

Toilet Training for Children with Moderate Intellectual Disabilities: Influence of Modeling Technique

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Article Info	Abstract
Article history: Received: January 28, 2026 Accepted: April 29, 2026 Published: May 31, 2026 Keywords: Children with moderate Intellectual disabilities Modeling technique Toilet training This article is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. © 2026 Vidya Karya	Toilet training is an important aspect in the development of children at toddler age and must receive parental attention when urinating and defecating. Based on preliminary studies, it was found that not all children with disabilities are ready to undertake toilet training when they are 5 years old. Data show that of 35 children with intellectual disabilities, 21 children were unable to use the toilet, 19 children were unable to clean themselves after urinating, and 24 children were unable to clean themselves after defecating. This study aims to determine the effect of modeling techniques on the success of toilet training in children with moderate intellectual disabilities. This research uses an experimental method in the form of Single Subject Research (SSR) with an A-B design. The subjects of this research were 5 children with moderate intellectual disabilities at SLB Negeri 3 Banjarmasin. The data obtained were analyzed using visual graphics analysis techniques. The modeling technique was carried out by providing education to parents and children by displaying pictures and direct practice of implementing good and correct toilet training. Modeling techniques can positively increase the success of toilet training. The results of the study showed that five children's toilet training abilities significantly increased from the baseline phase (A) to the intervention phase (B) after being given intervention using modeling techniques.
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INTRODUCTION

Children with intellectual disabilities are individuals who experience limitations in intellectual functioning, resulting in academic abilities that are generally below average compared to their peers (Sartinah, Sri, & Pamuji, 2023). These limitations also affect adaptive behavior, particularly in daily living skills such as self-care and independence. Children with moderate intellectual disabilities often face significant challenges in achieving independence due to their cognitive limitations. Independence in daily living skills is an important developmental goal, as it supports their ability to function effectively in everyday life (Wehmeyer, 2013). In addition, children with intellectual disabilities frequently experience delays in adaptive functioning, especially in toileting skills, which are essential for personal hygiene and social participation (Schalock et al., 2010).

Toilet training is the process of teaching children to stop using diapers so that they can independently urinate and defecate in the bathroom at an appropriate age (Langen & Alini, 2018). Difficulties in toilet training remain a significant issue. Based on data from the 2015 National Household Health Survey (SKRT), it is estimated that approximately 75 million

toddlers experience difficulties in controlling urination and defecation until preschool age (Langen & Alini, 2018). The problem at the research location is based on preliminary observations indicating that many children with moderate intellectual disabilities have not yet achieved independence in toilet training skills. At SLB Negeri 3 Banjarmasin, out of 35 children, 21 were unable to use the toilet independently, 19 were unable to clean themselves after urination, and 24 were unable to clean themselves after defecation. In addition, most children still depend on disposable diapers both at home and during daily activities outside the home. This condition reflects a significant gap between expected abilities and the actual conditions in the field, thus highlighting the need for appropriate interventions to improve children's independence in toilet training.

The problem identified at the research site is not only related to the low level of children's toilet training abilities but also to the lack of assistance in self-development training, particularly in the aspect of self-care such as toilet training. The support provided has not been optimal and has not been carried out consistently. In addition, there is a lack of strong commitment and consistency among teachers, parents, and the school in implementing a structured and integrated toilet training program. As a result, problem-solving efforts have not been effective, since the training provided at school is not always supported or continued at home. This lack of coordination and alignment in instructional strategies contributes to the slow development of children's independence in toilet training activities.

Previous studies have emphasized that improving children's toilet training abilities requires appropriate interventions, including increasing parental knowledge and involvement. Parents play a crucial role in shaping children's independence, as environmental factors, parenting styles, and education significantly influence developmental outcomes (Santrock, 2003). Parental knowledge about proper toilet training techniques has a strong impact on children's independence (Bukhari et al., 2017; Istianah et al., 2014). To obtain adequate knowledge, parents can access information through books, training modules, or professional counseling programs such as those provided by healthcare workers (Iryanti & Kamsatun, 2016; Musfiroh & Wisudaningtyas, 2014). Moreover, parental involvement has been widely recognized as a key factor in the success of toilet training programs (Johnson & Blasco, 1997).

In addition to parental factors, educational approaches also play a vital role in supporting children with intellectual disabilities. Learning for children with special needs should be contextual, meaning that it must be relevant to real-life situations and aligned with the intended learning objectives. Contextual and functional learning approaches have been shown to improve children's ability to generalize skills in daily life (Snell & Brown, 2011). Teachers, therefore, need to design learning strategies that are meaningful, functional, and directly applicable, such as structured teaching methods (Browder et al., 2013 in Supena & Hasanah, 2020). One effective instructional method that can be applied is the modeling technique. Modeling is a learning process that occurs through observation, where individuals acquire new behaviors by observing others, involving cognitive processes such as attention, retention, and imitation (Bandura, 1986; Azizah & Kasiyati, 2022). Through modeling provided by teachers or therapists, children can develop their potential and improve independence in performing daily activities (Komalasari et al., 2011). Observational learning allows children to imitate behaviors demonstrated by others and apply them in real situations (Cooper, Heron, & Heward, 2020). Furthermore, structured teaching combined with modeling techniques has been shown to effectively improve skill acquisition in children with special needs (Alberto & Troutman, 2013). This study is needed beyond existing toilet-training and modeling literature because it specifically addresses the characteristics of children with moderate intellectual disabilities, who require more concrete, repetitive, and guided learning experiences to achieve

independence in daily living skills. The specific contribution of this study lies in adapting modeling techniques into structured, functional toilet-training interventions tailored to the cognitive and adaptive profiles of children with moderate intellectual disability.

The modeling technique is implemented through direct practice, in which teachers provide step-by-step guidance for children to perform toilet training activities directly in the bathroom (Khoiruzzadi & Fajriyah, 2019). Through direct practical assignments, teachers can monitor children's progress in using the toilet and provide immediate feedback. In addition, direct practice contributes to the development of children's independence and self-confidence (Rochwidowati & Widyana, 2016; Silranti & Yaswinda, 2019). Early and structured intervention strategies, including modeling, are essential to improve toileting skills, especially for children with developmental disabilities (Kroeger & Sorensen, 2010). The modeling technique is particularly appropriate for children with moderate intellectual disabilities, as they learn best through concrete experiences, such as guided practice. Through modeling, children engage their motor skills and motor memory, which supports skill acquisition more effectively than learning through audio or visual media alone, which require higher levels of reasoning or abstract thinking. In addition, the implementation of modeling in this study refers to developmental milestones of children with moderate intellectual disability and is aligned with task analysis in self-care development, specifically in toilet training. Task analysis breaks down toileting skills into simple, sequential, and operational steps, making it easier for teachers, parents, and children to follow and implement the learning process consistently and effectively.

Despite the growing body of research on toilet training and modeling techniques, studies that specifically examine the effect of modeling techniques on toilet training abilities in children with moderate intellectual disabilities remain limited. Most previous studies have focused on early childhood populations in general or on other self-care skills rather than specifically addressing toileting independence in children with moderate intellectual disabilities. The novelty of this study lies in its focus on analyzing the effectiveness of modeling techniques in improving toilet training skills among children with moderate intellectual disabilities through a contextual, practice-based approach in special education settings. In addition, this study emphasizes the role of teachers as primary models in facilitating learning, thereby providing practical contributions to the development of effective instructional strategies for children with special needs. Based on the above explanation, the purpose of this study is to analyze the effect of the application of modeling techniques on toilet training abilities in children with moderate intellectual disabilities.

METHODS

This study applied a quantitative approach with an experimental method aimed at examining the effect of a specific treatment under controlled conditions (Sugiyono, 2006). The research employed a Single Subject Research (SSR) design using an A–B pattern, where phase A (baseline) was used to identify the participants' initial toilet training abilities without any intervention, and phase B (intervention) was conducted to evaluate changes after implementing the modeling technique as the primary intervention.

The participants in this study were five children with moderate intellectual disabilities at SLB Negeri 3 Banjarmasin, identified by the initials AM, IR, MRH, RJ, and RA. In this study, moderate intellectual disabilities refer to individuals who have significant limitations in intellectual functioning and adaptive behavior, particularly in conceptual, social, and practical skills, and who typically require structured guidance and repeated practice in daily living activities. The determination of participants was based on school records and formal assessments conducted by professionals (such as psychologists or special education experts), as well as teachers' considerations regarding the children's characteristics and needs related to toilet training skills. The study involved two variables, namely the

dependent variable, which is toilet training ability, and the independent variable, which is the modeling technique as the intervention. The modeling technique in this study was implemented by the teacher as the main instructor, while parents did not directly participate in the intervention sessions but supported the generalization of skills at home. The teacher applied the same instructional procedures consistently for all participants.

Data were collected using an observation checklist based on a structured toilet training task analysis. This included sequential activities such as entering the bathroom, removing pants or a skirt, taking off underwear, squatting properly on the toilet, taking water using a dipper, washing the genital area until clean, flushing the toilet, taking soap, washing hands, taking a towel or tissue, putting on underwear, and wearing pants or a skirt again. The task analysis consisted of 12 operational steps, where each step was observed and scored individually in every session. Each session consisted of one complete opportunity (1 trial) to perform all 12 steps of the task analysis. The scoring procedure used a binary system (1 = performed correctly, 0 = not performed or required full assistance), allowing clear measurement of skill acquisition. Mastery criteria were determined when the child was able to perform the majority of steps independently (at least 80% of the total steps) across consecutive sessions. To ensure data reliability, observations were conducted consistently using the same instrument, and where possible, interobserver agreement was applied by involving a second observer to cross-check the accuracy of the recorded behaviors. The intervention was carried out through modeling techniques supported by pictorial media and direct practice, where the teacher demonstrated each step and guided the children during practice. Each intervention session was conducted once per day with a duration of approximately 10–15 minutes.

The research procedure consisted of two stages: the baseline phase (A1), where the children's initial abilities were observed without any treatment, and the intervention phase (B), where the modeling technique was applied systematically and contextually. The baseline phase (A1) was conducted over four sessions to assess the students' initial abilities, while the intervention phase (B) was carried out over seven sessions. Each session followed the same structure and frequency, ensuring consistency in the implementation of the intervention across all participants. Data analysis was conducted using visual analysis in SSR, which is a research design focusing on intensive and repeated observation of individual behavior to evaluate the effect of an intervention. According to Kazdin (2011), SSR examines changes in behavior within an individual over time, while Cooper, Heron, and Heward (2020) define SSR as an approach that emphasizes functional relationships between variables through systematic manipulation and continuous measurement. The analysis included within-condition analysis, which refers to examining data patterns within a single phase (such as level, trend, and stability), and between-condition analysis, which involves comparing data across phases (baseline and intervention) to identify changes in behavior and determine the effectiveness of the intervention.

RESULTS AND DISCUSSION

The results of data collection on toilet training abilities for five children with moderate intellectual disabilities can be seen in Figure 1.

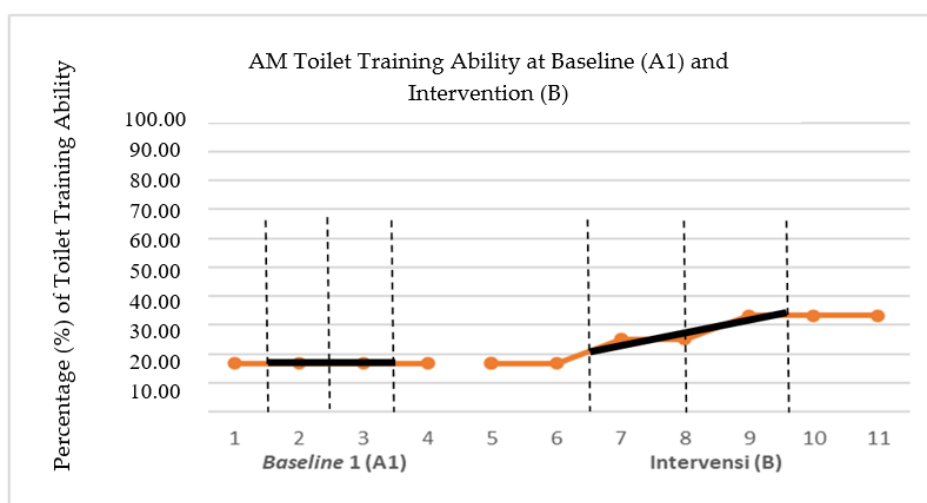


Figure 1 AM toilet training capability data track condition at bseline (A1) and intervention (B)

The results of the visual analysis of the morning toilet training ability data conditions are listed in Table 1.

Table 1 Results of visual analysis in am toilet training capability data conditions

No	Condition	A1	B
1.	Session Length	4	7
2.	Directional Trend Estimation	(=)	(+)
3.	Stability Trends	Stable (100%)	Variable (28.57%)
4.	Data Trace	(=)	(+)
5.	Stability Level and Range	Stable (16.67%-16.67%)	Variable (16.67%-33.33%)
6.	Level Change	(16.67%-16.67%) No change occurred	(16.67%-33.33%) Increase

The results of the visual analysis between the conditions of toilet training ability data are shown in Table 2.

Table 2 Results of visual analysis between conditions of am toilet training capability data

No	Condition Comparison	A1/B
1.	The number of variables changed	1
2.	Changes in direction and their effects	(=) (+)
3.	Stability Changes	Stable to Variable
4.	Level Change	16.67-33.33 (-16.66) (+)
5.	Overlap Percentage	28.57%

The results of the evaluation of the application of modeling techniques to the independence of toilet training children with moderate intellectual disabilities show that the level of mastery of children's toilet training abilities has increased. AM capability has increased from 16.67% to 33.33%. Based on the toilet training lessons that have been carried out, children are able to carry out toilet training steps independently, namely taking off their pants, washing their hands with soap, taking a towel/tissue, and drying their hands.

In the other seven steps, children are able to do so by being given examples and verbal instructions.

The tracking conditions for IR toilet training ability data in the initial (A1) and intervention (B) conditions are listed in Figure 2.

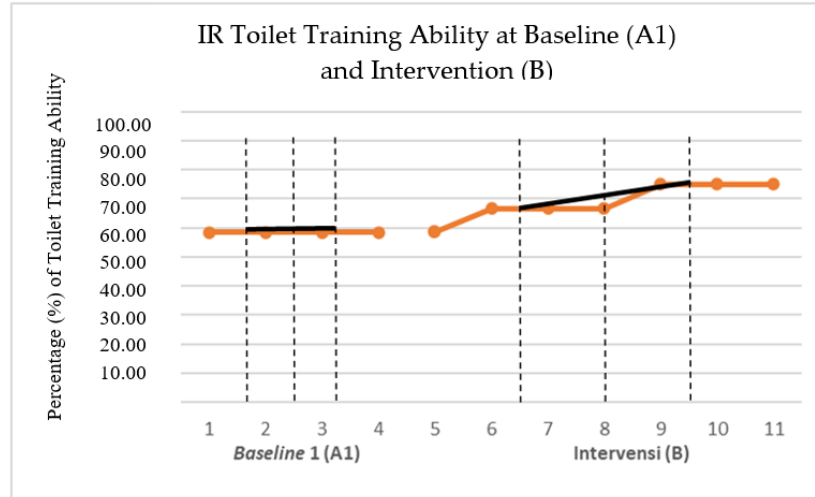


Figure 2 Trace condition of IR toilet training capability data at baseline (A1) and intervention (B)

The results of the visual analysis of the IR toilet training ability data conditions are listed in Table 3.

Table 3 Results of visual analysis in conditions of ir toilet training capability data

No	Condition	A1	B
1.	Session Length	4	7
2.	Directional Trend Estimation	(=)	(+)
3.	Stability Trends	Stable (100%)	Variable (42.86%)
4.	Data Trace	(=)	(+)
5.	Stability Level and Range	Stable (58.33%-58.33%)	Variable (58.33%-75%)
6.	Level Change	(58.33%-58.33%) No change occurred	(58.33%-75%) Increase

The results of the visual analysis between the conditions of the IR toilet training ability data are listed in Table 4.

Table 4 Results of visual analysis between conditions of ir toilet training capability data

No	Condition Comparison	A1/B
1.	The number of variables changed	1
2.	Changes in direction and their effects	(=) (+)
3.	Stability Changes	Stable to Variable
4.	Level Change	58.33 – 75.00 (-16.67) (+)
5.	Overlap Percentage	42.86%

IR capability has increased from 58.33% to 75%. Children are able to carry out 9 of the 12 stages independently, which consist of going to the toilet independently, taking off their

trousers, taking off their underwear, squatting in the toilet in the correct position, washing their hands with soap, taking a towel/tissue, drying their hands, and wearing trousers. Inside, and wear pants. In the other 3 steps, namely taking water with a ladle, washing the genitals until clean, and flushing the toilet, the child is able to use verbal instructions. Tracking the condition of MRH toilet training ability data in the initial condition (a1) and intervention (b) is listed in Figure 3.

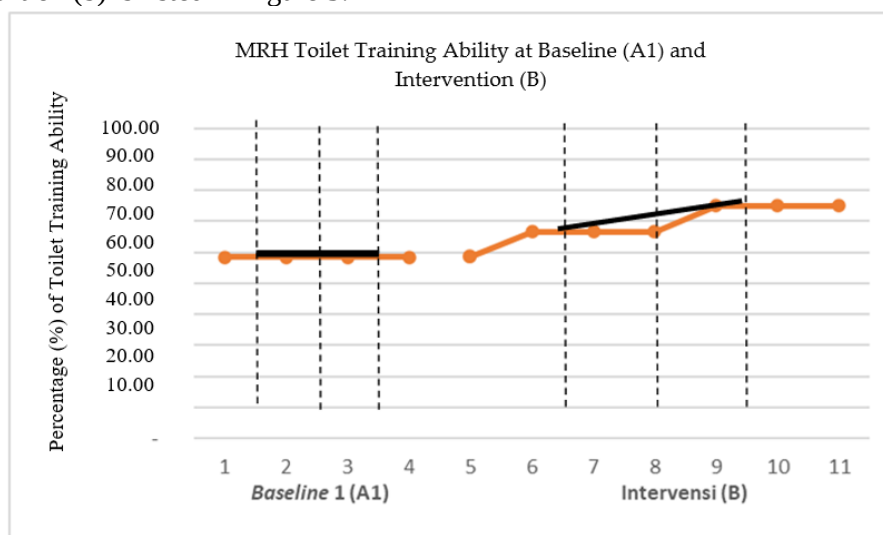


Figure 3 Trace condition of mrh toilet training capability data at baseline (a1) and intervention (b)

The results of the visual analysis of the MRH toilet training ability data conditions are listed in Table 5.

Table 5 Results of visual analysis in mrh toilet training capability data conditions

No	Condition	A1	B
1.	Session Length	4	7
2.	Directional Trend Estimation	(=)	(+)
3.	Stability Trends	Stable (100%)	Variable (42.86%)
4.	Data Trace	(=)	(+)
5.	Stability Level and Range	Stable (58.33%-58.33%)	Variable (58.33%-75%)
6.	Level Change	(58.33%-58.33%) No change occurred	(58.33%-75%) Increase

The results of the visual analysis between the MRH toilet training ability data conditions are shown in Table 6.

Table 6 Results of visual analysis between conditions of mrh toilet training capability data

No	Condition Comparison	A1/B
1.	The number of variables changed	1
2.	Changes in direction and their effects	(=) (+)
3.	Stability Changes	Stable to Variable
4.	Level Change	58.33 – 75.00 (-16.67) (+)
5.	Overlap Percentage	42.86%

MRH capability has increased from 58.33% to 75%. Children are able to carry out 9 of the 12 stages independently, which consist of going to the toilet independently, taking off their trousers, taking off their underwear, squatting in the toilet in the correct position, washing their hands with soap, taking a towel/tissue, drying their hands, and wearing trousers. inside, and wear pants. In the other 3 steps, namely taking water with a ladle, washing the genitals until clean, and flushing the toilet, the child is able to use verbal instructions.

Figure 4 The condition of the RJ toilet training ability data path at baseline (A1) and intervention (B) is listed in Figure 4.

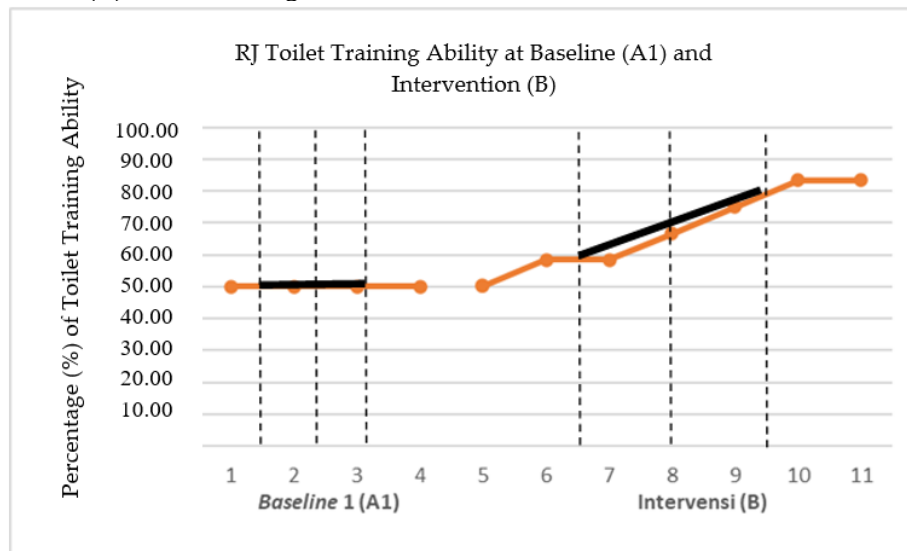


Figure 4 Track condition of rj toilet training capability data at baseline (a1) and intervention (b)

The results of the visual analysis of the condition of the RJ toilet training ability data are listed in Table 7.

Table 7 Results of visual analysis in the rj toilet training capability data conditions

No	Condition	A1	B
1.	Session Length	4	7
2.	Directional Trend Estimation	(=)	(+)
3.	Stability Trends	Stable (100%)	Variable (14.29%)
4.	Data Trace	(=)	(+)
5.	Stability Level and Range	Stable (50.00%-50.00%)	Variable (50.00%-83.33%)
6.	Level Change	(50.00%-50.00%) No change occurred	(50.00%-83.33%) Increase

The results of the visual analysis between the IR toilet training ability data conditions are listed in Table 8. RJ's ability has increased from 50% to 83.33%. Children are able to carry out 10 of the 12 stages independently, which consist of going to the toilet independently, taking off their pants, taking off their underwear, squatting in the toilet in the correct position, getting water with a dipper, washing their hands with soap, taking a towel/tissue, drying their hands, putting on underwear, and putting on pants. In the other 2 steps, namely

washing the genitals thoroughly and flushing the toilet, the child is able to use verbal instructions.

Table 8 Results of visual analysis between conditions of ir toilet training capability data

No	Condition Comparison	A1/B
1.	The number of variables changed	1
2.	Changes in direction and their effects	(=) (++)
3.	Stability Changes	Stable to Variable
4.	Level Change	(50.00%-83.33%) (-33.33%) (+)
5.	Overlap Percentage	14.29%

SA toilet training ability data tracking conditions at baseline (a1) and intervention (b) are listed in Figure 5.

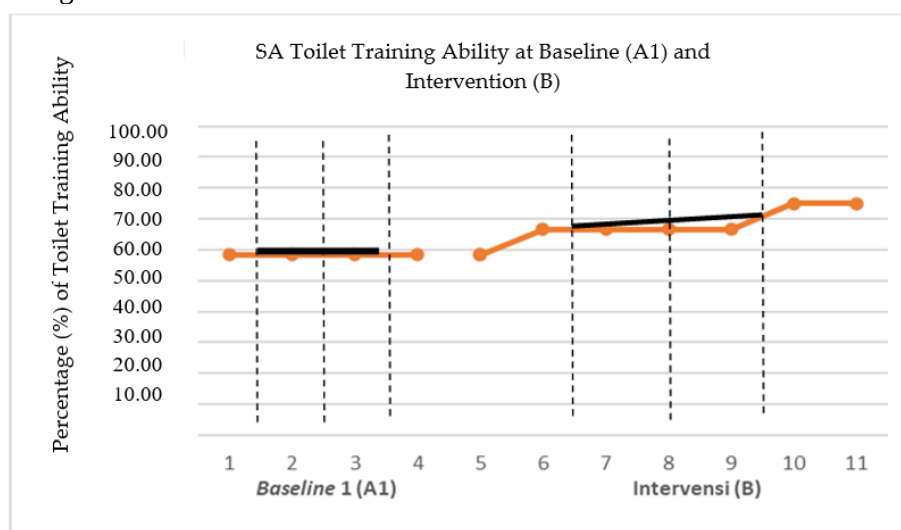


Figure 5 SA toilet training capability data track condition at baseline (a1) and intervention (b)

The results of the visual analysis of SA toilet training ability condition data are listed in Table 9.

Table 9 Results of visual analysis in sa toilet training capability data conditions

No	Condition	A1	B
1.	Session Length	4	7
2.	Directional Trend Estimation	(=)	(+)
3.	Stability Trends	Stable (100%)	Variable (57.14%)
4.	Data Trace	(=)	(+)
5.	Stability Level and Range	Stable (58.33%-58.33%)	Variable (58.33%-75%)
6.	Level Change	(58.33%-58.33%) No change occurred	(58.33%-75%) Increase

The results of the visual analysis between SA toilet training ability data conditions are listed in Table 10.

Table 10 Results of visual analysis between conditions of sa toilet training capability data

No	Condition Comparison	A1/B
1.	The number of variables changed	1
2.	Changes in direction and their effects	$\overline{\hspace{1cm}}$ (=) $\nearrow$ (+)
3.	Stability Changes	Stable to Variable
4.	Level Change	58.33 – 75.00 (-16.67) (+)
5.	Overlap Percentage	14.29%

SA capability has increased from 58.33% to 75%. Children are able to carry out 9 of the 12 stages independently, which consist of going to the toilet independently, taking off their trousers/skirts, taking off their underwear, squatting in the toilet in the correct position, washing their hands with soap, taking a towel/tissue, drying their hands, and wearing underwear. In the other 3 steps, namely washing the genitals thoroughly, flushing the toilet, and wearing a skirt, children are able to use verbal instructions.

The following is data on the results of applying modeling techniques to independent toilet training of children with moderate intellectual disabilities (see Table 11)

Table 11 Recapitulation of the application of modeling techniques to the independence of toilet training children with moderate intellectual disabilities

No.	Child's Name	Toilet Training Skills	
		A1	B
1.	AM	16.67%	26.19%
2.	IR	58.33%	69.05%
3.	MRH	58.33%	69.05%
4.	RJ	50.00%	67.86%
5.	SA	58.33%	75.00%

The summary of the average level of toilet training skills at baseline (A1) and intervention (B) is listed in Figure 6.

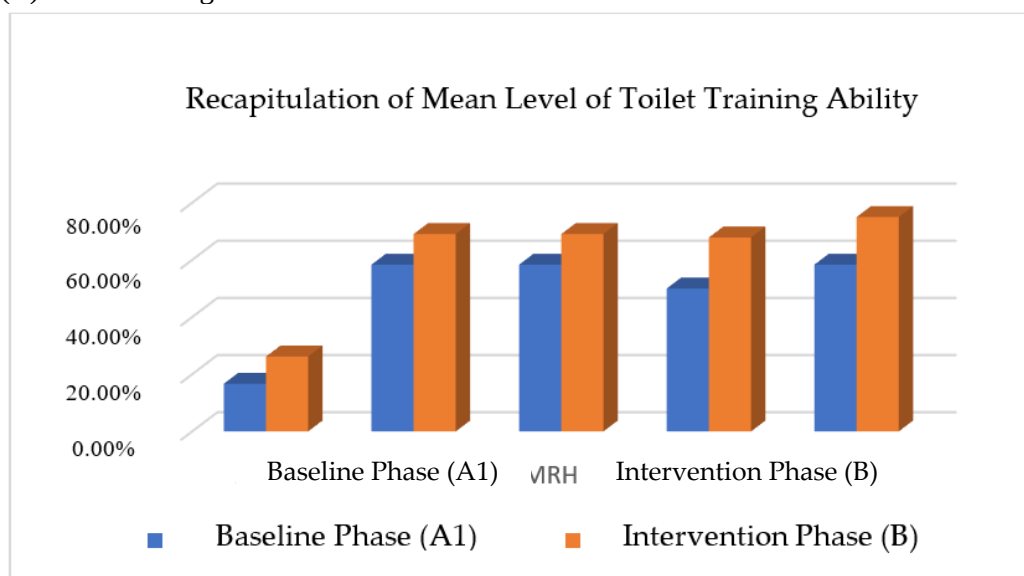


Figure 6 Recapitulation of mean level of toilet training skills at baseline (a1) and intervention (b)

The results of the assessment of children's toilet training abilities show that intervention in the form of applying modeling techniques can improve the toilet training abilities of children with moderate intellectual disabilities. Differences in toilet training abilities among children in this study can be attributed to several factors. In the context of Single Subject Research (SSR), such variation is expected due to individual characteristics, including cognitive ability, developmental readiness, communication skills, and level of independence. In addition, each child starts from a different baseline condition; therefore, the outcomes of the intervention also vary. This is consistent with the SSR approach, which focuses significantly on each individual's development and abilities. For this reason, it is referred to as single-subject research, as it emphasizes in-depth analysis of each participant.

The implementation of modeling techniques in this study involved the use of picture card media combined with direct practice by the children. Instruction using picture cards was conducted by teachers in the school setting, while parents reinforced the same approach at home by introducing the cards and guiding children through hands-on practice. Both teachers and parents provided structured instructions to support children in performing toilet training activities independently in the bathroom.

The study employed two observation phases, namely the baseline phase (A), conducted prior to the intervention, and the intervention phase (B), during which the treatment was applied. The baseline phase consisted of four sessions, while the intervention phase was carried out over seven sessions. Findings from the baseline phase indicated that children's toilet training abilities were relatively low and showed minimal progress. However, during the intervention phase, there was a noticeable improvement in the toilet training skills of the five children (Ganz et al., 2018; Koegel et al., 2019).

Data analysis further revealed that prior to the introduction of picture card-based learning, children's abilities tended to remain stagnant. Following the intervention, improvements were observed, and these gains were maintained even after the intervention was discontinued. Behavioral changes related to toilet training became more consistent and continued to develop over time. This suggests that modeling techniques have a significant impact on enhancing children's toilet training abilities, particularly because the learning process is contextual and directly applicable to daily routines (Banda & Grimmer, 2018; Charlop-Christy et al., 2020).

Moreover, children demonstrated an increased ability to recall and perform each step of the activity when supported by visual media and direct practice with their parents. The effectiveness of toilet training is closely linked to parental involvement in consistently implementing training at home. Providing reinforcement when children show progress plays a crucial role in motivating them to repeat the behavior, which over time contributes to the formation of more permanent habits (Kroeger & Sorensen-Burnworth, 2019; LeBlanc et al., 2021). In addition, positive support and guidance from teachers further contribute to the development of children's independence in daily living skills, including toileting. The collaboration between teachers and parents, along with the use of appropriate instructional media, is a key factor in achieving successful outcomes (Tiger et al., 2020). Based on the discussion above, it can be concluded that the application of modeling techniques effectively improves the toilet training abilities of children with moderate intellectual disabilities.

CONCLUSION

Based on the visual analysis of Single Subject Research (SSR) data, the principal finding of this study is that the application of modeling techniques led to a consistent and measurable improvement in toilet training abilities among five children with moderate intellectual disabilities. This conclusion is supported by cleaned SSR evidence across 11 sessions (four baseline and seven intervention sessions), where the baseline phase (A1) showed low, stable, and non-improving performance, while the intervention phase (B)

demonstrated a clear increase in level, an upward trend, and improved data stability across participants. Minimal overlap between baseline and intervention data further indicates a functional relationship between the modeling intervention and the observed behavioral changes. Thus, the modeling technique can be considered effective in improving toilet training skills in this population. Practically, these findings imply that teachers can implement structured modeling combined with task analysis and direct practice as an effective strategy to teach self-care skills, particularly toilet training, in special education settings. Parents are encouraged to reinforce the same step-by-step procedures at home to support skill generalization and consistency across environments. However, this study has several limitations that should be acknowledged. The use of a single-subject research design with a small number of participants limits the generalizability of the findings. In addition, the relatively short intervention duration and the absence of long-term follow-up data mean that the maintenance of skills over time cannot yet be confirmed. Future research is recommended to involve larger samples, include generalization and maintenance phases, and strengthen reliability measures to further validate the effectiveness of modeling techniques across broader ADL domains.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS STATEMENT

The first author was responsible for designing and developing the research framework, collecting data, and conducting data analysis using appropriate methods. In addition, the first author prepared the initial draft of the manuscript, including the introduction, methodology, results, and discussion sections. The second author contributed to the development of the theoretical framework and the literature review. The second author also revised the manuscript to improve the quality of the content and language accuracy. Furthermore, the second author managed the manuscript submission process and maintained communication with the journal editors.

AI DISCLOSURE STATEMENT

The authors used several tools and services during the preparation of this work, including Grammarly for language editing and improving clarity and Google Scholar, SINTA, and Scopus databases to access accredited national and international journal articles for literature review purposes. These tools and services were utilized to ensure the accuracy of references, enhance the quality of academic writing, and support a comprehensive and credible review of relevant literature. After using the tool/service, the authors thoroughly reviewed and edited the content as needed and took full responsibility for the content of the publication. The authors declare that this research was prepared, researched, written, and edited without the aid of artificial intelligence (AI) techniques.

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