

# Analysis of the Effectiveness of Rotating Shelf Design on Dressing Frame at Graha Ananda Kindergarten, West Bandung

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## ABSTRACT

The development of fine motor skills, independence, and cognitive abilities are some important aspects that need to be stimulated in early childhood development. This study aims to analyze the effectiveness of rotating shelf design on dressing frame at Graha Ananda Kindergarten, West Bandung Regency. Based on the results of preliminary studies, it can be identified that there is a need to produce an ergonomic rotating shelf design to feature dressing frames that facilitate early childhood independence according to Montessori principles. The purpose of this study was to evaluate the performance and benefits of this rotating shelf design in supporting children's learning. The methodology used in this research is qualitative with a case study approach. Data collection techniques were carried out through observation and survey of the use of dressing frame with rotating shelf design at Graha Ananda Kindergarten. The observations focused on ease of access, practicality of use, and effectiveness in supporting early childhood independence. The results of this study show that the rotating shelf design provides convenience in retrieving and storing dressing frames, supports children's independent learning process, and strengthens fine motor and cognitive skills in early childhood. This research also shows that the design of the rotating shelf on the dressing frame contributes significantly in improving the accessibility and practicality of using the dressing frame at Graha Ananda Kindergarten. This design encourages the child's independence in using the tool, in accordance with Montessori principles, while strengthening the development of fine motor skills and understanding of the sequence of steps. The implications of this study underscore the importance of ergonomic design in supporting effective learning approaches at the early childhood development stage.

## KEYWORDS

Dressing Frame  
Early Childhood  
Montessori  
Product Design  
Rotating Shelf

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## INTRODUCTION

The development of fine motor skills, independence, and cognitive understanding in early childhood education are important aspects that need to be considered (Ainnayah, 2021). Graha Ananda Kindergarten, located in West Bandung Regency, pays attention to the learning system carried out, starting from the curriculum to learning media, one of which is *the dressing frame* which aims to support the achievement of Montessori educational goals. This research focuses on the design of rotating shelf that support the effectiveness of the use of *dressing frames*. The design of this rotating shelf aims to facilitate accessibility and ergonomic storage, in line with Montessori principles that emphasize children's independence in the learning process (Ansari & Winsler, 2014). Based on

an interview conducted by the author with Mrs. Rosnia, an early childhood development expert and Principal of Graha Ananda Kindergarten in West Bandung Regency on Tuesday, August 1, 2023, discussed the need for learning media that can stimulate various early childhood developments based on Montessori principles (Hartanto & Yohana, 2020). One of them is the need for an ergonomically designed *dressing frame* and shelves according to the height of children (Muttaqien & Adiluhung, 2021), so that they can easily pick up and store *the dressing frame*. The materials used to make *the dressing frame* and shelves can also be considered so as not to pose a risk of injury or safety to children.

The Montessori approach is applied in Graha Ananda Kindergarten to emphasize the importance of a learning environment that allows children to be independent and active in skill development (Kayılı, 2018). However, the evaluation of the effectiveness of the design of the rotating shelf on *the dressing frame* as a learning medium is still difficult to find in previous studies. The use of *frame dressing* without the use of rotating shelves has shown some significant problems. Based on the results of the survey conducted, it can be identified that the use of *dressing frames* without rotating shelves makes this tool often scattered in various places and not well organized. This causes children to become less independent in taking and putting the *dressing frame* back in place. Children often need help from an adult to locate and return the tool, which ultimately reduces children's learning effectiveness and independence.

Therefore, this study aims to fill the gap by focusing on the analysis of the design of the rotating shelf on *the dressing frame* used in the context of early childhood education at Graha Ananda Kindergarten. Through this study, efforts are made to explore how the design of rotating shelves on *dressing frames* has a contribution to supporting early childhood learning (Sari et al., 2020). This approach is expected to provide a clearer picture of the importance of ergonomic design in the context of the use of *dressing frames* and how this design plays a role in developing children's independence in learning. This research also aims to provide suggestions for improving the learning environment in accordance with Montessori principles (Marshall, 2017) by deepening the understanding related to the effectiveness of the design of rotating shelves on *dressing frames*.

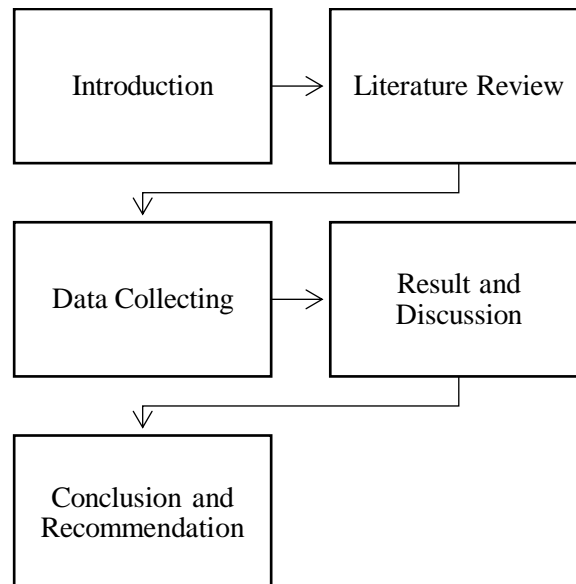
This research has the potential to contribute to a deeper understanding of effective instructional design in early childhood education settings (Heristian et al., 2022). An in-depth analysis of the design of the rotating shelf on *the dressing frame* is expected to provide a richer understanding of the relationship between instructional design and early childhood learning experiences in Graha Ananda Kindergarten (Courtier et al., 2021). It is also expected to be a useful reference for similar educational institutions to improve the effectiveness of the use of similar learning tools in the Montessori context. It is hoped that the results of this study can make a significant contribution to the development of early childhood education and provide useful direction for educational institutions in improving the design of the learning environment in accordance with the needs of early childhood (Mesa et al., 2022)

The effectiveness of using *dressing frame* products with rotating shelves can be analyzed based on several aspects, namely accessibility, ergonomics, safety, availability, organization, ease of use, development of independence, and aesthetics (Azhar et al., 2023). Through the identification and evaluation of these aspects, this study can provide a comprehensive picture of how the design of the rotating shelf on *the dressing frame* can support various needs in the early childhood education environment. An in-depth analysis of each of these aspects also made it possible to measure the extent to which the design is effective in improving the quality of learning and independence of children at Graha Ananda Kindergarten.

## METHOD

The method applied in this study uses a qualitative approach with a focus on a case study centered on the use of *dressing frames* with a rotating shelf design in Graha Ananda Kindergarten. The qualitative approach allows researchers to delve into the observed phenomena and understand the context of the use of these learning media in more detail. The data collection process is carried out through two main techniques, namely observation and survey. Observation was carried out to directly observe the use of *dressing frames* along with the design of rotating shelves in the field,

while a survey was conducted to obtain a comprehensive view from users regarding the aspects of ease of access, practicality of use, and the extent of its effectiveness in supporting early childhood independence in the Graha Ananda Kindergarten environment. Through this case study approach, the researcher aims to dig in depth information about the use of *dressing frames* with a rotating shelf design in Graha Ananda Kindergarten. The focus of the research is directed at the analysis of ease of access, ease of daily use, and the effectiveness of *dressing frames* in facilitating early childhood independence.



**Figure 1.** Research Framework  
(Source: Bahri, 2023)

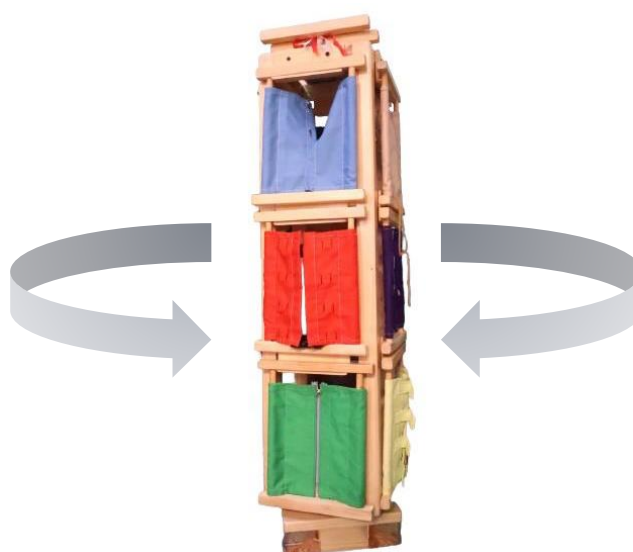
The framework of this study uses a qualitative approach with a focus on case studies at Graha Ananda Kindergarten to examine the effectiveness of the design of rotating shelves on *dressing frames*. The research began by identifying the problems faced with the use of dressing frames without rotating shelves and setting goals to evaluate the ease of access, practicality, and impact on children's independence. Data is collected through direct observation and surveys of teachers and staff, then analyzed qualitatively to identify key patterns and themes. The results of the research are expected to contribute to improving the design of more effective learning tools and supporting early childhood development in accordance with Montessori principles. Conclusions and recommendations will be compiled based on the main findings, with suggestions for implementation and further research.

## RESULT AND DISCUSSION

The dressing frame design has several elements such as screws, buckles, and buttons that are mounted on a stable wooden frame. The applied rotating shelf design consists of several levels of rotatable shelves, with each shelf providing storage for several types of frame dressings in an organized manner. Each dressing frame has clear labels for easy identification, and these rotating shelves are designed with heights that match children's heights for easy access and use. The rotating shelf design on the dressing frame has a structure consisting of several main components that function to facilitate optimal storage and accessibility of the dressing frame. This structure generally consists of elements such as support columns, rotate mechanisms, and storage shelves that are adjusted to the size of the dressing frame. The stable support columns provide a solid foundation for the overall rotating shelf structure, while the rotate mechanism allows easy and convenient access to pick up the dressing frame from different sides.

Wood material is the main choice in making this rotating shelf design because of its advantages in strength, durability, and attractive aesthetic beauty. The wood is selected with strong consideration

to ensure the safety, durability and sustainability of the revolving shelf structure. The design process, including the selection of quality and durable wood materials, is a key factor to ensure that the rotating shelf is able to safely withstand the weight of the dressing frame and still provide comfort in use. The proper use of materials is essential in the development of effective and durable learning tools. Wood materials are often chosen because of their flexible, strong, and easy-to-process properties. Wood also has an attractive natural aesthetic, which can create a fun and conducive learning environment for children. The advantages of wood materials also make it possible to process them properly, making it easier to form a precise and ergonomic rotating shelf structure (Jannah et al., 2019). The advantages of wood materials also make it possible to process them properly, making it easier to form a precise and ergonomic rotating shelf structure (Jannah et al., 2019). The use of wood materials in the design of rotating shelves on dressing frames at Graha Ananda Kindergarten can improve the overall quality of this learning media, ensure good durability, and provide a visually appealing impression for children who use it in the learning process (Bahri et al., 2023). The dressing frame and rotating shelf produced in this study can be seen in Figure 2.



**Figure 2.** Rotating Shelf  
(Source: Putri, 2023)

The observation results showed a high level of enthusiasm from children when using the dressing frame. They looked happy and interested in carrying out activities that involved dressing frames. In addition, it can also be seen that they feel proud and confident when they are able to take and store the dressing frame smoothly using the rotating shelf design provided. Data from observations also show that the design of the rotating shelf provides good ease of access for children. They can easily pick up the required frame dressing without any difficulty. In addition, the safety aspect is also met, with no risk of injury when picking up or storing the dressing frame due to the stable and precise design of the shelves.

One of the important aspects during the process of observing the use of dressing frames is that the organization of storage shows good management of the media, because it is supported by a shelf that makes it easier. Dressing frames are available in sufficient quantities for the needs of children at Graha Ananda Kindergarten. The organization of the storage is also well structured, where each type of dressing frame is placed on the appropriate shelf and clearly labeled. This makes it easier for children to find the dressing frame they need and allows for efficient management of learning media.



**Figure 3.** The Use of *Dressing Frame* with Rotating Shelf at Graha Ananda Kindergarten  
(Source: Putri, 2023)

The children at Graha Ananda Kindergarten showed a very positive response to the effectiveness of the rotating shelf design on the dressing frame. They responded enthusiastically and were happy to use the dressing frames available on the turnstile. In addition, the ease of accessibility provided by the rotating shelf design makes children more independent in picking up and storing the dressing frame without external assistance. This positive response can also be seen from their proud expressions when they successfully use the dressing frame and place it back easily on the shelves provided. Overall, the observation results show that the availability of well-organized dressing frames and the children's positive response to the rotating shelf design implies that this approach makes a positive contribution to the development of early childhood independence and activeness in the learning process at Graha Ananda Kindergarten.

The results of the observation showed that the children showed a high level of enthusiasm when interacting with the dressing frame. They seem to be very interested and excited in carrying out learning activities involving this tool. Their cheerful facial expressions, active mannerisms, and full involvement when using the dressing frame. The results of this observation provide important insights into how Dressing Frame can affect children's involvement in the learning process.

The observations made are in line with the findings in several previous studies that emphasize the importance of children's positive interaction with learning tools in increasing learning effectiveness. Children's enthusiasm for learning tools contributes significantly to their learning achievement (Randolph et al., 2023). Research on the analysis of the effectiveness of the design of rotary shelves on dressing frames at Graha Ananda Kindergarten, there are a number of important aspects that are the focus of discussion. These crucial points can summarize a number of important results and findings obtained during the research.

Based on the observation results, it can be seen that the design of the rotating shelf is able to provide easy access for children to pick up and store the Dressing Frame comfortably and support its safety. This safety is important because at an early age, protection from the risk of injury is one of the important things to consider in the design process of a product. Then, the results of observations related to the availability and organization of the storage of the dressing frame are also another aspect that is considered. Good management of the storage of dressing frames in an organized and structured manner has a positive impact. With adequate availability and regular storage, children can easily find these learning tools, optimizing the learning process at Graha Ananda Kindergarten.

Positive responses from children indicate that this design has succeeded in having a significant influence on their level of engagement and activeness in learning. These results are consistent with Piaget's theory of child development, which emphasizes the importance of a motivating and fun learning environment for children. Piaget posited that children learn most effectively through active interaction with their environment, which allows them to interact directly with new objects and concepts (Bahri & Haswanto, 2020). The design of a rotary shelf that supports independence and builds confidence in children can have a long-term impact on the educational process at Graha Ananda Kindergarten. An analysis of each aspect used to assess the effectiveness of the dressing frame rotating shelf can be seen in Table 1.

**Table 1.** Analysis of the Effectiveness of Dressing Frame Rotating Shelf at Graha Ananda Kindergarten

Aspect	Description
Accessibility	The accessibility of <i>the Dressing Frame</i> is very effective as the rotating shelf allows children to easily pick up and store <i>the Dressing Frame</i> without any hassle. <i>The Dressing Frame</i> can be reached freely without the need for adult assistance.
Ergonomics	The rotating shelf design is ergonomically adjusted to the height of the children, ensuring that <i>the Dressing Frame</i> can be reached comfortably. Children have no difficulty in picking up or storing <i>the Dressing Frame</i> .
Safety	The rotating shelf is designed with great attention to safety. No risk of injury was identified during the use of <i>the Dressing Frame</i> of the rotating shelf. The rotating shelf design minimizes the possibility of accidents.
Availability	The Dressing Frame is well stored in a rotating shelf, always available when needed. Adequate stock of Dressing Frames is also guaranteed, ensuring the sustainability of the use of this learning tool.
Organization	Rotating shelf are helpful in organized storage. Each Dressing Frame has a separate and easily accessible place, making it easy for children to find and use the tool without any difficulty.
Ease of Use	Children easily use the Dressing Frame of the rotating shelf. They do not experience any obstacles or difficulties in picking up or storing the Dressing Frame.
Independence Development	The effective design of the rotating shelf supports the development of children's independence. They are able to access the Dressing Frame on their own without assistance, supporting the development of independent learning skills.
Aesthetic	The rotating shelf design is visually appealing to children, increasing their interest and motivation to use the Dressing Frame. The design is attractive without compromising functionality.

The aspects analyzed in Table 1. It is important to support an ideal learning environment for early childhood. This study also provides an overview of the extent to which the dressing frame and rotating shelf design are in accordance with Montessori principles in supporting the early childhood learning process. The Montessori concept encourages self-directed and natural learning, and the findings from this study may show the extent to which this revolving shelf design supports that philosophy. Based on the results of the analysis of these factors, this study makes an important contribution related to the development of effective learning tools for early childhood in Graha Ananda Kindergarten. These results are important as a foundation for the development of better education for children in the future.

## CONCLUSIONS

Based on the results of the analysis, the design of the rotating shelf on the dressing frame has an important role in helping early childhood develop their fine motor skills, independence, and cognitive ability. The findings of this study confirm that the ergonomic design of the rotating shelf on the dressing frame is able to provide easy access, support children's independent learning, and strengthen fine motor and cognitive skills at the early development stage of early childhood.

The design of the rotary shelf on the dressing frame at Graha Ananda Kindergarten shows positive results in increasing the accessibility and practicality of using the learning media. The study also confirms that this design is in accordance with Montessori principles in providing independence to children in learning while strengthening the development of fine motor skills and understanding of the sequence of steps in daily activities.

Research on the analysis of the effectiveness of the design of rotary shelves on dressing frames at Graha Ananda Kindergarten, West Bandung Regency, can provide significant benefits for several parties. First, for educational institutions, the results of this study can provide an in-depth perspective on the effectiveness of learning media for early childhood. This can help Graha Ananda Kindergarten

in improving the quality of education offered, by improving or developing a more ergonomic and effective learning media design.

The target of the results of this study is kindergarten teachers and managers, who can use these findings as a guide to improve the use and storage of dressing frames with an effective rotating shelf design. This can improve the quality of teaching and learning in early childhood education, as well as provide opportunities for children to get the maximum benefit from the learning tools provided.

The results of this study can also be the basis for future research in the field of product design and early childhood education, especially related to the design of ergonomic learning tools. By analyzing the effectiveness of the design of the rotating shelf on the Dressing Frame, this study provides a solid foundation for further development in the design of learning media that supports early childhood development. Advanced studies may involve other aspects of design that are more complex or include different types of learning tools, thus providing a broader understanding of the needs and benefits of ergonomic design in early childhood education.

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