

Differentiated Learning Management in Improving Children's Cognitive Development and Creativity in Kindergarten

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ABSTRACT

The implementation of the Independent Curriculum at the Early Childhood Education level faces challenges in accommodating the diverse characteristics and unique learning rates of children. This study aims to explain and analyze differentiated learning management and its impact on the cognitive development and creativity of early childhood at the Kindergarten Model in Malang City. The research method used was a qualitative approach with a case study design. The research subjects included the principal and teachers, with data collection techniques using participatory observation, in-depth interviews, and documentation studies. Thematic data analysis was performed via data reduction, data presentation, and conclusion formulation, with its validity assessed through source and method triangulation. The results indicated that differentiated learning was managed systematically through the stages of planning, implementation, and assessment. Differentiation was applied to aspects of content, process, product, and learning environment by adjusting the level of readiness, interests, and learning profiles of children. This implementation has been proven to have a significant positive impact on cognitive development, especially in logical thinking, pre-mathematics, and simple problem-solving skills. In addition, children's creativity increased through meaningful play activities, free exploration, and the use of diverse media such as loose parts. This research provides a practical contribution as a reference for effective implementation strategies for the Independent Curriculum in Early Childhood Education units to create inclusive and child-centered learning.

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1. INTRODUCTION

Early childhood is a crucial period of foundational development, as this period determines how their thinking and creativity skills will develop in the future (Leggett, 2023; Nikkola et al., 2024). Experts such as Piaget and Vygotsky state that children learn actively through direct experiences with their surroundings and social support appropriate to their developmental level (Veraksa et al., 2022). In the preoperational

stage, children begin to think symbolically, solve simple problems, and have rapidly developing imaginations, necessitating a flexible, child-centered learning approach (Pardjono, 2016).

Early childhood cognitive development includes the ability to observe, remember, classify, and understand basic concepts, which are essential foundations for helping them succeed in long-term learning (Asrifan et al., 2025; Ninsiana et al., 2024). Furthermore, children's creativity is measured by the speed at which they generate ideas, their ability to transform ideas into various forms, their ability to generate new ideas, and their ability to elaborate on those ideas (Damayanti et al., 2023; Fakaruddin et al., 2024; Kupers et al., 2019). Additionally, children's creativity develops best when their learning environment fosters a passion for learning and provides a free space for expression (Maslin et al., 2023). Therefore, the learning environment plays a crucial role in simultaneously developing these two aspects of development.

Differentiated learning is a teaching method that focuses on adapting materials, learning methods, assignments, and the learning environment to suit the child's abilities, interests, and learning styles (Goyibova et al., 2025; Tomlinson, 2014). This approach is relevant in early childhood education because every child develops at a different pace (Ngaisah & Aulia, 2023). Differentiated learning also aligns with the principles of the Independent Curriculum, which encourages a responsive, inclusive learning process that respects the differences of each child (Hidayat et al., 2025; Trisnani et al., 2024).

Theoretically and based on real-life experience, differentiated learning has a positive impact on the cognitive development of early childhood (Astuti & Afendi, 2022). Adapting materials helps children learn at an appropriate level of difficulty, varying learning methods increases active engagement, and adapting task outcomes offers children the opportunity to demonstrate their understanding in appropriate ways (Ngaisah & Aulia, 2023). These adaptations ensure children learn within their zone of proximal development, as described by Vygotsky, allowing optimal development of thinking skills and conceptual understanding (Clarà, 2017).

Differentiated learning is important because teachers face students with varying abilities, interests, learning styles, and backgrounds within a single class (Geletu & Mihiretie, 2024). Teachers cannot use the same learning strategies for all students in such heterogeneous settings. Through differentiated learning, teachers adjust learning objectives, processes, and products to suit student needs, ensuring that each student receives equitable and meaningful learning opportunities (Fidiasih et al., 2025; Sayidah & Hidayat, 2025; Zulaikha & Laeli, 2023). Differentiated learning is conducted regularly through planning, implementation, and assessment stages. Differentiation is applied to aspects of the material, process, outcomes, and learning environment based on the child's level of readiness, interests, and learning style. Differentiated learning has a positive impact on children's cognitive development, particularly in logical thinking skills, basic mathematics, and simple problem-solving skills (Lestari et al., 2024). Furthermore, differentiated learning also enhances children's creativity through meaningful play activities, free exploration, and the use of diverse media such as loose parts. Research findings indicate that differentiated learning is an appropriate and

effective approach for implementing the Independent Curriculum in early childhood education (PAUD) units (Kastanja & Patilima, 2024).

However, in practice, the implementation of differentiated learning does not always run smoothly. Teachers often encounter obstacles in managing the learning process, from planning, implementation, and evaluation, especially when meeting institutional standards with limited resources. The Malang City Model Kindergarten also faces this situation, as the institution strives to uphold high quality and learning outcomes. Early childhood cognitive skills, such as observing, grouping, remembering, and solving simple problems, are an important foundation for long-term learning success (Chen, 2025).

Several previous studies have shown that differentiated learning can increase early childhood engagement and creativity (Arofaturrohman et al., 2023; Astuti, I., & Afendi, 2022; Kastanja & Patilima, 2024). However, most of these studies still focus on the effectiveness of methods or learning outcomes, and few have thoroughly studied the comprehensive management of differentiated learning—from planning to implementation to assessment—and its relationship to children's cognitive development and creativity, particularly in model kindergarten settings.

Recognizing this gap, this study explores the management of differentiated learning in Model Kindergartens in Malang City, as well as teachers' perspectives on its impact on early childhood cognitive development and creativity. This research uses a qualitative approach to gain a more profound understanding of real-world practices and is expected to provide theoretical and practical benefits in developing early childhood education that is more tailored to individual children's needs.

2. METHOD

This study used a descriptive qualitative approach to gain a deeper understanding of the management of differentiated learning and its relationship to the cognitive abilities and creativity of early childhood. A qualitative approach was chosen because it allows researchers to study educational phenomena naturally and contextually and to analyze the meaning inherent in learning practices in real-world settings. This approach was deemed appropriate for uncovering the processes, experiences, and perspectives of teachers in managing differentiated learning. The study was conducted at the Malang City Model Kindergarten, which was purposefully selected because it is characterized as a quality school and has implemented differentiated learning principles. The research subjects included the principal and class teachers directly involved in the planning, implementation, and assessment of learning.

Data collection techniques included observation, in-depth interviews, and document analysis. Observations were used to directly watch differentiated learning practices in the classroom. In-depth interviews were conducted to understand the thoughts, experiences, and perspectives of teachers and principals. Document analysis was used to review various learning tools such as the RPPM (Lesson Plan), RPPH (Lesson Plan), and assessment documents. The use of various data collection techniques aligns with

Creswell and Creswell (2017) opinion, which emphasizes the importance of utilizing multiple data sources to obtain a comprehensive picture of the phenomenon.

Data analysis was conducted interactively using a model developed by Miles and Huberman. This model consists of three main stages: data reduction, data presentation, and drawing conclusions or verification. This study performed simultaneous analysis during the data collection process, enabling researchers to consistently reflect on and enhance their comprehension of the data. This analysis model is considered effective in qualitative research because it presents data in a structured manner and facilitates researchers in drawing meaning from field observations.

To ensure data validity, triangulation of sources and methods was used, as well as increased observational diligence. Triangulation was conducted by comparing data from various sources, such as observations, interviews, and documents, thereby increasing the credibility and validity of the findings. By implementing this method, the research results are expected to be highly reliable and provide a clear picture of how differentiated learning is managed at the Malang City Model Kindergarten.

3. RESULTS AND DISCUSSION

Results

Managing Differentiated Learning in Malang City Model Kindergarten

Research shows that differentiated learning at the Malang City Model Kindergarten is implemented systematically and consistently. This is based on an interview with the school principal:

"At Model Kindergarten, differentiated learning is not just a trend but a foundation of our vision and mission. We are committed to a child-centered, inclusive, and adaptive approach. My role as principal is to ensure this policy is reflected in the curriculum and to provide inspiration and academic supervision to ensure teachers consistently implement it."

The principal and teachers play an active role in every step of the learning process. School policy serves as the primary foundation for implementing differentiated learning. This fact is evident in the school's vision, mission, and curriculum, which emphasize a child-centered, inclusive, adaptive, and creative learning approach. The kindergarten principal plays a crucial role as a policy maker, academic supervisor, and teacher inspiration in consistently implementing the principles of differentiation.

The research also indicates that the principal and teachers have a sufficient understanding of the concept of differentiated learning. They understand learning to accommodate differences in children's readiness levels, interests, and learning styles, so the learning process is not designed to be uniform. Teachers view children's diversity as an opportunity to be supported, not a barrier. This understanding provides a crucial foundation for implementing differentiated learning effectively in the classroom. This perspective is consistent with the following interview with a teacher:

"We don't see differences as obstacles. Instead, they're opportunities. We understand that every child has different levels of readiness, interests, and learning styles. It is our responsibility to adapt to each child's unique needs and interests, ensuring that learning is not uniform or universally applicable."

During the lesson planning stage, differentiation is based on the results of initial assessments. Teachers observe children's development, interview parents, and collect data on their growth to determine their learning styles. This data is used as the basis for developing the RPPM (Regional Learning Plan) and RPPH (Regional Learning Plan), which encompass differences in materials, teaching methods, learning outcomes, and the learning environment. The principal also conducts regular monitoring and evaluation to ensure that teaching plans address the differing abilities and needs of each child. These results demonstrate that learning is not merely administrative but is based on data and the children's actual needs. This evaluation is based on the following interviews with teachers and the principal:

Teacher: "Everything starts with data, not just administration. We conduct initial assessments through observations of child development, interviews with parents, and collection of growth data. We use the results to develop RPPM (Lesson Plan) and RPPH (Lesson Plan) plans that differentiate materials, methods, and learning environments."

Principal: "I also conduct regular monitoring to ensure the plans teachers create truly address the differences in each child's abilities."

Throughout the learning process, differentiation is implemented through flexible center activities and thematic learning. Children are provided the opportunity to choose activities, media, and learning methods according to their interests and abilities. Teachers act as facilitators, providing gradual challenges, individual and small group guidance, and stimulation appropriate to the child's abilities. The use of various learning media, such as educational games, free materials, and visual and audiovisual media, helps enrich the learning experience and supports various learning styles.

Observations of the implementation of differentiated learning in grades A5 and B4 indicate that teachers provide a variety of games that stimulate children's cognitive development and creativity. This is based on the following interview with the teacher:

Teacher: "We use a flexible and thematic learning center system. Children are free to choose their activities, media, and learning methods. For example, we provide a variety of media, from educational play equipment and natural materials (loose parts) to audiovisual media."

Furthermore,

Teacher: "We act as facilitators. We provide gradual challenges (scaffolding), provide individual or small group guidance, and provide stimulation appropriate to their learning abilities. In grades A5 and B4, our focus is on providing various games that specifically stimulate children's cognitive and creative abilities."

The following is a summary of interview findings in Table 1.

Table 1. Summary of Interview

Dimensions	Key Findings
Leadership	The principal plays an active role as a policy maker and academic supervisor.
Assessment	Learning styles are determined through observation and parental involvement.
Strategy	A center system is used that allows children to choose media and activities.
Learning Media	A combination of natural materials, educational materials (APE), and digital (audiovisual) devices is used.

Furthermore, below are presented differentiated learning activities in Group A5 in Figure 1 and differentiated learning activities in Group B4 in Figure 2.



Figure 1. Differentiated Learning Activities in Group A5



Figure 2. Differentiated Learning Activities in Group B4

Assessment in differentiated learning at the Malang City Model Kindergarten is conducted authentically and comprehensively. Teachers use observations, portfolios, projects, and brief notes to monitor individual children's development. Assessments do not compare children to one another but rather assess each child's progress based on their developmental baseline. Assessment results are used as a basis for designing

instructional improvements, making assessment an integral part of the learning process.

The Impact of Differentiated Learning Management on Children's Cognitive Development and Creativity in Malang City Model Kindergarten

In terms of impact, research shows that differentiated learning has a positive influence on the cognitive development of early childhood. Children demonstrate improved logical thinking skills, number comprehension, object grouping, pattern understanding, and problem-solving abilities through play tailored to their learning readiness level. Children become more focused, engaged, and confident in participating in learning activities because the challenges presented are tailored to each child's individual abilities. This is based on the following interviews with teachers and the principal:

Teacher: "The changes are very significant. Because the game challenges are tailored to each child's level of readiness, the children are more focused. Cognitive-wise, we see improvements in their logical thinking skills. They grasp number concepts more quickly, are adept at grouping objects, and recognize patterns better."

Principal: "Yes, the key is the 'appropriateness' of the challenge. Because the tasks are neither too difficult nor too easy for them, the children become more confident when solving problems. They are no longer afraid of making mistakes while learning."

Furthermore, differentiated learning also influences the development of children's creativity. Children are given space to freely express themselves through a variety of activities and tools, such as drawing, collage, finger painting, construction, and the use of free materials. A learning environment that does not require consistent results encourages children to experiment, express ideas creatively, and produce diverse works based on their imagination. These findings demonstrate that differentiated learning is important in helping children develop greater self-confidence, creativity, and flexibility in thinking. This is consistent with the following interview results with teachers and the principal:

Teacher: "We provide ample space for expression. In the art or block center, for example, children are free to choose their tools; some enjoy drawing, collage, finger painting, and even building. We provide lots of loose parts for them to play with as they please."

Furthermore, the teacher stated:

"We don't demand uniform results or 'what it should be.' Our learning environment allows them to experiment. The results are very diverse; each child produces unique work based on their own imagination. This makes them more flexible in their thinking."

This is reinforced by the principal's statement:

"The children are much more engaged. They come to school enthusiastically because they know they're doing something they enjoy and are capable of. Their self-confidence grows rapidly because each small achievement is recognized according to their individual progress."

The following is a summary of interview findings in Table 2.

Table 2. Summary of Interview

Developmental Aspects	Interview Findings
Cognitive	Improved logical thinking skills, number understanding, and object classification.
Creativity	Freedom to experiment with various media (collage, construction, etc.).
Psychological	Children are more confident, focused, and willing to take on challenges.
Work Output	Diverse and unique work (no rigid standards).

Supporting and Inhibiting Factors in Managing Differentiated Learning in Model Kindergartens in Malang City

This study also identified factors that both facilitate and hinder the implementation of differentiated learning. Supportive factors include the principal's leadership with a long-term vision, teacher capability and collaboration, a flexible curriculum, adequate facilities and equipment, and a culture of reflection and sharing of positive experiences. This is consistent with the following interviews with teachers and the principal:

Principal: "The key lies in leadership with a long-term vision. We don't just focus on immediate results but also on how this flexible curriculum can shape children's character. Furthermore, we are supported by adequate facilities and a culture of reflection. Teachers here regularly share positive experiences, fostering a strong spirit of collaboration."

Teacher: "Yes, collaboration between teachers is very helpful. We continue to hone our skills, and the availability of resources makes it easier for us to prepare various learning materials for our children."

Meanwhile, several barriers were identified, such as limited planning time, differing teacher understandings of differentiated learning, difficulties in classroom management, limited resources, and a mismatch between some parents' expectations and the principles of differentiated learning. This is based on the following interviews with teachers and principals:

Teacher: "The biggest challenge is usually limited planning time. Preparing different activities for one class takes extra time. Furthermore, classroom management can be

difficult when all the children are actively engaged with their own choices. Sometimes there are still differences in understanding among peers or limited resources for certain themes."

Principal: "Another issue is parental expectations. Some parents don't fully understand the principle of differentiation and still want uniform or conventional learning outcomes."

To address these issues, the school conducted internal training, fostered collaboration between teachers, utilized simple materials, and maintained communication with parents. This is based on interviews with teachers and the principal, as follows:

Principal: "We regularly hold in-house training to align teachers' perceptions. Regarding parent issues, we maintain intensive communication to explain that every child is unique."

Teacher: "To manage resources and time, we collaborate and start utilizing simple materials (loose parts) that are easy to find but still have high educational value."

From the results of the interview, it can be concluded that the management of differentiated learning in the Malang City Model Kindergarten has been planned & structured: not just a spontaneous activity but based on assessment data; flexible: able to adapt to the diversity of children's needs; and positive impact: significantly improving cognitive and creativity aspects. The following is a summary of supporting and inhibiting factors in Table 3.

Table 3. Summary of Supporting and Inhibiting Factors

Supporting Factors	Inhibiting Factors	School Solutions
Long-term visionary leadership.	Limited planning time.	In-House Training.
Flexible curriculum and comprehensive facilities.	Complex classroom management.	Utilization of simple/waste materials.
A culture of collaboration and teacher reflection.	Differing parental expectations.	Education and communication with parents.

Overall, the study results indicate that the implementation of differentiated learning at the Malang City Model Kindergarten is planned, structured, flexible, and tailored to the children's needs. This management approach has a positive impact on the cognitive and creative development of early childhood and strengthens the school's role as a learning environment that responds to student diversity.

Discussion

This research discussion shows that the management of differentiated learning at the Malang City Model Kindergarten is carried out with a clear and structured plan and is supported by the principal's policies that focus on meeting the various needs of children.

Teachers' understanding of the concept of differentiated learning is the main foundation for successful implementation. Teachers view differentiated learning as an approach that adapts content, processes, outcomes, and learning environments to suit children's readiness, interests, and learning styles. This aligns with the views of [Demirci-Ünal and Öztürk \(2025\)](#), [Tomlinson \(2014\)](#), and [Trisnani et al. \(2024\)](#), who emphasize that differentiation is an active and responsive approach to the uniqueness of each child, particularly in early childhood education, where each child has their own unique developmental path.

During the planning stage, differentiated learning at the Malang City Model Kindergarten is conducted based on diagnostic assessments and mapping of children's learning profiles. Teachers identify children's readiness, interests, and learning styles as the basis for developing RPPM (Learning Plan), RPPH (Learning Plan), and teaching modules. The principal also plays an active role through academic supervision and regular evaluations to ensure that learning plans truly align with children's needs. These findings reinforce the opinions of [Lestari \(2024\)](#), [Ngaisah and Aulia \(2023\)](#), who emphasized that diagnostic assessment is a key requirement for realizing effective and inclusive differentiated learning, and aligns with the principles of the Independent Curriculum, which places children at the center of learning.

In the learning process, differentiation is implemented through customizable themes and learning centers, providing various activity options, using various learning media, and creating a flexible learning environment. Teachers act as facilitators, providing challenges appropriate to children's abilities and readiness levels, and encouraging active participation through various play styles. This approach aligns with the opinions of [Goyibova et al. \(2025\)](#), [Sianturi \(2025\)](#), who stated that the teacher's role in differentiated learning is to tailor learning experiences to children's needs and interests to make the learning process meaningful and enjoyable.

Assessment in differentiated learning at the Malang City Model Kindergarten is conducted authentically, continuously, and focused on child development. Teachers use observations, portfolios, and documentation of work as a basis for reflecting on and improving the learning process. This assessment approach aligns with the thinking of [Trisnani et al. \(2024\)](#), who emphasize that assessment in differentiated learning in early childhood education (PAUD) should focus on the process and children's progress, not just the outcome.

Differentiated learning has been shown to have a positive effect on children's cognitive development. Children demonstrate improved logical thinking, numeracy, grouping, and problem-solving skills through play activities tailored to their individual abilities. These results align with research by [Allen et al. \(2015\)](#), [Surandika et al. \(2023\)](#), which states that early childhood cognitive development develops optimally when learning experiences align with their developmental stage and readiness.

Furthermore, differentiated learning also influences children's creativity. Providing freedom of expression, various learning media, and the use of loose-part materials encourage children to imagine, experiment, and create original works. This finding is consistent with the views of [Murray \(2023\)](#), [Tok \(2022\)](#), who asserted that children's

creativity flourishes when they are afforded the freedom to explore, play, and create. The use of loose-part materials as learning media has also proven effective in enhancing children's creativity, as found by [Sumarmi and Afendi \(2022\)](#).

Additionally, the discussion reveals factors that support and hinder the implementation of differentiated learning. The main supporting factors include the principal's visionary leadership, teacher competence and commitment, a collaborative work culture, the availability of learning resources, and parental involvement. This aligns with the opinions of [Keane et al. \(2020\)](#), who emphasize the role of principal leadership in creating an innovative learning environment. Meanwhile, inhibiting factors such as limited time for planning, differences in teacher understanding, classroom management difficulties, limited resources, and parental expectations that are not fully aligned with the principles of differentiated learning, as found by [Mahfudz \(2023\)](#), also contribute to this.

Overall, this discussion demonstrates that differentiated learning at the Malang City Model Kindergarten not only enhances children's cognitive development and creativity but also strengthens inclusive, adaptive, and child-centered learning practices. The findings of this study have important implications for developing school policies, improving teacher competency, and strengthening the implementation of differentiated learning in early childhood education units.

4. CONCLUSION

This study provides significant evidence that differentiated learning effectively supports the cognitive, social, and emotional growth and development of young children. This method showcases how adaptable teaching methods can foster an inclusive learning environment that caters to each child's unique needs. Furthermore, a strong relationship between teachers and students is a key factor in achieving success, encouraging children to be more confident and enthusiastic. The benefits of this study emphasize the importance of recognizing individual differences as a basis for designing an effective and sustainable educational approach. From a scientific perspective, this study updates the viewpoint on the implementation of differentiated learning, especially in the local context of early childhood education in Indonesia. By comprehensively explaining the techniques and their impact, this study provides practical guidance for educators while also expanding insight into the field of inclusive education.

As a suggestion, considering that strong relationships are the key to success, teachers are advised to continue honing their empathetic communication skills to build children's confidence and enthusiasm for learning. Increase sharing sessions between teachers to overcome classroom management constraints and time constraints in designing teaching preparations. For further research, conduct similar research involving a larger and more diverse sample (not just limited to one school or two teachers) to obtain a more general picture. In addition, use a survey or mixed-methods approach to obtain comprehensive data that can strengthen the basis for making educational policies at the macro level.

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