

## **A systemic model of furniture meant for stimulating development of a child based on educational aids from M. Montessori**

IWONA BŁASZCZAK<sup>1</sup>, EWA DOBROWOLSKA<sup>2</sup>, AGNIESZKA MIELNIK<sup>2</sup>,  
EWA LISIECKA<sup>2</sup>

<sup>1</sup> Warsaw University of Life Sciences– SGGW, Institute of Sociological Sciences and Pedagogy

<sup>2</sup> Warsaw University of Life Sciences– SGGW, Institute of Wood Sciences and Furniture

**Abstract:** In furniture design, understood as a kind of evolutionary process, there is room for designer’s creativity, but not in the sense traditionally accepted in the psychology of creation. The creativity of the designer shapes the products of the evolutionary algorithm but does not replace them. This can be illustrated by the genesis of any design, such as furniture that stimulates the development of the child. The Montessori pedagogy leaves a lot of room for new designs of Montessorian teaching aids. The Montessori didactic material forms a logically structured whole. It enables the child to move out of experience and sensual cognition; it serves not only the development of the intellect but also the education of the whole personality. The Montessorian materials take into account the child’s stage of development, corresponding to a given sensitive phase and the very logic of things, so that the child, while learning, can embrace larger cognitive sequences, arouse a sense of aesthetics, motivation, curiosity and interest, thus triggering various forms of activity.

**Keywords:** didactic materials, Montessori, solid wood and plywood furniture

*“Education should never again be primarily a transfer of knowledge, but it must take on a new form, seeking liberation for human possibilities.”*  
Maria Montessori

### INTRODUCTION

In furniture design, understood as a kind of multi-stage process, there is room for designer’s creativity, but not in the sense traditionally accepted in the psychology of creativity. The designer’s creativity shapes the work through a complex algorithm, not replacing it.

This can be illustrated by the creation of any design, using the example of furniture that stimulates the development of the child. The starting point for the project team’s work is a thorough understanding of the situation of the recipients of the product or service, in this case children in early childhood.

The authors of this article are interested in the creative adaptation and improvement of developmental and didactic materials prepared by the Italian pedagogue Maria Montessori, which correspond to the developmental needs of children at an early school age.

The authors of the article have attempted to design their own innovative educational material based on Montessori’s didactic principles, taking into account the uniqueness of each child’s personality, shaped by the environment in which they are located. This approach has made it possible to present teaching aids that effectively contribute to the comprehensive development of the child.

After analysing the literature “Between psychology and art” related to the course of proper development of children in early school age Designers and researchers (W. J. Paluchowski, M. Stańko-Kaczmarek), concluded that satisfying the needs of their creative activity depends on objects surrounding the child, such as furniture and toys.

According to the basic concept of the Montessorian pedagogy, the comprehensive development of a child is influenced by a rich, well-organised educational environment adapted to his or her mental characteristics.

A well-prepared environment includes basic and expanding development materials. They contain four elements: anthropological, psychological, educational and didactic. They should also meet the criteria of simplicity, functionality and aesthetics and reduce difficulties, enabling the child to control their own behaviour.

Each of the Montessorian support tasks, regardless of the department in which it is located, includes a specific purpose and course of exercise for the children <sup>1</sup>.

M. Montessori's pedagogical concept is still popular in many countries, including Poland. The figure of M. Montessori herself, as emphasized by Nawroczyński (...), is nowadays included in the group of preschool education innovators<sup>2</sup>. The pedagogical system developed and implemented by her at the beginning of the 20<sup>th</sup> century for years has had many supporters and followers, also in Poland, creating kindergartens, associations and educational institutions, using both the Montessori Method and Montessori development and teaching aids in working with children. Each child's ability to develop manually as well as cognitively and to focus on the content he or she learns depends to a large extent on the quality of the teaching material in the form of toys and furniture they use during their education.

The process of learning is determined by the quality of human understanding of the surrounding reality from an early age. It occurs quickly and effectively and creatively if the right conditions for its development are created.

The assumptions of the didactic and educational concept developed by M. Montessori express the conviction that every child is a unique individuality and should be able to develop according to his or her developmental plans. M. Montessori believed that these plans included children's abilities, competences and skills, enabling them to learn independently and effectively.

For M. Montessori, childhood is a very important stage in the development of each individual's personality, which is why she repeatedly stressed that:

*"(...) the educational influences are a specific kind of help for the human person in his or her efforts to achieve independence, it is also a help given to the child from birth in his or her mental and spiritual development"*<sup>3</sup>.

Being in a properly prepared and adapted educational environment (furniture, toys) allows the child to become "master of himself" a builder of his own personality.

According to the views of M. Montessori, "Help me do it myself", the teacher is a guide and advisor to the child. The activities of adults should only be about helping and supporting and serving the child.

An important role in the implementation of these ideas is played by the didactic methods used in the M. Montessori system, such as play and individual experience gained by the child.

In M. Montessori's concept, this process should consist of alternating the child's transition from play to elements of work, based on interest and stimulating curiosity, releasing emotions and providing satisfaction, and thus leading to success.

---

<sup>1</sup> R. Czekalska, A. Gaj, B. Lauba, J. Matczak, A. Piecusiak, J. Sosnowska, *Let's discover Montessori once again, Pre-school education program developed on the basis of Maria Montessori's pedagogical assumptions at the Municipal Kindergarten No. 106 in Łódź*, Łódź 2009, p. 7.

<sup>2</sup> B. Nawroczyński, Contemporary pedagogical currents, (in:) *Encyclopedia of Education*, (ed.) S. Łempicki, T.1, Upbringing, Warsaw 1933, p. 534.

<sup>3</sup> M. Montessori, *Ueber Die Bildung des Menschen*, (w:) H. Holstiege, *Erzieher in der Montessori – Paedagogik*, Paedagogische Schriften 1991, No. 4, p.3

For the didactic work in this method, the original set of didactic aids called “Montessori Material” is used. It is very simple, precise and aesthetically pleasing, taking into account the rules of difficulty gradation, and its construction allows for independent control of the child’s mistakes. As M. Montessori emphasises: *“The aim of sensory training is not to make sure that the child knows the names of colours, shapes and different qualities of materials, but to improve the senses through comparison, estimation and observation exercises. These exercises are gymnastics for the intellect. (...) As with physical exercises that enhance health and bring vibrancy into life”*<sup>4</sup>.

The didactic material used in the Montessorian pedagogy is one of the most extensive set of didactic aids assigned to the initial and early school teaching methods. It was designed by Maria Montessori herself and her students. Nevertheless, M. Montessori’s pedagogical system still leaves plenty of room for new designs of didactic sets and aids.

## CHARACTERISTICS OF MARIA MONTESSORI’S DEVELOPMENTAL AND TEACHING MATERIALS

The teaching material creates a logically structured curriculum, helping the child to learn the transition from experience to sensory cognition, serving not only the development of the intellect, but also the education of the whole personality. Maria Montessori called her materials “materialised abstraction”, transforming images into tangible processes.

Montessorian materials take into account the child’s stage of development, correspond to a given phase of his or her sensitivity and the logic of things, so that the child can understand wider cognitive sequences when learning. They have a holistic effect, involving both the senses and motor activity. They evoke a sense of aesthetics, motivation, curiosity and interest, triggering various forms of activity, enabling the application of many solutions and giving a chance to repeat the experience. The child may engage in these activities on their own or with someone else if they allow them to be involved.

In the Montessorian resources, a number of functions can be distinguished, which include isolating difficulties, error control, aesthetic and motivational motifs, functional exercises, comprehensive involvement of the child, autonomy and independence, development of the child’s organisational skills, teaching, planning, anticipation, division of labour into stages, communication with others and cooperation.

There are four categories of teaching material in the Montessori pedagogy:

- Material for practical everyday exercises: related to environmental care, self-service, customs and courtesy forms, related to homework,
- Sensory material: for versatile training of the senses and stimulation of mental activity,
- School material: for the study of language, mathematics and other fields of knowledge,
- Artistic materials: related to the artistic and musical expression of the child.

The characteristics of the Montessorian material include in particular:

- Attractive appearance and precision of the build,
- Logical coherence of the links and thematic strings,
- Design allowing self-control of errors.

Montessori didactic materials are aesthetic and precisely made and durable. Thanks to these aids, it is possible to carry out various tasks and experiences on your own, according to the principle that the only way to develop a child is his or her own work.

---

<sup>4</sup> M. Montessori, *The Montessori Method, scientific pedagogy as applied to child education in the Childrens Houses with additions and revisions by the author*, New York 1912, s. 377.

Montessori didactic materials are aesthetic and precisely made and durable. Thanks to these aids, it is possible to carry out various tasks and experiences on your own, according to the principle that the only way to develop a child is his or her own work.

Maria Montessori discovered the phenomenon of attention polarisation in her child. It is a mental process, which is the result of a long and deep concentration of attention, thanks to which the child optimizes its development. It is a time when relations with the world of things and people improve and deepen. The self awakens and the child becomes more independent. Polarisation is a “phenomenon of consciousness” that results in the association of developmental competence with an object, movement or mental process. The terminology of the method calls such a child “a normalised child”. Getting used to concentrated work influences the acquisition of knowledge, responsibility for one’s own actions, perseverance and discipline.

The original set of teaching aids called “Montessori Material” is used for this purpose. Its characteristic features include:

- Simplicity, precision and aesthetics,
- Principle of grading difficulties,
- Adapting to the child’s developmental needs,
- Logical coherence of the thematic links,
- Design for self-control of errors,
- Repeatability limit – a given type only occurs once, in one copy

#### PROTOTYPES OF FURNITURE MADE IN ACCORDANCE WITH PEDAGOGICAL CONCEPT OF M. MONTESSORI

Important elements of the Montessori teaching material are furniture of special construction and functionality, fulfilling several important tasks at once. Examples are the designs of the double-functional seat and desk, and the Savoir-Vivre learning table, made in accordance with M. Montessori’s pedagogical concept.

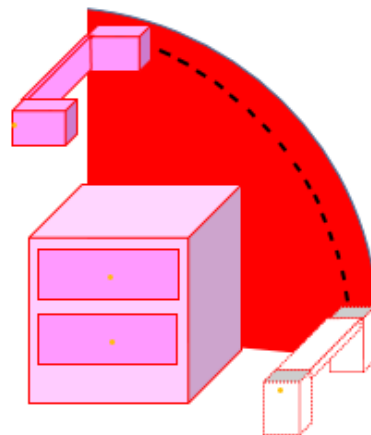


Figure1. An overview drawing of the design of the double-functional seat in M. Montessori’s pedagogical concept

I. The two-functional simple stool is designed to stimulate mental activity while allowing the child self-control their mistakes. The seat has been designed from wood

materials such as birch plywood and solid pine, without the use of unnecessary impregnation, with the use of harmless natural pigments for surface finishing. Raw materials used in the construction of the furniture emphasize care for the child's health and surrounding environment.

In the seat in the form of a cuboid in its side face there are two drawers. The lower drawer extends much further than the upper one, allowing the child to use it as a step to climb on the seat. The top drawer is used to store toys and small items. The seat has a side wall in which a child-safe slide is mounted, allowing the element to move slowly (there is a sliding handle on the other side), serving as both a backrest and, in the lower position, a platform for climbing onto the seat. In order to increase safety, the backrest is lowered in slow motion. The U-shaped backrest board with shortened arms is designed from plywood. The side wall, which also serves as a backrest and a barrier, may be helpful when climbing onto the seat.

The colours of the chair are a mix of light pink (or green) with red side wall and red edges (alternatively blue in the second version). The purpose of this furniture is not only to arouse interest and curiosity in the design configurations used in it, but also to develop a sense of aesthetics and increase the child's motor activity.

II. The Savouir-Vivre learning table is designed in a simple column structure with an aesthetic design. The table top is round and made of waterproof plywood. On the table top, outlines of plates and cutlery are drawn, showing the basic settings of the tableware. The leg of the column is cylindrical, made of bent and glued plywood, and its base is made of solid wood with outlines of feet. Placing the feet at a specific height with the seat in the right position will allow children to maintain a correct posture during a meal.

The table is made in white, which imitates a tablecloth on the top and the leg of the column in pink or beige. The arrangement of drawn plates and cutlery gives an opportunity to develop habits of sitting down to family meals and show courtesy while eating.

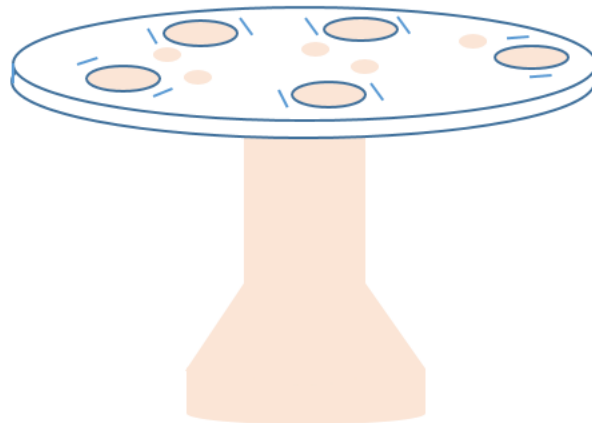


Figure 2. An overview drawing of the Savouir-Vivre Learning Table project in M. Montessori's pedagogical concept

III. The dual-function desk will allow children to perform various activities using the tabletop, store trinkets, toys, paper blocks, crayons, markers, etc. After closing the top plate, older children can sit on this furniture. The desk is designed in a box structure. On the front there are shelves, one on the right side of which is pulled out and acts as an organiser. The other one, mounted on the left side of the face (the wall, the front plane) has a door. Handles in drawers and doors are recessed. The top of the desk is moved on special secure slides,

which allow the desk to be opened and additional storage space to be uncovered. In the rear wall there is a fold-out footrest and in the side part there is a footrest fixed to support the top.

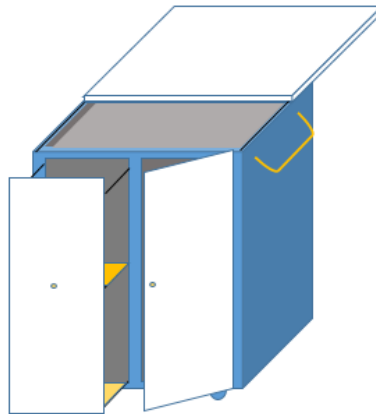


Figure 3. An overview drawing of a design of the Double Functional Desk in the pedagogical concept of M. Montessori

The side walls are equipped with handles and at the bottom of the desk there are wheels with a lock for smooth movement of the desk. The desk is made of birch plywood and solid pinewood in white and blue, where the tops and the face of the shelves are painted white and the construction elements are blue. The desk is easy to keep clean and takes up little space. Thanks to its multi-tasking design, it allows the child to shape the form of the piece of furniture according to his or her needs, involving his or her senses.

## CONCLUSION

1. Properly designed furniture, its shapes and textures have, as M. Montessori proved in her pedagogical concept, a very important influence on the sensory and motor development of the child. The designed prototypes of furniture in the form of a simple two-functional stool, Savuoir-Vivre learning table, two-functional desk are adapted to the stage corresponding to the child's development and provide a safe space for his/her intellectual and motor activity
2. Thanks to its multifunctionality, the designed furniture has become elements of child's play that improve the activity of the senses, increase motor skills, develop aesthetic sensitivity, stimulate imagination, and the ability to feel and act independently.
3. Natural materials such as wood and plywood that are safe for children's health and the environment are used to make the furniture.

## REFERENCES

1. BŁASZAK M., D. WIENER D.( 2011): Rusztowanie poznawcze człowieka: projekt mebli dziecięcych MAMAMA, [w:] W.J. Paluchowski, M. Stańko-Kaczmarek (red.) Między psychologią i sztuką, Poznań 2011, p. 147–155.
2. CZEKALSKA R., GAJ A., LAUBA B., MATCZAK J., PIECUSIAK A., SOSNOWSKA J., (2009); Odkryjmy Montessori raz jeszcze, program wychowania przedszkolnego

- opracowany na podstawie założeń pedagogiki Marii Montessori w Przedszkolu Miejskim nr 106 w Łodzi, Łódź 2009, p. 7.
3. KOZŁOWSKA M., (2010); O potrzebie kształtowania kompetencji autokreacyjnych dorosłych. Rocznik Andragogiczny, Radom 2010.
  4. KWIATKOWSKA H., (1995); Europejski wymiar edukacji – próba identyfikacji idei – implikacje dla kształcenia nauczycieli, (w:) H. Kwiatkowska, T. Lewowicki (red.) Z zagadnień pedeutologii i kształcenia nauczycieli, Warszawa 1995.
  5. MIKSZA M. (1997): Zrozumieć Montessori, czyli Maria Montessori o wychowaniu dziecka, Kraków 1997.
  6. MONTESSORI M. (1912): The Montessori Method, scientific pedagogy as applied to child education in the Childrens Houses with additions and revisions by the author, New York 1912.
  7. MONTESSORI M. (1991): Ueber Die Bildung des Menschen, (in:) H. Holstiege, Erzieher in der Montessori – Paedagogik, Paedagogische Schriften 1991, No. 4.
  8. NAWROCZYŃSKI B.(1933); Współczesne prądy pedagogiczne, (w:) Encyklopedia wychowania,(red.) S. Łempicki, T.1, Wychowanie, Warszawa 1933.
  9. Pachociński R. (1986); Pedagogika porównawcza, Trans Humana, Białystok 1995.
  10. SHULMAN L. (1986); Those who understand foundations of The New reform, Educational Researcher, vol. 15, New York 1986.
  11. ŚLIWERSKI B. (2003); Współczesne prądy i kierunki pedagogiczne. Wstęp, (w:) Pedagogika – podręcznik akademicki, (red.) Z. Kwieciński, B. Śliwerski, Wydawnictwo Naukowe PWN, Warszawa 2003.

*Streszczenie: Systemowy model projektowania mebli stymulujących rozwój dziecka w oparciu o pomoce dydaktyczne M. Montessori. W projektowaniu mebli rozumianym, jako rodzaj ewolucyjnego procesu, jest miejsce na kreatywność projektanta, ale nie w znaczeniu tradycyjnie przyjmowanym w psychologii twórczości. Kreatywność projektanta kształtuje wytwory ewolucyjnego algorytmu, ale ich nie zastępuje. Ilustracją może być geneza dowolnego projektu mebli stymulującego rozwój dziecka. Pedagogika Montessori pozostawia szerokie miejsce dla nowych projektów zestawów dydaktycznych pomocy montessoriańskich. Materiał dydaktyczny Montessori tworzy logicznie uporządkowaną całość programową. Umożliwia w uczeniu dziecka przechodzenie od doświadczenia i poznania zmysłowego, rozwoju intelektu, ale przede wszystkim do kształtowania całej jego osobowości. Materiały montessoriańskie uwzględniają stopień, odpowiadający danej wrażliwej fazie rozwoju dziecka. Dzięki temu dziecko ucząc się może przyswoić sobie większe sekwencje poznawcze, modelować odczucia estetyczne, motywację, ciekawość oraz zainteresowania, wyzwajające różne formy aktywności.*

**Corresponding author:**

Iwona Błaszczak  
Warsaw University of Life Sciences– SGGW  
Institute of Sociological Sciences and Pedagogy  
Nowoursynowska St. 159  
02-776 Warsaw  
Poland  
e-mail: iwona\_blaszczaki@sggw.edu.pl