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Early Writing Ability for Early Childhood Education Using Metal Insets Media with Motor Sensory

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Language is a socially or conventionally accepted code used to express a concept through the use of the desired symbols and combinations of symbols arranged by words. Early childhood is in a sensitive period in language, language skills are very important, they have a vital role in all aspects of intellectual development, in this period children will continue to master and develop their language's development, if no stimulus is given, children will have limited intellectual development. Early language development involves four skills: hearing, speaking, reading, and writing. Writing is a helpful approach to encourage children to use signs and symbols to communicate their ideas. The aims of this study are to describe and analyze the application of Metal Insets media with sensory motor for learning to write through literature studies, explain the characteristics of Metal Insets Media with sensory motor, analyze the advantages and disadvantages of Metal Insets Media with sensory motor. This research method is a qualitative with a literature study approach to describe and analyze. The results obtained that Metal Insets media is a writing aid to stimulate early writing ability childhood involving sensory motor it is related to Montessori's research about humans control their surroundings with their hands and change it in accordance with the direction of their minds, which is inextricably linked to their body morphology and abilities, Metal Insets application take notice on Montessori approach, with the four pillars, such as sensitive periods, a prepared environment, sensory education and spontaneous activity through repetition.

Keywords:

Early Writing
Ability, Early
Childhood, Metal
Insets, Motor
Sensory

I. INTRODUCTION

Children can absorb all the information and knowledge around them quickly, a period at this age is called the golden ages (Suyadi & Ulfah, 2015). Early childhood is the "golden age," as the brain of a child experiences the most rapid development throughout this time, and begins at age 0 (Salnita et al., 2019). Early childhood education provides learning and stimulus for children's development, growth, and potential. Regarding the vital role of education during early childhood and the golden age: (1) Kindergarten education is essential for further development because child development occurs continuously, (2) the central point of developing human resources, (3) forms the basic foundation of children, (4) affects the increase in learning achievement, work ethic,

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*Cite this Article: Alya Nur Fadhilah, Hendratno, Sri Setyowati (2023). Early Writing Ability for Early Childhood Education Using Metal Insets Media with Motor Sensory. International Journal of Social Science and Education Research Studies, 3(1), 190-198 and children's productivity, (5) The golden age period is the period when the brain develops vitally (80%), namely the brain develops 30% in ages 0-4 years, and the brain develops 50% at ages 5-8 years (Setiawan & Nadar, 2021). Montessori coined the term "absorbent mind" to describe how quickly young children could pick up new information, much like a sponge picking up water (Davies, 2019).

Humans grow and develop in a variety of ways, including physical growth (body, brain, sensory, and motor skills), social emotional growth, cognitive or intelligence growth (learning, memory, reasoning, and language), and growth in quantity and quality, language development is one of these growth and development processes (Khosibah & Dimyati, 2021). Language is a socially or conventionally accepted code used to express a concept through the use of the desired symbols and combinations of symbols arranged by words (Suardi et al., 2019). The inherently dynamic nature of human language allows for continuing development, language regarded as something special, because language is a human way of thinking and the foundation of human understanding and knowledge (Purba et al., 2022).

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Early childhood is in a sensitive period in language, language skills are very important because they have a vital role in all aspects of intellectual development, in this period children will continue to master complex sentence structures and develop their vocabulary, if no stimulus is given during this period, then children will have limited intellectual development (Britton, 2017). Early language development has a substantial impact on a child's future academic success since language development takes place in social settings where knowledge is acquired and ideas are exchanged (Rojas & Abenavoli, 2021). Early language development involves four skills: hearing, speaking, reading, and writing. Because these skills are developed in a unit and in a specific order, educators cannot focus just on one skill without affecting the others (Tatminingsih, 2022). Permendikbud No.137 (2014) Standards for Levels of Achievement Level of Language Development for Children 4-5 Years: 1) Recognize symbols, 2) Understand the relationship between sounds and letter shapes, 3) Say familiar letters 4) Make a scribble that meaningful, 5) Imitating (writing and pronouncing letters A-Z). Then for ages 5-6 years: 1) Mentioning familiar letter symbols, 2) Recognizing the sound of the initial letters of the names of objects around them, 3) Mentioning groups of images that have the same initial sound/letter, 4) Understand the relationship between sound and letter shape.

Writing is a helpful approach to encourage children to use signs and symbols to communicate their ideas. Early literacy abilities can be developed in early childhood classes through writing activities (Bingham et al., 2018). Preschoolers are proved to be able to write before entering kindergarten by doing things like writing their first names, writing the alphabet, and utilizing made-up spelling (Puranik et al., 2018). Before teaching other subjects to early childhood, they must first develop their reading and writing skills (Arini et al., 2022).

The global problem that occurs in early childhood aged 4-6 years based on an observation in several kindergarten, teacher focused on pencil grasp, early writing with a pencil demands a grip that requires fine motor skills, educators and parents frequently insist that children use paper and pencils to imitate the alphabet. Instead, children's sensory motors needs to be stimulated so that children's hands are strong enough to handle a pencil to write an alphabet, teachers tend to force children to write alphabets directly without paying attention to sensory-motor readiness.

An integrated skill of kinesthetic movement, eyehand coordination, visual motor, high coordination, and high regulatory precision style is called fine motor (Fitriyah et al., 2021). But, based on recent study by (Andika et al., 2022) explained there are several skills for preparing a stimulation to write for children. As an educators or a teachers, it is a must to get to know about how to stimulate early childhood language's development, especially for early writing. Metal Insets is a writing aid consisting of two sloping wooden planks, on top of each of which there are five pink square metal frames, in each frame, a blue geometric object is inserted along with a small knob as a handle, the child chooses a frame, put it down on paper and outline it inside the geometric frame with colored pencils (Montessori, 2020). It is also highlighted that the Montessori educational approach respects a children's normal physical and physiological development, which is separated into three phases: (1) Language, (2) Sense/sensory stimulation, and (3) Motor Stimulation (Montessori, 2020). Children learn to hold a pencil together by making motions on Metal Insets, it involved the motor sensory ability.

The aims of this study are to describe and analyze the application of Metal Insets media with sensory motor for learning to write through literature studies, explain the characteristics of Metal Insets Media with Sensory Motor, analyze the advantages and disadvantages of Metal Insets Media with sensory motor.

II. METHOD

This research is a qualitative with a literature study approach to describe and analyze. Through references to the values, culture, and norms that emerge in the social context under study, the literature study was related to theoretical studies (Sugiyono, 2019). Literature review using 10 Scopus and Sinta articles (2014, 2018, 2020, and 2021). Articles were accessed via Google Scholar and Science Direct journal pages with relevant search keywords regarding Early Writing Ability Using Metal Insets Media with Sensory Motor. The data analysis technique of this research is Miles & Huberman analysis: (1) Selecting data, (2) Displaying data, and (3) Verifying data.

Qualitative Research Design Literature Study Approach (Snyder, 2019):

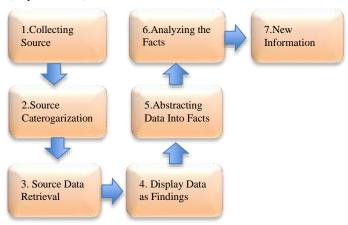


Figure 1. Research Flow

III. RESULTS

Table 1. Literature Review

No.	1. Literatur	Tittle and Journal	Results
1.	(Andika et	Keterampilan	Hand-eye coordination
1.	al., 2022)	Penting Sebelum	is necessary for writing
		Anak Siap Menulis.	preparation; media
		(Jurnal Obsesi :	devices like iPads and
		Jurnal Pendidikan	other tablets cannot take
		Anak Usia Dini	the place of preparation.
		(S2))	Training children
			between the ages of 4-5 has a positive influence.
			has a positive influence.
			There are nine
			important skills to be
			stimulated before the
			child is ready to write,
			including core muscle
			strength, crossing midline, grasping the
			pencil correctly, eye-
			hand coordination,
			bilateral integration,
			upper body strength,
			object manipulation,
			visual perception, and
			visual hand dominance. These nine skills
			indicate a child's
			writing readiness for
			good writing mastery.
2.	(Adams &	Exploring individual	Boys' writing was
	Simmons,	and gender	typically shorter,
	2019)	differences in early	contained fewer
		writing performance.	correctly spelled words, and was regarded as
		(Reading and	being of worse quality
		Writing (Q1))	than that of girls. The
		0 (2 //	abilities assumed to
			underlie the cognitive
			underpinnings of
			writing, including as
			vocabulary, letter knowledge, and
			phonological
			processing, were not
			found to be significantly
			better in girls. These
			relationships between
			phonological skills and
			writing components were further
			investigated, and these
			phonological skills
			were introduced as
			interaction factors in
			multiple regression
			analyses that included
			gender. Regardless of cognitive capacities,
			gender predicted a
			significant and
			distinctive difference in
			the quality of writing
			and alphabet
			transcription despite the
			fact that gender did not

3.	(Donica et al., 2018)	A quantitative study on the relationship	dictate spelling ability. The connections between phonological knowledge and writing are unaffected by gender. Investigating the potential role of environmental, motivating, or attitude factors in explaining gender disparities in early writing ability may therefore be worthwhile. All but one of the students demonstrated
		between grasp and handwriting legibility: does grasp really matter? (Journal of Occupational Therapy, Schools, & Early Intervention (Q3))	one of the four adult grips: dynamic tripod, lateral tripod, dynamic quadrupod, and lateral quadrupod. The only immature grip is the static tripod grip. This study offers crucial proof that the most popular grip patterns in grades one and two are dynamic and lateral tripod grips. Pencils are typically held in a dynamic and lateral tripod pattern by
			first- and second- graders.
4	(Catherine et al., 2020)	Four Pillars of the Montessori Method and Their Support by Current (Neuroscience. Mind, Brain, and Education (Q2))	Montessori believed that young children should have a prepared environment to encourage spontaneous repetition and sensory education. This concept is in line with the current understanding of neurodevelopmental processes, including early sensory and motor cortex development and synaptic pruning in parts of the brain associated with attention. Given that none of these factors were recognized when Maria Montessori created and popularized her approach, this is crucial. Even in the absence of precise knowledge of the neural system, recent study has underlined MM's contributions to language and the

			advantages of physical
			exercise on the brain.
			In the Montessori
			method, sensory
			education plays a role in
			both learning and
			growth. This point of
			view is compatible with
			inspired experience-
			dependent processes
			throughout the temporal
			window that anticipates
			experience, or in a condensed combination
			of growth and learning.
			This indicates that
			during the formative
			years of childhood,
			brain changes
			associated with growth
			and learning go hand in
			hand. The neurobiology
			of synaptic pruning also
			supports the Montessori
			theory of enriched
			surroundings.
			Therefore, the
			Montessori philosophy
			of providing children
			with a straightforward,
			authentic, and
			structured setting may
			be a suitable choice for
			£4i1
			fostering optimal
			learning within the
			learning within the
5.	(Lillard,	Montessori as an	learning within the context of healthy
5.	(Lillard, 2021)	Montessori as an Alternatuve Early	learning within the context of healthy growth.
5.	,	Alternatuve Early Childhood	learning within the context of healthy growth. Although writing and
5.	,	Alternatuve Early	learning within the context of healthy growth. Although writing and reading are not the
5.	,	Alternatuve Early Childhood	learning within the context of healthy growth. Although writing and reading are not the primary means of educating conventional schools
5.	,	Alternatuve Early Childhood Education (Early	learning within the context of healthy growth. Although writing and reading are not the primary means of educating conventional schools place a lot of emphasis
5.	,	Alternatuve Early Childhood Education (Early Child Development	learning within the context of healthy growth. Although writing and reading are not the primary means of educating conventional schools place a lot of emphasis on having students
5.	,	Alternatuve Early Childhood Education (Early Child Development	learning within the context of healthy growth. Although writing and reading are not the primary means of educating children, conventional schools place a lot of emphasis on having students memorize and decode
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within these confines, children are free to decide each day which activities to engage in, who to engage in them with, and for how long.

Montessori was a systems thinker. Like Piaget (who attended at least one Montessori congress and was President of the Swiss Montessori Society), his background biological (in medicine), and he approaches children with a deep appreciation of the body and brain as physical entities that respond to and with the environment.

In brief. Montessori was a modern theorist in that she viewed child development as a positive, reciprocal connection between the environment and the kid's biology on a variety of levels. The difficulties between work and play and structure and freedom in early education were also resolved by Montessori since work is enjoyable and rigid structure encloses freedom.

One is frequently taken aback by the fact that the Children's Home, a Montessori classroom for children ages 3-6, is calm and that the kids are occupied with autonomous activities. Some people practice life skills, while others study with Montessori materials (B - buh for letters). Every morning and evening, without a break, the kids choose what to do, who to work with, and when to stop and start. This type of labor lasted 2.5 to 3 hours. Teachers keep track of which students have received each lesson and make sure that nearly all students

			complete the basic curriculum within their three years in school.
7.	(Bingham et al., 2018)	Integrating into the Early Childhood Curriculum: A Frame for Intentional and Meaningful Writing Experiences (Early Childhood Education Journal (Q2))	Early writing for young children must consider how to stimulate the child's developing fine motor abilities, and then it must be incorporated with play activities (learning while playing). Spelling and handwriting are two of the three key aspects of writing that preschool teachers frequently emphasize. In contrast to providing meaningful play-based environments for children to experience with early composition, teaching techniques that emphasize writing names, copying, and orally spelling words for children to write are proof of this. Professional advice and practitioner guides emphasize how crucial integration is. The integration enables teachers to concentrate on teaching opportunities built into routine activities and experiences while smoothly integrating writing into enjoyable teaching situations. When writing and play are combined, writing-related exchanges take place, allowing teachers to support and involve students in meaningful writing teaching. In order to prepare students for early writing, teachers need to know how to help the children develop their fine motor skills through gardening, they learn about science at the same time. The findings revealed
	Lockman, 2018)	handwriting is influenced by letter knowledge: Visual–	that, despite the fact that children of all ages produced letters for the

8.	(Chandler et al., 2021)	motor coordination during children's form copying (Journal of Experimental Child Psychology (Q1)) Self-regulation Moderates the Relationship between Fine Motor Skills and Writing in	same length of time, younger children need more time to visually interpret letters or symbols and commence writing motions than older children. The study also showed that youngsters duplicated common English letters more skillfully. The impact of letter recognition on the emergence of automaticity in young handwriting is taken into account while analyzing the results. Self-regulation and fine motor function were linked to the performance of writing abilities in early life,
		Early Childhood (Early Childhood Research Quarterly (Q1))	therefore children should be given the opportunity to communicate using any technique of transcription (such as scribbles, drawings, or letter-like forms).
9.	(Thomas et al., 2020)	The Early Writing Skills of Children Identified as at-risk for Literacy Difficulties (Early Childhood Research Quarterly (Q1))	It appears that current early literacy screeners may help teachers identify these children so that early and appropriate writing opportunities can be provided. Early writing of young children identified as at-risk for later literacy difficulties tended to have less developed writing skills than their peers.
10.	(Puranik & Lonigan, 2014)	Emergent Writing in Preschoolers: Preliminary Evidence for a Theoretical Framework (Reading Research Quarterly (Q1))	Children's understanding of the fundamental elements of writing can be shown in their understanding of its principles, concepts, and functions. Children's mastery of the alphabet, which includes letter identification and writing skills, name writing, and elementary word spelling, serves as a proxy for their knowledge and proficiency in writing mechanics. When preschool-aged children learn the alphabet, how to write letters, and how

	to use this knowledge to construct written words, the abilities necessary to convert concepts into symbols for written language develop (such as writing names or continuous circular c
	spelling simple CVC phrases).

IV. DISCUSSION

The Characteristics of Metal Insets Media with Sensory Motor

Metal Insets is a writing aid consisting of two sloping wooden planks, on top of each of which there are five pink square metal frames, in each frame, a blue geometric object is inserted along with a small knob as a handle, the child chooses a frame, put it down on paper and outline it inside the geometric frame with colored pencils (Montessori, 2020).

Sensory education, in Montessori, is not just about learning; it is also a part of development. This view fits with inspired experiential-dependent processes within the time window that expects experience; in other words, in a tight mix of development and learning. This means that, during early childhood, brain changes related to development and learning (Catherine et al., 2020). Children prepared their hands to write since a long time before, with a practice of sensory, their hands are practiced for the future and fine motor will collab with mind (Montessori, 2020).

Metal Insets is one of the Montessori's media. For children ages 3-6, Maria Montessori developed an educational approach that trains children's skills and senses using the appropriate special game tools. Montessori playthings are concrete, can correct both internal and external flaws, have functional isolation, and can train children's social and cognitive skills in addition to their language and math abilities (Rahmadhani & Surbakti, 2022).

Early writing for early childhood must pay attention to the readiness of the child's fine motor skills by providing stimulation; then, early writing must be integrated with play activities (learning while playing) (Bingham et al., 2018).

Children should be given the chance to write messages using any method of transcription (e.g., scribbles, drawing, letter-like forms), self-regulation and fine motor function were linked to the performance of writing abilities in early life (Chandler et al., 2021).

There are nine important skills to be stimulated before the child is ready to write, including core muscle strength, crossing midline, grasping the pencil correctly, eyehand coordination, bilateral integration, upper body strength, object manipulation, visual perception, and visual hand dominance. These nine skills indicate a child's writing readiness for good writing mastery (Andika et al., 2022). It is related with Montessori's research, it is said that humans control their surroundings with their hands and change it in

accordance with the direction of their minds, fulfilling their purpose on the grand stage of the universe, which is inextricably linked to their body morphology and abilities (Montessori, 2021).

Based on those research, Metal Insets is a media that created by dr. Montessori, this media given involving sensory motor, and Montessori wrote about sensory education that explained during early childhood, brain changes related to development and learning go hand in hand.

Montessori created a curriculum about language development and made a lot of media for all children's development, Montessori explained that children learn to write first before to read, it is related to the others media that involving sensory motor, the media called Sandpaper Letters, Ginns (Ginns et al., 2016) explained fine motor instruction of movement to promote learning has a long story in education; the Montessori pedagogy of Sandpaper Letters involves tracing letters of the alphabet, which means learning to write before learning to read. What makes Metal Insets interesting is this media was made by Montessori and it follows the Montessori Pedagogy about stimulating language development involving sensory motor.

Based on Donica's research, it explained that fine motor skills related to hand grip when holding a pencil the development of fine motor abilities in children between the ages of 4 to 10.5 years necessitates examination of writing readiness; grip patterns often develop as children enter grades 3 and 4, there are two type of grasps (immature grasps and mature grasps), Immature grasps include: (1) Radial cross palmar grasp, (2) Palmar supinate grasp, (3) Digital pronate grasp, (4) Brush grasp, (5) Grasp with extended fingers, and (6) Static tripod grasp. Mature grasps include: (1) Radial cross palmar grasp, (2) Palmar supinate grasp, (3) Digital pronate grasp, (4) Brush grasp, and (5) Grasp with extended fingers (Donica et al., 2018).

Metal insets stimulates children to prepare the readiness of the ability of early writing through the stimulation of sensory motor, and grasps by outline the inside of the geometric frame with colored pencils.

The Application of Metal Insets Media with Sensory Motor for Learning to Write

The child chooses a frame of Metal Insets, put it down on paper and outline it inside the geometric frame with colored pencils (Montessori, 2020).

The application is to provide a flat surface, ask a child to put a paper beneath the geometrical frame and prepare a colored pencils, hold the frame and outline it inside the geometric frame with colored pencils, make a straight horizontal lines side to side with others colored pencils (Savitri, 2019).

Two boards are placed side by side, on top of which ten geometric objects are mounted, then the child is given a blank sheet of paper and a box containing ten colored pencils,

after that choosing a metal insets frame, the child will be taught: (1) One hand holds the frame, (2) One hand holds the frame others follow the outline of the inside of the frame with colored pencils, (3) Then the geometric shape is printed on paper, (4) Then the child draws the outline of the geometric slab with different colored pencils, the child is encouraged to draw all the geometry (Montessori, 2020).

The four pillars, such as sensitive periods, a prepared environment, sensory education, and spontaneous activity through repetition, which play a significant part in teaching guidelines, were explained in the guidelines that were described by (Catherine et al., 2020). The Montessori approach also provides three-period lessons as a guideline (Paramita, 2020).

Based on those explanation, Metal Insets given with Montessori approach, with the four pillars, such as sensitive periods, a prepared environment, sensory education and spontaneous activity through repetition.

The Advantages and Disadvantages of Metal Insets Media with Sensory Motor

The advantages of Metal insets is tangible items that are not gadgets, and writing readiness requires both hand and finger strength and eye-hand coordination because, in the digital age, based on research, children's eye-hand coordination skills deteriorate if they constantly use a digital device (Andika et al., 2022). Application of metal insets involves using colored pencils to draw an outline inside a geometric frame. This involves sensory motors, which is consistent with research on the readiness of young children for writing, and it requires that the child's fingers and hands be prepared with sufficient muscle strength (Andika et al., 2022).

The advantages of Metal Insets include: (1) Strengthening children's gripping muscles for writing instruments, (2) Developing control and accuracy with flexible muscles, (3) Giving counterclockwise writing practice, (4) Drawing parallel lines, vertical and horizontal, and (5) Learning to recognize words like frame, print, straight line, horizontal, and vertical (Savitri, 2019).

Metal Insets is a media that made by dr. Montessori, Montessori educational approach respects a child's normal physical and physiological development and Metal Insets made based on the 5 years observation of the children (Montessori, 2020). The Montessori method of teaching children has a profound understanding of the body and brain as physical beings that interact with and respond to their surroundings (Lillard, 2021). At this period of development, chromatic sensory stimulation functions as a lever to enable kids to write with clarity, boldness, and beautiful handwriting (Montessori, 2020).

The disadvantages is the conventional school is very organized; the teacher sets the agenda, and the students are guided through a schedule and curriculum with specific times in a highly structured classroom. Children sit, facing the teacher, listening to or reading from designated textbooks. However, Montessori education offers freedom with a highly organized structured; children are free to choose activities to engage in, with whom and for how long, this method has been criticized by the analogy of parenting (Lillard, 2021). The Montessori method of freedom in the classroom is criticized by the analogy of parenting because it seems like an authoritarian style of parenting because of the guidelines and strict rules, according to Lillard, who also explained that school today needs a specific schedule, time, and curriculum, but the characteristic of children and sensitivity must be taken into consideration.

V. CONCLUSION

Early language development has a substantial impact on a child's future academic success since language development takes place in social settings where knowledge is acquired and ideas are exchanged. Early language development involves four skills: hearing, speaking, reading, and writing. Metal Insets is a writing aid consisting of two sloping wooden planks, on top of each of which there are five pink square metal frames, in each frame, a blue geometric object is inserted along with a small knob as a handle, the child chooses a frame, put it down on paper and outline it inside the geometric frame with colored pencils.

Metal insets stimulates children to prepare the readiness of the ability of early writing through the stimulation of sensory motor, and grasps by outline the inside of the geometric frame with colored pencils.

Metal Insets given with Montessori approach, with the four pillars, such as sensitive periods, a prepared environment, sensory education and spontaneous activity through repetition.

The advantages of Metal Insets are to strengthening children's gripping muscles for early writing, and made by dr. Montessori that respect a child's normal physical and physiological development. Metal Insets made based on the 5 years observation of the children.

The disadvantages is Montessori method is criticized by the analogy of parenting.

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