

The Role of Parents in the Development of Numerical Literacy in Early Childhood

Gunarti Dwi Lestari, Widodo, and Ali Yusuf

ABSTRACT

This study aimed to examine the role of parents in developing numeracy literacy skills in early childhood. This study uses a quantitative research design. The population in this study amounted to 100 respondents with research subjects, namely parents who have school-age children. The sampling technique used is the total sampling technique. The data analysis technique in this study used descriptive statistical techniques. The results showed that the role of parents in the development of numeracy literacy in early childhood was good, with a percentage of 79.68%. These results are supported by the suitability of the results on each question item which includes parents' efforts to improve literacy skills and numeracy literacy skills in early childhood. In this case, it can be interpreted that the role of the family is very important in increasing literacy. The development of numeracy literacy skills in children is the family's responsibility, especially parents as the first and foremost educators for children. Therefore, literacy, as the ability to identify information needs, seek, retrieve, process, and communicate information, must be improved.

Keywords: Early Childhood Education, Numeracy Literacy, Role of Parents.

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G. D. Lestari*

Department of Non-Formal Education,
Universitas Negeri Surabaya, Indonesia.

(e-mail: gunartilestari@unesa.ac.id)

Widodo

Dept. of Non-Formal Education,
Universitas Negeri Surabaya, Indonesia.

(e-mail: widodo@unesa.ac.id)

A. Yusuf

Dept. of Non-Formal Education,
Universitas Negeri Surabaya, Indonesia.

(e-mail: aliyusuf@unesa.ac.id)

**Corresponding Author*

I. INTRODUCTION

Literacy, or the ability to read, write, count and solve problems, is basic. Every individual has various literacy abilities. This causes differences in output for each individual in his life. Individuals who have good literacy skills will have good output as well. On the other hand, individuals who lack literacy skills will have poor outputs (Vágvölgyi *et al.*, 2016). Differences in literacy skills are based on differences in a person's interest in developing their literacy skills.

Individual literacy interests are as unique as individual intelligence. Not all individuals have the same level of interest in a particular field. This diversity of interests is also the root of the diversity of individual mastery in a field. People who have intelligence in the field of language do not necessarily have the same good intelligence in the kinesthetic field. This uniqueness of intelligence is called multiple intelligences (Hernández-Torrano *et al.*, 2014). If the multiple intelligences of each individual are unique because of different birth talents, then individual literacy interests are unique because of the individual's interests. In plural intelligence, if a person is born with superior kinesthetic abilities, it can be said that the intelligence possessed by that individual is kinesthetic. In contrast to literacy interests, if the individual does not have good reading skills, it does not mean that the individual does not have intelligence in reading. However, there is a need for more stimulation so that his reading interest increases and develops for the better (Mudlofir, 2021).

Literacy skills consist of reading, writing, counting, and solving problems. The development of these abilities affects how a person reacts to his life. The ability to read can help individuals have broader insights so that the reference knowledge they have can help find solutions to a problem. The ability to write can help individuals to convey their thoughts. The ability to count can help individuals to be able to make transactions, calculate time and distance, measure things, or perform simple calculations such as addition, subtraction, multiplication, and division. The ability to solve problems can help individuals find solutions to various problems faced. This ability is also motivated by previous literacy skills, namely reading, writing, and arithmetic (Abidin *et al.*, 2021).

The literacy ability that is often not mastered by most people is numeracy literacy. Numerical literacy is a person's ability to perform calculations. Most people find it difficult to have the ability to count at a certain level. This can be caused by the community's low interest in learning arithmetic. Numerical skills such as addition and subtraction are the most important thing in numeracy literacy, but the level of difficulty increases when you reach multiplication and division calculations. Disabilities in numeracy literacy have a significant influence on everyday life. Numbers are always associated with time, distance, money, and size. In order to be able to interact and transact in daily life, it is necessary to have numeracy literacy skills (Salminen *et al.*, 2021).

The cause many individuals who find it difficult to have numeracy literacy skills learn to count, which is considered

difficult. In numeracy subjects, individuals are invited to participate in thinking more critically to find appropriate answers. Because in finding answers to numerical problems, the answer is always a definite number (Zaini & Sutirna, 2021). To find a definite answer to a problem, individuals need to remember a variety of mathematical formulas in order to find the answer. This makes many school students have relatively low scores in numeracy subjects.

Counting subjects are not only an important reference in the final assessment in educational institutions but has also become an essential ability in everyday life. People's low numeracy skills can affect the progress of an area. In an area, if the community has good literacy skills, it can support the community's welfare. The area can progress more rapidly when compared to areas that lack literacy skills. The ability to read, write and count is not only a provision in living daily life but has more benefits for the development of society as a whole (Gal *et al.*, 2020).

The ability to count is closely related to one's reasoning ability. This is also the goal of numeracy literacy, namely, to improve individual abilities in the reasoning (Hadi & Zaidah, 2021). The reasoning in numeracy literacy is analyzing and understanding a statement through activities in manipulating mathematical symbols or language found in everyday life, then expressing the statement in writing or orally (Perdana & Suswandari, 2021). Having good reasoning skills can help individuals solve problems that require solutions in the form of analysis. The relationship between numeracy and reasoning abilities can be raised through numeracy subjects such as mathematics. The demand to have greater concentration and the ability to think more critically and apply a series of formulas in solving problems can impact a person's analytical ability.

The difficulty that tends to be a problem for people in improving their numeracy literacy skills is the view of the complexity of the problem of numbers and formulas in learning to count, such as mathematics. These difficulties are usually faced by individuals when the learning has reached a certain level, resulting in an increase in the complexity of the formula and the calculation formula in the learning. However, this will not happen if the individual can follow the development of the level of learning difficulty according to his level. Not only racing at the level of education, but overall, it can be learned from the lowest level of difficulty to the higher level of difficulty. It will be easier for individuals who follow the development of the difficulty level to solve more complicated problems in the future because the individual has more mature readiness for the next levels of difficulty.

Learning that is carried out to improve numeracy literacy skills is learning to count. In order to make it easier for someone to take part in numeracy learning, it is necessary to be persistent in learning to count at the lowest level. In formal educational institutions, learning to count usually begins with the addition of units (Muliani & Muniksu, 2020). Through the addition of units, children are introduced to mathematics. The unit addition material is taught to first graders in elementary schools. However, some children have received these materials while participating in the Early Childhood Education program.

Numerical literacy, although generally understood as learning to add units as the initial material, actually learning

to count begins when children recognize numbers. When children are introduced to something that represents the numbers 0-9, then that is when the child begins his development in numeracy literacy skills. This ability is graded along with the numeracy learning received by an individual. If learning to count does not develop, one's numeracy literacy ability also stops. For a person's numeracy literacy ability to continue to develop, stimulation is needed in carrying out learning, both stimulation from the surrounding environment and oneself (Martini & Sénéchal, 2012).

Learning to count needs to be prepared from an early age. This is necessary so that children do not experience difficulties when dealing with problems that require analytical and reasoning abilities when children grow up. So that learning to count does not become a feat in itself for someone, it is necessary to get used to learning to count in everyday life. This habit can be started in early childhood by introducing numerical representations related to the number, volume, distance, time, money, size, et cetera. Early childhood is often referred to as the golden age. At this time, children will more easily absorb and digest something around them, including the learning provided. It will be easier for a child to digest a lesson when he is at the golden age of 0-6 years than when the child is at school age or more than six years. Taking advantage of the early childhood moments to provide learning related to numeracy is the right thing. Because at this time, children can receive stimulation well from parents and the surrounding environment.

The right early childhood numeracy literacy skills will impact children's reasoning, analysis, and critical thinking abilities as adults. Children with good numeracy literacy skills are not always associated with test scores or schoolwork scores at school teachers' math lessons. Learning mathematics is only one subject that provides numeracy learning. Many other lessons facilitate children to learn to count and improve their numeracy literacy skills, such as science, economics, technology, et cetera. Improving children's numeracy literacy skills is not only about how mathematical problems can be easily solved but also about the process of reasoning and analyzing children about how a problem can find the right solution (Martini & Sénéchal, 2012; Webster, 2017).

The importance of growing children's interest in learning to count from an early age is a first step to growing an individual's reasoning ability. In the stimulation process, children can be given simple learning by parents and the environment by introducing number representations. Children will receive stimulation from simple numeric learning to foster greater interest in developing numeracy literacy skills. If the child is accustomed to receiving information and knowledge from an early age, it will be easier for the child to process problems in everyday life when the child grows up (Bailey *et al.*, 2017).

Based on the explanation above, this research has a good novelty and urgency in improving numeracy literacy skills for early childhood in the family environment. The people's numeracy literacy ability, which is relatively lower than other literacy skills, is a problem for most individuals in solving problems that require reasoning and critical thinking skills. Therefore, stimulating the development of individual

numeracy literacy in early childhood is of interest in conducting this research. This study aimed to examine the role of parents in developing numeracy literacy skills in early childhood.

II. THEORETICAL STUDY

A. Numerical Literacy

The essential ability possessed by a person is called literacy ability. Literacy consists of the ability to read, write, speak, count, and think critically (Umbara *et al.*, 2019). Having good literacy skills can help someone solve problems in everyday life better. Literacy abilities cannot develop by themselves, but there is a need for habituation in growing literacy interests to create a literacy culture around individuals.

Based on the description of the Research and Development Agency of the Ministry of Education and Culture of the Republic of Indonesia, the types of basic literacy consist of six types of literacy, including 1) language and literature; 2) numeration; 3) science; 4) informatics and technology; 5) financial; 6) culture and citizenship (Kemdikbud, 2017). Various kinds of literacy are fundamental for individuals to develop in all aspects of daily life. Each literacy focus has different benefits and impacts and individual efforts in developing their literacy skills to achieve optimal literacy skills. One of the literacy skills that are important to continue to be honed is numeracy literacy. A person's reasoning ability determines how the problems faced can find the right solution to the person's condition (Maharani & Bernard, 2018).

The development of numeracy literacy can be done through learning related to numbers or numbers. In mastering numeracy literacy, the primary learning materials are aspects of counting, aspects of numeracy relations, and arithmetic operations. Good numeracy literacy skills will significantly affect one's reasoning and analytical abilities. The numeracy ability of an individual will affect the learning trajectory of that individual. Someone will get the impact of numeracy literacy when they understand the concept of learning to count through the process they go through. This involves individual attitudes in solving these problems so that they can get used to analyzing each problem properly in everyday life (Mahmud & Pratiwi, 2019).

B. Early Childhood Education

Early Childhood Education (ECE) is an informal level of education before the child enters elementary school. The purpose of holding ECE is to provide primary education with a positive learning approach and prepare early childhood to carry out secondary school (Ansari *et al.*, 2019). The learning carried out in the ECE program is basic lessons such as reading, writing, counting, drawing, and coloring. Basic lessons must be prepared for children in the golden age.

When children are at an early age, learning does not have to be done in certain educational institutions or agencies. Indeed, education for early childhood can be carried out through parents, family, and the surrounding environment (Sahlan, 2018). The closest education for early childhood is education carried out informally in family institutions. Because early childhood is easy to imitate and imitate the things around them. If the family environment exemplifies

good things, then the child will also provide good behavior. The opposite will also happen. If the family environment provides a bad example, the child will also misbehave.

Apart from the role of parents and families who are most closely related to children's growth and development in providing education, the implementation of early childhood education has three paths, namely formal education, non-formal education, and informal education (Kustiani & Fauziyah, 2019). Learning in early childhood is categorized based on its growth and development characteristics. There are three stages related to the growth of early childhood development, including (a) infancy, which is 0-12 months old, (b) toddler period, which is 1-3 years old, and (c) preschool period, namely ages 3-6 years (Meriem *et al.*, 2020). Based on these stages, learning can be adapted to physical growth and development, thinking power, creativity, emotional, social, language, and balanced communication as the basis for forming a complete personality. This focus on early childhood growth and development determines a child's success in living everyday life when he grows up. If early childhood education can support the growth and development of children according to their portion, then the future of children will have good preparation.

C. Literacy Improvement in the Family Environment

Family is the closest environment for a child to understand and receive information and knowledge. The most important education of a person is received through an environment that has attachments to everyday life. Family education provides new knowledge-based education for a child about cognitive, affective, and psychomotor values (Saracho, 2017). Children who have a supportive family environment in meeting their growth and development needs will have good preparation in the future.

Developing literacy interests must be accompanied by optimal stimulation. The stimulation must be sought to increase individual interest in literacy skills. The best time to stimulate an individual's literacy ability is when the child is early. At that time, children can absorb good information to maximize their potential and optimally encourage their interests to develop literacy skills (Septiani & Syaodih, 2021; Turker & Hartwigen, 2022).

In connection with this, to increase interest in basic literacy in early childhood, stimulation is needed by the closest people related to the daily life of children. Parents and families are the parties who have the most role in the development of children. Children's literacy ability is also determined by the stimulation provided by parents and families. Providing stimulation to children to foster literacy interest begins with introducing children to reading, whether it is introduced orally or in writing (Sumaryanti, 2018).

Literacy applied to early childhood is not the same as efforts to apply literacy to adults. Literacy for early childhood is the process of recognizing information through learning experiences with the surrounding environment, including the family in it. In this process, all behaviors and activities related to literacy will be the most critical aspects of early literacy development. These activities include sound representation of a word, pretend reading behavior, making scribbles, and seeing the writing on various objects (Whitehurst & Lonigan; Purnamasari *et al.*, 2019). Therefore, parents and families as the first environment can provide initial stimulation to

children using reading and writing habits before learning literacy skills at the next stage.

III. METHOD

This study used a research design with a quantitative approach. The use of quantitative descriptive methods in this study is to describe and explain facts from the field related to early childhood numeracy literacy skills.

The research subjects were parents who had school-age children at the ECE level in this study. Sampling in this study uses a total sampling technique; namely, if the subject is less than 100, it is better to take all of them to use population research. Furthermore, if the number of subjects is large, 10% to 15% or 20% to 25% or more are taken. In this study, the researchers took the entire population of 100 people as samples (Arikunto, 2013).

Researchers used data collection tools or research instruments in questionnaires or questionnaires to obtain research results. In this study, the questionnaire was prepared with closed and open statements. The use of a questionnaire to measure how much numeracy literacy skills in early childhood. Respondents choose answers that are considered relevant to their personality so that they can help researchers analyze data on all questionnaires.

The answers to the questionnaire are arranged based on a *Likert scale*. The researcher provides 4 (four) alternative answers so that respondents do not choose the middle answer alternative. Meanwhile, for data analysis in this study, descriptive statistics in the form of percentages using descriptive statics frequencies with the help of *SPSS 26.0*.

IV. RESULTS AND DISCUSSION

The descriptive analysis in this study is related to the role of parents in the development of numeracy literacy in early childhood. The frequency in this study is used to calculate the percentage of the sub-variables in the study. The sub-variables in this study consist of “parents’ efforts to improve literacy skills” and “numeric literacy skills in early childhood”. It is known that the calculation description of the variable percentage analysis formula is as follows.

TABLE I: SUMMARY OF EMPIRICAL SCORES AND IDEAL SCORES FOR SUB VARIABLES

Sub Variables	Empirical Score	Ideal Score	%	Category
Parental efforts in improving literacy skills	3.427	4.400	77.89	Good
Numerical literacy ability in early childhood	2.933	3.600	81.47	Excellent

Based on Table I, it can be seen that the analysis of the sub-variable “parental efforts in improving literacy skills” shows promising results with a percentage of 77.89%. In comparison, “numeric literacy skills in early childhood” shows very good results with a percentage of 81.47%. This is adjusted to the percentage criteria in the pre-defined categories. So it can be concluded that the role of parents in

the development of numeracy literacy in early childhood shows promising results with a percentage of 79.68%.

A. Parents' Efforts in Improving Literacy Ability

Literacy is a tangible set of skills, particularly cognitive skills in reading and writing. Literacy is not only related to written language and understanding of written texts but also spoken language and verbal communication. Literacy cannot be separated from language, where the ultimate goal to be achieved in early literacy learning is basic language skills, including listening, speaking, reading, and writing. In this case, it can be interpreted that literacy is an essential ability, especially in child development (Perry, 2012; Zadeh, 2010).

Parents are the people who play an essential role in providing the necessary stimulation for the development of early childhood literacy, considering that parents are the closest people to their children. Parents are models or role models for their children, so they have a strong influence in terms of examples for the child, both positive and negative (Segers *et al.*, 2015). In this case, parents become a pattern for forming a way of life or a child's lifestyle, including the way parents think and act in inheriting and developing early literacy (Jafarov, 2015; Kleemans *et al.*, 2012).

In this regard, this study states that parents' efforts in improving children's literacy skills are reflected in the form of (a) assisting children in learning to count; (b) providing facilities for children such as tools and media for learning to read, write, count on their own; (c) parents provide opportunities for children to find their solutions if they have difficulties in writing or counting; (d) parents give appreciation every time the child can do something, and (e) parents provide various references or learning resources to improve children's literacy skills. The efforts made by the parents have been reasonable. This is evidenced by the research results on the following variables, which reached 77.89% (good category). Parents have carried out their four roles optimally, namely modeling, mentoring, organizing, and teaching.

The results of this study are in line with the statement that early literacy skills are necessary skills for legal literacy needs. Including expanding vocabulary and language, understanding concepts from print, phoneme awareness, demonstrating phonological awareness, knowledge of letters, and understanding stories. These skills are instilled during the child's preschool age and can be improved through parental involvement in a home literacy environment (literacy activities carried out at home) (Callaghan & Madelaine, 2012; Rababah, 2017; Terrell & Watson, 2018).

In their research, (Carroll & Fox, 2017; Yang *et al.*, 2021) also prove that increasing literacy requires active participation from parents. The initial activity that parents can do to foster early literacy is print motivation. In this case, it is related to reading construction activities, including buying books for children and providing quality time between parents and children to carry out literacy activities (reading, counting, and writing) together. For other activities, phonological awareness can be done. Phonological awareness trains children to spell words or syllables by singing, playing roles, interacting with children at bedtime, and using educational game tools/electronic or digital media.

Based on the discussion above, it can be concluded that literacy skills act as the initial foundation for mastering science and technology, especially in the modern era like today, to build a child's self-foundation. On the other hand, it is a form of readiness for children to live their lives. Therefore, parents play an essential role in improving children's literacy skills, as did parents in this study. Literacy is the opening door for the learning process and is the key to children's success in the future. In this study, parents have carried out four roles: modeling, mentoring, organizing, and teaching children. In addition to parents, creating a child-friendly environment can also increase numeracy literacy in early childhood (Kostelny & Wessells, 2013; Rogowsky *et al.*, 2018).

B. Numerical Literacy Ability in Early Childhood

Literacy is defined as reading, writing, and numeric literacy. The development of literacy and numeracy are interrelated. Numerical literacy is the ability to use numbers, data, or symbols. In numeracy, literacy skills provide benefits to help solve the problems of human life. Numerical literacy skills are related to the skills to apply basic knowledge, principles, and contexts of everyday life both at home, school and work. The problem is that only a few people take advantage of numeracy literacy skills. Given the importance of literacy in increasing intelligence, the government, through the Ministry of Education and Culture, has taken various ways to increase the literacy of the Indonesian people, one of which is the School Literacy Movement, including early childhood education.

Early Childhood Education (ECE) is one of the coaching efforts aimed at children from birth to the age of six, which is carried out through educational stimuli to assist physical and spiritual development and growth so that children are ready to enter further education. Referring to the definition of ECE, numeracy literacy is critical in efforts to improve human resources. In this context, numeracy literacy needs to be introduced early.

One of the concentrations of global issues in literacy and numeracy education is to equip children to more easily participate and play a role in society. Children will learn to develop their literacy and numeracy skills through authentic experiences and support from the surrounding environment, including parents, teachers, and peers. To achieve this goal, as one of the supporting pillars of literacy and numeracy, the family should be as conducive to developing literacy and numeracy in children.

Numerical literacy does not only cover the ability to read, write and count. *Numerical literacy* is defined as a life skill covering many aspects of human life. Even one of the indicators used to measure developed countries is looking at the literacy level and the lives of their people. Especially in the competitive global context, especially in the field of education, numeracy literacy is seen as an essential need to be mastered by all stakeholders, including internal stakeholders such as teachers, students, parents, and community ecosystems (Block *et al.*, 2012; Nambiar *et al.*, 2019).

In this regard, this study states that numeracy literacy skills in early childhood include: (a) learning activities to read, write, and count; (b) children's reactions or responses when

learning to read, write, and count; and (c) the way children solve problems carefully. In this study, numeracy literacy skills in early childhood reached 81.47%. Thus, it can be interpreted that the numeracy literacy ability of early childhood in this study is included in the excellent category.

The results of this study are also supported by (Goldman, 2012) statement, which emphasizes that literacy and numeracy can be interpreted as reasoning abilities related to the ability to analyze, synthesize and evaluate information that can be grown by being integrated into children's daily activities at home. Therefore, literacy and numeracy skills in children from an early age in the home environment are essential. Based on these conditions, it is required to increase the awareness and understanding of parents about the potential role of the family environment as a source of learning literacy and numeracy (Anders *et al.*, 2012).

Skwarchuk *et al.*, (2014) confirm that families must familiarize children's literacy and numeracy skills. Numeracy literacy in early childhood must be continued with activities that trigger children's thinking power. This can be done by stimulating them to find an opinion on what they have read. Parents can be more creative in carrying out numeracy literacy activities with their children. Literacy and numeracy that are practiced thoroughly exemplified by the parents above will increase the child's higher-order thinking power. Children will be able to begin to understand and make it possible for them to create a continuation of their numeracy literacy activities more creatively (Benavides-Varela *et al.*, 2016; de Haan *et al.*, 2014; Sonnenschein *et al.*, 2012).

Based on the discussion above, it can be concluded that literacy and numeracy skills need to be instilled at an early age. This study assessed literacy and numeracy skills in early childhood as very good. The importance of planting numeracy literacy from an early age is because children will be involved in society in everyday life and always encounter problems related to literacy and numeracy in their lives. Therefore, knowledge about literacy and numeracy does not only impact children as individuals but also as a society, nation, and state.

In this broad scope, it can be concluded that the role of the family is significant in increasing literacy. The portion of developing numeracy literacy skills in children is the family's responsibility, especially parents. This is based on parents who are also the first and foremost educators for children. As the smallest unit in society, the family is the first and most important learning environment for children in terms of education. Therefore, literacy must be improved as the ability to identify information needs, seek, retrieve, process, and communicate information.

V. CONCLUSION

The descriptive analysis in this study is related to the role of Based on the research results described previously, it can be concluded that the overall role of parents in the development of numeracy literacy in early childhood is considered good. This is evidenced by the study results, which reached 79.68%. The calculation results are supported by the suitability of the results for each question item which includes parents' efforts to improve literacy skills and numeracy literacy skills in early childhood. Numerical

literacy skills in early childhood include: (a) learning activities to read, write, and count; (b) children's reactions or responses when learning to read, write, and count; and (c) the way children solve problems carefully.

Parents' efforts in improving children's literacy skills in this study were reflected in the form of (a) assisting children in learning to count; (b) providing facilities for children such as tools and media for learning to read, write, count on their own; (c) parents provide opportunities for children to find their solutions if they have difficulties in writing or counting; (d) parents give appreciation every time the child can do something; and (e) parents provide various references or learning resources to improve children's literacy skills.

In this case, it can be interpreted that the role of the family is significant in increasing literacy. Therefore, literacy, as the ability to identify information needs, seek, retrieve, process, and communicate information, must be improved.

REFERENCES

- Abidin, Y., Mulyati, T., & Yunansah, H. (2021). *Pembelajaran Literasi: Strategi Meningkatkan Kemampuan Literasi Matematika, Sains, Membaca, dan Menulis*. Bumi Aksara.
- Anders, Y., Rossbach, H.-G., Weinert, S., Ebert, S., Kuger, S., Lehrl, S., & von Maurice, J. (2012). Home and preschool learning environments and their relations to the development of early numeracy skills. *Early Childhood Research Quarterly*, 27(2), 231–244. <https://doi.org/10.1016/j.ecresq.2011.08.003>.
- Ansari, A., Pianta, R. C., Whittaker, J. V., Vitiello, V. E., & Ruzek, E. A. (2019). Starting Early: The Benefits of Attending Early Childhood Education Programs at Age 3. *American Educational Research Journal*, 56(4), 1495–1523. <https://doi.org/10.3102/0002831218817737>.
- Arikunto, S. (2013). *Prosedur Penelitian Suatu Pendekatan Praktik* (15th ed.). PT. Rineka Cipta.
- Bailey, D., Duncan, G. J., Odgers, C. L., & Yu, W. (2017). Persistence and Fadeout in the Impacts of Child and Adolescent Interventions. *Journal of Research on Educational Effectiveness*, 10(1), 7–39. <https://doi.org/10.1080/19345747.2016.1232459>.
- Benavides-Varela, S., Butterworth, B., Burgio, F., Arcara, G., Lucangeli, D., & Semenza, C. (2016). Numerical Activities and Information Learned at Home Link to the Exact Numeracy Skills in 5–6 Years-Old Children. *Frontiers in Psychology*, 7. <https://www.frontiersin.org/article/10.3389/fpsyg.2016.00094>.
- Block, K., Gibbs, L., Staiger, P. K., Gold, L., Johnson, B., Macfarlane, S., Long, C., & Townsend, M. (2012). Growing Community: The Impact of the Stephanie Alexander Kitchen Garden Program on the Social and Learning Environment in Primary Schools. *Health Education & Behavior*, 39(4), 419–432. <https://doi.org/10.1177/1090198111422937>.
- Callaghan, G., & Madeline, A. (2012). Levelling the Playing Field for Kindergarten Entry: Research Implications for Preschool Early Literacy Instruction. *Australasian Journal of Early Childhood*, 37(1), 13–23. <https://doi.org/10.1177/183693911203700103>.
- Carroll, J. M., & Fox, A. C. (2017). Reading Self-Efficacy Predicts Word Reading But Not Comprehension in Both Girls and Boys. *Frontiers in Psychology*, 7. <https://www.frontiersin.org/article/10.3389/fpsyg.2016.02056>.
- de Haan, A. K. E., Elbers, E., & Leseman, P. P. M. (2014). Teacher- and Child-Managed Academic Activities in Preschool and Kindergarten and Their Influence on Children's Gains in Emergent Academic Skills. *Journal of Research in Childhood Education*, 28(1), 43–58. <https://doi.org/10.1080/02568543.2013.851750>.
- Gal, I., Grotluschen, A., Tout, D., & Kaiser, G. (2020). Numeracy, adult education, and vulnerable adults: A critical view of a neglected field. *ZDM*, 52(3), 377–394. <https://doi.org/10.1007/s11858-020-01155-9>.
- Goldman, S. R. (2012). Adolescent literacy: Learning and understanding content. *The Future of Children*, 22(2), 89–116. <https://doi.org/10.1353/foc.2012.0011>.
- Hadi, S., & Zaidah, A. (2021). Analisa Kemampuan Literasi Numerasi dan Self-Efficacy Siswa Madrasah dalam Pembelajaran Matematika Realistik. *Jurnal Ilmiah Wahana Pendidikan*, 7(7), 300–310. <https://doi.org/10.5281/zenodo.5716119>.
- Hernández-Torrano, D., Ferrándiz, C., Ferrando, M., Prieto, L., & Fernández, M. C. (2014). The theory of multiple intelligences in the identification of high-ability students. *Anales de Psicología*, 30(1), 192–200. <https://doi.org/10.6018/analesps.30.1.148271>.
- Jafarov, J. (2015). Factors Affecting Parental Involvement in Education: The Analysis of Literature. *Khazar Journal of Humanities and Social Sciences*, 18(4), 35–44. <https://doi.org/10.5782/2223-2621.2015.18.4.35>.
- Kemdikbud. (2017). *Gerakan Literasi Nasional | GLN*. GLN Kemdikbud. <https://gln.kemdikbud.go.id/glnsite/>.
- Kleemans, T., Peeters, M., Segers, E., & Verhoeven, L. (2012). Child and home predictors of early numeracy skills in kindergarten. *Early Childhood Research Quarterly*, 27(3), 471–477. <https://doi.org/10.1016/j.ecresq.2011.12.004>.
- Kostelny, K., & Wessells, M. (2013). Child Friendly Spaces: Promoting Children's Resiliency Amidst War. In C. Fernando & M. Ferrari (Eds.), *Handbook of Resilience in Children of War* (pp. 119–129). Springer. https://doi.org/10.1007/978-1-4614-6375-7_9.
- Kustiani, A. T., & Fauziyah, P. Y. (2019). Analysis of Factors Affecting Parental Participation Towards Early Childhood Education Program. *Journal of Nonformal Education*, 5(1), 47–56. <https://doi.org/10.15294/jne.v5i1.18333>.
- Maharani, S., & Bernard, M. (2018). Analisis Hubungan Resiliensi Matematik Terhadap Kemampuan Pemecahan Masalah Siswa Pada Materi Lingkaran. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, 1(5), 819–826. <https://doi.org/10.22460/jpmi.v1i5.p819-826>.
- Mahmud, M. R., & Pratiwi, I. M. (2019). LITERASI NUMERASI SISWA DALAM PEMECAHAN MASALAH TIDAK TERSTRUKTUR. *Kalamatika: Jurnal Pendidikan Matematika*, 4(1), 69–88. <https://doi.org/10.22236/KALAMATIKA.vol4no1.2019pp69-88>.
- Martini, F., & Sénéchal, M. (2012). Learning literacy skills at home: Parent teaching, expectations, and child interest. *Canadian Journal of Behavioural Science / Revue Canadienne Des Sciences Du Comportement*, 44(3), 210–221. <https://doi.org/10.1037/a0026758>.
- Meriem, C., Khaoula, M., Ghizlane, C., Asmaa, M. A., & Ahmed, A. O. T. (2020). Early Childhood Development (0 - 6 Years Old) from Healthy to Pathologic: A Review of the Literature. *Open Journal of Medical Psychology*, 09(03), 100–122. <https://doi.org/10.4236/ojmp.2020.93009>.
- Mudlofir, A. (2021). *Desain Pembelajaran Inovatif: Dari Teori ke Praktik - Rajawali Pers*. PT. RajaGrafindo Persada.
- Muliani, N. M., & Muniksu, I. M. S. (2020). METODE MENYENANGKAN BELAJAR PENJUMLAHAN DAN PENGURANGAN PADA ANAK SD. *Adi Widya: Jurnal Pendidikan Dasar*, 5(1), 1–9. <https://doi.org/10.25078/aw.v5i1.1199>.
- Nambiar, D., Karki, S., Rahardiani, D., & Singh, K. (2019). *Study on skills for the future in Indonesia* (p. 117). UNICEF.
- Perdana, R., & Suswandari, M. (2021). LITERASI NUMERASI DALAM PEMBELAJARAN TEMATIK SISWA KELAS ATAS SEKOLAH DASAR. *Absis: Mathematics Education Journal*, 3(1), 9. <https://doi.org/10.32585/absis.v3i1.1385>.
- Perry, K. H. (2012). What Is Literacy?—A Critical Overview of Sociocultural Perspectives. *Journal of Language and Literacy Education*, 8(1), 50–71.
- Purnamasari, B. N., N. N., & Asri, S. A. (2019). Penerapan Pembelajaran Literasi dalam Menstimulasi Keaksaraan Awal Anak Usia Dini. *Prosiding Seminar Nasional Pendidikan STKIP Kusuma Negara*, PAUD-035.
- Rababah, E. Q. (2017). The Impact of Using Reading Storybooks and Writing Journal Activities on Print and Phonemic Awareness of Jordanian Kindergarten Children. *Journal of Educational and Psychological Studies [JEPS]*, 11(4), 736–748. <https://doi.org/10.53540/jeps.vol11iss4pp736-748>.
- Rogowsky, B. A., Terwilliger, C. C., Young, C. A., & Kribbs, E. E. (2018). Playful learning with technology: The effect of computer-assisted instruction on literacy and numeracy skills of preschoolers. *International Journal of Play*, 7(1), 60–80. <https://doi.org/10.1080/21594937.2017.1348324>.
- Sahlan, A. K. (2018). *Mendidik Perspektif Psikologi*. Deepublish.
- Salminen, J., Khanolainen, D., Koponen, T., Torppa, M., & Lerkanen, M.-K. (2021). Development of Numeracy and Literacy Skills in Early Childhood—A Longitudinal Study on the Roles of Home Environment and Familial Risk for Reading and Math Difficulties. *Frontiers in Education*, 6. <https://www.frontiersin.org/articles/10.3389/feduc.2021.725337>.
- Saracho, O. N. (2017). Literacy in the twenty-first century: Children, families and policy. *Early Child Development and Care*, 187(3–4), 630–643. <https://doi.org/10.1080/03004430.2016.1261513>.
- Segers, E., Kleemans, T., & Verhoeven, L. (2015). Role of Parent Literacy and Numeracy Expectations and Activities in Predicting Early Numeracy Skills. *Mathematical Thinking and Learning*, 17(2–3), 219–236. <https://doi.org/10.1080/10986065.2015.1016819>.

- Septiani, N., & Syaodih, E. (2021). *Emergent Literacy in Early Childhood*. 5th International Conference on Early Childhood Education (ICECE 2020), Bandung, Indonesia. <https://doi.org/10.2991/assehr.k.210322.012>.
- Skwarchuk, S.-L., Sowinski, C., & LeFevre, J.-A. (2014). Formal and informal home learning activities in relation to children's early numeracy and literacy skills: The development of a home numeracy model. *Journal of Experimental Child Psychology*, 121, 63–84. <https://doi.org/10.1016/j.jecp.2013.11.006>.
- Sonnenschein, S., Galindo, C., Metzger, S. R., Thompson, J. A., Huang, H. C., & Lewis, H. (2012). Parents' Beliefs about Children's Math Development and Children's Participation in Math Activities. *Child Development Research*, 2012, 1–13. <https://doi.org/10.1155/2012/851657>.
- Sumaryanti, L. (2018). MEMBUDAYAKAN LITERASI PADA ANAK USIA DINI DENGAN METODE MENDONGENG. *AL-ASASIYYA: Journal of Basic Education*, 3(1), 117–125. <https://doi.org/10.24269/ajbe.v3i1.1332>.
- Terrell, P., & Watson, M. (2018). Laying a Firm Foundation: Embedding Evidence-Based Emergent Literacy Practices Into Early Intervention and Preschool Environments. *Language, Speech, and Hearing Services in Schools*, 49(2), 148–164. https://doi.org/10.1044/2017_LSHSS-17-0053.
- Turker, S., & Hartwigsen, G. (2022). The use of noninvasive brain stimulation techniques to improve reading difficulties in dyslexia: A systematic review. *Human Brain Mapping*, 43(3), 1157–1173. <https://doi.org/10.1002/hbm.25700>.
- Umbara, U., Suryadi, D., & Prof., Department of Mathematics Education, Universitas Pendidikan Indonesia, ddsuryadi1@gmail.com. (2019). Re-Interpretation of Mathematical Literacy Based on the Teacher's Perspective. *International Journal of Instruction*, 12(4), 789–806. <https://doi.org/10.29333/iji.2019.12450a>.
- Vágvölgyi, R., Coldea, A., Dresler, T., Schrader, J., & Nuerk, H.-C. (2016). A Review about Functional Illiteracy: Definition, Cognitive, Linguistic, and Numerical Aspects. *Frontiers in Psychology*, 7(1617). <https://doi.org/10.3389/fpsyg.2016.01617>.
- Webster, A. (Ed.). (2017). *Deafness, Development and Literacy*. Routledge. <https://doi.org/10.4324/9781351236027>.
- Yang, X., Dulay, K. M., McBride, C., & Cheung, S. K. (2021). How do phonological awareness, rapid automatized naming, and vocabulary contribute to early numeracy and print knowledge of Filipino children? *Journal of Experimental Child Psychology*, 209, 105179. <https://doi.org/10.1016/j.jecp.2021.105179>.
- Zadeh, M. H. (2010). *Advances in Haptics*. BoD – Books on Demand.
- Zaini, R. N., & Sutirna, S. (2021). ANALISIS KEMAMPUAN NUMERIK MATEMATIS SISWA SMP IT NURUL HUDA BATUJAYA KELAS VII PADA MATERI ARITMATIKA DASAR. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, 4(5), 1137–1146. <https://doi.org/10.22460/jpmi.v4i5.p%pp>.