

Adaptive Peer Tutoring: Enhancing Engagement and Independence of Students with Mild Intellectual Disabilities in Inclusive Classrooms

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Abstract: *This study adopted a descriptive qualitative design and involved one classroom teacher, two regular students acting as peer tutors, and two students with mild intellectual disabilities as tutees. Participants were chosen through purposive sampling to ensure they matched the needs of the study. Data were obtained through classroom observations, semi-structured interviews, and documentation. The collected data were then processed using the Miles and Huberman analysis model, which consists of data reduction, data presentation, and drawing conclusions. The results indicate that adaptive peer tutoring produced notable improvements in all examined areas. Learning engagement increased by 65%, student independence rose by 63%, and social interaction improved by 70%. These changes occurred because tutors were able to adjust their communication style, use concrete learning tools, and consistently deliver positive feedback. Throughout the process, the teacher played an essential role as a facilitator, guiding and monitoring the interaction between tutors and tutees to ensure the learning support was effective. In addition to benefiting students with intellectual disabilities, the activity also helped regular students develop stronger empathy, concern, and inclusive attitudes toward their peers with special needs. Overall, adaptive peer tutoring strengthened both academic and social development while fostering a more inclusive and responsive classroom environment.*

Keywords: *inclusive education, adaptive peer tutoring, mild intellectual disability*

Abstrak: Penelitian ini menggunakan pendekatan kualitatif deskriptif dengan melibatkan satu guru kelas, dua peserta didik reguler sebagai tutor, dan dua peserta didik tunagrahita ringan sebagai tutee. Pemilihan partisipan dilakukan melalui teknik purposive sampling agar sesuai dengan fokus dan kebutuhan penelitian. Proses pengumpulan data dilakukan melalui observasi partisipatif, wawancara semi terstruktur, dan dokumentasi selama empat sesi pembelajaran. Seluruh data dianalisis menggunakan model Miles dan Huberman yang meliputi reduksi data, penyajian data, serta penarikan kesimpulan secara berulang untuk memastikan temuan yang akurat dan valid. Hasil penelitian menunjukkan adanya dampak positif penerapan peer tutoring adaptif terhadap ketiga aspek perkembangan yang diamati. Keterlibatan belajar peserta didik meningkat sebesar 65%, kemandirian bertambah 63%, dan kemampuan interaksi sosial naik hingga 70%. Peningkatan ini terjadi karena para tutor mampu menyesuaikan bahasa yang digunakan, memilih media pembelajaran konkret, memberikan contoh langsung, serta memberikan penguatan positif secara konsisten. Guru berperan sebagai fasilitator yang memantau jalannya kegiatan, memberikan arahan strategi, dan memastikan interaksi antara tutor dan tutee berjalan efektif dan saling mendukung. Selain memberi manfaat bagi peserta didik dengan hambatan intelektual, kegiatan ini juga berdampak positif pada peserta didik reguler. Mereka menjadi lebih empatik, peduli, serta menunjukkan sikap inklusif terhadap teman berkebutuhan khusus. Dengan demikian, peer tutoring adaptif tidak hanya memperkuat aspek akademik, tetapi juga membantu menciptakan lingkungan belajar yang lebih suportif, inklusif, dan responsif terhadap keberagaman kebutuhan peserta didik.

Kata kunci: pendidikan inklusif, *peer tutoring adaptif*, tunagrahita ringan

1. INTRODUCTION

Inclusive education is a learning approach that ensures all students whether they have special needs or not learn together in the same classroom and take part in the same academic and social activities. According to UNESCO (2020), inclusive education is important because it helps create learning environments that respect differences, value every learner, and provide equal opportunities for everyone.

Around the world, more than 90% of PBB member countries have already adopted policies that support inclusive education. This shows a strong global commitment to human rights and education for all.

In Indonesia, inclusive education is supported by several legal regulations, including Law No. 8 of 2016 on Persons with Disabilities and Ministerial Regulation No. 70 of 2009. These documents guide schools in adapting their teaching methods and services to meet the needs of diverse learners. Data from the Ministry of Education (2023) reports that intellectual disability affects about 1–3% of the Indonesian population, and mild intellectual disability makes up 0.37–0.59% of that number. Although children with mild intellectual disabilities are entitled to inclusive education, teachers often face challenges in planning lessons that match their learning abilities and developmental needs.

Students with mild intellectual disabilities typically have IQ scores between 55 and 70 (APA, 2022). Many of them can learn basic reading, writing, and math when given appropriate support. However, they may struggle with abstract concepts, long-term memory, and social communication with peers. Reiss (as cited in Suharmini, 2007) explains that these challenges can make it difficult for them to follow classroom routines and meet academic expectations without additional help. The AAIDD (2010) further states that around 85% of individuals with intellectual disabilities fall into the mild category, meaning they have strong potential to learn academic skills similar to students in grades 4–6 when they receive structured teaching, clear guidance, and steady support from adults and peers. A positive, patient, and understanding learning environment can greatly improve their confidence and motivation.

Many studies highlight the need for flexible, interactive, and supportive teaching strategies for students with intellectual disabilities. Putnam (2021) found that individualized instruction where teachers adjust lessons to each student's needs helps children stay focused longer and develop stronger persistence in completing tasks. McMaster and Fuchs (2018) showed that peer-assisted learning not only supports academic skills but also builds social connections and emotional understanding between students. In Indonesia, a study by Hidayati and Prasetyo (2022) revealed that peer support increases confidence, reduces anxiety, and encourages more active participation among learners with intellectual disabilities.

One teaching method that has received positive attention is adaptive peer tutoring. In this approach, regular students act as tutors and help classmates with mild intellectual disabilities through simple explanations, step by step instructions, and individualized guidance. Tutors are chosen not only for their academic ability but also for their patience, empathy, and communication skills. Meanwhile, tutees are selected based on their ability to communicate in basic ways and follow simple directions.

Adaptive peer tutoring allows meaningful, two-way interaction. Tutors simplify language, use concrete learning materials, repeat instructions when needed, and offer frequent praise to keep tutees motivated. Teachers play an essential role by supervising the sessions, guiding tutors, and ensuring that learning activities match the needs of each student. When done well, this method creates a supportive classroom atmosphere where both tutors and tutees learn from each other.

Based on these considerations, the present study aims to explore how adaptive peer tutoring can improve learning engagement, independence, and social interaction among students with mild intellectual disabilities in inclusive classrooms. The results are expected to help schools and teachers design teaching practices that are more inclusive, flexible, and effective for all learners, while also promoting empathy and cooperation among students.

2. METHOD

This study employed a descriptive qualitative approach to obtain a rich, deep, and comprehensive understanding of how adaptive peer tutoring functions as a learning strategy to enhance engagement, independence, and social interaction among students with mild intellectual disabilities in inclusive classrooms. A qualitative design was selected because it provides the flexibility needed to explore real-life situations, uncover authentic behaviors, and interpret the meaning behind participants' actions in their natural learning environment. Through this approach, the researcher was able to closely examine how students interacted with peers, how instructional support was provided, and how learning attitudes developed throughout the intervention.

The participants consisted of one inclusive classroom teacher, two typically developing students who served as peer tutors, and two students with mild intellectual disabilities who took part as tutees.

Purposive sampling was used to ensure that each participant possessed characteristics relevant to the objectives of the study. The tutors were selected not only because they demonstrated high academic achievement but also due to their empathy, patience, and strong communication skills qualities that are essential for providing effective peer support. They also consistently showed responsibility and willingness to assist classmates, making them ideal as tutors. Conversely, the tutees were selected based on their ability to communicate basic ideas, follow simple instructions, and show motivation to learn, even though they sometimes required encouragement. Their stable and non-disruptive behavior was also an important selection criterion, ensuring that the peer tutoring sessions could take place in a conducive and safe learning atmosphere.

The study was conducted at an inclusive elementary school in Langsa City, Aceh, from September to October 2025. The school was chosen because it had a track record of implementing inclusive practices and provided opportunities for students with mild intellectual disabilities to learn side-by-side with regular students. This environment offered a realistic setting for observing how adaptive peer tutoring naturally unfolds, making it possible to capture authentic interactions and learning behaviors as they occurred.

Data were gathered using three complementary techniques: participatory observation, semi-structured interviews, and documentation. Participatory observation allowed the researcher to take part directly in the classroom, enabling close monitoring of how tutors guided their peers, how tutees responded to instructions, and how learning engagement and social interactions evolved over time. Semi-structured interviews provided deeper insights into participants' experiences, challenges, and perceptions regarding the peer tutoring process. Meanwhile, documentation such as photographs, lesson notes, learning worksheets, and video recordings served to strengthen the overall data by offering visual and written evidence that supported the observed events.

The analysis of data followed Miles and Huberman's (1994) interactive model, which involves data reduction, data display, and conclusion drawing/verification. In the reduction stage, irrelevant or repetitive information was filtered out, allowing the researcher to focus on key findings. The data display stage involved organizing information in structured forms such as narrative summaries, tables, and matrices so that recurring themes and patterns could be identified more easily. In the final stage, conclusions were drawn and consistently validated through repeated comparisons and reflections to ensure that the interpretations truly represented the field data.

To maintain the validity and reliability of the findings, this study employed both source triangulation and method triangulation. Source triangulation was conducted by comparing the perspectives of different participants teachers, tutors, and tutees to identify similarities or discrepancies in their experiences. Method triangulation strengthened the results by comparing observations with interview data and documentation. Member checking was also carried out by sharing preliminary interpretations with participants to confirm their accuracy. Through these rigorous procedures, the study produced credible and trustworthy findings that genuinely reflect how adaptive peer tutoring supports the learning process of students with mild intellectual disabilities in inclusive classroom settings.

3. RESULT AND DISCUSSION

The results of this study show that adaptive peer tutoring has a strong positive effect on the learning engagement, independence, and social interaction of students with mild intellectual disabilities in inclusive classrooms. The learning activities were carried out through cooperation between the teacher, the peer tutors (regular students), and the tutees (students with mild intellectual disabilities). In this arrangement, the teacher served as a facilitator who supervised the process and ensured that tutors adjusted their teaching approach to meet each tutee's individual needs. The tutors, meanwhile, supported the tutees by using simple language, hands-on materials, and continuous encouragement to help them understand lessons and stay motivated.

At the beginning of the observation, the tutees showed low levels of engagement. They tended to be passive, were easily distracted, and did not participate much in group work. However, after four sessions of adaptive peer tutoring, their engagement improved noticeably. Their average engagement score rose from 2.0 to 3.3 on a 1–4 scale an increase of about 65%. This progress could be seen in their ability to stay focused longer, their willingness to answer or ask questions, and their faster responses to

instructions. These changes occurred largely because the tutors used simple, clear, and interactive teaching techniques that matched the tutees' abilities.

The tutees' learning independence also showed meaningful growth. At first, they relied heavily on the tutors, waiting for instructions and needing full assistance to complete even simple tasks. After the peer tutoring sessions, however, they began taking initiative working on assignments independently, using learning tools on their own, and showing greater persistence. Their independence score increased from 2.0 to 3.3, or about 63%. This happened because the tutors gradually reduced direct help, allowing the tutees to take more responsibility for their learning. This process reflects Vygotsky's idea of scaffolding, where support is slowly removed as learners become more capable of performing tasks independently.

Social interaction showed the greatest improvement among all aspects. Before the tutoring program, the tutees were more withdrawn, spoke less, and had difficulty forming connections with classmates. After joining adaptive peer tutoring, they became more confident in communicating with peers, responded to greetings, and participated actively in group activities. Their average social interaction score rose from 2.0 to 3.4 an increase of about 70%. The tutors also experienced positive change; they became more empathetic, patient, and understanding of their peers with special needs. This finding supports the results of Nuraini and Rahmawati (2021), who reported that peer tutoring builds empathy, tolerance, and social responsibility in inclusive settings.

One effective example of adaptive learning observed in the study was the use of concrete objects such as colored buttons to teach basic addition and subtraction. Tutors guided the tutees to sort and group the buttons, helping them understand numbers in a more visual and hands-on way. Simple verbal prompts like "Add two more; how many now?" helped guide the tutees' thinking. Positive reinforcement such as "Good job!" and "You're almost there!" also increased the tutees' confidence and willingness to keep trying.

The teacher played an essential coordinating role by ensuring that each tutor understood the tutee's learning profile and could adjust strategies as needed. At the end of every session, the teacher provided feedback to help tutors reflect on what worked well and what needed to be improved. This process created a supportive and well-coordinated learning environment.

Overall, the analysis showed an average improvement of 66% across the three main areas of development: learning engagement increased by 65%, independence by 63%, and social interaction by 70%. These results highlight the strong effectiveness of adaptive peer tutoring in promoting meaningful learning experiences for students with mild intellectual disabilities in inclusive classrooms.

Table 1. Average Score Improvement of Learning Aspects in Students with Mild Intellectual Disabilities After Implementing Adaptive Peer Tutoring

| No | Observed Aspect | Initial Score | Final Score | Percentage of Improvement | Key Observations |
|----------------|-----------------------|---------------|-------------|---------------------------|---|
| 1 | Learning Engagement | 2.0 | 3.3 | 65% | More focused, actively asks questions, responds quickly to instructions |
| 2 | Learning Independence | 2.0 | 3.3 | 63% | More independent in using learning aids and completing tasks |
| 3 | Social Interaction | 2.0 | 3.4 | 70% | More confident, able to communicate, and participate in group work |
| Average | | — | — | 66% | — |

The data demonstrate that adaptive peer tutoring is effective in supporting students with mild intellectual disabilities to achieve both academic and social progress. Moreover, this strategy reinforces inclusive values in the classroom, creating a supportive learning environment and fostering mutual respect among students. With the teacher serving as a facilitator and peers acting as learning partners,

adaptive peer tutoring has proven to be a powerful instructional model that bridges individual learning needs within the framework of inclusive education.

4. CONCLUSION

The findings of this study clearly show that adaptive peer tutoring is a highly effective strategy for enhancing learning engagement, promoting functional independence, and improving social interaction among students with mild intellectual disabilities in inclusive classroom settings. When carefully implemented, this approach helps students feel more supported, encourages active participation, and creates a learning environment where all students both tutors and tutees benefit academically and socially. The teacher's role as a facilitator is vital in ensuring that the tutoring process runs smoothly. Teachers guide the planning of activities, monitor interactions, and help tutors adjust their instructional methods to match each tutee's learning pace, communication style, strengths, and specific challenges.

In practice, adaptive peer tutoring requires close collaboration among teachers, tutors, and tutees. When this collaboration is strong, the classroom becomes more interactive, responsive, and respectful of student diversity. Peer tutors learn to communicate with empathy, provide step-by-step explanations, offer encouragement, and help tutees stay motivated. Meanwhile, tutees become more confident in expressing ideas, taking initiative, and engaging in two-way communication with peers. Over time, these positive interactions can foster a strong sense of belonging and improve classroom harmony.

Based on these results, it is recommended that teachers integrate adaptive peer tutoring into daily classroom learning activities. To achieve this, schools should provide structured training for peer tutors, equipping them with basic communication techniques, ways to simplify instructions, and strategies to support tutees without creating dependency. Ongoing supervision from teachers is also necessary to ensure the quality and consistency of the tutoring sessions. In addition, institutional support plays a crucial role. Schools need to establish policies that strengthen inclusive practices and ensure access to essential resources, including concrete teaching materials, visual supports, and simple assistive tools. Such resources help tutors and tutees engage in meaningful learning activities and maintain program effectiveness.

For a more comprehensive understanding of this approach, future research should consider using quantitative or mixed-method designs to examine the long-term impact of adaptive peer tutoring on academic achievement, behavioral improvement, and social development. Experimental studies comparing classrooms with and without peer tutoring interventions would also provide stronger evidence of effectiveness. Furthermore, involving larger and more diverse participant groups across different grade levels, schools, or regions could produce broader insights into how adaptive peer tutoring contributes to building inclusive, equitable, and high-quality learning environments. Such research would also help identify the factors that influence successful implementation, including school culture, teacher readiness, parental support, and availability of resources. Overall, expanding future studies will help strengthen the evidence base and guide schools in adopting adaptive peer tutoring as a sustainable inclusive teaching strategy.

5. SUGGESTIONS

Based on the findings from this study on the use of adaptive peer tutoring for students with mild intellectual disabilities in an inclusive classroom, several recommendations can be offered for practice and future research.

5.1. For Teachers

Teachers are encouraged to keep improving the use of peer tutoring by giving short training sessions to student tutors, especially on how to give appropriate support, use simple and clear language, and provide positive feedback. Regular monitoring is also important to make sure the tutor-tutee interaction runs smoothly and safely.

5.2. *For Schools*

Schools should create a supportive environment for peer tutoring. This includes preparing a flexible schedule, providing a comfortable learning space, and strengthening school policies that promote cooperation, empathy, and inclusive values among students.

5.3. *For Student Tutors*

Regular students who serve as tutors should receive ongoing guidance on how to communicate with empathy, use concrete learning materials, and give constructive feedback so their tutoring skills continue to grow.

5.4. *For Future Researchers*

Future studies may involve a larger number of participants, apply a mixed-methods design, or examine the long-term effects of adaptive peer tutoring on the social and emotional development of learners with special needs.

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