



A Meaningful Learning Framework for Autistic Students: Teacher Innovation in Elementary

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Abstract: This study aims to describe the implementation of Meaningful Learning in an inclusive elementary school and to analyze its impact on students' learning outcomes. The study employed a qualitative approach using a case study design conducted at SDN Pajang 1 Surakarta. The participants consisted of one classroom teacher, one special education teacher (GPK), and one autistic student. Data were collected through observations, interviews, and documentation, and were analyzed using data reduction, data display, and conclusion drawing. The findings indicate that Meaningful Learning was implemented through the use of concrete and visual media, experience-based learning activities, adapted student worksheets and evaluation methods, and flexible support tailored to the emotional conditions of the autistic student. Teachers connected learning materials to students' daily lives, enabling abstract concepts to be understood through real-life experiences. Collaboration between the classroom teacher and the special education teacher further strengthened student understanding through simplified materials and individualized guidance. The implementation of Meaningful Learning positively influenced the student's conceptual understanding, learning focus, classroom engagement, emotional stability, and motivation. These findings suggest that Meaningful Learning not only enhances the academic development of autistic students but also provides practical implications for inclusive elementary education, particularly in designing adaptive instruction and strengthening collaborative teaching practices.

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Introduction

Meaningful Learning proposed by David Ausubel, highlights that learning becomes more productive when students relate new information to their current knowledge framework. As per Ausubel (Bryce, 2024), Significant learning leads to enduring comprehension as learners engage directly in their cognitive activities. The implementation of significant learning for autistic students emphasizes hands on activities, the incorporation of visual resources, and customized education adjusted to personal requirements (Pettersson-Bloom & Holmqvist, 2022). This method has been demonstrated to enhance conceptual comprehension and bolster long-term retention via organized and contextual learning techniques (Yakubova et al., 2023).

Educators must implement inclusive teaching strategies that consider the various learning preferences of autistic students. (Azuka, C. V., Wei, C. R., Ikechukwu, U. L., & Nwachukwu, 2024) states that inclusive learning design should cater to students' cognitive differences by using visual, auditory, and kinesthetic methods to present material, ensuring that all students, including those with special needs like autism, can effectively access and



comprehend concepts. This design extends beyond merely adjusting media; it includes versatility in delivery methods, chances for students to demonstrate their comprehension in various ways, and the choice of instructional strategies that cater to personal requirements (Inclusive Instructional Design for Neurodiverse Learners, 2024). The qualitative study “Barriers general education teachers face regarding the inclusion of students with autism” (Jaffal, 2022) disclosed that educators frequently lack targeted training, collaborative assistance, and resources for adapting instruction. Teachers in inclusive education must be creative to modify learning for the requirements of students with special needs. (Minsih et al., 2021) indicates that educators encounter considerable difficulties in modifying teaching strategies and tools for autistic students who need personalized support. Furthermore, (Mujahid et al., 2024) highlights the necessity for an adjusted curriculum to ensure that educational resources and activities are more attainable and relevant for learners with learning disabilities. Additional studies conducted by (Taufik, Muhamad et al., 2021) also emphasized that teacher self efficacy is an essential element, as educators with high self-efficacy can more effectively adapt and employ inclusive approaches. These three studies highlight that teacher innovation encompasses not just developing new strategies but also tailoring learning to be meaningful for every student, including those with autism.

Students with autism exhibit unique traits, including challenges in social engagement, communication, and repetitive actions, which directly affect their learning experience and results (Barokatin, R., Nasir, M., & Jannah, 2023). Autism Spectrum Disorder (ASD) is a neurodevelopmental condition marked by ongoing challenges in communication and social engagement (Hirota, T., & King, 2023). This condition also encompasses limited and repetitive patterns of behavior, interests, and activities. These symptoms typically emerge in early childhood and exhibit a broad range of severity, leading to differing manifestations among individuals and affecting learning capabilities and social interactions in school settings (Zeidan, J., 2022). The worldwide prevalence of ASD is also rising, exhibiting significant regional differences, highlighting the importance of a tailored educational strategy for autistic learners (Salari, N., 2022). The effectiveness of teachers in delivering relevant, contextual learning tailored to the unique needs of autistic students significantly impacts their learning outcomes (Rustandar, D., & Widinarsih, 2021).

Enhancing the educational results of autistic students following the implementation of a significant learning method, such as studies conducted by (Mauliddiyah, R., & Permata, 2024) indicates that Meaningful Learning through interactive visual media can enhance involvement and comprehension of fundamental science concepts for students with autism. A comparable statement was made by (Maulidah & Mufalakhah, 2024), who discovered that using concrete and visual experiences in learning enabled autistic students to enhance their academic performance by as much as 35% in comparison to traditional approaches. Although previous studies have explored Meaningful Learning and inclusive practices for autistic students, such as those conducted by (Mauliddiyah, R., & Permata, 2024) and (Sinyanyuri et al., 2024), these studies primarily focus on learning outcomes, media use, or policy implementation at a broader level. In contrast, the present study distinguishes itself by providing an in depth qualitative case study that closely examines the classroom level instructional process involving one autistic student in an inclusive elementary school. This study places particular emphasis on the collaborative roles of the classroom teacher and the special education teacher (GPK) in designing and implementing Meaningful Learning. Furthermore, this research extends beyond academic outcomes by examining students’ learning focus, emotional stability, and classroom engagement as integral elements of



meaningful learning. These features offer a contextual and practice oriented contribution that complements existing research on inclusive education for autistic students.

Nonetheless, applying meaningful learning for autistic students comes with its own obstacles. Educators require expertise and inventiveness in creating media, choosing suitable techniques, and adapting the curriculum to meet learning goals (Baek, H., Lee, Y., & Choi, n.d.). Issues like inadequate resources, teachers' administrative responsibilities, and insufficient training significantly hinder the effective execution of meaningful learning in inclusive educational settings (Bolourian, Y., 2021). Qualitative study by (Jaffal, 2022) revealed that general education teachers often face significant barriers in implementing inclusion of autistic students, such as lack of specialized training, little collaboration with special education teachers, and limited school resources.

The application of inclusive education in Central Java, especially in Surakarta City, has demonstrated a notable increase over the last five years. Public elementary schools have started to open inclusive classes and welcome students with autism, but not all can offer adaptive learning services, as stated by the Center for Inclusive Education (Rahmania, L., Nurhayati, S., & Syafrina, 2023). (Sinyanyuri et al., 2024) Although there are still few adaptive and needs-based teaching strategies for autistic children, this conclusion is also backed by (Rahayu, D., & Hapsari, 2024) which showed that the primary barriers to executing inclusive education in Surakarta consist of insufficient continuous training, inadequate visual resources, and reduced cooperation between general teachers and GPK.

Studies on significant learning and the influence of educators in facilitating the learning journey of autistic students have taken place in multiple settings. Research conducted by (Tay & Kee, 2019) demonstrated that employing open ended questions and positive reinforcement can enhance engagement, comprehension, and learning motivation among autistic students in inclusive settings. These results highlight the significance of impactful teacher-student interactions, aligning with the notion that meaningful learning necessitates active student engagement and attentive communication from educators. Moreover, the research (Minsih et al., 2021), Instructing autistic children necessitates that educators modify and implement creative methods suited to their specific requirements. This is consistent with results (Minsih et al., 2021) This research indicates that general education teachers and special education instructors encounter notable difficulties in adjusting teaching techniques and resources for students with special needs, including those with autism, particularly when learners struggle to concentrate and need considerable assistance. This scenario highlights that innovation from teachers is essential rather than optional, ensuring that the learning experience is impactful and relevant for students with special needs. In this research, educators must adapt their teaching strategies, establish effective communication with parents, and create learning experiences that are adaptable and sensitive to the child's needs. This aspect relates to the goals of this research, highlighting the significance of meaningful learning as a method that offers contextual learning experiences suitable for the abilities of autistic learners. Consequently, the findings of this research (Minsih et al., 2021) This research emphasizes the significance of teacher creativity in fostering adaptive, inclusive education that enhances the growth of autistic children.

According to the description above, research is required that not only outlines the conditions for effective learning but also explores in detail how this approach can enhance the academic growth of autistic students in inclusive elementary settings. This study focuses on examining the implementation of Meaningful Learning as a form of teacher innovation in



instructing autistic students at SD N Pajang 1 Surakarta and exploring its effects on students' academic development.

SD N Pajang 1 Surakarta was selected as the case study site based on methodological and contextual considerations. The school is a public inclusive elementary school that actively implements inclusive education by accommodating students with Autism Spectrum Disorder (ASD) in regular classrooms. This school provides a relevant setting to examine Meaningful Learning because classroom teachers and a special education teacher (GPK) collaboratively design and implement adaptive instructional strategies during daily learning activities. Rather than representing an exceptional or elite model, SD N Pajang 1 reflects a typical inclusive public school context in Surakarta, allowing this study to capture realistic classroom practices and challenges. The presence of continuous teacher and GPK collaboration and contextual learning practices makes this school an appropriate case for exploring how Meaningful Learning is enacted at the classroom level for autistic students.

Research Method

This study employed a qualitative approach with a case study design following (Yin, 2023). The case study approach was used to gain an in-depth understanding of the implementation of Meaningful Learning in its real-life classroom context. This approach was appropriate to the research focus, which examined the instructional practices of a classroom teacher and a special education teacher (GPK) in supporting the learning process of an autistic student in an inclusive elementary school. The study involved one autistic student enrolled in an inclusive classroom at SD N Pajang 1 Surakarta. The classroom teacher had experience teaching in inclusive elementary school settings. The special education teacher (GPK) had a formal educational background in special education and experience in providing individualized support for autistic students, selected through purposive sampling due to their direct involvement in the learning process. The study was conducted at SD N Pajang 1 Surakarta over one academic semester, and data collection included preparation activities, observations, documentation, and interviews with teachers. The research instruments consisted of observation guidelines, interview guides, and documentation.

Data sources included primary data obtained from observations and interviews, as well as secondary data in the form of school documents such as lesson plans, evaluation results, and activity photographs. Data collection was carried out using three main techniques: observation, interviews, and documentation. Data validity was ensured through credibility, transferability, dependability, and confirmability, supported by triangulation of data collection techniques and sources. Data analysis was carried out in three stages: data reduction, data display, and conclusion drawing. Data selection involves selecting, focusing, and simplifying data related to meaningful learning processes for autistic students, including observations of students' focus, responses, and understanding during learning activities. Observations of autistic students include their ability to follow instructions, maintain attention, and participate in learning with the help of classroom teachers and GPK. Data presentation is done by organizing the reduced data into descriptive narratives and tables based on key aspects of meaningful learning. Drawing conclusions involves interpreting patterns and relationships among findings obtained from three informants, namely the classroom teacher, autistic students, and GPK. As this was a qualitative study, no statistical tests were applied, and the data were compared based on the consistency of findings across sources.



Results and Discussion

The findings of this study provide a detailed overview of the implementation of meaningful learning in inclusive classrooms for students with Autism Spectrum Disorder (ASD). Interviews with the classroom teacher, Special Education Teacher (GPK), and students highlighted key aspects such as adjustments to learning materials, teaching strategies, student preferences, and observed impacts on engagement and understanding. This information serves as an empirical basis for the discussion, connecting specific classroom practices with broader research on inclusive education and meaningful learning.

Table 1. Interview Results the Implementation of Meaningful Learning

Aspect/Informan	Interview Findings
Overview of Meaningful Learning Application/YN (learning materials)	Classroom teachers understand meaningful learning as learning that relates material to everyday life, is presented in an interesting way, and involves students' direct experiences based on the results of discussions in the teacher learning community.
Modification of Educational Resources and Media/YN (teaching strategies and innovation in visual learning media)	Teachers adjust LKPD and evaluation forms and use concrete and visual learning media because autistic students have difficulty understanding verbal explanations.
Function of the Special Education Teacher (GPK)/NN (teaching strategies)	GPK plays a role in simplifying written material and providing additional explanations because even though students are able to read, their understanding is limited and they are more interested in visual media and practical activities than in numerical materials such as mathematics.
Student Preferences for Learning/AA (student preferences)	Students enjoy learning Indonesian using pictures and stories, find it easier to understand material that suits their interests, and are more comfortable learning independently than in large groups.
Comprehension of Learning Resources by Students/YN (observed impacts on engagement and understanding)	The class teacher stated that students' ability to remember and explain material was influenced by the way the learning was presented, where material based on concrete objects and everyday experiences was easier to understand than abstract material.
Effects of Implementing Meaningful Learning/YN & NN (observed impacts on engagement and understanding)	Classroom teachers and GPK agreed that teacher creativity through tailored learning, the use of concrete learning resources, and consistent collaboration can improve students' focus, engagement, understanding of learning, and academic, social, and emotional development.

The findings in Table 1 show that the autistic student demonstrated a preference for visual learning media, particularly images, during the learning process. This preference can be explained through cognitive load theory, which states that visual representations help reduce cognitive load by presenting information in a more concrete and structured form. For autistic students, visual materials minimize reliance on abstract verbal explanations that may increase cognitive demands. In addition, theories of visual processing in Autism Spectrum Disorder suggest that autistic learners tend to process visual information more effectively than verbal information. Therefore, the use of images in Meaningful Learning supports students' understanding, learning focus, and engagement.



Table 2. Inclusive Learning Observation Data

Observation Aspects	Observation Findings
The Homeroom Teacher's Role in Learning (learning materials)	The homeroom teacher delivers material in a classroom setting, repeating instructions and adjusting the pace of learning when students with special needs experience difficulties.
The role of the GPK during learning (teaching strategies and innovation in visual learning media)	The GPK assists students with special needs individually, helping them understand instructions and providing additional guidance without disrupting the classroom learning process.
Interaction between homeroom teachers and the GPK (teaching strategies)	Homeroom teachers and GPK coordinate flexibly during lessons to ensure students with special needs remain engaged in learning activities.
Involvement of autistic students in learning activities (student preferences and engagement)	Autistic students participate in learning activities and complete assignments with gradual assistance as needed.
Response and Focus of Autistic Students (observed impacts on engagement)	Students with Autism exhibit fluctuating concentration, but can regain focus after receiving guidance from the GPK or direct direction from the homeroom teacher.
Emotional Condition of Autistic Students (observed impacts on engagement)	During the learning process, students' emotional condition was relatively stable in a calm and supportive classroom environment.

Meaningful Learning contributed to emotion and attention management in autistic students by providing learning experiences that were structured, predictable, and closely connected to real-life contexts. The use of familiar and concrete materials helped reduce students' anxiety and emotional overload, as learning tasks felt more meaningful and less abstract. When learning content was related to students' daily experiences, the autistic student appeared more emotionally stable and better able to regulate attention during classroom activities. The real-world relevance of the material supported a sense of familiarity and security, allowing the student to feel more grounded and engaged in the learning process. As a result, Meaningful Learning not only facilitated cognitive understanding but also supported emotional regulation and sustained attention in inclusive classroom settings.

The findings of this study indicate that implementing inclusive education for young students with Autism Spectrum Disorder (ASD) necessitates teaching strategies that are adaptable, pertinent, and attentive to the individual needs of each student. In inclusive classrooms, teachers frequently encounter difficulties in overseeing varied learners, modifying teaching methods, and promoting the engagement of students with ASD while fulfilling the requirements of the standard curriculum. These results align with earlier studies showing that teachers' attitudes and effectiveness in inclusive environments are heavily shaped by their training and support concerning ASD. (Russell et al., 2023) discovered that insufficient specialized training might diminish teachers' confidence in applying inclusive methods, consequently impacting their capacity to effectively engage students with ASD. This emphasizes the necessity of flexible teaching methods and ongoing professional growth to facilitate significant learning opportunities for autistic learners in regular classrooms.

Meaningful learning arises as an important strategy in the realm of inclusive education for students with autism. (Educação, 2024) highlighted that inclusive education is



more successful when educators relate learning resources to students' real-life situations and foster a safe, supportive learning atmosphere. Significant learning aids autistic students in grasping concepts more tangibly and lowers cognitive demands from abstract content. In a comparable manner, (Azevedo et al., 2024) stated that teaching strategies in inclusive education must highlight adaptable techniques, suitable media applications, and modifications in activities to enable autistic students to engage fully in mainstream classrooms.

In addition to pedagogical factors, comprehending the experiences and viewpoints of autistic students is essential for effective inclusive education. A recent scoping review by (Kasztelan Chapman et al., 2025) emphasized that many studies on inclusive education have ignored the perspectives of autistic students, resulting in approaches that prioritize physical placement over genuine involvement and assistance. When students sense that their thoughts are acknowledged and comprehended, they tend to participate more actively in the learning experience. (Fletcher-Watson et al., 2019) highlighted that significant engagement in education and autism research can improve the relevance, acceptance, and sustainability of inclusive methods. This shows that the effectiveness of inclusive education is evaluated not just by academic success but also by the quality of learning experiences for autistic students.

Worldwide studies in inclusive education indicate a growing focus on access, involvement, and learning quality for students with special needs. (Armstrong et al., 2023) conducted a bibliometric review and discovered that research on inclusion after Salamanca is increasingly centering on teaching methods that address student diversity. Research focus has moved from policy debates to actual classroom execution. These results highlight that inclusive education is an evolving practice that necessitates ongoing adjustments to the needs of students and the contexts of schools.

In the national framework, considerable understanding of inclusive education methods in Indonesian primary schools has been revealed. (Mahya et al., 2022) highlighted that the function of Special Education Teachers (GPK) is essential in assisting students with special needs to comprehend learning materials, adhere to instructions, and engage actively. The existence of GPK helps classroom teachers create and implement more flexible learning. This discovery indicates that cooperation between classroom educators and GPK is a crucial factor in developing effective and lasting inclusive education.

Innovative teaching in inclusive education plays a vital role in facilitating the success of autistic students. According to (Minsih, Helzi, et al., 2025) the use of digital media and creative instructional strategies enables teachers to adapt learning activities to meet the diverse needs of students with special needs. This approach allows autistic students to learn according to their individual pace and learning style, enhancing their engagement, comprehension, and overall academic achievement. Additionally, (Minsih, Saifudin, et al., 2025) highlighted that differentiated instruction effectively addresses the learning requirements of students with special needs in inclusive elementary education. This method enables autistic students to learn in a manner and speed tailored to their unique traits.

Recognizing learning challenges in autistic students is crucial for fostering inclusive education. (Nurdiantika et al., 2022) demonstrated that educators who recognize learning obstacles promptly can create focused teaching methods more effectively. Grasping students' learning challenges enables teachers to offer fitting assistance by modifying resources, techniques, and evaluations. This aligns with the principles of inclusive education, which stress equal access and learning opportunities for every student.



Regularly applying inclusive learning strategies also affects students' views and educational experiences. (Rahmadani et al., 2025) discovered that well-structured inclusive learning approaches can enhance students' positive views of the learning experience in inclusive primary schools. Instruction that adapts to student requirements not only improves academic comprehension but also boosts students' confidence and ease in learning. Moreover, (Hukmawati, 2023) emphasized that contextual learning models help students with special needs better understand learning materials by linking instructional content to real-life situations, allowing students to construct meaning based on their daily experiences.

Teacher strategies play a crucial role in supporting inclusive education. (Saadiya & Khaira, 2025) found that classroom teachers facilitate the learning needs of students with special needs by adapting instructional strategies, providing individualized support, and creating a flexible learning environment. These strategies enable students to participate more actively in learning activities and better understand instructional content. Such practices align with the principles of meaningful learning, which emphasize adapting learning experiences to students' needs and connecting instruction to meaningful and supportive classroom contexts.

Based on the case at SD N Pajang 1, this study does not propose a completely new or formalized collaboration model but highlights a practical classroom-based collaboration pattern between the classroom teacher and the special education teacher (GPK). In this model, the classroom teacher is responsible for designing and delivering learning activities aligned with the regular curriculum, while the GPK provides ongoing support by simplifying learning materials, adjusting instructional strategies, and offering individualized assistance based on the autistic student's needs. Collaboration occurs flexibly during lesson planning, classroom instruction, and evaluation, rather than through rigid procedural stages. This adaptive and context-driven collaboration allows instructional decisions to respond directly to students' emotional, attentional, and learning conditions. Therefore, the collaboration model observed at SD N Pajang 1 Surakarta can be described as a contextual teacher and GPK collaboration model that supports meaningful learning in inclusive classrooms. In summary, the findings of this study indicate that the effectiveness of inclusive education for autistic learners is influenced by both educational policies and classroom teaching practices. Meaningful, flexible, and context-sensitive instruction, supported by collaboration between classroom teachers and special education teachers (GPK), instructional innovations, and awareness of individual student needs, serves as a crucial foundation for fostering an inclusive learning environment.

Conclusion

This research indicates that applying meaningful learning in inclusive elementary classrooms successfully aids autistic students when teaching methods are flexible, context-specific, and focused on personal needs. The study illustrates that teacher creativity, cooperation with Special Education Teachers (GPK), and tailored instruction are vital for improving student involvement, comprehension, and academic results. Additionally, contextual and practical learning methods assist students in linking concepts to actual experiences, enhancing both understanding and enthusiasm. Inclusion in education thrives when teaching methods are adaptable, focus on students, and created in collaboration to cater to the specific needs of autistic students, fulfilling the research goals of enhancing learning success in inclusive environments.



Recommendation

For Teachers: Teachers are encouraged to implement Meaningful Learning through structured and student-centered strategies, such as developing Meaningful Learning-based visual schedules and using concrete and contextual learning materials. These practices can help autistic students better manage attention and emotions while supporting conceptual understanding in inclusive classrooms.

For Schools: Schools should establish formal and regular coordination mechanisms between classroom teachers and special education teachers (GPK), including scheduled planning meetings and collaborative evaluation of learning outcomes. Institutional support for inclusive practices and continuous professional development is essential to strengthen teacher collaboration and ensure consistent implementation of Meaningful Learning.

For Future Researchers: Future studies are recommended to explore the implementation of Meaningful Learning in broader and more diverse inclusive education contexts, involving multiple schools, grade levels, and participants. Further research may also examine long-term academic, emotional, and social outcomes of autistic students to deepen understanding of the effectiveness of inclusive education practices.

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