A Scoping Review of the Implication of Montessori Curriculum in Early Childhood Education

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ABSTRACT

A child-centered educational method, the Montessori curriculum places a strong emphasis on independent study, hands-on learning, and respect for a child's normal psychological development. Its foundation is found in Maria Montessori's educational philosophy, which integrates different disciplines through a prepared atmosphere that encourages inquiry and learning. The curriculum is developed to support a comprehensive educational experience by meeting the developmental needs of kids ages three to twelve. The present article sets out based on objectives: (1) To explain the various aspects of Montessori Curriculum in early childhood education and (2) To examine the impact of the various aspects of Montessori curriculum in early childhood education. A systematic review from education journals based on Scopus database of the years 2020 to 2024 was conducted, guided by the PRISMA Statement (Preferred Reporting Items for Systematic reviews and Meta-Analyses) review method Using narrative and thematic analysis, eighteen out of twenty-two articles were validated related studies were found. The analysis of the articles that have been carried out found that the teaching approach using the Montessori Curriculum has a lot of impact on early childhood Mathematics and Literacy development which show a high success rate compared to conventional learning methods. Further review of these articles resulted in six main aspects developmental of mathematics which not only focus on the numbers but also pre-number such as colors, measurements and inferences to develop problem solving skills. Emotional management skills highlight how children express their inner needs or emotion. Literacy and cognitive which both domains are interrelated to children's milestone. Teacher knowledge is essential to guide children and lastly is parental view needed to find out the implication. The findings showed that most teachers are competent in using Montessori teaching methods partly due to their personal expertise and initiative in enrolling for the course after the students indicate significant progress in their education. Moreover, many parents also acknowledge the success of this curriculum on their children who have shown positive progress in most aspects of development domains. In conclusion, early childhood educators should incorporate the Montessori Curriculum since studies have indicated that it has a favorable effect especially on children's development of their reading and numeracy skills. Inequalities in funding, material distribution, and teacher preparation must be addressed in order to support an inclusive Montessori learning environment.

Keywords: Montessori Curriculum, impact, children development, early childhood education

INTRODUCTION

Early childhood education is a core for humans in starting a good life in the future. The provision of good and effective education from the beginning is the basis for the success of a human or child's life to lead a good or bad direction. An education system that emphasizes balance and overall development is a necessity so that

children can have a meaningful learning experience in order to produce knowledgeable and skilled children. Therefore, a teacher's skills in teaching and educating children need to be there to nurture the development of the children accordingly. The teacher's skill in using the best method or approach allows every child to enjoy the learning process and meaningful experiences in a fun way. Early childhood educators play an essential role throughout this process. They completed crucial parts in children's lives, providing guidance, encouragement, and care. According to Suh and Jang (2023), the quality of the teacher-child interaction is a key aspect in developing children's cognitive and social-emotional skills. This interaction affects various developmental outcomes, including cognitive, social, linguistic, and literacy development (Malik and Marwaha 2021).

The paper will begin with an introductory section, which will explain the implication of Montessori Curriculum in early childhood education. It will elaborate on a few aspects of children's development and the relationship between teacher and parental view of Montessori Curriculum. The issue to be studied is determined by the study article obtained on the effect of Montessori curriculum. Montessori Curriculum is an education method that allows children to freely choose their activities, leading to self-directed learning with teacher assistance and feedback from parents (Courtier et al. 2021). This will be followed by a discussion of the play-based approach which implements the value of individual choices and play for children in early childhood education. (Lino and Parente 2018). The paper then will foreground its contribution to implication by highlighting the interpretation of previous review studies: the urge for a scoping review on the implication of Montessori Curriculum in early childhood education. Following these introductory sections, methodology for this review will be in further discussion, using the Scopus database to extract journals that related, narrative and thematic analysis will be applied guided by the PRISMA Statement. The result section will then expand on the findings, explaining the implication of Montessori Curriculum in early childhood education on the selected aspects. The discussion returns to two research aims/questions, keeping in mind the six key themes identified from the thematic analysis: mathematics, emotional. Literacy, cognitive, teacher knowledge and parental view. The paper will conclude with a discussion of the study‘s limitations and its implication for current and future educational practice.

Montessori Curriculum

In 1906, Montessori education started when an Italian educator, physician, and scientist, Maria Montessori was invited to create a childcare center for underprivileged children. Montessori Curriculum places a strong-emphasis on independent study, hands-on learning, and respect for a child‘s normal psychological development (Liu and Tian 2023). This foundation is found in Maria Montessori‘s educational philosophy, which integrates different disciplines through a prepared atmosphere that encourages inquiry and learning. Montessori pedagogy has been tremendously successful in recent decades due to favorable feedback and passionate comments from past students and educators, to the point that many academies have been founded based on the Montessori education model (Gentaz and Richard 2022). According to Nordin Mamat and Romarzila Omar (2022), Montessori contribution was to set the child free by letting the child become an agent in his or own learning where they will be offered plenty of opportunities and materials for their exploration. Furthermore, the foundation of knowledge is connected to science learning in school and becomes more general concepts as it is connected with everyday objects and events in their life.

These are different stages in harnessing early childhood education, where conventional learning is still implied. Conventional learning still implies an instructor-centered approach where teaching mainly focuses on memorizing facts, principle and theories which cause pressure and limit the creativity and imagination of children. The use of textbooks, examination and award should be changed as children had their own development and different interest in exploring education (Li and Wang 2024). Mutmainnna et al. (2024) discussed that Montessori education is a more perceived benefit in fostering independence, creativity, and intrinsic motivation to the point where structured curriculum such as conventional education noted with their grades and award. To simplify and further refine this curriculum, Ansari and Winsler (2022) come out with results of participation of Montessori education has extended upwards benefits as more children who graduated from Montessori Curriculum are ready to learn and improve developmental skills. The research also showed that the children who attended Montessori programs, at age 4, performed better on regular tests for math and reading in conventional school (Ansari and Winsler 2022).

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In addition, this education also greatly contributes to the development of various aspects not only in terms of education but also the emotions and social skills of children who are growing up. Montessori education is also able to build critical thinking skills, problem solving skills and also skills to adapt to new environments. This point is also supported by Faryadi (2017) as cited in Tympa et al (2022), which claims that, in comparison to their peers whose education involves traditional methods, students whose education is based on Montessori exhibit better performance in mathematics, highly developed critical thinking and problem-solving skills, and generally more adaptability in the classroom. This is due to Montessori education, children make decisions about which activities they will engage in or what they want to learn based on what the teacher offers that day. Children are also encouraged to take the initiative on any obstacles they may encounter while playing and learning, with the assistance of their teacher, in order to explore and encourage problem solving skills. The distinction highlighted has an impact on the traditional school system, which continues to use the Montessori curriculum, which has not been widely implemented for children.

How do the teachers differentiate the Montessori Curriculum with a play-based approach from other methods? As children progress through different developmental stages and sensitive learning periods, lesson planning based on the Montessori curriculum starts with direct engagement with learning materials that allow them to participate in self-directed activities that support their self- development (Efe and Ulutas 2022). This curriculum engagement includes comprises four subjects: practical life, sensorial, language, and mathematics that can nuture their natural tendencies in available phase of freedom (Aimi Liyana Sha'rani and Suziyani Mohamed 2023). Considering playing is an essential habit that encourages children's cognitive, social, emotional, and motor development, all of these elements can be achieved simultaneously with a play-based approach (Lino and Parente 2018). This stage of learning methods enables the Montessori curriculum to make a positive impact on the field of children's education by setting it apart from other learning approaches.

Meanwhile, in the explanation phase, the focus is on commentary on the effect of Montessori Curriculum in all aspects that can be help to develop holistically includes physical, cognitive, social, emotion and language development on children by approaching of play- based. Supporting children's potential in a disciplined, appealing, and inspiring setting as well as their capacity to encourage their independent activities based on a profound respect for each child's uniqueness is the key objective of this method (Lino and Parente 2018). Although play-based learning that related with Montessori Curriculum has been presented as a pedagogy that can promotes all area of children development and learning, research will be divided aspect into few in order to know the implication of it towards early childhood education. Those aspects will be explained with the evidence of the article that has been extracted.

Play-based Learning

Play-based learning was tracked back to the work of a pioneering educator who believed that play was the primary way for children learn, Fredrich Froebel in 1782-1852 (Aisyah et al. 2024). Froebel also believes that young children should have a separate learning environment from adults. An effective strategy that has received a lot of attention in early education programs is play-based learning, which encourages children's natural curiosity and inventiveness while also promoting their growth. This learning also provides opportunities for children to actively and imaginatively engage with people, objects and the environment which symbolic representation is a critical aspect (Tekyi-Arhin 2023). Thus, children's play encourages holistic development and, depending on how it is used, can also enhance a number of literacy and numeracy skills (Haile and Ghirmai 2024). Therefore, teachers can construct scaffolding into their lessons, which helps children gradually develop their understanding and problem-solving skills, amongst other skills. As a result, play-based learning should be associated with these methods as part of the attempt to engage children in learning in a pleasant and informative manner. However, play-based learning provides powerful instruments for early childhood teachers to activate self-directed learning. According to a UNICEF (2018) study, early childhood learners perform better when their formal learning activities are defined by a play-based approach rather than a combination of instructional and formal teaching (Parker and Thomsen, 2019 as cited in Ndlovu and Mncube, 2021). Most studies are acknowledged the play-based approach as hybrid education since it points out the emphasizes on play-based teaching and learning. Practical activities have a significant impact on children's development, such as imitating numbers in the classroom appears to build pictured counting

techniques, which are related to children's imaginative natures. This also demonstrates that when children are encouraged to employ play and games in the learning process, they could envision projects. Furthermore, Isaac et al. (2019) as cites in Ndlovu and Mncube (2021) stated that despite practical activity by itself has not much impact on teaching and learning in the classroom, play-based learning usually leaves a lasting imprint.

The summarized explanation for holistic development of children in play-based approach can be seen in a few aspects such as mathematics subject, cognitive skills, emotional, literacy, teacher knowledge and parental view. All these aspects can be referred to children‘s progress in classroom as teacher implies the approach on the activities that have been choose. All these aspects can be seen with the effectiveness that goes along with the progress of the children in the classroom as well as in the activities planned by the teacher using this play-based approach. The preparation of the appropriate environment and materials also plays an important role in the effort to apply play-based education to children. This is because the unappealing surroundings and materials prevent children from enjoying the learning process well because there is no encouraging atmosphere that can help foster their thoughts and imagination. To ensure that the above approach is used consistently, it is required to address the requirements of both teachers and students with the collaboration of all parties involved in the construction of education for children.

Montessori Curriculum and play-based learning in early childhood education

A unique educational approach that has numerous advantages in the field of education was created as a result of the interaction and relationship between play-based learning and the Montessori curriculum in early childhood education. Children are empowered to become self-reliant, imaginative, and passionate learners through an educational experience that combines the Montessori Curriculum with the benefits of a play-based approach. It also becomes a duty for parents to comprehend this pedagogical diversity and provide children with the best possible foundation for their success (Eden et al. 2024). Our children's minds and hearts can be nurtured by a rich and stimulating learning environment. Studies by Ndlovu and Mncube (2021) also show this acknowledgement is the result of highlighting the need to give holistic skill development—like play—priority, and it suggests that the procurement strategy be centralized in order to benefit all educational institutions and attain resource equity.

This combination offers lifelong learning with the theoretical foundation that children have an absorbent mind and the advantage of receiving information in a pleasurable way considering that the Montessori curriculum focuses significant importance on a child's freedom or independence in their education (Liu and Tian 2023). Along with transferring new knowledge to larger teaching and learning contexts, the benefit of this merging is that it enables children to participate in a learning environment that gradually eradicates scaffolding as mastery and can recognize when and from whom support can be requested. Children could also develop toward employing rules, concepts, strategies, and aptitude on their own. In addition, Montessori encourages the development of polarization of attention, independence, free will, decision-making, and willpower, and this may distinguish children ahead of others. As a result, this merger can determine the efficacy of the scope research conducted by separating down the results into several components that are essential to early childhood education, such as the roles of teachers and the perspectives of parents.

Previous review on impact of Montessori Curriculum, play-based learning

Studies related to the Montessori curriculum and the play approach are conducted a lot, but there are still not many studies that focus on many aspects of early childhood education. Instead, most studies are conducted related to specific subjects or aspects that allow us to obtain data and findings about the impact of early childhood education. Previous studies that employ both quantitative and qualitative methods provide an opportunity to extract and compare benefits to find the impact of the research topic being conducted. As well as other research methods employed by each author who offers convincing arguments and supporting data to support their conclusions in order to conduct more research. To be specific, Tiryaki et al. (2021) discussed the effect of the Montessori Education on children self- regulation in the preschool. Meanwhile, Croset et al. (2023) reviewed the impact of the Montessori education on early number learning in French preschools. The study was to compared the development of early number learning in pre-schooler through Montessori

Education with―conventional‖ education in France. However, Demangeon et al. (2024) review study on early literacy, early numeracy and executive function of French Kindergartners in Montessori and conventional environment. Lastly, the studied by Ndlovu and Mncube (2021) conducted study on play-based teaching strategy across the foundation phase in physical education teacher‘s perception.

Beach (2023) conducted a systematic review to examined early literacy in Reggio Emilia and Montessori classrooms which come with five-stage framework to led the review. The review discussed four main themes associated with the studies was literacy learning, home-school connection, early literacy advantages and enriches literacy environment. In another study, Basargekar and Lillard (2021) conducted research on how math achievement outcomes associated with Montessori education. The study was conducted on math learning and achievement across Montessori students and alumni does not consistently demonstrated that Montessori programs are preferable compared to alternative or conventional programs. In conclusion, search for related article and studies for this study has been extract from databases in Scopus, thus far not many studies reviewed has done a research on implementation of Montessori Curriculum in on early childhood education. Hence, the review‘s focus on impact of curriculum in early childhood education. Its commonly acknowledge that play-based learning in Montessori Curriculum was crucial in enhancing education for children in early childhood education system. According to a study supported by Vygotsky (1978), which was referenced in Ndlovu and Mncube's (2021) theory of cognitive constructivism, play-based pedagogy should always be the foundation for teachers and students to interact with the environment. Meanwhile, combining technology for the impact of with play-based learning and Montessori Curriculum in various aspect of early children education could render children excitement in gaining knowledge and experience from education.

To address the gaps in the literature, this scoping review was conducted to identify the impact of Montessori Curriculum in previous research that only employed on certain aspects and the analysis results of Montessori Curriculum in early childhood education. In response, this study was to answer the following research questions:

1. What is the explanation of various aspects of Montessori Curriculum in early childhood education?

2. What is the impact of the various aspects of Montessori Curriculum in early childhood education?

METHODS

Following the scoping review framework suggested by Amstrong et. al (2011), this study aims to identify the implication of Montessori Curriculum in early childhood education. Ackerman (2019) highlighted that Montessori education revolves around the idea that children ―best learn by absorbing and interacting with different aspects of their environment, as opposed to being directly taught specific knowledge and skills. Thus, it is vital to explore the various aspects of the Montessori Curriculum in early childhood education and how to examine the impact of the various aspects of the Montessori curriculum in early childhood education. A scoping study was chosen as the methodology for this review to focus on broad research issues, rather than to address highly specific research problems or to assess the quality of selected studies (Arksey and O‘Malley 2005). This approach differs from a systematic literature review that has a strongly oriented research question with limited parameters, uses frequent article quality filters, and harnesses extensive data extraction procedures (Armstrong et al. 2011). Therefore, a scoping review was used to address the research objectives and clarify parameters and inconsistencies in the chosen works of literature.

Only journal articles were selected to answer the two research questions set at the beginning of the review. Kraus, Breier, and Dasí-Rodríguez (2020) recommend that authors perform their searches primarily through online databases, focusing on journal papers exclusively, as this search strategy contributes to creating a more transparent, globally applicable procedure. Since journal articles had undergone peer review, they were considered a more suitable source type than textbooks or website data. This process is vital as it subjects information to the inspection of experts in the same area to detect deliberate or inadvertent inaccuracies (Reifsnider 2022). Relevant articles were first searched for from the metrics of education journals based on Scopus database of the years 2020 to 2024. These included 9 education journals, notably:

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1. Applied Developmental Science (Taylor & Francis)
2. Child Development (Wiley)
3. Cognitive Development (Elsevier Inc.)
4. Early Child Development and Care (Taylor & Francis)
5. Early Years (An International Research Journal) (Taylor and Francis)
6. Educational Research for Policy and practice (Springer)
7. International Journal of Primary, Elementary and early Years education (Taylor & Francis)
8. London Review of Education (UCL Press)
9. Scrutiny2 (Issues in English Studies in Southern Africa) (Taylor & Francis)

Specific Boolean search terms and keywords used to find the articles were _montessori AND curriculum‘, with an advanced search restriction limited to articles published from 2020 to 2024. The year restriction was used to ensure only the latest technological interventions were included in the review because of rapid technological advancements. The first process generated 22 articles. The researchers further screened the materials by reading the abstract of each of the articles. A total of 4 articles were eliminated from the screening process as the studies were not conducted in the Montessori curriculum context. In addition, some articles were rejected because they were not empirical studies and did not report on the impact of Montessori curriculum in early childhood education. As a result, eighteen articles from seventeen journals (as shown in Table 1) were viable to proceed to the next stage and were extracted for review.

Table 1. Articles extracted from the Scopus database.

Journals	Articles
Applied Developmental Science	Ansari and Winsler (2022)
Child Development	Courtier et al. (2021)
Cognitive Development	Guerrero et al. (2023)
Early Child Development and Care	Tiryaki et al. (2021)
	Basargekar and Lillard (2021)
Early Years (An International Research Journal)	Demangeon et al. (2024)
Educational Research for Policy and practice	Efe and Ulutas (2022)
Human, Technologies and Quality of Education	Ligita Stramkale (2021)
International Journal of Academic Research in Progressive Education and Development	Aimi Liyana Sha‘rani and Suziyani Mohamed (2023)
International Journal of Evaluation and Research in Education (IJERE)	Elfi Rahmadhani et al. (2023)
International Journal of Learning, Teaching and Educational Research	Ndlovu and Mncube (2021)
International Journal of Primary, Elementary and early Years education	Tympa et al. (2022)
Journal of Montessori Research	Dansereau and Wyman (2020)
Journal of Student Research	Tebben (2023)
London Review of Education	Owen and Davies (2020)
Participatory Educational Research (PER)	Kocabaş and Bavlı (2022)
Scrutiny2 (Issues in English Studies in Southern Africa)	Masunga & Van der Merwe (2022)
Swiss Journal of Educational Research	Croset et al. (2023)

All the selected articles (n = 18) underwent two processes of analysis to answer the research questions: narrative analysis and thematic analysis. The use of narrative review aligned with the researchers 'aim of better displaying summarized key information from the articles with the reader, as narrative texts are dense and full of sociological information, while most empirical evidence is in a narrative form (Franzosi 1998). In the beginning, each article was analyzed one by one to summarize the research objectives, the implication towards various aspect in Montessori curriculum used, participants in the study (age and grade level), how the curriculum was implemented in the lesson, and the effects of the curriculum used in early childhood education. Based on the information collected, a cross analysis between articles was conducted to identify the implications of the Montessori curriculum used.

Thematic analysis was employed as a technique for detecting, analyzing, and reporting on patterns included within the data, in order to describe them in detail and in the simplest way possible (Braun and Clarke 2006). The first step was to analyses the sections of the findings and discussions in each selected study. Then, the coding process was conducted to identify patterns in the data from all studies reviewed. All the coding generated was further examined for similarities, leading to the classification of seven themes: mathematics, emotional, literacy, cognitive, motor skills, teacher knowledge and parental view. The discussion section will answer the two research questions, using these themes as a guide.

RESULT AND DISCUSSION

Result

A total of 18 articles were extracted and reviewed in this study (as shown in Table 2). The research was conducted in twelve jurisdictions, with most studies from French (n = 3), Turkey (n = 3), and the United States (n = 3). The remaining studies were conducted in Europe, South Africa, Italy, Florida, United Kingdom, Indonesia, Australia, Spain and Malaysia. All studies implemented various aspects in Montessori curriculum. For Tympa et al. (2022) was implemented the Montessori educational system with three different groups of participants during their two-year attendance in a public preschool setting. All of the studies involved children across different age groups in preschool centre. Data collection included semi-structured interviews to collect parents 'views about Montessori approach effectiveness and dialogic interviews with parents to collect their views about their children's learning development (Siraj-Blatchford 2010). The findings clearly reported that children are more confident and surer of themselves especially in mathematics, they use more difficult words when they talk about their day experiences at home, and they can read on their own.

All of the studies in this review highlighted the implication of Montessori curriculum in early childhood education. Courtier et al. ((2021) used tested on a range of tasks assessing language, mathematical, executive and social abilities. Participants were recruited from two preschools in the Lyon area (France). This study was used two experiments (cross-sectional experiment and longitudinal experiment). However, the cross-sectional and longitudinal findings largely support the null hypothesis (i.e., no difference between the Montessori and the conventional preschool curriculum) in the majority of competences tested. The studies showed that the adapted Montessori curriculum was associated with outcomes comparable to the conventional curriculum on math, executive functions, and social skills. However, disadvantaged kindergarteners from Montessori classrooms outperformed their peers on reading.

In resonance with Courtier et al. (2021) works, Demangeon et al. (2024) observed the performance between children attending three types of preschools: fully conventional preschools (control group), conventional preschools that use some Montessori methods (Partial Montessori: PM group), and Classic Montessori preschools (CM group) in academic (literacy, numeracy) and developmental (executive functions) outcomes. The findings from Demangeon's study indicates that early numeracy, early literacy, and executive functions scores were highest for children in the CM group and lowest for children in the control group. The findings also showed that Montessori children perform better in numeracy and executive function tests. These differences are consistent with some previous research (e.g., Lillard 2012 for executive functions), but not with others (e.g., Courtier et al. 2021 for literacy).

Tebben (2023) employed a multi-method approach in Montessori preschool education to analyses the impacts

on short-term emotional development in children ages 3 to 5 years old, compared to conventional forms of education. The article concluded that Montessori preschool students have higher emotional development than conventional preschool students. Likewise, Tiryaki et al. (2021) examined the effects of Montessori Education on children‘s self-regulation skills in the preschool period. The study shows a significant difference in posttest mean scores for Self-Regulation and Attention/Impulse Control in favor of the experimental group. Therefore, these findings demonstrate the positive impact of Montessori Education on Attention/Impulse Control and Self-Regulation. Meanwhile, Ansari and Winsler (2022) study focused on the long-term benefit of Montessori education to promote stronger pre-academic skills and, in turn, performed better on standardized assessments of math and reading. Furthermore, these results also make clear is that early Montessori participation had benefits that extend upwards because Montessori graduates entered school readier to learn

Table 2. Articles extracted and reviewed in this study.

Articles	Aspects	Jurisdictions	Participants
Demangeon et al. (2024)	Literacy, Mathematic, Cognitive	French	105 children (aged 5 to 6 years old)
Tiryaki et al. (2021)	Emotional	Turkey	108 children (aged 4 to 6 years old)
Ansari and Winsler (2022)	Emotional	Florida	5136 Grade 3 children (aged 4 years old)
Basargekar and Lillard (2021)	Mathematic	United States	Children aged 3 to 12 years old
Tebben (2023)	Emotional	United States	2 Montessori schools and 1 conventional school (children aged 3 to 5 years old)
Courtier et al. (2021)	Cognitive, Literacy, Mathematic	French	196 children (aged 5 to 6 years old)
Dansereau and Wyman (2020)	Cognitive	United Kingdom	20 children (aged 3 to 6 years old)
Elfi Rahmadhani et al. (2023)	Cognitive	Indonesia	112 kindergarten students
Tympa et al. (2022)	Parental View	Europe	105 parents
Efe and Ulutas (2022)	Teacher Knowledge	Turkey	5 female teachers (aged 29 to 31 years old)
Kocabaş and Bavlı (2022)	Teacher Knowledge	Turkey	12 female Montessori teachers (aged 23 to 38 years old)
Ligita Stramkale (2021)	Cognitive	Europe	Grade 1 to 3 children
Croset et al. (2023)	Mathematic	French	129 children (aged 3 to 5 years old)
Masunga & Van der Merwe (2022)	Literacy	South Africa	4 Grade R teachers
Ndlovu and	Teacher Knowledge	South Africa	5 preservice teachers

Mncube (2021)			
Owen and Davies (2020)	Literacy	Australia	Children aged 3 to 5 years old
Guerrero et al. (2023)	Cognitive, Emotional	Spain	58 children (aged 4 to 6 years old)
Aimi Liyana Sha'rani and Suziyani Mohamed (2023)	Teacher Knowledge	Malaysia	284 individuals (aged 20 to 60 years old)

Basargekar and Lillard (2021) investigated how Math achievement outcomes associated with Montessori education. The study concluded that Montessori programs are better than conventional programs for math learning. Significantly greater advances were seen in executive function, which is related to math. On the other hand, Croset et al. (2023) investigated the impact of Montessori method during the preschool years. The study shows that there is no evidence of a difference in mathematics test performance between the groups of students who were taught using the Montessori Method compared with conventional pedagogical methods. These results are consistent with the results of Ansari & Winsler (2014) and Lopata et al. (2005).

Guerrero et al. (2023) assess the executive function processes that fall under the wider definition of the term, including both the traditional core elements (working memory, inhibitory control, and cognitive flexibility) but also EF processes involved in self-regulation. The study concluded that early educational practice has an impact in the development of the EF. The Montessori program seems to offer educational practice that enhance executive skills and facilitate the acquisition of complex executive control in preschoolers as compared to the conventional practice. Meanwhile, Ligita Stramkale (2021) conducted a study to identify the Montessori education principles and the keywords that describe them, as well as to compare them with the content of learning topics in today's music subject curriculum for grades 1 to 3. Firstly, the study proposed that Montessori education creates interest, curiosity and a desire to learn. Secondly, collaboration can be used in group work to deal with real-life problems together. For example, researchers (Livstrom, Szostkowski & Roehrig, 2018; Rinke, Gimbel & Haskell, 2013; Negru, 2012) have found in their study that children between ages six to twelve enjoy group learning, and this is one of the best ages to foster collaboration. Finally, learning by doing can be promoted by active involvement in several activities and self- regulated learning.

In a more recent study, Kocabaş and Bavlı (2022) examining the practices of Montessori teachers in communication and collaboration with the child. The researchers found that teachers' communication approach was based on respect for the child. The main subjects that maintain collaboration with the child were support from their peers, involving the children in making class rules, giving the children responsibility, and encouraging them to work together during learning. On the other hand, Elfi Rahmadhani et al. (2023) determined the symbolic thinking ability of kindergarten students through Montessori games based on gender. This study found that the symbolic thinking ability of male and female students is at the level of developing according to expectations. However, there are still students at the beginning to develop and undeveloped levels for both male and female students in this ability. This means that teachers' role is still needed to help students develop their symbolic thinking skills.

Dansereau and Wyman (2020) conducted a study by developing and implementing a curriculum that is consistent with the Montessori approach, child directed, and focused on sound examination and music learning. The researcher designed six shelf works and offered them, over the course of 6 CPAR cycles, to 20 3 to 6 years old children attending a Montessori school. These findings indicate that the children received the works positively, chose to engage with them, became more confident in their musical tasks over time, showed signs of deep concentration and attention, and demonstrated consistent performance across similar tasks related to perception and cognition. Meanwhile, Masunga and Van der Merwe (2022) conducted a study on how the implementation of Grade R children's literature curricula at selected early childhood development (ECD) centres in Johannesburg. The study results show positive aspects of the children's literature curriculum at these

centres, notably their focus on children‘s holistic development (including literacy development), the intentional use of different methods by teachers to implement the curriculum, and the teachers‘ careful awareness of the contexts in which they teach.

Ndlovu and Mncube (2021) investigated how early childhood pre-service educators' perceptions of using play-based teaching strategy across the Foundation Phase. The study highlighted that play-based approach promotes a special mode of thinking, sense of possibility, ownership, control, and competence in math‘s and Physical Education learners. Moreover, scholars also believe that hybrid pedagogical content knowledge that integrates play-based learning sustains learner attention throughout the lesson and promotes problem-solving skills. On the other hand, Efe and Ulutas (2022) conducted a study on the experiences of teachers who work in public preschools using their initiative and effort to implement Montessori education in their classes. The main finding of the study showed that despite reactions from their colleagues in terms of material procurement, activities, and teaching styles, they continued to practice the Montessori philosophy. Although this initiative is a difficult process, teachers willingly preparing and using resources and supports effectively can create positive outcomes for the educators, families, and children.

Aimi Liyana Sha‘rani and Suziyani Mohamed (2023) were investigated the knowledge level of private kindergarten teachers regarding the Montessori Curriculum. The article suggests that by providing a comprehensive guide, private kindergartens using this curriculum can ensure that all aspects are met. Thus, a specialized module for teachers to use with The Montessori Curriculum should be develop, as it helps teachers expand their teaching approaches and develop their teaching skills. Meanwhile, Owen and Davies (2020) studied how educators at Montessori school implemented their approach to use of digital technologies in their classrooms. The researcher was defined a solution that met the mandated curriculum needs and fitted with the school autonomy. Most importantly the project and the solution empowered educators, as it aligned with the school identified virtues and utilized the three-period lesson to teach it, all of which was consistent with Montessori pedagogy.

DISCUSSION

The aim of this scoping review study was to explain the various aspects of Montessori Curriculum in early childhood education and to examine the implication of the various aspects of Montessori curriculum in early childhood education. The discussion of this scoping review study is structured based on the proposed research questions.

Various aspects of Montessori Curriculum in early childhood education

The relationship between all the 18 reviewed articles can be observed in terms of the Montessori curriculum used (as shown in Table 3). In general, six main areas were discussed, including aspects of mathematic, emotional, literacy, cognitive, teacher knowledge and from parental view. In the reviewed articles, the researchers discuss the implication of various aspects of Montessori curriculum in early childhood education.

During the early years, children become more independent and advance in all areas of development. Since many skills and significant knowledge that form the foundation for future developmental periods are gained throughout early childhood, it is important that children's developmental needs be supported during this time. Questions about the effectiveness of Montessori programs often invite a closer look not only at the Montessori programs, but also at the programs with which they are being compared. Thematic analysis was used in order to describe them in detail and in the simplest way possible.

Mathematics

Early mathematics skills cover several domains, including numeracy, geometry, patterning, and problem-solving (NRC 2009). Although each of these early skills is distinct, they develop in interaction to build more advanced mathematics skills (Purpura, Baroody, and Lonigan 2013). A. Demangeon et al. (2024) state that both Montessori groups (classic and partial) performed better in early numeracy. Likewise, Basargekar and Lillard (2021) find that kids who have participated in Montessori programs for a longer period of time, have

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assessments that are more conceptual in character, and follow key Montessori educational principles are more likely to have a Montessori advantage in math.

Literacy

Early literacy describes the skills, knowledge, and attitudes on which reading and writing are based. The process of learning to read and write is a continuum that begins with acquiring early literacy skills and culminates with the mastery of advanced reading and writing skills (Whitehurst and Lonigan 1998). Masunga & Van der Merwe (2022) identified that exposing children to children‘s literature can significantly improve their literacy skills, for example using nursery rhymes to introduce lessons. This is in keeping with the view that nursery rhymes appeal to children and stimulate their interest in learning (Pourkalhor and Tavakoli 2017). This study suggests that using rhymes to introduce lessons, accompanied by rhythmic clapping of hands also seems to have stimulated the children‘s interest in learning.

Table 3. Measured aspects of Montessori Curriculum in Early Childhood Education

Articles	Math	Emotional	Literacy	Cognitive	Teacher Knowledge	Parental View
Demangeon et al. (2024)	✓		✓	✓		
Tiryaki et al. (2021)		✓				
Ansari and Winsler (2022)		✓				
Basargekar and Lillard (2021)	✓					
Tebben (2023)		✓				
Courtier et al. (2021)	✓		✓	✓		
Dansereau and Wyman (2020)				✓		
Elfi Rahmadhani et al. (2023)				✓		
Tympa et al. (2022)						✓
Efe and Ulutas (2022)					✓	
Kocabaş and Bavlı (2022)					✓	
Ligita Stramkale (2021)				✓		
Croset et al. (2023)	✓					
Masunga & Van der Merwe (2022)			✓			
Ndlovu and Mncube (2021)					✓	
Owen and Davies (2020)			✓			
Guerrero et al. (2023)		✓		✓		
Aimi Liyana Sha‘rani and Suziyani Mohamed (2023)					✓	

Cognitive

Cognitive development means how children think, explore and figure things out. It is the development of knowledge, skills, problem solving and dispositions, which help children to think about and understand the world around them. Children's cognitive abilities can be developed early, including thinking logically and symbolically and problem-solving using various methods. For example, in counting, Elfi Rahmadhani et al. (2023) state that playing using number blocks is proven to be very effective. It has a positive effect on student's cognitive abilities, in line with the opinion Praet et. al (2013) which says that students' ability to recognize numbers can be helped to develop optimally by playing number blocks. This is also in line with research Khachatryan (2015) stated that Montessori games can help develop children's motor, sensory, and mathematical skills.

Emotional

Emotional development is defined as learning what feelings and emotions are, understanding how and why they occur, recognizing one 's own feelings and those of others, and developing effective ways for managing those feelings (Emotional Development - Be You, 2018). Around the ages of 3-5 years old, children are considered more emotionally developed if they can identify emotions, develop prosocial behaviors, and practice nondisruptive behavior (Maguire et al., 2016). Tebben (2023) investigates how Montessori preschool education impacts short-term emotional development in children ages 3 to 5 years old compared to conventional forms of education. The results of this study provide valuable insights on the effectiveness of Montessori education regarding promoting emotional development in preschoolers.

Teacher knowledge

Knowledge is the information a person discovers to acquire the understanding, learning, and experience that influence the concept of knowing (Noor et al., 2015). According to Kang and Lim (2015), a teacher's knowledge is required for educational innovation to occur. Teachers can create interesting and effective teaching and learning experiences for both themselves and their pupils if they deeply understanding a subject. According to the study by Aimi Liyana Sha'rani and Suziyani Mohamed (2023), a teacher's familiarity with a curriculum is necessary for teaching and learning sessions to operate smoothly. Thus, teacher knowledge will increase as they gain more work experience (Masnan et al., 2019).

Parental view

Walls (2018) suggested that Montessori parents from the target school should value Montessori principles, even though few of the parents had a Montessori education themselves. According to Tympa et al. (2022), parents'views their children gained confidence in mathematics and reading stories by their own, cooperated more easily and resolved problems with maturity after the implementation of Montessori educational approach. Furthermore, children are more sociable, more capable in problem solving, have more self-esteem and they are more mature in justifying situations at school.

The impact of various aspects of Montessori curriculum in early childhood education

The relationship between the studies can be observed in terms of their impact on Montessori curriculum (as shown in Table 4). The impact has been analysed and divided into six themes: mathematic, emotional, literacy, cognitive, teacher knowledge and from parental view. The reviewed articles that garnered the most measured impact on Montessori curriculum were cognitive (n = 6), followed by the other four impact – mathematic, emotional, literacy and teacher knowledge – with the same number of studies for each category (n = 4) and parental view (n = 1).

Montessori education revolves around the idea that children ―best learn by absorbing and interacting with different aspects of their environment, as opposed to being directly taught specific knowledge and skills‖ (Ackerman, 2019). The following discussion will explain about the impact of various aspects of Montessori curriculum, using these themes as a guide.

Table 4. Measured impacts of Montessori Curriculum in Early Childhood Education

0	Math	Emotional	Literacy	Cognitive	Teacher Knowledge
Demangeon et al. (2024)	✓		✓	✓	
Tiryaki et al. (2021)		✓			
Ansari and Winsler (2022)		✓			
Basargekar and Lillard (2021)	✓				
Tebben (2023)		✓			
Courtier et al. (2021)	✓		✓	✓	
Dansereau and Wyman (2020)				✓	
Elfi Rahmadhani et al. (2023)				✓	
Tympa et al. (2022)					
Efe and Ulutas (2022)					✓
Kocabaş and Bavlı (2022)					✓
Ligita Stramkale (2021)				✓	
Croset et al. (2023)	✓				
Masunga & Van der Merwe (2022)			✓		
Ndlovu and Mncube (2021)					✓
Owen and Davies (2020)			✓		
Guerrero et al. (2023)		✓		✓	
Aimi Liyana Sha'rani and Suziyani Mohamed (2023)					✓

Mathematic

Compared with children in the control group, those in both Montessori groups (classic and partial) performed better in early numeracy. Montessori Education's (ME's) beneficial effect on performance may be due to both the ME environment and the materials used, as preschoolers in Montessori classrooms are more active than those in conventional classrooms (Bassok, Latham, and Rorem 2016; Lillard 2016). Finding shows that how children participate in activities has a potentially positive effect on their academic achievement. ME allows children to choose their activity and to engage in it actively and repetitively without interruption and free from grades or other extrinsic rewards (Marshall 2017). In addition, Montessori materials allow children to approach mathematical concepts in different ways, most notably by reinforcing connections between spatial and mathematical skills (Verdine et al. 2017). Meanwhile, according to the study of Demangeon et al. (2024), the results show better outcomes in the numeracy and inhibition control tests in the fully ME group, followed by the partial ME group while the group of children who had received conventional education obtained the lowest results.

Literacy

Children in both the traditional and partial Montessori groups outperformed children in the control group in early literacy, although the difference was not statistically significant. This outcome is surprising as embodied cognition is promoted by Montessori teaching tools. Lillard (2021) state that manipulating the material as an

initial step in learning to read is consistent with the fact that haptic exercises facilitate learning (Bara, Gentaz, and Colé 2007). On the other hand, A. Demangeon et al. (2024) found that the differences in literacy scores were not significant. Therefore, two explanations can be offered. First, the small size of our samples may limit the variability of student outcomes. Second, the nature of early literacy tests may also explain why results differ from other studies.

Cognitive

Compared with the children in the control group, those in both Montessori groups (classic and partial) had more highly developed in cognitive skills (Demangeon et al. 2024). Education in human life has a very important position, especially at an early age, because all the major elements in humans are formed at that time, including all psychic abilities such as cognitive abilities. ME capitalises on this by creating a nurturing environment where children can engage in hands-on activities that stimulate cognitive growth. As children interact with Montessori materials, they develop critical thinking skills, enhance their memory, and build a strong academic foundation. For example, Montessori‘s practical life activities such as pouring, sorting, and arranging. These skills also support the development of fine motor skills and concentration, contributing to a balanced cognitive and physical development.

Emotional

Compared with children in the control group, the students of Montessori preschool education have higher emotional development percentages than students of conventional preschool education (Tebben 2023). Early childhood education significantly impacts on social and emotional skills. In Montessori classrooms, children learn the value of empathy, cooperation, and respect. The multi-age structure encourages mentoring and collaboration, while structured group activities help children develop interpersonal skills in a supportive setting. From an early age, ME children are encouraged to take on responsibilities and practice self-discipline. This contributes to a well-rounded development, preparing them to manage emotions and build positive relationships as they grow.

Teacher knowledge

This finding indicates that the teachers are well-versed in the curriculum, which can aid private kindergartens

in determining their teachers' level of knowledge. Thus, the teacher's curriculum knowledge will help produce meaningful teaching and learning experiences (Aimi Liyana Sha‘rani and Suziyani Mohamed 2023). The teachers are considered as a mechanism that will assisting in the development of children, and they play a crucial role in education.

Parental view

According to parents‘ views, children gained confidence in mathematics and reading stories by their own, cooperated more easily and resolved problems with maturity. The data indicates that in such an environment, the classroom becomes productive, and the children individually give their personal interpretation of the information offered to them (Tympa et al. 2022). In this study, the parents noticed that children had more self-confidence and were less reluctant to voice their opinions and thoughts. Through the Montessori teaching method, children are encouraged to feel free to take decisions, make choices and take initiatives, which results in the gradual enhancement of their socio-emotional skills, with emphasis laid on self-esteem, self-awareness and social skills (Ozerem and Kavaz 2013; Shivakumara, Dhiksha, and Nagaraj 2016). Therefore, children and teachers work together as collaborators in this teaching and learning environment, exploring and battling together to accomplish the learning goals.

CONCLUSION

This scoping review focused on a specific aspect of research in early childhood education, with parameters including research that reported the impacts of Montessori curriculum. As a result, the majority of the reviewed studies showed the positive impacts of the Montessori curriculum on preschool children‘s‘ learning in early ages. However, despite of the positive impacts, some studies discussed the challenges and drawbacks of the

approach. According to Efe and Ulutas (2022), the teachers stated that they encountered challenges to implement the Montessori method, namely the high cost of materials, the reactions of other teachers, and the lack of assistant teachers in the classroom. With ever-increasing investments in preschool education, it is important that they improve staff, physical conditions, and the quality of the implemented program, to provide quality education (Erisen & Güle 2007).

To apply an educational approach that may need for special materials and techniques such as Montessori curriculum, the teachers need moral support and unique learning materials and resources. To be more specifically, the quantity and variety of educational materials may necessitate financial support. Thus, we need school administrators, parents, and policymakers to support educators who wish to take the initiative and work to improve the quality of education and progress. The positive outcomes will be increased the initiating teachers‘ efforts and can be evaluated with the help and collaboration of parents, school administrators, and community leaders. Thus, the support of parents, policymakers, and school administrators is inevitably needed to pave the way for teachers' initiatives. The administrators may assist teachers by fostering an environment of learning that is open-minded. Meanwhile the parents may provide emotional support and patiently follow the teachers' guidance. On the other hand, policymakers should play a key role in giving educators the resources (training, environment, materials, etc.) which they can begin and continue their initiatives. Hence, innovative ideas in educational institutions can be sustained, and teachers' inner lights can be ignited, by enacting policies that promote entrepreneurial teachers and increasing financial resources for entrepreneurial endeavors. Moreover, increasing resources for education can benefit implementers by allowing them to make adaptations in response to the evolving needs of the family, the physical environment, and the child. Thus, to improve their pedagogical viewpoint, educational institutions might offer teachers workshops, seminars, and training.

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REFERENCES

1. Ackerman, D. J. (2019). The Montessori Preschool Landscape in the United States: History, Programmatic Inputs, Availability, and Effects. ETS Research Report Series, 106(4), 1–18. https://doi.org/10.1002/ets2.12252
2. Aimi Liyana Sha'rani, & Suziyani Mohamed. (2023). Teachers ‘Knowledge on the Implementation of the Montessori Curriculum. International Journal of Academic Research in Progressive Education and Development, 12(2), 2630–2637. https://dx.doi.org/10.6007/IJARPED/v12-i2/17778
3. Aisyah, E. N., Harun, H., & Rohman, A. (2023). Learning Through Play in Early Children‘s Education

in Friedrich Wilhelm Froebel's Perspective. Proceedings of the International Conference on Educational Management and Technology (ICEMT 2022), 571–582. https://doi.org/10.2991/978-2-494069-95-4_66

4. Ansari, A., & Winsler, A. (2014). Montessori public school pre-K programs and the school readiness of low-income Black and Latino children. Journal of Educational Psychology, 106(4), 1066–1079. https://doi.org/10.1037/a0036799
5. Ansari, A., & Winsler, A. (2022). The long-term benefits of Montessori pre-K for Latinx children from low-income families. Applied Developmental Science, 26(2), 252–266. https://doi.org/10.1080/10888691.2020.1781632
6. Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a Methodological Framework. International Journal of Social Research Methodology, 8(1), 19–32. https://doi.org/10.1080/1364557032000119616
7. Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). ―Scoping the scope‖ of a cochrane review. Journal of Public Health, 33(1), 147–150. https://academic.oup.com/jpubhealth/article/33/1/147/1549781
8. Bara, F., Gentaz, E., & Colé, P. (2007). Haptics in learning to read with children from low socio-economic status families. British Journal of Developmental Psychology, 25(4), 643–663. https://doi.org/10.1348/026151007x186643
9. Basargekar, A., & Lillard, A. S. (2021). Math achievement outcomes associated with Montessori education. Early Child Development and Care, 191(7-8), 1207–1218. https://doi.org/10.1080/03004430.2020.1860955
10. Bassok, D., Latham, S., & Rorem, A. (2016). Is Kindergarten the New First Grade? AERA Open, 2(1), 233285841561635. https://doi.org/10.1177/2332858415616358 Beach, P. (2023). Research on early literacy in Reggio and Montessori classrooms: A scoping review. Journal of Early Childhood Literacy,1. https://doi.org/10.1177/14687984231186090
11. Braun, V., & Clarke, V. (2006). Using Thematic Analysis in Psychology. Qualitative Research in Psychology, 3(2), 77–101. Tandfonline. https://doi.org/10.1191/1478088706qp063oa
12. Courtier, P., Gardes, M., Van der Henst, J., Noveck, I. A., Croset, M., Epinat-Duclos, J., Léone, J., & Prado, J. (2021). Effects of Montessori Education on the Academic, Cognitive, and Social Development of Disadvantaged Preschoolers: A Randomized Controlled Study in the French Public-School System. Child Development, 92(5), 2069–2088. https://doi.org/10.1111/cdev.13575
13. Croset, M.-C., Courtier, P., & Gardes, M.-L. (2023). The impact of the Montessori Education on early number learning in French pre-schools. Swiss Journal of Educational Research, 45(3), 307–319. https://doi.org/10.24452/sjer.45.3.7
14. Dansereau, D. R., & Wyman, B. (2020). A Child-Directed Music Curriculum in the Montessori Classroom. Journal of Montessori Research, 6(1), 19–31. https://doi.org/10.17161/jomr.v6i1.10631
15. Demangeon, A., Claudel-Valentin, S., & Tazouti, Y. (2024). Early literacy, early numeracy and executive functions of French Kindergartners in Montessori and conventional environments. Early Years, 1–15. https://doi.org/10.1080/09575146.2024.2343706
16. Eden, C. A., Chisom, O. N., & Adeniyi, I. S. (2024). PARENT AND COMMUNITY INVOLVEMENT IN EDUCATION: STRENGTHENING PARTNERSHIPS FOR SOCIAL IMPROVEMENT. International Journal of Applied Research in Social Sciences, 6(3), 372–382. https://doi.org/10.51594/ijarss.v6i3.894
17. Efe, M., & Ulutas, I. (2022). Beyond teaching: Montessori education initiatives of public preschool teachers in Turkey. Educational Research for Policy and Practice, 21, 375–388. https://doi.org/10.1007/s10671-022-09310-7
18. Elfi Rahmadhani, Septia Wahyuni, & Mandasari, L. (2023). The symbolic thinking ability of kindergarten students in central Aceh through Montessori games based on gender. International Journal of Evaluation and Research in Education (IJERE), 12(1), 139–139. https://doi.org/10.11591/ijere.v12i1.23777
19. Emotional development - Be You. (2018). Beyou.edu.au. https://beyou.edu.au/resources/fact-sheets/social-and-emotional- learning/emotional- development
20. Erisen, Y., & Güle¸s, F. (2007). Evaluation of design quality properties of Montessori materials. Selçuk University Social Sciences Institute Journal, 18, 287–305.

21. Franzosi, R. (1998). Narrative Analysis—Or Why (and How) Sociologists Should Be Interested In Narrative. Annual Review of Sociology, 24(1), 517–554. https://doi.org/10.1146/annurev.soc.24.1.517
22. Gentaz, E., & Richard, S. (2022). The Behavioral Effects of Montessori Pedagogy on Children‘s Psychological Development and School Learning. Children, 9(2), 133. https://doi.org/10.3390/children9020133
23. Guerrero, S., Nunez, M., & Corbacho, C. (2023). Shaping executive function in pre-school: The role of early educational practice. Cognitive Development, 67, 101344. https://doi.org/10.1016/j.cogdev.2023.101344
24. Haile, T. S., & Ghirmai, D. J. (2024). Play-Based Learning: Benefits and Challenges of its Implementation. European Scientific Journal, 28. https://doi.org/10.19044/esipreprint.4.2024.p15
25. Kang, M. H., & Lim, H. L. (2015). Pengetahuan dan keprihatinan guru-guru terhadap pelaksanaan Kurikulum Standard Sekolah R endah (KSSR). Mohe.gov.my, 9(1394-7176), 22–31. https://myjurnal.mohe.gov.my/public/article-view.php?id=95847
26. Khachatryan, M. (2015). A Look at AUA Pre-school English Program Through the Lens of Montessori Pedagogy. Procedia - Social and Behavioral Sciences, 197, 304–307. https://doi.org/10.1016/j.sbspro.2015.07.141
27. Kocabas, H. U., & Bavli, B. (2022). The Montessori Educational Method: Communication and Collaboration of Teachers with the Child. Participatory Educational Research, 9(1), 443–462. https://doi.org/10.17275/per.22.24.9.1
28. Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2020). The Art of Crafting a Systematic Literature Review in Entrepreneurship Research.
29. International Entrepreneurship and Management Journal, 16, 1023–1042. https://doi.org/10.1007/s11365-020-00635-4
30. Li, F., & Wang, L. (2024). A study on textbook use and its effects on students ‘academic performance. Disciplinary and Interdisciplinary Science Education Research, 6(1). https://doi.org/10.1186/s43031-023-00094-1
31. Ligita Stramkale. (2021). The Content of Today ‘s Music Subject Curriculum for Grades 1–3 in the Context of Montessori Education Principles. HUMAN, TECHNOLOGIES and QUALITY of EDUCATION.https://doi.org/10.22364/htqe.2021.81
32. Lillard, A. S. (2012). Preschool children ‘s development in classic Montessori, supplemented Montessori, and conventional programs. Journal of School Psychology, 50(3), 379–401. https://doi.org/10.1016/j.jsp.2012.01.001
33. Lino, D., & Parente, C. (2018). Play and learning in early childhood education: The contribution of High Scope, Reggio Emilia and Montessori pedagogical approaches. Early Childhood Education from an Intercultural and Bilingual Perspective, 147–163.
34. Liu, S., & Tian, A. (2023). The Influence of Montessori Education on Children ‘s Personality Development and the Way of Thinking. Lecture Notes in Education Psychology and Public Media, 16(1), 173–180. https://doi.org/10.54254/2753-7048/16/20231141
35. Livstrom, I. C., Szostkowski, A. H., & Roehrig, G. H. (2019). Integrated STEM in practice: Learning from Montessori philosophies and practices. School Science and Mathematics, 119(4), 190–202. https://doi.org/10.1111/ssm.12331
36. Lopata, C., Wallace, N. V., & Finn, K. V. (2005). Comparison of Academic Achievement Between Montessori and Traditional Education Programs. Journal of Research in Childhood Education, 20(1), 5–13. https://doi.org/10.1080/02568540509594546
37. Maguire, L. K., Niens, U., McCann, M., & Connolly, P. (2015). Emotional development among early school-age children: gender differences in the role of problem behaviours. Educational Psychology, 36(8), 1408–1428. https://doi.org/10.1080/01443410.2015.1034090
38. Malik, F., & Marwaha, R. (2021). Developmental Stages of Social Emotional Development In Children. PubMed; StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK534819
39. Mamat, N., & Omar (2022). Early Childhood curriculum (pp. 2–234). University Pendidikan Sultan Idris. (Original work published 2022) Marshall, C. (2017). Montessori education: a review of the evidence base. Npj Science of Learning, 2(11), 1–9. https://doi.org/10.1038/s41539-
a. 017-0012-7
40. Masnan, A. H., Anthony, N. E., & Syahindah Zainudin, N. rArifah. (2019). The Level of Teaching

Knowledge Preschool Teachers in Malaysia.
41. Pacific Early Childhood Education Research Association, 13(2), 39–48. https://doi.org/10.17206/apjrece.2019.13.2.39
42. Masunga, D., & van der Merwe, D. (2022). English Literature in the Grade R Classroom: Exploring the Implementation of Children‘s Literature Curricula in Selected Early Childhood Development Centres. Scrutiny2, 27(2–3), 33–51. https://doi.org/10.1080/18125441.2023.2283888
43. Mutmainna, N., Rizqi, V., Halim, C., & Astuti, P. (2024). A Comparative Study of Montessori and Traditional Education Approaches: Cognitive Development and Academic Achievement. International Education Trend Issues, 2(2), 298–205. https://doi.org/10.56442/ieti.v2i2.697
44. Ndlovu, B. N., & Mncube, D. W. (2021). Pre-service Mathematics and Physical Education Teachers‘ Perceptions of using Play-based Teaching Strategy across the Foundation Phase. International Journal of Learning, Teaching and Educational Research, 20(1), 185–198. https://doi.org/10.26803/ijlter.20.1.10
45. Negru, A. (2012). PLURALIST APPROACH TO THE MONTESSORI METHOD IN THE ART OF PRE-SCHOOL EDUCATION. Journal plus Education, 8(1), 40–43.
46. Nisa, T. F., Ariyanto, F. L. T., & Asyhar, A. H. (2019). Montessori learning: understanding the concept of early childhood mathematics. Journal of Physics: Conference Series, 1211(1), 012094. https://doi.org/10.1088/1742-6596/1211/1/012094
47. Noor, A. F. M., Jasmi, K. A., & Shukor, K. A. (2015). Elemen Pengetahuan Pensyarah Cemerlang Unit Pendidikan Islam dan Moral di Politeknik Premier: Satu Kajian Rintis. The Online Journal of Islamic Education, 3(1), 13–21
48. NRC (National Research Council). 2009. Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity. Washington DC: National Academies Press.
49. Owen, S. J., & Davies, S. (2020). Maintaining an empowered school community: Introducing digital technologies by building digital literacies at Beehive Montessori School. London Review of Education, 18(3), 356–372. https://doi.org/10.14324/lre.18.3.03
50. Ozerem, A., and R. Kavaz. 2013. ―Montessori Approach in pre-School Education and its Effects. ‖ The Online Journal of New Horizons in Education 3 (3): 12–25.
51. Pourkalhor, O., & Akhavan Tavakoli, M. (2017). Nursery Rhymes and Language Learning: Issues and Pedagogical Implications. International Journal of English Language & Translation Studies, 5(1), 111–116.
52. Praet, M., Titeca, D., Ceulemans, A., & Desoete, A. (2013). Language in the prediction of arithmetics in kindergarten and grade 1. Learning and Individual Differences, 27, 90–96. https://doi.org/10.1016/j.lindif.2013.07.003
53. Purpura, D. J., Baroody, A. J., & Lonigan, C. J. (2013). The transition from informal to formal mathematical knowledge: Mediation by numeral knowledge. Journal of Educational Psychology, 105(2), 453–464. https://doi.org/10.1037/a0031753
54. Reifsnider, E. (2022). President ‘s pen: The importance of peer review. Research in Nursing & Health, 45(3). https://doi.org/10.1002/nur.22224 Rinke, C. R., Gimbel, S. J., & Haskell, S. (2012). Opportunities for Inquiry Science in Montessori Classrooms: Learning from a Culture of Interest, Communication, and Explanation. Research in Science Education, 43(4), 1517–1533.https://doi.org/10.1007/s11165-012-9319-9
55. Schipperijn, J., Cathrine Damsbo Madsen, Mette Toftager, Danielle Nørager Johansen, Lousen, I., Thea Toft Amholt, & Charlotte Skau Pawlowski. (2024). The role of playgrounds in promoting children ‘s health – a scoping review. ˜the international Journal of Behavioral Nutrition and Physical Activity, 21(1). https://doi.org/10.1186/s12966-024-01618-2
56. Shivakumara, K., Dhiksha, J., & Nagaraj, O. (2016). Efficacy of Montessori and traditional method of education on self-concept development of children. International Journal of Educational Policy Research and Review, 3(2), 29–35. https://doi.org/10.15739/IJEPRR.16.005
57. Siraj-Blatchford, J. (2020). Surveys and questionnaires: An evaluative case study. Doing Early Childhood Research, 223–238. https://doi.org/10.4324/9781003115403-16
58. Suh, Y., & Jang, Y. (2023). The development and characteristics of Korean children‘s invented notation for musical representation. Music Education Research, 25(3), 330–345. https://doi.org/10.1080/14613808.2023.2217724

59. Tebben, C. (2023). Montessori Education: A Study on the Impact of Montessori Preschools in Washington on Short-Term Emotional Development in Children. Journal of Student Research, 12(3). https://doi.org/10.47611/jsrhs.v12i3.4717
60. Tekyi-Arhin, O. (2023, March 2). The importance of play-based learning in early childhood education by oliver tekyi-arhin. ResearchGate. http://surl.li/qbdvlf
61. Tiryaki, A. Y., Findik, E., Çetin Sultanoğlu, S., Beker, E., Biçakçi, M. Y., Aral, N., & Özdoğan Özbal, E. (2021). A study on the effect of Montessori Education on self-regulation skills in preschoolers. Early Child Development and Care, 191(7-8), 1219–1229. https://doi.org/10.1080/03004430.2021.1928107
62. Tympa, E., Karavida, V., Charissi, A., & Siaviki, A. (2022). Parental views of the Montessori approach in a Public Greek Early years setting.
63. Education 3-13, 50(2), 281–287. https://doi.org/10.1080/03004279.2020.1849344
64. Walls, J. K. (2018). To What Extent Do Parents of Montessori-Educated Children ―Do Montessori‖ at Home? Preliminary Findings and Future Directions. Journal of Montessori Research, 4(1), 14–24. https://doi.org/10.17161/jomr.v4i1.6737
65. Whitehurst, G. J., & Lonigan, C. J. (1998). Child Development and Emergent Literacy. Child Development, 69(3), 848–872. https://doi.org/10.1111/j.1467-8624.1998.tb06247.x
66. Yin, R., Lee, J., & Jang, Y. (2024). Are early child teachers'coping flexibility and narcissism associated with the teacher-child relationship?
67. The mediation of teacher efficacy. Acta Psychologica, 251, 104583–104583. https://doi.org/10.1016/j.actpsy.2024.104583