

Adaptive Digital Service Management Using ASYIK ATIK SIUUL Models Supporting Inclusive Early Childhood Education

Sri Watini^{1*} , Mohammadtahir Cheumar² 

¹Master of Management, Universitas Panca Sakti Bekasi, Indonesia

²Kulliyyah Kewangan Islam, Sains Pengurusan dan Hospitaliti, Sultan Abdul Halim Mu'adzam Shah International Islamic University, Malaysia

¹srie.watini@gmail.com, ²tahir@unishams.edu.my

*Corresponding Author

Article Info

Article history:

Submission February 27, 2026

Revised August 18, 2026

Accepted October 1, 2026

Published October 8, 2026

Keywords:

ATIK Model

Basic Life Skills

Inclusive Early Childhood
Education

Program Development

Children



ABSTRACT

Adaptive Digital Service Management is increasingly essential for developing intelligent, personalized, and trustworthy digital service ecosystems that can adapt to diverse user requirements. In inclusive Early Childhood Education (ECE), children with disabilities require adaptive assistance mechanisms that continuously respond to individual learning conditions. **This study aims** to develop and validate an Adaptive Digital Service Management framework by integrating the ASYIK ATIK SIUUL Models with Prompt-based assistance mechanisms to support basic life skills development in inclusive ECE environments. The research applied a **Research and Development (R&D) methodology** using a mixed-method approach **with the ADDIE development model**. The participants consisted of 10 children with disabilities from Class A and Class B at PAUD Baitul Huda Kebon Jeruk, West Jakarta. The framework was implemented through 12 basic life skill activities involving 12 achievement indicators over a six-month intervention period. Data were collected using structured observation instruments with a 1–4 rating scale and analyzed using N-Gain evaluation and the Wilcoxon Signed-Rank Test due to the small non-normally distributed paired dataset. The **findings** demonstrate that the integration of ASYIK ATIK SIUUL Models with Prompt mechanisms improves adaptive learning service effectiveness through continuous observation, personalized assistance adjustment, and progressive fading strategies. The proposed framework provides an adaptive service mechanism that dynamically manages learning support based on individual performance conditions. This study **contributes** a trustworthy and intelligent service management approach that integrates human-centered adaptation, performance monitoring, and personalized digital service delivery. The proposed framework provides practical implications for educators, caregivers, and digital service developers in designing resilient and adaptive learning service systems for inclusive education environments.

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DOI: <https://doi.org/10.34306/ijcitsm.v6i2.270>

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1. INTRODUCTION

Early childhood is a developmental stage in which children undergo significant growth and learning processes. They possess unique characteristics, including a high level of curiosity and a tendency to imitate and perform actions based on figures they admire. Children observe their surroundings carefully using all their senses. During early childhood, children begin to understand natural and social phenomena around them through observation and direct exploration [1]. Their strong curiosity encourages them to learn and ask questions to parents or responsive individuals who can fulfill their desire for knowledge [1]. This curiosity-driven learning process enables children to actively interact with their environment, acquire new experiences, and gradually develop cognitive and social understanding.

Early childhood children have a strong tendency to imitate observed behaviors, making imitation an important mechanism for developing social, cognitive, communication, and basic life skills. Through observation of parents, caregivers, and significant figures, children learn behaviors, language, and daily activities that support development [2–4]. However, children with disabilities may experience limitations affecting daily functioning, education, and social participation [5]. They also face barriers such as stigma, discrimination, limited educational access, and inadequate support systems that may hinder development and independence [6]. Therefore, inclusive learning approaches are needed to provide adaptive support according to individual needs.

Children with disabilities have the right to receive inclusive education that addresses their pedagogical, environmental, and social needs [7]. Therefore, early intervention programs should consider individual developmental conditions, particularly in developing basic life skills to support independence. Activities such as brushing teeth, dressing, organizing materials, and other self-care routines are essential skills that should be strengthened from an early age. However, many children with disabilities still experience barriers in performing these activities independently due to limitations in motor, cognitive, communication, and adaptive abilities.

Based on these challenges, appropriate solutions are required to address the existing problems. The implementation of the Amati-Tiru-Kerjakan (ATIK) Model framework integrated with Prompt provides a practical approach for developing basic life skills programs, particularly for children with disabilities in inclusive early childhood education. This framework provides guidance and a structured roadmap for teachers in implementing learning practices within the classroom. With a child-friendly framework that provides concrete and contextual examples of basic life skills, teachers can implement learning activities according to available facilities and resources without experiencing significant obstacles.

This study contributes to SDG 4 Quality Education by supporting inclusive and equitable learning opportunities for children with disabilities through structured, adaptive, and individualized basic life skills development, while also supporting SDG 10 Reduced Inequalities by reducing learning barriers and promoting equitable participation. The objective of this study is to develop and validate an integrated ATIK Model with Prompt framework that combines observational learning, guided imitation, structured task execution, and systematic prompt fading within an adaptive learning mechanism. This framework provides a practical and replicable approach for teachers, caregivers, and parents in developing basic life skills programs while offering a conceptual foundation for future research on improving independence and developmental outcomes in inclusive education settings.

2. LITERATURE REVIEW

According to [8], learning through modeling involves direct, symbolic, verbal, and non-verbal processes that support children's cognitive development and positive behavior formation. The integration of the ATIK Model framework with Prompt provides an innovative and contextual learning strategy for children with disabilities in inclusive early childhood education. Previous studies have applied prompting strategies in various fields [9], while participatory pedagogical approaches emphasize active involvement, exploration, interaction, and collaboration in learning processes [10].

The ATIK Model with Prompt provides an alternative strategy adapted from previous learning model developments. Programs for children with disabilities should consider individual needs and developmental characteristics. Identifying children's social-emotional and contextual challenges enables teachers to design appropriate intervention programs aligned with their needs [11]. Individual Learning Programs (ILPs) support the implementation of structured interventions through well-defined frameworks and activity sequences for children with various disability conditions.

Within inclusive early childhood education settings, ILPs should accommodate children's developmental levels, learning pace, and individual learning styles. Basic life skills are essential for supporting children's daily functioning and future development through strategies involving physical-motor skills, social interaction, daily activities, and environmental adaptation [12]. Therefore, the ATIK Model with Prompt provides an adaptive framework to enhance independence among children with disabilities in performing self-care activities, including dressing, brushing teeth, combing hair, wearing socks, organizing materials, and cleaning utensils.

3. RESEARCH METHOD

This study employed a Research and Development (R&D) approach using the ADDIE model to develop a basic life skills learning program for children with disabilities in inclusive early childhood education. The development process was designed by considering children's developmental stages, individual characteristics, and specific learning needs. The research participants consisted of 10 young children with disabilities at PAUD Baitul Huda Jakarta, including 6 children from Class A and 4 children from Class B. The participants represented various developmental conditions, including autism spectrum disorder, intellectual disabilities, developmental delays, and other developmental challenges identified through institutional assessment records. The study was conducted over a six-month period from January to June 2026, during which the developed learning program was implemented and evaluated.

During the implementation phase, participants engaged in 12 basic life skills activities, including eating and drinking, dressing, combing hair, wearing socks, putting on shoes, organizing stationery, washing eating utensils, arranging tables and chairs, organizing toys, and other daily self-care activities. Each activity was evaluated using an attitude observation sheet with a 1–4 rating scale, representing children's independence level and the assistance required during task completion. Observations were conducted before and after the intervention to measure changes in basic life skills performance and skill acquisition. The data were analyzed using the Normalized Gain (N-Gain) score to evaluate improvement effectiveness and the Wilcoxon Signed-Rank Test to examine differences between paired pretest and posttest scores, considering the small dataset and non-normal distribution.

The intervention protocol was implemented across the 12 targeted basic life skills during the six-month research period. Each activity followed a structured sequence consisting of assessment, task analysis, observation (Amati), guided imitation (Tiru), supported or independent performance (Kerjakan), prompt evaluation, recording, and fading of assistance. Although support levels were individualized based on each child's characteristics and performance, the intervention sequence remained consistent. Teachers or caregivers monitored responses, recorded assistance levels, and adjusted support accordingly to maintain procedural consistency while accommodating individual needs in inclusive early childhood education.

This research consisted of several stages, including the analysis stage, design stage, development stage, implementation stage, and evaluation stage. The analysis stage was the initial step aimed at identifying the urgency of developing a basic life skills learning program using the ATIK Model Framework integrated with Prompt in inclusive early childhood education (ECE). This analysis was based on the diverse characteristics of learners, different learning needs, and the demands of inclusive education implementation that provides effective, adaptive, and independence-oriented learning services for children. Based on theoretical studies and field needs assessments, several key considerations support the importance of developing this program:

- First, the ATIK Model Framework integrated with Prompt is capable of accommodating the diverse characteristics of children in inclusive ECE settings. Children with special needs have different abilities, learning styles, and developmental levels, requiring flexible learning approaches. The ATIK Model Framework, consisting of the stages of Amati (Observe), Tiru (Imitate), and Kerjakan (Perform), provides a simple, systematic, and easily applicable learning sequence for various learner characteristics. Meanwhile, the prompting strategy functions as learning assistance provided gradually according to each child's abilities and needs. Learning success is not only measured by the child's ability to complete tasks but also by the reduction of assistance provided through the fading process until children are able to perform skills independently.
- Second, the development of this program supports the implementation of errorless learning, or learning without failure. Children with developmental barriers are generally more vulnerable to frustration when

experiencing failure during the learning process. Therefore, the use of a most-to-least prompting strategy allows children to receive optimal support during the initial stages of learning, enabling them to complete tasks with a high level of success. These positive learning experiences contribute to increased self-confidence, learning motivation, and children's willingness to attempt new skills without fear of failure.

- Third, the ATIK Model Framework integrated with Prompt creates a predictable and consistent learning structure. Most children with disabilities require clear and repetitive routines to feel secure during learning activities. The stages of Observe, Imitate, and Perform provide a consistent learning pattern that helps children understand activity sequences gradually. This consistency reduces anxiety when children encounter new tasks or instructions while improving their ability to follow learning procedures independently.
- Fourth, the implementation of the ATIK Model Framework with Prompt has the potential to reduce executive function barriers commonly experienced by children with disabilities. These barriers include difficulties in planning, organizing, remembering sequences of steps, and completing tasks systematically. Through the processes of observing, imitating, and performing, complex skills are broken down into simpler steps, making them easier for children to understand and execute. Furthermore, gradual prompting provides support at each learning stage, allowing children to complete tasks more effectively until they are eventually able to perform them independently.
- Fifth, the ATIK Model Framework integrated with Prompt serves as a bridge toward children's independence. This approach positions teachers not only as instructors but also as facilitators who provide assistance according to learners' needs and systematically reduce support through the fading process. This strategy enables children to gradually develop the ability to perform various basic life skills until they achieve greater independence. Therefore, the development of this learning program aligns with the primary objectives of inclusive education, namely preparing children to manage daily activities independently, reducing dependence on others, and improving their quality of participation within family, school, and community environments.

The effectiveness of the ATIK Model Framework with Prompt can be understood by comparing its characteristics with conventional approaches. Traditional approaches often provide instructions without considering individual abilities, task complexity, or gradual assistance reduction, which may maintain dependency on external support. In contrast, the ATIK Model Framework with Prompt integrates structured learning sequences, individualized prompting, and systematic fading to help children with disabilities develop functional abilities and independence. The comparison between both approaches is presented in Table 1.

Table 1. Comparison of ATIK Prompt Effectiveness

Without ATIK Model and Prompting	With ATIK Model and Prompting
The instructions provided are often too abstract, making it difficult for children to understand directions and potentially causing misinterpretation.	Instructions are structured with simple, understandable, and concrete steps through the use of visual media, direct demonstrations (modeling), and physical activities.
Children often experience confusion in determining the initial steps, sequence, and priorities of activities that need to be performed.	The "Observe" (Amati) stage functions to clarify the starting point of activities, allowing children to understand what needs to be done before beginning the task.
The level of children's dependence on teachers remains high and tends to persist, resulting in suboptimal development of independence in completing tasks.	The implementation of the fading technique (gradual reduction of assistance) aims to reduce children's dependence on teachers and encourage independence in completing tasks.
The evaluation process is still limited to the categories of "Able" or "Unable," thus failing to provide a comprehensive overview of children's developmental progress.	Evaluation is conducted based on the level of assistance provided to children. Learning success is indicated by the decreasing level of support required until children are able to complete tasks independently.

The design stage is the second phase of the ADDIE model, focusing on developing a systematic, adaptive, and learner-centered basic life skills program for children with disabilities in inclusive Early Childhood Education (ECE). The program design was developed based on the needs analysis by considering children's developmental characteristics, learning diversity, and inclusive education principles. This stage includes the development of learning activities, materials, implementation strategies, and evaluation procedures based on the ATIK Model integrated with prompting strategies. The learning design applies flexible approaches, including Universal Design for Learning (UDL) principles, through various learning media and participation methods. The ATIK sequence of Observe (*Amati*), Imitate (*Tiru*), and Perform (*Kerjakan*) supports skill acquisition through observation, guided practice, and independent performance, while prompting strategies provide individualized assistance and gradual fading. Evaluation instruments were also developed to monitor learning outcomes and children's independence progress based on individual abilities.

The developed design provides a foundation for implementing an adaptive basic life skills program that is flexible, inclusive, and responsive to children's needs. The combination of structured learning stages, accessible learning media, individualized prompting, and authentic evaluation mechanisms enables teachers to provide meaningful learning experiences while supporting children's gradual transition toward independence. The development process of the Basic Life Skills Program in inclusive early childhood education using the ATIK Model integrated with Prompting strategy is presented in Figure 1, illustrating the operational relationship between needs analysis, ATIK-Prompt implementation stages, evaluation procedures, and the development of independent life skills.

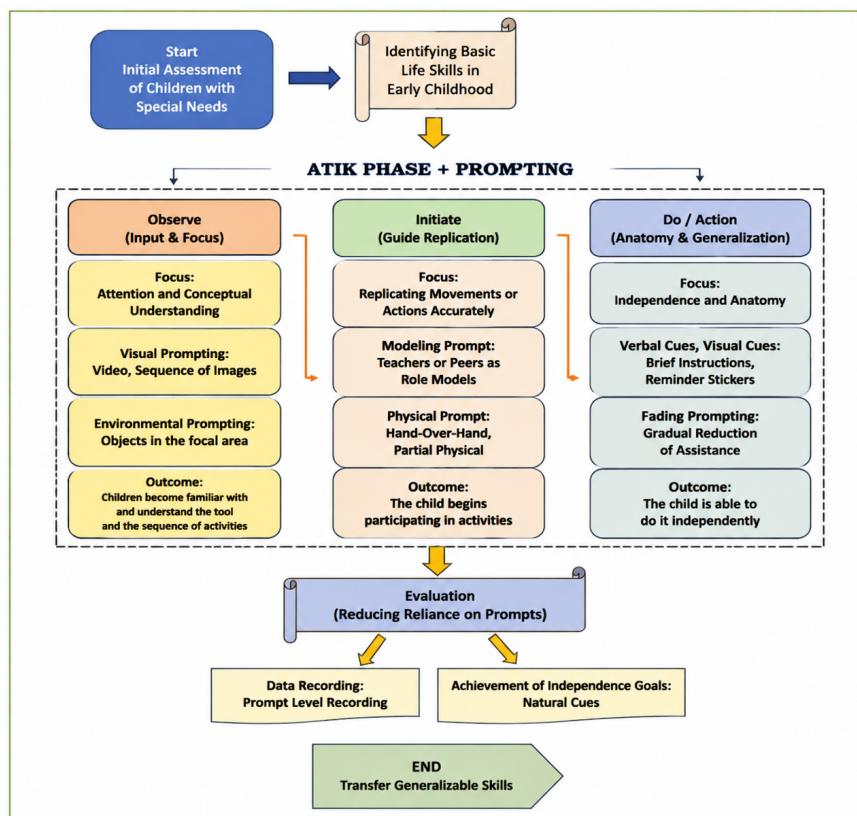


Figure 1. Operational Implementation Protocol of the ATIK Model Integrated with Prompting for Basic Life Skills Development

The implementation stage involves implementing the basic life skills development program using the ATIK Model and Prompting strategy, such as tooth-brushing activities, through structured and systematic learning procedures. The implementation procedure is conducted gradually to ensure that each child receives appropriate learning support based on their individual characteristics and needs. This procedure consists of seven interconnected stages, beginning with initial assessment and continuing through advanced skill development:

- The first stage is the initial assessment, which aims to identify each child's characteristics, initial abilities, developmental strengths, developmental barriers, and learning needs. The information obtained from this stage serves as the foundation for developing individualized learning programs, selecting basic life skills targets, and determining the type and level of assistance (prompt) required during the learning process.
- The second stage is the identification of basic life skills through task analysis. At this stage, life skills to be taught are selected based on children's developmental needs and readiness levels. The selected skills are then broken down into a series of simple, structured, and sequential steps. Task analysis aims to reduce the complexity of activities so that each component of the skill can be learned gradually according to the learners' abilities.
- The third stage is the implementation of the ATIK Model integrated with the prompting strategy. The learning process is carried out through three main stages: Amati (Observe), Tiru (Imitate), and Kerjakan (Perform). In the Amati stage, teachers provide demonstrations or examples of the target behavior so that children obtain a clear understanding of the skills to be learned. Subsequently, in the Tiru stage, children imitate the demonstrated behavior with assistance through prompts adjusted to their individual needs, ranging from full assistance to minimal support. The prompt hierarchy progresses from full physical assistance, partial physical assistance, modeling, gestural or verbal cues, visual or environmental cues, to independent performance according to each child's response. In the Kerjakan stage, children are given opportunities to perform the skills more independently, while teachers gradually reduce the intensity of assistance through the fading process until children are able to complete tasks without dependence on external support.
- The fourth stage is prompt fading evaluation. Evaluation is conducted continuously to assess children's progress based on the reduction of assistance required to complete each skill. Learning success is not only determined by the final achievement of the task but also by children's ability to complete activities with an increasing level of independence.
- The fifth stage is prompt level recording. During each learning session, teachers document the type, level, and frequency of prompts provided to each child. These data are used to monitor individual development, evaluate the effectiveness of learning strategies, and determine appropriate decisions regarding when assistance should be reduced or discontinued. Assistance was maintained when performance remained inconsistent, reduced when the child demonstrated stable task completion, restored when performance declined after fading, and discontinued when the child completed the task independently.
- The sixth stage is independent performance achievement. This stage is characterized by children's ability to perform basic life skills independently by utilizing natural cues available in the environment without requiring assistance from teachers, caregivers, or parents. This achievement becomes the primary indicator of the effectiveness of the ATIK Model implementation with the prompting strategy in developing children's independence.
- The seventh stage is skill expansion and generalization. After children master a specific basic life skill, the learning process continues with more complex skills. Furthermore, children are provided with opportunities to apply acquired skills across different situations, environments, and daily life contexts. This generalization stage ensures that acquired skills are not only demonstrated during learning activities but can also be consistently applied in everyday routines, supporting the development of sustainable independence.

The implementation process demonstrates how the ATIK Model integrated with Prompting strategy supports functional life skills development through structured learning experiences. Activities begin with observation using teacher demonstrations and visual cues, followed by guided imitation with individualized assistance, and progress toward independent performance through systematic prompt fading. This gradual transition from assisted learning to independent execution enables children to develop functional competence, confidence, and consistency in performing daily activities.

4. RESULT AND DISCUSSION

Based on the data collected through the observation worksheets, the profile of children's basic life skills before (pretest) and after (posttest) the intervention was obtained.

Table 2. Pretest and Posttest Results of Basic Life Skills

No	Basic Life Skills	Pretest	Posttest
1	Bathing Yourself	58%	85%
2	Brushing Teeth	55%	90%
3	Eat and Drink	51%	93%
4	Wearing Clothes	54%	95%
5	Combing Hair	52%	92%
6	Using Socks	55%	91%
7	Using Shoes	46%	87%
8	Shoeing	60%	94%
9	Preparing Stationery	54%	95%
10	Washing Tableware	60%	90%
11	Tidying up tables, study chairs	59%	94%
12	Tidying up toys	51%	89%

Referring to the table above, there was a significant increase in the overall percentage of children's independence. Before receiving the intervention using the ATIK Model Framework with Prompting strategy, the average percentage of students' independence was categorized as not yet independent, ranging from 46% to 60%. However, after the ATIK-Prompt intervention was completed, all basic life skills indicators exceeded 85%. These findings directly support the research objective by demonstrating that the ATIK-Prompt framework effectively transforms structured learning activities into measurable improvements in children's functional independence.

Although the improvement in shoe-wearing skills appeared lower compared with other skills, a significant increase was still observed. Some children with disabilities experienced fine motor difficulties that affected their ability to manage shoe fasteners, adjust shoe positions, and complete sequential movements. Shoe-wearing is a complex self-care activity because it requires the integration of motor coordination, balance, concentration, and problem-solving abilities. These challenges become greater when children use lace-up shoes, which require additional skills such as managing shoelaces, coordinating bilateral hand movements, and maintaining attention throughout the activity. Therefore, shoe-wearing requires structured guidance, adaptive strategies, and individualized assistance to support children in gradually developing greater independence.

Children with disabilities may also experience physical variations that influence their ability to perform shoe-wearing activities independently. Previous studies reported that children with physical disabilities, such as cerebral palsy, may experience foot deformities that create difficulties in selecting and using appropriate footwear [13]. In addition, children with intellectual and developmental disabilities frequently experience foot-related challenges, including foot shape differences, fitting difficulties, and complications related to orthopedic devices. In this study, three out of ten children demonstrated differences in foot shape and size between the right and left feet, which affected their balance, comfort, and ability to complete shoe-wearing activities. Therefore, adaptive learning strategies and individualized support are required to accommodate children's physical characteristics and promote independence in self-care activities.

In addition to motor difficulties, observations during the intervention indicated that children with disabilities also experienced challenges in understanding instructions, remembering previously learned steps, and completing multi-step activities. Children with intellectual disabilities often experience difficulties in abstract thinking, processing complex information, and following sequential instructions, which may affect their ability to perform daily activities independently. The improvement of basic life skills independence before and after the intervention is presented in Figure 2. The results demonstrate that the ATIK Model integrated with Prompting strategy supported children's gradual transition from assisted performance toward greater independence through structured learning activities, adaptive assistance, and systematic reduction of support.

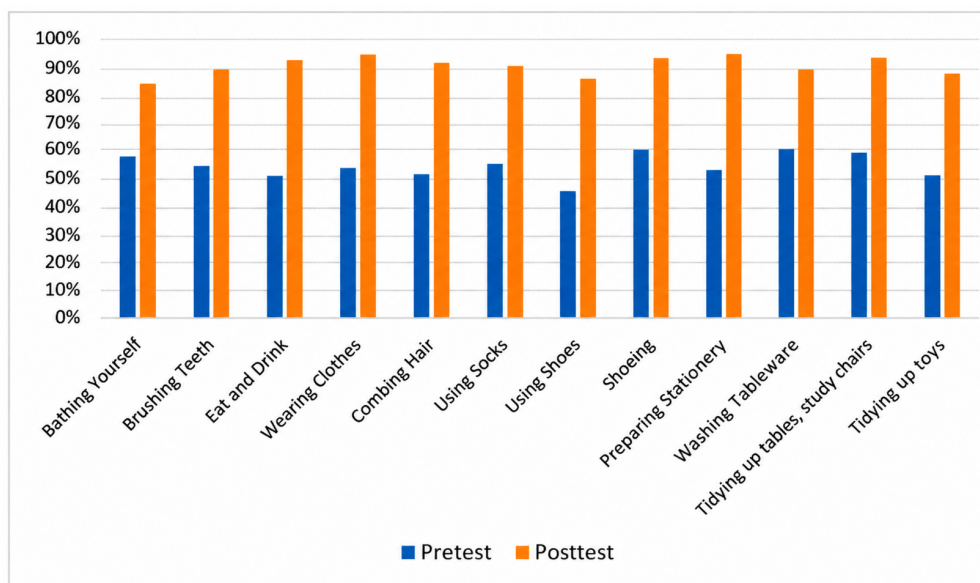


Figure 2. Improvement of Basic Life Skills Independence Before and After Intervention

Referring to Figure 2 above, the highest posttest scores were observed in the independence skills of wearing clothes and preparing stationery, with the percentage increasing from 54% to 95%. During the intervention activities for teaching children with disabilities how to dress independently, initial difficulties were identified, particularly when children used clothes with traditional button designs similar to those worn by typically developing children. This activity requires coordination between both fingers and visual focus to insert the button into the hole, as well as balanced fine motor strength to push the button through the opening.

Furthermore, clothing usually consists of multiple buttons arranged from the bottom to the top, typically ranging from four to five buttons, which increases the level of difficulty and requires a longer completion time. Therefore, teachers/caregivers provided alternative solutions by preparing clothes equipped with Velcro or magnetic fasteners. For lower garments, such as skirts or trousers, elastic waistbands were selected to make dressing easier. For shirts, larger sizes were chosen to facilitate wearing, and shoulder areas were modified using Velcro fasteners to provide additional accessibility for children with disabilities [14].

The selection and modification of adaptive clothing should be adjusted according to the characteristics, functional abilities, and specific needs of each child with disabilities. Different types of disabilities may create different challenges in performing dressing activities, including difficulties related to fine motor coordination, muscle strength, sensory responses, and cognitive processing. Therefore, clothing designs that reduce task complexity and provide easier fastening mechanisms can support children in developing greater independence during self-care activities. Adaptive clothing features, such as Velcro fasteners, magnetic closures, elastic materials, and simplified designs, can serve as supportive interventions by reducing physical barriers and enabling children to participate more actively in dressing routines.

For children with motor disabilities, the use of Velcro fasteners is easier because it only requires simple hand movements to secure the clothing. Children with motor limitations often experience difficulties when using clothing with buttons, zippers, or hooks. Therefore, clothing for children with these disabilities requires adaptive designs, such as pullover styles, elastic materials, or Velcro fasteners, which are preferred and easier for children to use independently. For some children with cerebral palsy who experience muscle weakness, magnetic buttons can serve as an alternative solution. Connecting magnetic buttons does not require strong finger pressure because the magnets automatically attract each other when positioned closely. However, previous studies have not explicitly and specifically confirmed that clothing with magnetic buttons directly facilitates dressing independence among children with cerebral palsy.

For children with autism, teachers observed that some children appeared surprised when using Velcro clothing because they reacted to the sound produced when opening the fastener. Therefore, it is important to understand that each child with a disability has different clothing needs. Well-designed clothing can improve children's independence, self-confidence, physical health, and ability to participate socially. Clothing for

individuals with disabilities should be designed to accommodate body deformities, provide comfort, support adaptability, and align with their social and cultural contexts [15].

In the learning activity focused on independence skills in preparing learning stationery, a similar improvement was observed as in the clothing skill, increasing from 54% to 95%. Initially, children experienced difficulties when preparing learning materials with higher levels of complexity, such as pencil cases with zippers, bags with metal hooks, and backpack designs that were less adaptive. These challenges were then discussed with the children's parents to prepare more suitable learning equipment, including pencil cases with magnetic or Velcro closures, bags with Velcro fasteners, backpacks with wider and looser straps, and wheeled bags that are easier to pull and reduce physical burden.

Learning bags for children with disabilities should use materials that are lightweight, durable, environmentally friendly, easy to use, supportive of children's activities, and ensure safety and sustainability [16]. The availability of learning equipment agreed upon by teachers and parents contributed to improving children's ability to independently prepare their learning materials. Involving children with disabilities in the process of designing bag models ensures that the products meet their specific needs [17]. Appropriate bag designs for children with disabilities include features such as magnetic fasteners, easily accessible pockets, Velcro closures, wider and looser straps, adjustable carrying systems, and flexible usage options that support children's independence. Considerations for pencil cases used by children with disabilities, particularly those with motor impairments, include selecting materials and designs that match children's needs, such as easy-to-open magnetic closures or large-sized zippers. Pencil case designs should accommodate various abilities and limitations while ensuring ease of use for all children with disabilities.

In the learning activity focused on independent bathing skills, the percentage increased from 58% to 85%. Most children with disabilities in this study showed interest in water-based activities, which motivated them to learn independent bathing skills. However, several important observations were identified during the bathing activities. Eight children initially experienced difficulties when using a water scoop (*gayung*). In practice, the activity required body balance while standing, hand balance and coordination when taking water from the tap and pouring it over the body, as well as concentration when performing sequential movements. These challenges indicate that bathing skills require not only physical coordination but also gradual training and appropriate support to achieve independence.

A modeling method provided by teachers or caregivers plays an essential role in teaching personal hygiene skills to children with disabilities, including bathing activities. Through direct demonstrations and structured guidance, children can observe, understand, and imitate the correct procedures more effectively [18]. Bathing activities involve multiple sequential actions that require coordination, attention, and motor planning. During the initial learning sessions, children often experienced difficulties when pouring water over their bodies because water was frequently spilled and did not reach the intended areas. However, through repeated practice, appropriate prompting, and consistent support, children gradually improved their ability to perform bathing activities more independently.

Among the 10 children involved in this study, two children were accustomed to using showers at home when bathing independently. For these children, using a shower was easier because they did not need to scoop water using a dipper (*gayung*), maintain water balance in the container, and then pour it over their entire body. In contrast, using a dipper requires several sequential steps that children must understand and master, including maintaining body balance, stabilizing hand movements, and coordinating movements while pouring water. The use of a shower allows water to flow directly onto the child's body without requiring additional steps involving balance, stability, and concentration.

For children with disabilities, bathing activities involve several challenging components, such as taking soap, applying soap, and returning the soap to its container. The small and slippery size of soap requires high levels of concentration, coordination, and patience. Bathing activities also require supervision from teachers, caregivers, or parents because soap residue can make the floor slippery, creating potential safety risks, especially for children with motor limitations. Understanding personal hygiene learning for children with disabilities requires structured approaches involving active participation from parents, caregivers, and teachers in designing appropriate interventions and effective learning programs [19]. Furthermore, the availability of accessible sanitation facilities is an important consideration in supporting personal hygiene education, particularly within inclusive education environments [20].

The learning intervention for independent tooth-brushing skills increased from 55% to 90%. This improvement was influenced by children's motivation to play with water using their mouths during the activity.

During the tooth-brushing lessons, teachers and caregivers demonstrated the activity in front of a mirror using attractive dental care equipment. A pleasant learning environment helped children learn tooth-brushing skills more easily. The use of mirrors, attractive toothbrush designs, engaging toothpaste containers, and opportunities to play with water provided enjoyable learning experiences for children. When children were asked to observe teachers demonstrating tooth-brushing procedures, including brushing movements, rinsing, and spitting water while observing themselves in the mirror, they showed positive responses and enjoyment. These experiences encouraged improvements in children's independence in performing tooth-brushing activities. The use of video prompting media during tooth-brushing instruction has also been reported to facilitate learning and improve children's independence, achieving accuracy levels ranging from 80% to 91% [20].

The learning intervention for eating and drinking independence showed improvement from 51% to 93%. At the beginning of the learning process, children experienced difficulties in several abilities, including holding a spoon, scooping rice or food, and bringing food to their mouths, which often resulted in spilled food or drinks. Eating and drinking activities require high levels of concentration, hand-eye coordination, self-confidence, finger strength for holding utensils, and understanding of structured activity sequences. During each activity, teachers continuously observed whether children required assistance or were able to complete tasks independently. The provision of adaptive eating and drinking equipment helped children overcome difficulties during the learning process. Cups with handles and utensils with curved handles at 135° and a 2.5 cm diameter grip have been proven to significantly improve independent skills among children with disabilities, including children with cerebral palsy [21]. Teachers, caregivers, and parents also need to modify the environment and adjust children's positioning to facilitate learning activities related to eating and drinking. Various challenges may occur during eating and drinking skill development due to both physical and non-physical factors. Therefore, educational programs for teachers, caregivers, and parents are needed to strengthen their understanding and support children's confidence, particularly through training programs related to dysphagia management that improve caregivers' knowledge and skills [22].

The learning intervention for hair-combing skills among children with disabilities increased independence from 52% to 92%. In this activity, almost all children were able to perform the skill independently. However, the position of the comb was generally not upright compared with typically developing children. Most children held and placed the comb at an angle rather than vertically on the head. Children experienced difficulties in positioning the comb properly, as this activity requires the ability to grip the comb, move, and pull it through the hair while maintaining hand balance, stability, and concentration. Repeated practice was required to achieve optimal independence in hair-combing skills. Caregivers or parents can serve as direct models to teach hair-combing skills, as modeling provides an effective and accessible learning approach for children. Children can also learn through video-based instruction by following the sequence of observing, imitating, and independently performing the activity [23].

The design and shape of combs also influence children's ability to perform hair-combing activities. Several comb designs can support children with disabilities, such as combs equipped with easy-to-grip handles, handles wrapped with sponge or foam materials, or hollow handles that allow children to insert their fingers while combing. Combs designed for children with disabilities should include larger handles, non-slip grips, and lightweight materials to improve usability and reduce hand strain. Safety and comfort are essential considerations when selecting combs for children with disabilities.

The learning intervention for independent sock-wearing skills increased from 55% to 91%. This skill did not present significant difficulties during the learning process. However, appropriate socks must be provided according to the needs and characteristics of children with disabilities. Some children have differences in foot shape and size between their right and left feet. Therefore, selecting socks with slightly larger sizes is necessary to prevent difficulties during use or discomfort caused by excessive pressure.

The selection of sock materials should also consider children's needs. Socks should be soft, lightweight, flexible, and comfortable to prevent irritation and avoid discomfort caused by overly thick materials. In the context of children with disabilities, socks should ideally be made from lightweight, soft, flexible, and environmentally friendly materials, such as chromium-free materials, which are safe for sensitive skin. Attractive cartoon designs are also recommended because they can increase children's interest and motivation in using them [24].

In addition to selecting appropriate materials and designs, teaching children how to wear socks independently requires consistent guidance and support from parents, caregivers, and teachers. Children need to understand the correct sequence of activities, including identifying the front and back parts of the socks,

positioning the feet correctly, and gradually pulling the socks until they are properly worn. Providing structured demonstrations, repeated practice, and appropriate assistance can help children develop confidence and independence in performing this self-care activity. Therefore, increasing parents' and caregivers' awareness regarding the selection of safe socks and effective teaching strategies is essential to ensure that children can use socks safely, comfortably, and independently [24].

- **Learning to Organize Eating and Drinking Utensils**

The learning intervention for independence skills in cleaning and organizing eating and drinking utensils showed an improvement from 60% to 89%. The development of independence in eating and drinking routines among children with disabilities requires structured education, consistent guidance, and appropriate support from caregivers or assistants, particularly in managing challenges related to daily feeding activities [25]. Environmental modifications and supportive facilities, including safe and accessible eating areas, preparation tools, sinks, and dishwashing spaces, also play an important role in creating meaningful learning experiences and reducing barriers during daily routines [25, 26]. Through structured interventions and inclusive environmental arrangements, children with disabilities can gradually improve their ability to participate in preparing, using, and organizing eating and drinking utensils independently [27]. The improvement of children's independence skills in cleaning and organizing eating and drinking utensils before and after the intervention.

- **Learning Independence in Organizing Tables and Chairs**

The learning intervention for independence skills in organizing tables and chairs after use showed an improvement from 59% to 94%. This activity was relatively easier for children with disabilities because arranging tables and chairs requires less fine motor coordination and concentration compared with activities involving smaller objects, such as lace-up shoes. However, some children still required guidance in positioning chairs properly, as they occasionally used body movements rather than their hands to complete the task. Continuous practice in daily activities, including reorganizing learning environments and personal belongings, is essential to strengthen independent living skills and encourage responsibility among children with disabilities.

- **Learning to Organize Toys**

The learning intervention for independence skills in organizing toys after use showed an improvement from 51% to 90%. This improvement indicates that children with disabilities gradually developed the ability to manage personal belongings through structured guidance, repeated practice, and consistent learning routines. Organizing toys requires children to recognize objects, classify items, place them in appropriate locations, and develop responsibility for maintaining their environment, involving cognitive processes, motor coordination, attention, and decision-making abilities that support functional independence. Similar to other daily living activities, organizing toys should be developed as a continuous habit to encourage responsibility and independence among children with disabilities. Simple, gradual, and consistent learning processes, combined with active participation in daily activities, can support emotional development and promote meaningful learning experiences. The improvement in children's independence skills before and after the intervention demonstrates the effectiveness of the ATIK Model integrated with Prompting strategy in supporting adaptive daily living skill development.

- **Effectiveness Level**

The effectiveness of the ATIK Model integrated with Prompting strategy was assessed through the Normalized Gain (N-Gain) score analysis. This analysis was conducted to identify the level of improvement achieved by children with disabilities after participating in the intervention program across various basic life skill activities. The N-Gain score provides an indication of the extent to which the implemented learning approach contributes to accelerating children's independence development by comparing their initial and final performance outcomes. Based on Hake's classification, the effectiveness level can be categorized according to the magnitude of improvement obtained. The average N-Gain score results for each independence skill indicator are presented in Figure 3.

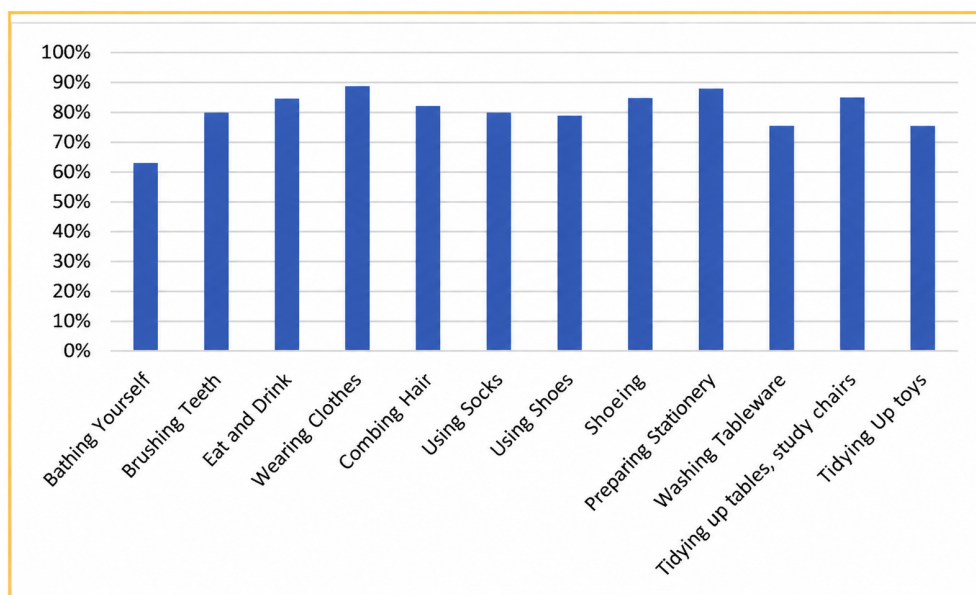


Figure 3. Average N-Gain Score

Referring to the Figure 3, overall average (Mean) N-Gain Score was predominantly above 70%, which, based on Hake's classification, falls into the High Category. This finding indicates that the ATIK Model integrated with Prompting strategy generally demonstrates excellent efficiency in accelerating the development of independence among children with special needs.

- Difference Test of the Intervention Effect Using the ATIK Model Framework with Prompting Strategy

Based on the effectiveness analysis results using the N-Gain Score presented in the previous subsection, the next step was to conduct hypothesis testing to empirically verify that the improvement in students' basic life skills occurred with statistical significance. To determine the overall significance of the effect of implementing the "*Amati, Tiru, Kerjakan (ATIK)*" Model integrated with Prompting strategy, a paired comparative analysis was performed using the Wilcoxon Signed-Rank Test.

The data analyzed in this test consisted of task achievement percentages under pretest and posttest conditions from 10 research subjects ($N = 10$). The use of percentage-based data aimed to provide a more concrete representation of the reduction in students' independence gaps after receiving the intervention. Therefore, the observed changes could be interpreted more clearly and meaningfully. The results of the statistical data analysis are summarized in the following Table 3.

Table 3. The Effect of Implementing the "*Amati, Tiru, Kerjakan (ATIK)*" Model with Prompting Strategy

Basic Life Skills	Pretest (Mean±SD)	Posttest (Mean±SD)	p
Independent Bathing	58.0%±0.13	85.0%±0.13	0.005
Tooth Brushing	54.5%±0.15	89.5%±0.12	0.005
Eating and Drinking	51.0%±0.13	92.5%±0.08	0.005
Wearing Clothes	53.5%±0.15	95.0%±0.08	0.005
Hair Combing	52.0%±0.14	92.0%±0.11	0.005
Wearing Socks	55.0%±0.14	90.5%±0.14	0.005
Wearing Shoes	48.0%±0.10	89.5%±0.17	0.005
Organizing Shoes	59.5%±0.09	93.5%±0.08	0.005
Preparing Stationery	53.5%±0.13	95.0%±0.05	0.005
Washing Eating Utensils	60.0%±0.11	90.0%±0.11	0.007
Organizing Tables and Learning Chairs	59.0%±0.08	93.5%±0.12	0.005
Organizing Toys	51.0%±0.10	88.5%±0.13	0.005

Based on Table 3, all 12 basic life skills indicators showed significant differences between pretest and posttest results, with p-values ranging from 0.005 to 0.007 ($p < 0.05$). Therefore, H_0 was rejected and H_1 was accepted, confirming that the ATIK-Prompt intervention significantly improved children's independence levels.

Thus, the implementation of the "*Amati, Tiru, Kerjakan (ATIK)*" Model integrated with Prompting strategy was proven to be effective in significantly improving children's independence. Before the intervention (pretest), the average percentage of students' initial abilities generally ranged from low to moderate levels (predominantly below 60%), with the lowest achievement observed in the wearing shoes skill ($48.0\% \pm 0.10$). This condition reflects the high dependency of children with special needs on physical assistance from adults in performing daily activities.

Wearing shoes, particularly lace-up shoes, is a complex activity that requires high concentration, coordination between hands, body balance, hand and foot coordination, stability, patience, and accuracy in inserting shoelaces into small holes, adjusting lace lengths, and completing other sequential steps. Lace-up shoes involve structured procedures, require more time to complete, and have a higher level of difficulty. Therefore, for children with disabilities, adaptive footwear with Velcro fasteners is recommended as it can simplify the process and support greater independence in wearing shoes.

5. MANAGERIAL IMPLICATIONS

The findings of this study provide managerial implications for early childhood education institutions, teachers, caregivers, and policymakers in strengthening inclusive education practices. The validated ATIK Model integrated with Prompting Strategy can be adopted as a practical framework for designing structured, adaptive, and child-centered basic life skills programs for children with disabilities. Educational institutions can utilize this framework to improve learning management by implementing systematic stages of observation, imitation, and independent performance while gradually reducing assistance through fading. Teachers and caregivers can apply the model as an operational guideline to identify learning needs, select appropriate adaptive learning media, and provide personalized support that encourages children's independence in daily activities. Furthermore, school administrators can integrate this approach into inclusive education policies by providing teacher training, developing accessible learning environments, and encouraging collaboration among educators, parents, and caregivers. The implementation of the ATIK-Prompt framework is expected to improve basic life skills development programs while supporting sustainable inclusive education practices that enhance children's participation, confidence, and independence in daily living activities.

6. CONCLUSION

This study successfully developed and validated the "*Amati, Tiru, Kerjakan (ATIK)*" Model Framework integrated with a prompting strategy as a learning approach to support the development of basic life skills among children with disabilities in inclusive Early Childhood Education (ECE) settings. The findings indicate that the integration of observing, imitating, and performing stages, combined with systematic assistance and gradual reduction of support through the fading process, creates a more structured, adaptive, and child-centered learning process. This approach provides opportunities for children to actively participate, improves task completion success, reduces dependency on teachers, caregivers, and parents, and strengthens their ability to perform basic life skills independently. The theoretical contribution of this study lies in developing a conceptual framework that integrates observational learning principles with prompting strategies into a unified learning model suitable for inclusive ECE contexts.

The ATIK-Prompt framework expands the study of basic life skills learning by introducing a systematic, gradual, and independence-oriented approach for children with disabilities. From a practical perspective, this model provides a simple, applicable, and replicable implementation guideline for teachers in designing learning activities that respond to the diverse characteristics of learners in inclusive classrooms. Furthermore, this framework can serve as a reference for schools, parents, caregivers, and policymakers in strengthening inclusive education practices that focus on developing children's independence from an early age.

This study has several limitations, including model validation conducted within a specific context and with particular participant characteristics, meaning that the generalization of findings should be interpreted cautiously. Therefore, future research is recommended to examine the effectiveness of the ATIK-Prompt Model

Framework through experimental designs involving larger sample sizes, various disability categories, and different educational contexts. Further studies should also evaluate its long-term impact on children's independence development and quality of life. Future research is also needed to explore the implementation of this model through collaboration among teachers, parents, and professional practitioners as part of sustainable inclusive education practices.

7. DECLARATIONS

7.1. About Authors

Sri Watini (SW)  <https://orcid.org/0000-0002-7757-0656>

Mohammadtahir Cheumar (MC)  <https://orcid.org/0000-0003-2130-3150>

7.2. Author Contributions

Conceptualization: SW; Methodology: MC; Software: SW; Validation: SW and MC; Formal Analysis: MC and SW; Investigation: SW; Resources: SW; Data Curation: SW; Writing Original Draft Preparation: SW and MC; Writing Review and Editing: MC and SW; Visualization: MC; All authors, SW and MC, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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