



# Role-Playing Method to Improve Mathematics Learning Outcomes for Mildly Intellectually Disabled Students

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## Article history:

Received : Dec, 18 2024

Revised : May, 22 2025

Accepted : Jun, 18 2025

**Abstract:** This classroom action research aimed to improve mathematics learning outcomes on the topic of money denominations of IDR 500.00, IDR 1,000.00, and IDR 2,000.00 for Grade VIII students with mild intellectual disabilities at SLB BC Nurasih Bintaro through the role playing method. The sample consisted of five students with mild intellectual disabilities. This study employed the Kemmis and McTaggart model, with data collected through tests analyzed quantitatively, and observations, interviews, and documentation analyzed qualitatively. The results showed an average initial score of 64, which increased to 78 in the first cycle and reached 85 in the second cycle. These findings indicate that the role playing method is effective in improving mathematics learning outcomes in money denomination material for students with mild intellectual disabilities.

**Keywords:** *learning outcomes, mathematics, mild intellectual disabilities, role playing*

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## I. Introduction

Learning outcomes are a crucial indicator in determining the success of the teaching and learning process in schools (Tsang et al., 2021). Various factors affect students learning achievements, including the teaching methods used, students physical and psychological conditions, and the availability of adequate learning facilities and infrastructure (Jannah & Sontani, 2018). If these factors are not properly addressed, achieving optimal learning objectives becomes difficult. Therefore, appropriate and creative learning strategies are needed to improve students academic outcomes, especially for students with special educational needs.

One of the essential subjects taught from elementary to secondary education is mathematics. However, many students consider mathematics difficult and confusing, which affects their motivation and learning outcomes, particularly those with intellectual disabilities (Susanto & Hidayati, 2021). A vital topic in mathematics closely linked to daily life is recognizing monetary denominations. The ability to identify and determine the value of money is fundamental for performing buying and selling transactions and basic financial management in everyday life (Putri et al., 2021).

According to the, the mathematics learning objectives for Phase D require students to identify money denominations ranging from IDR 500 to IDR 100,000. Achieving this competence poses a significant challenge for students with intellectual disabilities, whose cognitive abilities are below average (Rahayu et al., 2023). Children with intellectual disabilities require specialized educational services tailored to their conditions and characteristics. The American Psychiatric Association (2013), through the DSM-5, classifies intellectual disability into four levels: mild, moderate, severe, and profound, based on intellectual and adaptive functioning.

Wardani (2019) state that students with mild intellectual disabilities develop cognitive skills at about half to three-quarters the rate of typically developing children, with an adult mental age equivalent to a 9–12-year-old child. Consequently, they require concrete, engaging, and activity-based learning methods. At SLB BC Nurasih Bintaro, students with mild intellectual disabilities struggle to understand the concept of money denominations, even though they can recognize numbers well. Observations revealed that out of 5 students in Grade VIII, only 1 student achieved a score above the minimum mastery criterion, scoring 73.

Thus far, teaching methods applied in class have relied on lectures and question-and-answer sessions. These methods are less effective because they are primarily verbal and abstract, whereas students with mild intellectual disabilities need learning approaches that involve concrete

experiences and active participation. Limitations in learning facilities caused by a fire incident at the school in 2022 further complicated the learning process. Therefore, alternative teaching methods that enhance student engagement and comprehension, especially for learning about money denominations, are urgently needed.

One suitable method is role playing, a learning approach involving students in enacting scenarios related to the lesson content. Piaget (2013) emphasized that play is a natural behavior in childhood that facilitates learning about the surrounding environment and evokes enjoyment. The role playing method enables students to practice developing their imagination, social skills, and problem-solving abilities through simulated situations.

Murtikusuma and Fatahillah (2017) asserted that role playing effectively improves learning mastery by allowing students to play characters relevant to a given topic. Likewise, Vygotsky (1978) argued that role-based activities help children exceed their current developmental level and enter their zone of proximal development. In this context, students can perform activities beyond their present capabilities when engaged in role-based play, which may not be possible in regular situations.

Previous research corroborates the effectiveness of role playing in mathematics education for students with intellectual disabilities. A study by Adawiah & Qomariyah (2023) found significant improvements in students arithmetic skills and classroom engagement following the implementation of role playing. Therefore, this study seeks to examine the impact of role playing on the mathematics learning outcomes of Grade VIII students with mild intellectual disabilities at SLB BC Nurasih Bintaro, focusing specifically on money denomination materials.

Several previous studies have demonstrated the effectiveness of the role playing method in improving students' learning outcomes. Tarjiah et al. (2023) found that applying role playing in mathematics classes increased both participation and academic performance among inclusive classroom students. Similarly, Telloni (2024) reported that role playing enhanced learning outcomes in social arithmetic for junior high school students. However, research specifically focusing on using role playing to teach money denomination topics to students with mild intellectual disabilities remains limited.

Based on the above explanation, this study aims to apply the role playing method to improve mathematics learning outcomes on money denominations of IDR 500, 1,000, and 2,000 among 5 students with mild intellectual disabilities in Grade VIII at SLB BC Nurasih Bintaro. The research intends to investigate the effect of the role playing method on improving the cognitive learning outcomes of these students in this particular topic.

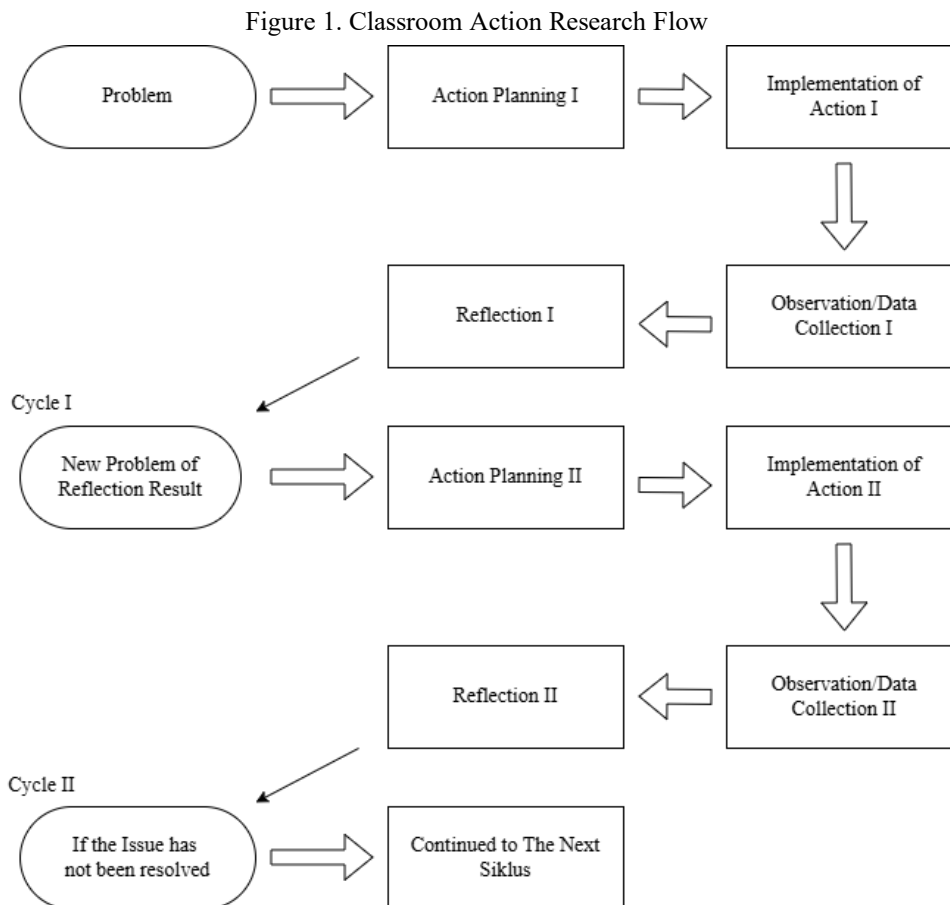
## II. Method

This research employed a Classroom Action Research (CAR) design, aiming to improve the quality of classroom practice and student learning outcomes. Classroom action research is a form of inquiry conducted by teachers in their own classrooms to enhance teaching quality and directly address problems encountered in the learning process (Kemmis & McTaggart, 2014). In addition, this study adopted a mixed-methods approach, combining quantitative and qualitative data collection and analysis techniques, considering the relatively small number of research subjects.

The subjects of this study consisted of 5 students with mild intellectual disabilities in Grade VIII at SLB BC Nurasih Bintaro. The small sample size made it necessary to apply both quantitative and qualitative data to obtain comprehensive findings and more valid conclusions. As supported by Creswell (1999), who emphasized that mixed-methods research is particularly useful when quantitative data alone may be insufficient due to sample limitations.

Data collection techniques included: (1) tests to assess cognitive learning outcomes quantitatively, (2) observations to document students' learning behavior and classroom interactions, (3) interviews with teachers to gather qualitative insights on students' learning progress, and (4) documentation in the form of students' worksheets and learning records. The test instruments consisted of a pre-test, formative evaluation at the end of Cycle I, and a final evaluation in Cycle II.

The quantitative data obtained from test results were analyzed using descriptive statistical analysis to calculate mean scores and percentages of improvement. Qualitative data from observations, interviews, and documentation were analyzed using the Miles and Huberman (1994) interactive model, which involves data reduction, data display, and conclusion drawing. The following figure 1 is a chart that visualizes the method that will be used.



The flowchart describes the cyclical process of Classroom Action Research (CAR), which begins with identifying a problem in the classroom. This is followed by Action Planning I, where a strategy is designed to address the issue, then implemented in Action I. Data is collected through Observation and Data Collection I, and the outcomes are analyzed in Reflection I to evaluate the effectiveness of the action and identify any new problems.

If the problem remains unresolved or new challenges arise, these become the basis for Action Planning II. A revised plan is then implemented in Action II, followed by further observation, data collection, and Reflection II. The process continues through additional cycles if necessary until the identified classroom problems are successfully addressed. This reflective and systematic process ensures continuous improvement in teaching practices and student learning outcomes.

Through this systematic method, the study aimed not only to improve mathematics learning outcomes on the topic of money denominations but also to enhance students participation, engagement, and problem-solving skills during role playing activities in class.

### III. Results and Discussion

The implementation of actions in Cycle I revealed positive developments in students' enthusiasm during mathematics lessons through the role playing method. Active participation was consistently observed, although excessive enthusiasm occasionally led to classroom noise. Clear classroom regulations were established by the researcher and the collaborating classroom teacher to maintain a conducive learning environment. The evaluation results indicated a significant increase in students learning outcomes in the topic of money denominations. The following table 1 presents the comparison between the initial ability test and the Cycle I evaluation scores, identifying students by initials to maintain confidentiality .

Table 1. Results of Initial Ability Test and Cycle I Evaluation

No	Student Initials	Initial Ability Test	Cycle I Evaluation
1.	SV	60	80
2.	ND	64	87
3.	RF	69	78
4.	SL	64	78
5.	SF	60	73
<b>Average</b>	—	64	79

The average score increased from 64 in the initial test to 79 in Cycle I, with the highest score reaching 87 and the lowest 73. All five students experienced improvement, though the expected mastery criterion had not yet been fully achieved. Based on reflection and data analysis, it was decided to continue to Cycle II with adjustments to classroom management and teaching strategies, including assigning students to act as teachers within the role playing sessions to promote autonomy and decision-making skills.

Cycle II demonstrated further progress as students displayed improved discipline and problem-solving abilities. The activity of simulating buying and selling transactions using play money provided meaningful learning experiences closely linked to students' daily lives. Increased confidence was evident as students began independently applying their knowledge during the activities. The results of Cycle II evaluations are displayed in the following table, highlighting consistent improvements in student performance. The results of Cycle II are displayed in the following table 2, highlighting consistent improvements in student performance:

Table 2. Results of Cycle I and Cycle II Evaluation

No	Student Initials	Cycle I Evaluation	Cycle II Evaluation
1.	SV	80	82
2.	ND	87	87
3.	RF	78	87
4.	SL	78	82
5.	SF	73	87
<b>Average</b>	—	79	85

The improvement in student learning outcomes through the role playing method aligns with experiential learning theory. Kolb (1984) emphasized that learning occurs most effectively through direct, meaningful experiences, reflection, and conceptualization. Practical, activity-based learning allows students with mild intellectual disabilities to engage with abstract mathematical concepts in ways that connect directly to real-life contexts. Students benefited from learning through physical enactments of transaction scenarios, reducing cognitive load and enhancing comprehension.

Motivation also increased as role playing offered opportunities for autonomy, competence, and social interaction. Ryan and Deci (2000) asserted that fulfilling these psychological needs improves intrinsic motivation and learning engagement. Students gained autonomy by choosing roles and contributing to classroom management, experienced competence through successfully completing tasks, and built social bonds within their learning community. Improved motivation was evident in higher participation rates and greater enthusiasm throughout both research cycles.

Meaningful learning was further supported through contextualized instructional activities. Berns and Erickson (2001) found that placing knowledge in authentic, relevant settings enhances learning retention and relevance for students. Students participating in market simulation scenarios could immediately apply money denomination knowledge within a context that mirrored their everyday financial exchanges. This practical approach promoted functional numeracy and empowered students to transfer classroom knowledge to real-life situations.

The multisensory and differentiated nature of role playing met the diverse learning preferences and cognitive abilities of students with mild intellectual disabilities. Tomlinson (2017) argued that differentiated instruction, which offers multiple pathways for students to engage with content, improves outcomes for learners with varying profiles. By combining visual, auditory, kinesthetic, and verbal learning elements, role playing provided students with opportunities to interact with content in ways most accessible to their individual strengths. The method's adaptability and capacity to reduce instructional monotony enhanced both student achievement and classroom dynamics.

#### **IV. Conclusion and Suggestion**

This study concludes that the role playing method effectively improves mathematics learning outcomes on money denomination topics for students with mild intellectual disabilities in Grade VIII at SLB BC Nurasih Bintaro. Students demonstrated increased motivation, confidence, and active participation throughout the learning process, supported by meaningful, contextual, and enjoyable activities. The improvement was reflected not only in students scores but also in their ability to engage in problem-solving and social interaction during learning. The multisensory, experiential, and flexible nature of role playing successfully addressed students diverse learning needs and reduced learning anxiety. Future research should involve a larger sample, explore variations of role playing, and assess its long-term impact on students' functional numeracy and social competence..

Several recommendations are proposed based on the findings of this study. First, schools are encouraged to facilitate and support teachers in applying varied, interactive, and contextual learning methods tailored to students' specific needs and characteristics. Second, teachers should consider implementing role playing when delivering abstract or practical materials to make learning experiences more meaningful, enjoyable, and accessible for students with intellectual disabilities. Third, students should be actively motivated to engage in classroom activities by providing structured yet playful learning opportunities that promote autonomy, problem-solving, and social interaction. Fourth, future researchers are advised to conduct similar studies with larger sample sizes and a combination of quantitative and qualitative data to obtain richer and more comprehensive insights. Fifth, educational institutions are expected to improve learning facilities and provide adequate resources to support the implementation of interactive and experiential learning methods in special education settings.

### References

- Adawiah, E. R., & Qomariyah, S. (2023). Peran *Role Playing* dalam Meningkatkan Kreativitas Siswa pada Pembelajaran Matematika Kelas VII di SMPN 1 Sagaranten. *SOKO GURU: Jurnal Ilmu Pendidikan*, 3(1), 144-162.
- Berns, R. G., & Erickson, P. M. (2001). Contextual Teaching and Learning: Preparing Students for the New Economy. The Highlight Zone: Research Work No. 5.
- Creswell, J. W. (1999). Mixed-Method Research: Introduction and Application. In *Handbook of Educational Policy* (pp. 455-472). Academic Press.
- Jannah, S. N., & Sontani, U. T. (2018). Sarana dan Prasarana Pembelajaran Sebagai Faktor Determinan terhadap Motivasi Belajar Siswa. *Jurnal Pendidikan Manajemen Perkantoran*, 3(1), 210.
- Kemmis, S. K., & Taggart, R. M. (2014). *The Action Research Planner: Doing Critical Participatory Action Research*. Springer.
- Kolb, D. A. (2014). Experiential Learning: Experience as the Source Of Learning And Development. *FT Press*.
- Miles, M. B., & Huberman, A. M. (1984). Drawing Valid Meaning from Qualitative Data: Toward a Shared Craft. *Educational Researcher*, 13(5), 20-30.
- Murtikusuma, R. P., & Fatahillah, A. (2017). Implementasi Metode Pembelajaran Role Playing pada Aritmetika Sosial untuk Meningkatkan Hasil Belajar dan Aktivitas Siswa. *Jurnal Edukasi*, 4(2), 27-30.
- Piaget, J. (2013). *Play, Dreams and Imitation in Childhood*. Routledge.
- Putri, Y. D. A., Devita, D., & Vernanda, G. (2023). Pembelajaran Mengidentifikasi Nilai Mata Uang Rupiah pada Siswa Tunagrahita Ringan Kelas V di SLB Pelita Bunga. *Special Need Education Journal*, 3(1), 020-032.
- Rahayu, N. A., Junaidi, A. R., & Susilawati, S. Y. (2023). The Curriculum Accommodations for Children Intellectual Disabilities in Madrasah Ibtidaiyah. *Jurnal Penelitian Dan Pengembangan Pendidikan Luar Biasa (JPPPLB)*, 10(1), 9–16.
- Ryan, R. M., & Deci, E. L. (2009). Promoting Self-Determined School Engagement. *Handbook of Motivation at School*, 171-195.
- Susanto, H. A., & Hidayati, A. (2021). Exploring Thinking Process of Students with Mathematics Learning Disability in Solving Arithmetic Problems. *International Journal of Education in Mathematics, Science and Technology*, 9(3), 498-513.
- Tarjiah, I., Wicaksono, D., Aryani, R., Purnamawati, S. N., & Kurniawan, E. (2023). Thematic Learning Models with the Role-Playing Method in the Merdeka Curriculum in Inclusive Schools. *JPI (Jurnal Pendidikan Indonesia)*, 12(1), 97-106.
- Telloni, A. I. (2024). Roleplaying to Develop Students Awareness and Robust Learning Of Advanced Mathematical Concepts. *International Journal of Mathematical Education in Science and Technology*, 55(1), 44-67.
- Tomlinson, C. A. (2017). *How to Differentiate Instruction in Academically Diverse Classrooms*. Ascd.
- Tsang, J. T., So, M. K., Chong, A. C., Lam, B. S., & Chu, A. M. (2021). Higher Education During the Pandemic: The Predictive Factors of Learning Effectiveness in COVID-19 Online Learning. *Education Sciences*, 11(8), 446.
- Wardhani, R. D. K. (2019). Layanan Pendidikan dan Pembelajaran pada Anak Slow Learner. *Jurnal UNIK: Pendidikan Luar Biasa*, 4(1).