvements in learning outcomes than classes with traditional approaches. Through adjustments to content, processes, products, and learning environments, inclusive learning can be more effective, so that every student has an equal opportunity to develop according to their potential. Therefore, DI can be considered an approach that is not only based on theory but has also been empirically proven to increase the effectiveness of inclusive learning.

2. Effectiveness of Differentiated Instruction Implementation in Improving Learning Quality

The application of Differentiated Instruction (DI) has been proven effective in improving the quality of learning by adjusting teaching methods based on students' needs, interests, and learning styles. The concept of DI is rooted in the constructivism theory put forward by Pertiwi (2021), where effective learning occurs when students learn in the Zone of Proximal Development (ZPD), which is the boundary between what they can do on their own and what they can achieve with assistance. The application of DI allows teachers to identify and adjust learning strategies according to the level of student readiness, so that they can learn optimally in this developmental zone. A study by Kempa et al (2024), who is one of the pioneers in the concept of DI, shows that students who learn in a differentiated learning environment have a higher level of engagement compared to those in traditional learning. This is due to the fact that the DI strategy provides a variety of approaches in delivering material, such as the use of visual, auditory, and kinesthetic media, which allows students to understand the material in the way that suits them best.

In addition to improving motivation and academic outcomes, DI also plays an important role in reducing academic gaps in heterogeneous classes. In a study conducted by Jamila et al (2024), DI was shown to help students with special needs to continue to actively participate in regular classes with the adaptation of materials and more flexible teaching strategies. This approach is in line with the Universal Design for Learning (UDL) principle developed by Rose and Meyer (2002), which emphasizes that learning must be accessible to all students by providing various pathways to absorb information, express understanding, and maintain engagement in learning. In addition, the results of a study conducted by Trisnani et al (2024) showed that gifted students who were given more challenging tasks in a differentiated learning environment showed faster academic development compared to gifted students who received standard instruction. Thus, DI not only provides support for students who experience difficulties but also provides opportunities for students with high abilities to develop optimally. In addition, collaboration between students with different levels of ability applied in DI encourages more inclusive and supportive learning, as found in the study by Iriansyah et al. (2023), who emphasized that interactions in heterogeneous environments improve students' critical and social thinking skills.

Fuji Lestari[1], Nurul Fadhilah[2], Amalia Tasya[3]

However, the effectiveness of DI is highly dependent on various factors, including teacher readiness, school policy support, and the availability of adequate educational resources. In a study conducted by Laulita et al (2022), it was found that most teachers still have difficulty in implementing DI due to a lack of understanding and skills in adjusting learning to various levels of student readiness. Therefore, professional training for teachers is a key element in ensuring the success of DI implementation. The importance of developing teacher skills in analyzing student needs and using various different learning strategies. In addition, school policies must support curriculum flexibility and a more varied evaluation system, so that DI can be implemented without significant administrative barriers. A report by Taridala & Anwar (2023) showed that schools that provide teachers with the flexibility to adapt learning methods tend to have a higher success rate in implementing DI compared to schools that implement a rigid curriculum. In addition to teacher readiness and school policies, the availability of resources such as educational technology also plays an important role in supporting DI. A study by Wibowo (2023) shows that technology can enrich the learning experience in DI by providing a platform that enables personalization of learning, such as the use of artificial intelligence-based adaptive learning systems that can adjust the difficulty level of tasks based on student performance.

To ensure optimal implementation of DI, several strategic steps need to be taken. Teacher training should be a top priority so that they have a deep understanding of how to implement DI strategies effectively in the classroom. In addition, a collaborative approach between teachers, parents, and students is essential in creating a learning environment that is more flexible and adaptive to individual needs. A study conducted by Lumuan et al (2023) confirmed that parental involvement in learning planning has a positive impact on the effectiveness of DI, especially in helping students understand their role in more independent learning. Continuous evaluation should also be implemented, not only to measure academic achievement but also to assess the development of critical thinking skills, creativity, and student learning motivation in the context of DI. A meta-analysis conducted by Misnawati (2025) showed that formative assessment integrated into DI has a very large impact on improving learning outcomes, because it provides more specific feedback and helps students understand their development. The integration of technology into DI is also an effective solution for presenting learning materials that are more varied, interesting, and in accordance with the characteristics of each student.

With the various benefits offered, DI is a very potential approach in improving the quality of learning at various levels of education. However, its success is highly dependent on the readiness and support of various parties, especially teachers, schools, and the education system as a whole. Therefore, the implementation of DI must be supported by ongoing professional training, a collaborative approach, and comprehensive evaluation in order to provide maximum impact in improving motivation, academic outcomes, and overall learning quality. The various studies that have been mentioned show that DI is not just a theoretical concept, but an evidence-based strategy that has a significant impact in improving learning outcomes. With the right investment in teacher training, flexible school policies, and the use of educational technology, DI can be a promising approach in creating a more inclusive, adaptive, and quality learning system in the future.

Challenges and Strategies for Strengthening Differentiated Instruction in the Context of Elementary Education

1. Structural and Pedagogical Constraints in the Implementation of Differentiated Instruction

The implementation of Differentiated Instruction (DI) in inclusive learning still faces various obstacles, both from a structural and pedagogical perspective. From a structural perspective, the applicable education policy has not fully accommodated the optimal implementation of DI. Many education systems are still oriented towards rigid curriculum standards, which require the achievement of certain competencies within a specified time period, making it difficult for teachers to adjust learning methods to the individual needs of students. According to Gunawan & Bahari (2024), DI requires curriculum flexibility that allows adaptation to the diverse needs of students. However, in many countries, including Indonesia, the curriculum is still designed with a uniform approach that emphasizes academic achievement standards rather than meeting individual learning needs. In addition, limited resources, such as a lack of varied teaching materials, supporting technological facilities, and minimal access to digital learning devices, are major obstacles in supporting learning differentiation. Research by Naaziat et al (2024) shows that the success of DI is highly dependent on the availability of sufficient resources, both in the form of diverse learning materials and technology that supports more effective classroom management.

On the other hand, pedagogical constraints are also a serious challenge in the implementation of DI. Many teachers have not received adequate professional training to understand and apply differentiated learning strategies effectively. A study by Amelia (2023) emphasized that teacher training is a key factor in the success of DI implementation, but many teachers admitted that they did not receive sufficient training to develop learning strategies that are appropriate to the various learning styles of students. As a result, they often feel less confident or confused in adjusting learning methods to the various needs of students in the classroom. The challenge is further exacerbated by the high number of students in one class, which makes it difficult for teachers to provide individual attention to each student. This is supported by research findings from Hafizhah et al (2022) which show that large class sizes have a negative correlation with the effectiveness of DI, because teachers have difficulty managing diverse learning needs in a limited time. In addition, high administrative burdens, such as compiling academic reports, participating in various meetings, and fulfilling other demands of educational bureaucracy, increasingly take up time that teachers could have used to design and adapt more effective learning strategies.

With these various constraints, the implementation of Differentiated Instruction in elementary schools is at risk of becoming only a theoretical concept without real application in daily learning. Without more flexible policies, adequate resource support, and increased teacher capacity through comprehensive training, it is difficult for DI to be implemented effectively in educational environments. Therefore, concrete steps are needed to improve structural and pedagogical aspects so that DI can truly provide benefits to all students according to their learning needs. Schools that successfully implement DI generally have more flexible education policies, adequate resource support, and ongoing professional development programs for teachers. Thus, a more holistic approach to

Fuji Lestari[1], Nurul Fadhilah[2], Amalia Tasya[3]

implementing DI needs to be considered in order to realize more inclusive and effective learning for all students.

2. Differentiated Instruction Strengthening Strategy in Inclusive Learning

The Differentiated Instruction (DI) reinforcement strategy in inclusive learning aims to ensure that every student, including those with special needs, gets a learning experience that suits their needs and potential. DI has become an increasingly recognized approach in education as an effective method in dealing with student diversity in the classroom. Rukbi et al (2024), one of the main figures in the development of DI, stated that this approach allows each student to get learning that is aligned with their level of readiness, interests, and learning profile. With the implementation of the right strategy, DI can improve the quality of learning by providing space for students to develop according to their abilities. This also contributes to increased student engagement, because learning materials and methods that are tailored to individual needs will make them feel more valued and supported. In addition, effective DI implementation can improve teacher competence in managing inclusive classes and creating a more friendly and adaptive learning environment for all students.

One of the main strategies in strengthening DI is increasing teacher capacity through practice-based training. Teachers play a central role in inclusive learning, so they need to be equipped with a deep understanding of DI implementation. The results of a study conducted by Ningsi et al (2024) showed that many teachers still have difficulty in implementing DI effectively due to a lack of understanding and adequate training. Therefore, practice-based training is a crucial step, where teachers can gain direct experience in implementing different learning strategies according to student needs. In addition, mentoring and supervision from mentors or inclusive education experts can help teachers improve their teaching methods. A study conducted by Azri & Raniyah (2024) confirmed that teachers who received training and guidance in DI were better able to adjust learning according to student needs compared to those who did not receive training. To strengthen the implementation of DI, it is also important for teachers to be involved in discussion forums and share good practices in order to exchange experiences and find solutions to the challenges faced in inclusive learning.

In addition to increasing teacher capacity, flexibility in education policies is also an important factor in supporting the implementation of DI. A curriculum that is too rigid can be an obstacle for teachers in adjusting learning according to student needs. Research by Widyawati & Rachmadyanti (2023) shows that schools that are given greater autonomy in adjusting the curriculum tend to be more successful in creating inclusive and differentiation-based learning. Therefore, education policies need to provide space for teachers to adapt the curriculum to be more responsive to student diversity. In addition, the assessment system must also be more adaptive by allowing various forms of assessment that reflect student development more fairly and comprehensively. Policies that support differentiation-based learning will provide teachers with the flexibility to implement various learning models that are appropriate to the characteristics of inclusive classes.

The use of adaptive learning technology also plays a role in strengthening DI, especially in supporting differentiation in the delivery of materials, assessments, and learning methods. Technology has been shown to increase the effectiveness of DI, as stated in a study conducted by Lestari & Kurnia (2023), where the use of software and digital platforms allows teachers to adjust materials to the needs of each student. Technology can help provide materials that are tailored to students' level of understanding

through interactive media such as educational videos, digital-based learning applications, and online platforms that enable learning personalization. In addition, technology can also be used in formative assessments that provide real-time feedback, so that teachers can adjust their learning strategies based on student development. Technology-based learning models such as flipped classrooms or blended learning can also be a solution for students to learn at their own pace, thereby increasing the effectiveness of DI in inclusive classes. A study conducted by Nurhaswinda & Parisu (2025) found that the use of technology in DI increases student engagement and improves learning outcomes, especially for students who have difficulty learning in traditional environments.

In order for the DI strengthening strategy to run optimally, inclusive policy support and the provision of adequate resources are factors that cannot be ignored. The government needs to provide policies that are more supportive of inclusive education and ensure sufficient budget allocation for the provision of the necessary learning facilities and resources. A study by Hasanah et al (2024) emphasized that inclusive policies supported by adequate funding can improve access and quality of learning for all students. Schools also need to play an active role in creating an inclusive learning environment by providing facilities and infrastructure that support learning differentiation. In addition, parental involvement in the learning process is very important to provide additional support for students at home, so that learning implemented in schools can continue in the family environment. Research by Rosyadi (2024) shows that parental involvement in children's education can improve student motivation and learning outcomes, especially in the context of inclusive learning.

In practice, teachers need to implement differentiation strategies in various aspects of learning so that DI can run effectively. Differentiation can be done in three main aspects: content, process, and product. Content differentiation allows teachers to deliver materials with varying levels of difficulty that are adjusted to students' abilities. Process differentiation involves the use of various learning strategies such as group discussions, experiments, or project-based approaches that can accommodate different student learning styles. Meanwhile, product differentiation provides opportunities for students to demonstrate their understanding in various forms of assessment that suit their strengths and preferences, such as presentations, essays, or creative projects. The results of research conducted by Ulfah et al (2023) show that a differentiation approach that includes these three aspects significantly increases student participation and understanding in learning.

Thus, the strategy to strengthen DI in inclusive learning must be carried out comprehensively and involve various stakeholders. Increasing teacher capacity, flexibility of education policies, utilization of technology, and support from the government, schools, and parents are key factors in the success of DI implementation. If this strategy is implemented optimally, inclusive learning can run more effectively, provide equal opportunities for all students, and help them achieve their best potential in an inclusive and supportive educational environment. Previous studies have shown that this approach not only improves student learning outcomes, but also creates a more meaningful and empowering learning experience for all parties involved in the education process

CONCLUSION

Differentiated Instruction (DI) in inclusive learning in Elementary Schools aims to adjust the learning process to the needs, interests, and learning styles of each student.

Fuji Lestari[1], Nurul Fadhilah[2], Amalia Tasya[3]

The main principles of DI include a student-centered approach, flexibility in learning, equality of access to education, and the use of various learning methods and resources. By implementing differentiation in content, process, product, and learning environment, teachers can create a more inclusive and effective learning environment. The implementation of DI has been proven to increase student motivation, engagement, and academic outcomes by adjusting the level of difficulty of the material according to their readiness, while helping to reduce academic gaps by providing support for students who are having difficulties and challenges for students who are more able. The success of DI is highly dependent on teacher readiness, school policy support, and the availability of adequate resources, so teacher training is a key factor in effective DI implementation. In addition, curriculum flexibility and supportive education policies are also very important, while the integration of technology in learning can enrich the learning experience by providing more adaptive and interactive materials. To achieve maximum effectiveness, collaboration between teachers, schools, and parents is needed to support the successful implementation of DI. With the right strategy, DI can create a more inclusive, adaptive, and quality learning system for all students

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Fuji Lestari[1], Nurul Fadhilah[2], Amalia Tasya[3]

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