

BUKTI KORESPONDENSI ARTIKEL PADA JURNAL SINTA 2

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FAKULTAS ILMU PENDIDIKAN UNIVERSITAS NEGERI SEMARANG Yth.

Penilai Pada Usulan PAK

Bersama surat ini, saya bermaksud menyertakan bukti - bukti korespondensi proses artikel pada Jurnal Pendidikan Anak Usia Dini dengan judul "ECE Teachers' Roles of Developing Numeracy Literacy in Specialn Needs Children", yang dimuat pada Volume 17, Number 2, November 2023 Pages 268-283 dengan alamat url:

https://journal.unj.ac.id/unj/index.php/jpud/article/view/38762 dengan ISSN: 2503-0566 (Online) 1693-1603 (Print)

No	Tanggal	Aktivitas
1	24 Mei 2023	Melakukan proses submit artikel
2	14 Agustus 2023	Melakukan proses review artikel
3	23 Oktober 2023	Proses copyediting
4	02 November	Publishing artikel

Demikian, agar dapat menjadi periksa.

Terimakasih

Semarang, 28 Mei 2024 Hormat saya,

ane.

Dr. Diana, M.Pd

KRONOLOGI KORESPONDENSI PUBLIKASI ARTIKEL PADA JURNAL SINTA 2

Judul	: ECE Teachers' Roles of Developing Numeracy Literacy in Specialn Needs Children
Jurnal	: Jurnal Pendidikan Anak Usia Dini
Volume	: 17
Nomor	:2
Tanggal publikasi	: 2 November 2023
ISSN (p)	: 2503-0566 (Print)
ISSN (e)	: 1693-1603 (Online)
Hal	: 268-283
Penerbit	: Post Graduate Program UNJ
SINTA	: 23 Desember 2020-23 Desember 2023
Penulis	: Diana, Neneng Tasu'ah, Sony Zulfikasari, Tias Martika

Bukti indexing jurnal:





The Role of Early Childhood Teachers in Developing Numeracy Literacy in Children with Special Needs

ABSTRACT: This study aims to explore and evaluate the pedagogical strategies used by teachers in providing reinforcement to children with special needs in improving literacy and numeracy skills, as a support to their transition process from ECE to primary year. The research applied a qualitative data method with data collection techniques through interviews, observations, and documentation. The sample consisted of 20 teachers from ten ECE institutions located in five regions in Central Java that have implemented inclusive education in their institutions. The study concludes that teachers plan to strengthen literacy and numeracy in children with special needs using the common methods as regular children with some modifications to the activities and achievements adapted with the needs of children with special needs. ECE teachers feel that they still have limitations in dealing with children with special needs. They expect support through the provision of training and guidance in dealing with children with special needs, especially in developing their literacy and numeracy.

Keywords : Literacy and numeracy, children with special needs, ECE-Primary school transition

1 INTRODUCTION

It is necessary for teachers to well understand the essence of literacy and numeracy and determine the important first steps of their skills or competencies. The measurement of literacy and numeracy skills currently still refers to the results of assessments during the primary and secondary education levels. The following graphs illustrate the results of national assessments and education reports for literacy and numeracy achievements of primary, junior high, and senior high school levels in the Central Java (BBPMP, 2022).

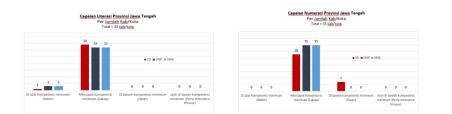


Figure 1 Literacy achievement. Source: https://bbpmpjateng.kemdikbud.go.id (2021)

The illustrations reflect that children in the primary and high school levels have shown literacy and numeracy skills at the "proficient" category, which means that they have surpassed the minimum level of proficiency. There are the other problems, including why literacy and numeracy skills are not prepared starting from the previous level (ECE) and whether children can receive literacy and numeracy skill development in ECE, considering the prevailing teaching activities of reading, writing, and counting for children.

It turns out that literacy and numeracy have broader and richer scopes compared to reading, writing, and counting because these definitions exist in almost all life aspects (Comunitity Child Care Victoria, 2011), as cited below:

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Commented [b2]: The abstract needs to be revised following the following pattern: 1. Brief background (one sentence only) 2. research objectives 3. Brief method (location and sampling technique do not need to be abstracted) 4. Brief Research Results (Findings) 5. Short conclusion

Commented [b3]: It is best not to write about laws or government data in the introduction, it is better to reveal the latest relevant research results. "Literacy is the capacity, confidence and disposition to use language in all its forms. Literacy incorporates a range of modes of communication including music, movement, dance, storytelling, visual arts, media and drama, as well as talking, listening, viewing, reading and writing. Children benefit from opportunities to explore their world using technologies and to develop confidence in using digital media."

"Numeracy is the capacity, confidence and disposition to use mathematics in daily life. Children bring new mathematical understandings through engaging with problem solving. It is essential that the mathematical ideas with which young children interact are relevant and meaningful in the context of their current lives. Educators require a rich mathematical vocabulary to accurately describe and explain children's mathematical ideas and to support numeracy development. Spatial sense, structure and pattern, number, measurement, data argumentation, connections and exploring the world mathematically are the powerful mathematical ideas children need to become numerate." (Department of Education and Early Childhood Development, 2009)

The government is currently promoting preliteracy and prenumeracy development programs in ECE units, considering that early childhood education serves as the basis for stimulation of all development aspects in children, including literacy and numeracy skills (Nurhayani & Nurhafizah, 2022)

Teachers can also provide many opportunities and supports to offer them meaningful literacy experiences. Children can access a meaningful literacy experience through their interaction with their peers, teachers, and the surrounding environment in a pleasant atmosphere (Sari, 2017; Suryawati & Akkas, 2021). A strong literacy experience will provide a foundation for their reading and writing skills as well as stimulate their problem-solving skills in daily life and the other skills needed at the next education levels (Purab & Purwono, 2022).

Teachers who handle special needs children in inclusive classrooms should acquire special strategies to support their learning (Winarsih et al., 2013). Special needs children may face various obstacles, thus require a special service to help them achieve optimal development. Special needs learners are learners with various characteristics of different needs, both physical and mental, including acceptance, special attention, appropriate services, and support in their environment (Davenport, 2012). The variety of special needs children in each institution demands teachers to have relevant skills to plan and design interesting activities for children, including children with special needs. It is important to note that developing preliteracy and prenumeracy skills does not mean to intensely expose children to learning how to read, write, and count like adults (Justice et al., 2018). Such learning methods may stress children and jeopardize their development. Through this exposition, it is expected that teachers will not redo similar mistakes in serving special needs children can be managed properly.

Information literacy among teachers will have a positive impact on learning (Fatmawati & Safitri, 2020; Haerudin, 2021; Ningsih et al., 2022) Teachers can have proper knowledge and skills in managing learning, especially for inclusive classrooms. Teachers can optimally implement their information literacy in various settings to enable special needs children have the same opportunity to develop their potential despite some obstacles and limitations that they face (Alberta, 2019). Kiyment (2010) mentioned, *"Teachers need to improve knowlegde of management and instructional skills to enhance improvement and exploration of their teaching* practice." (Jurmang, 2014). It is fundamental to support efforts in improving teachers' ability in learning management through their information literacy skills (Kurnianingsih et al., 2017; Sanches, 2018) Considering the diverse classroom conditions and different characteristics in children, teachers are encouraged to nurture their learning management ability.

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Teachers in inclusive classrooms of ECE institutions, are now also required to to package play activities for children that lead children to basic literacy and numeracy skills. One of the challenges for early childhood educators is providing early literacy and numeracy activities for children in a way that reflects their developmental stage and their needs. This study aims to explore information related the role to teachers'in facilitating preliteracy and prenumeracy development activities for special needs children in five regions in Central Java. The findings in this study will provide the basis for further research in improving teacher competencies and developing models for good practice, especially in inclusive classrooms.

Studies on inclusive education, in the form of mapping, model development, and implementation of inclusive teaching models in ECE institutions have started from 2017 to 2022 (Diana et al., 2020a; Diana et al., 2020b) This research is in accordance with the national research priority scale in the sociohumanities of cultural arts and education, of which will explore and provide an overview of the information literacy skills of ECE educators, especially teachers of inclusive classes who design preliteracy and prenumeracy development for special needs children.

2 THEORITICAL STUDY

2.1 Literacy and Numeracy Skills

Early childhood is at the informal numeracy stage, so children should be able to count sequentially and recognize the properties of an object. Relevant activities at this stage consist of counting the number of objects or identifying the number of objects. Children need an ability to understand and write number symbols in order to read information in the form of written numbers (Indah, 2023). Providing literacy experiences in early childhood is essential. These experiences can motivate children to learn reading and writing. The "early literacy" refers to the first steps that children should go through in understanding writing before attending formal reading and writing education (Shvartsman & Shaul, 2023) These literacy skills, including awareness of alphabets and phonology, verbal language, and writing development form the foundation of the literacy tests used in this study (Barham et al., 2019).

Numeracy is an ability to recognize and apply mathematical concepts in all areas of life. Numeracy skills include understanding numbers, counting, solving numerical problems, measuring, estimating, sequencing, noticing patterns, adding, and subtracting numbers, and so on. The Core Numerical Skills Model divides skills into four categories, including the understanding of symbolic/non-symbolic numbers, mathematical relationships, numeracy skills, and basic numeracy skills. Symbolic and non-symbolic skills are defined as the processes used to estimate the size of a symbol (Shvartsman & Shaul, 2023) Math skills at the informal numeracy stage do not much involve algorithms or symbols, but focus more on associating numerical words with quantities and understanding the relationship between different quantities. Core numerical skills focus on four main factors, comprising (1) understanding symbolic and non-symbolic numbers, (2) understanding mathematical relationships (early logical-mathematical principles, arithmetic principles, mathematical operational symbols, place value system, and base ten); (3) counting skills (knowledge of numerical symbols, word order, counting with concrete objects); and (4) basic arithmetic skills (arithmetic combination skills, addition, and subtraction with number symbols) (Aunio & Räsänen, 2016).

2.2 ECE to Elementary School Transition

The transition from early childhood education to primary school is a complex phenomenon. A smooth transition to primary school helps children feel safe, relaxed, and comfortable in their new environment (Stein et al., 2019). The concept of "school readiness" has different meanings and

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1. Background of the problem, deepening of the problem, 2. The gap between the idealized and the existing facts,

3. Supported by the latest theory and research relevant to

the problem,

Have new research value (or benefit) which is innovation,
Ends with the research objectives

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interpretations in the context of early childhood education practice. One common nativist view of readiness supports the view that children are ready to start school when they reach the maturity to be able to sit quietly, focus on work, interact with peers in socially acceptable ways, and accept directions and rules from teachers and coaches (Kokkalia et al., 2019). Researchers note that developmental status does not determine readiness because the skills and abilities required for school success may substantially differ from one school to another or even from one classroom to another within a school (Brooks-Gunn & Markman, 2005)

Transitioning to school at an early age may be difficult for many children, in which children with Autism Spectrum Disorder (ASD) often have greater difficulty transitioning to school (Fontil et al., 2019). Previous research provides information to help the secondary transition scope understand how the school experiences of adolescents with disabilities affect their school and postschool outcomes (Mazzotti et al., 2021) These results, coupled with other influencing factors (e.g. poverty, culture, marginalization), suggest that many youths with disabilities are not accessing the necessary transition-related instructions and supports required for school to achieve postschool success (Trainor et al., 2020), in addition to the importance of collaboration between parents, children, and support staff during the transition to school in facilitating a successful start to school (Fontil, et al., 2020). (Fontil et al., 2020).

3 METHOD

This design is applied to the collection and analysis of descriptive qualitative. The sample of this study used are 20 teachers from ten ECE institutions located in five regions in Central Java that have implemented inclusive education in their institutions. The qualitative data used in this research derived from interviews, observations, and documentation studies from both primary and secondary data sources. Interviews and observations were set using relevant guidelines related to classroom management, teaching strategies, and evaluation and monitoring of literacy and numeracy skill development activities for special needs children. Teachers who taught in inclusive classrooms were counted as primary data.

4 RESULT AND DISCUSSION

This research embarked from the objectives to explore and evaluate pedagogical strategies performed by teachers in providing reinforcement for special needs children, as a strategy to improve their literacy and numeracy abilities and skills and support their transition process from ECE to primary year. The respondents in this first-year study were teachers with the following details of demographic data.

4.1 Result

Kindergarten Teachers as Respondent

Characteristics by age

The following data present the characteristics of teacher respondents based on age.

Table 1. Teacher respondents by age

Age (Years)	Frequency
21-30	3
31-40	8
41-50	7

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- 1. Research approach,
- 2. Subject/participant
- 3. Procedure
- 4. Use of tools, materials, and instruments,
- 5. data collection techniques
- 6. Data analysis, not theory
- 7. Formulas that are commonly used do not need to be
- written down
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51-60	2
Total	20

Most of the respondents were kindergarten teachers aged 41-50 years and the least respondents were teachers aged 51-60 years, reflecting that the majority of respondents were at a productive age range for self-development.

Characteristics based on teaching experience

The following data present the characteristics of teacher respondents based on their teaching experiences.

Table 2. Teacher respondents based on teaching experiences

Time (Years)	Frequency
1-10	7
11-20	7
21-30	6
Total	20

The respondents in each group based on the duration of their teaching experiences shared the common distribution. The records of teaching experiences can strengthen the learning process for children. Brandenburg et al. (2016) revealed a direct linear relationship between years of teacher's experience and teaching quality. This suggestion should be interpreted by considering other factors that may affect teaching quality in the classroom settings.

Characteristics based on educational backgrounds

The following graph displays the characteristics of teacher respondents based on educational backgrounds:

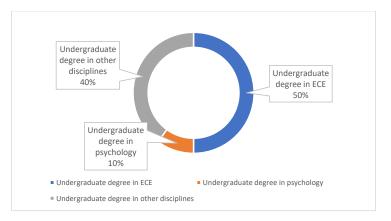
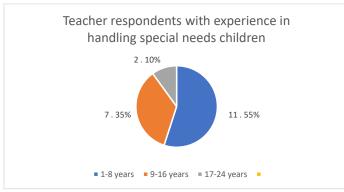


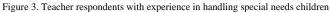
Figure 2. Respondents based on educational backgrounds

The majority of teachers graduated from the Undergraduate degree in ECE with a total of ten respondents. Two teachers were graduates of psychology program and eight teachers were from other disciplines. Teachers' educational backgrounds contribute to the quality and ability to educate students. The success of a teacher's education affects self-competence, performance, and creativity in learning (Rehalat & Nurul 'ainy, 2022; Yin et al., 2013) What about teachers in early childhood education institutions? Does the educational background influence the quality and ability to educate children, especially children with special needs? With regard to this issue, qualified and competent early childhood education teachers are in demands to improve learning management in early childhood education (Manning et al., 2017). The requirements of ECE educators follow the provisions set by the government. There are at least two requirements that ECE teachers should fulfill, namely competence and academic qualifications (Imtiyas & Simatupang, 2022) With their backgrounds and experiences in early childhood education, teachers adapt to recognize and understand the characteristics and needs of each child.

Characteristics based on experience with children with disabilities

Based on the results of the study, demographic data show the involvement of teacher respondents in handling special needs children. The following data show characteristics of teacher respondents' experiences in handling children with special needs.





The majority of respondents had teaching experience with special needs children for 1-8 years, reaching 55% or 11 teachers. A total of seven teachers (35%) were experienced in handling special needs children for 9-16 years and two teachers (10%) were experienced for 17-24 years. Teaching experience in handling special needs children will have an impact on the teacher's knowledge and skills in teaching special needs children (Park et al., 2018). When children started primary school, teachers are expected to strengthen their literacy and numeracy skills, including for special needs children obtain meaningful literacy experiences through their interaction with other children, teachers, and the surrounding environment in a pleasant atmosphere (Sari, 2017; Suryawati & Akkas, 2021) A strong literacy experience will offer them foundation for reading and writing skills, problem-solving skills for daily life, and the skills needed at the next levels of education (Purab & Purwono, 2022) Therefore, it is fundamental that teachers also have an understanding of literacy and numeracy for early childhood.

Research related to children's transition from kindergarten to primary school dated back to the 1980s in Shanghai, with an overview of how children were prepared for primary school (Zhao, 2017). The results showed that early childhood teachers understood the urgency of literacy and numeracy skills for preparing children's transition from kindergarten to primary school. Literacy is understood as an ability to process and understand information. The introduction of language to children can be initiated through story telling methods as well as reading pictures or books. Meanwhile, numeracy is understood as an ability to analyze numbers, symbols, and concepts. This is confirmed from the results of interviews conducted with Teacher DV, Teacher WN, and Teacher MF who taught in inclusive classes.

"Literacy is to introduce children to speaking language, such as recognizing words, reading fairy tales, and telling stories." (Informant DV)

"Numeracy is a material or learning related to counting, numbers, and symbols." (Informant WN)

"Early childhood literacy competencies mark children's abilities to think and communicate as well as the ability to read and write or understand simple symbols, such as colors." (Informant MF)

Teachers understand that literacy and numeracy competencies in early childhood are children's abilities to communicate and understand information by reading, writing, listening, and speaking. As part of the abilities, children are able to read symbols and understand the concept of numbers. These competencies have been included in the Content Standards on Child Development Achievement Levels (STTPA) published by the Ministry of Education and Culture. However, literacy and numeracy competencies for children with special needs are adjusted to the children's abilities. For example, if the child is not yet able to pronounce words correctly, the target achievement should be set to construct the child's ability in correctly pronouncing the words. When the child is not yet able to count, the target achievement should be designed to enable the child's ability to count 1-10. This is emphasized by DV:

"Literacy and numeracy skills for normal children are adjusted to the levels of children's abilities and age development. Meanwhile, for special needs children, the task is adjusted to their abilities." (Informant DV)

Based on the results of interviews with teachers, literacy and numeracy competencies of regular early childhood and special needs children have differences in the levels of achievements. This is adjusted to the children's initial abilities and abilities that later should be improved. Narayana Rao (1987) suggests the following systematics for effective teaching and learning, including (1) teaching should be carefully planned, taking into account the students' capacities of mind, objectives, levels of experiences, and education, (2) the length of the lesson, (3) slow learners can grasp concrete ideas rather than abstract ideas, so the use of audio-visual aids is indispensable, (4) teachers should be aware of the fact that a friendly approach allows remedial teaching, (5) focusing on social skills and social confidence levels among slow learners as well as emphasizing the effective use of art, music, and drama, (6) teachers should prepare the most important aspects to be taught, repeated, and reviewed, and (7) optimal guarantee of human resources specifically prepared for slow learners (Mumpuniarti, 2017).

Each school makes different policies regarding literacy and numeracy learning, in which some schools plan to do it every day or on certain days as well as during special hours or in free play activities. The planning process starts with identifying children's needs and creating a learning plan that includes:

"Identifying children's special literacy and numeracy skills and planning activities based on their abilities." (Informant MF)

Literacy and numeracy learning activities for children with special needs in each school are performed in different ways, such as using flash cards, story books and blocks, using occupational therapy, and providing their own space to stimulate their literacy and numeracy skills. In general, the activities provided are the same as other children. Only the level of difficulty is adjusted to the children's abilities.

"The special activities are common in general. However, we need to make some adjustments based on the children's needs. For example, autistic children are encouraged using relevant media that attract their interest instead of forcing them to tell stories, considering that they can't express their intentions through speaking." (Informant SP)

The Daily Learning Implementation Plan (RPPH) for special needs children and regular children in each school is different. Not all schools have a specific Individual Daily Learning Implementation Plan (RPPHI)/Individual Education Program, yet learning activities are adjusted to the levels of each child's learning achievements and adapted to the child's abilities. Schools consult their lesson plans with the coordinator of inclusive education and class teacher, while the lesson plans are made by the homeroom teacher.

"So far, we utilize the same lesson plans with some adjustments to the levels of difficulties based on the levels of special needs children." (Informant JF)

The learning media for introducing literacy and numeracy to special needs children is the same as for regular children, yet an adjustment should be made with different activities. For example, regular children use a ball to learn addition, while special needs children use a little ball to learn counting.

"Children are divided into their categories, yet they still use the same media. We also provide the learning media made of the same safe materials to allow special needs children to feel the same feelings as normal children do." (Informant TH)

Teachers' constraints in implementing learning activities for special needs children with disabilities include limited learning time, unconditioned classes due to the lack of teaching workforce, insufficient facilities and infrastructure, and children's moods that change quickly.

Special needs children have their personal needs. Schools should ensure that special needs children are able to communicate with others, play with others, have skills for themselves, and recognize the concept of numbers and letters. Life skills taught to special needs children include changing their own clothes, buttoning their clothes, bathing, wearing properties for performing prayer, toilet training, washing their hands, and eating by themselves.

Teachers attract the attention of special needs children, as their early strategy in the teaching and learning process. Later on, they can provide interesting Educational Game Tools (APE) for them.

"We offer something interesting to the special needs children to attract their attention and trigger their willingness to learn about literacy or numeracy. It is important to ensure that the children show their interest in the first place, for example through beadwork, reading stories, or arranging blocks and colors." (Informant LM)

The results of the literacy and numeracy learning process in special needs children showed an improvement, as shown in children who started to recognize letters and count from one to ten. There were children who had been able to gradually imitate what the teachers said. Each school has a different method of child development reporting, such as quarterly reports, semester reports, monthly reports, and daily reports. Reports can be provided in the form of narratives, photos of children's activities, and children's work. The submission of reports also varies, in which a number of institutions do not segregate regular children and special needs children, while the others offer daily reports specifically for special needs children. The report cards submission system utilizes direct meetings and through online platforms, such as WhatsApp.

Teachers try their best to provide literacy and numeracy skills for children with disabilities. However, a number of ECE teachers are unable to provide literacy and numeracy skills to children with disabilities due to the lack of abilities both in terms of educators and infrastructure. Meanwhile, teachers with sufficient conditions can offer learning that is adjusted to the children's abilities to facilitate their improvement. "Everything depends on the shortcomings and abilities of each child. It depends on the type and level of the group. There are children who are not yet proficient in literacy and numeracy, especially those with severe disabilities. Children with mild and moderate disabilities are quite familiar with simple literacy and numeracy." (Informant DV)

Teachers felt the need for training in handling children with disabilities. They also require the availability of activity references for children with disabilities to improve their literacy and numeracy skills. This is because teachers still feel they do not have in-depth knowledge about handling children with disabilities, especially in inclusive classes. By providing information and motivation to ECE teachers, these teachers can form teacher enthusiasm and knowledge to develop environmental literacy learning and teaching in early childhood classes (Titi & Siti, 2022). Apart from that, research conducted by Rachmat et al. (2017) has proven that providing motivation to teachers will influence teachers' understanding of implementing inclusive education.

4.2 Discussion

Literacy and numeracy skills are interrelated abilities. Early literacy skills are fostered through various activities, such as telling stories using objects that children can find in their surroundings (toys, cutlery, stationery, favorite foods), as a method to train their early reading skills by understanding the meaning of words. Numeracy in early childhood is considered as a basic problem-solving ability and the application of mathematics in everyday life. In addition to calculation skills, children also grow their understanding about patterns (algebra), geometry (shape, location, and position), measurement, and data analysis. Numeracy consists of the knowledge, skills, behaviors, and tendency (dispositions) that someone needs to solve problems using formulation of mathematics in various situations (BSKAP, 2022). The development of early literacy and numeracy skills serves the initial foundation for children's readiness at the next level (Keily et al., 2019). The misconceptions that still occur today are the impacts of the inaccurate provision of early literacy and numeracy concepts by early childhood institutions due to the demands of parents and school institutions at the primary school level.

Literacy and numeracy skills for special needs children are a concern for educators, considering that most special needs children have different benchmarks of literacy and numeracy skills compared to the development of children in general (Wackerle-Hollman et al., 2020). Special needs children in the early childhood education should be equipped with adequate basic literacy and numeracy skills (Khasanah & Purnamasari, 2023). Children can obtain meaningful literacy experiences through interactions between peers, teachers, parents, and the surrounding environment. Information and skills developed through meaningful literacy experiences for children. Cooperation between teachers and parents is fundamental in developing literacy skills. Many parents expect their children to have good literacy and numeracy skills when starting primary school, so they also provide reinforcement for literacy and numeracy skills of their children at home (Elliott et al., 2021; Salminen et al., 2021).

Teaching special needs children is a challenge, considering the uniqueness of each child in the classroom. This situation requires teaching practitioners to emphasize specialized training that integrates various pedagogical knowledge and skills. Teachers are also encouraged to promote positive attitudes and characteristics in designing activities that develop literacy and numeracy for special needs children (Mumpuniarti, 2017). Teachers can design learning programs that encourage early literacy and numeracy skills based on children's achievements in their development respectively (Atlar & Uzuner, 2023). Not all teachers who assist special needs children have adequate knowledge in teaching basic literacy skills. Most teachers find challenges in designing appropriate learning programs and media to help children with different abilities. Strategies for teaching basic literacy and numeracy skills are needed through the implementation of adaptive learning programs for special needs children. Learning also requires some supporting facilities that allow manipulative activities by children during the introduction and comprehension of basic skills, including the recognition of sounds, alphabets, and numbers.

Special needs children learn through the power of their five senses to recognize a variety of things, from which their learning materials should contain literacy and numeracy concepts to train their basic abilities for the next level (Kurniastuti et al., 2023). The use of media can help the introduction of literacy and numeracy in children, especially special needs children whose thinking abilities must be assisted by concrete media (Setiawan, 2018). Teachers should provide special needs children opportunities to express their opinions, emotions, and ideas based on their respective characteristics. To overcome potential hindrance in numeracy literacy skills, teachers in inclusive schools can facilitate learning with concrete and real problems related to daily life. Teachers start by reading aloud activities and children can have fun play-learning activities followed by the development of basic literacy skills using some relevant learning media (Agustina & Zayyadi, 2023).

The implementation of appropriate methods, media, and learning strategies based on the children's specificities should be performed and publicized, considering the significant point of this information to help teachers in accommodating learning needs of special needs children, especially in regular schools that accept children with special needs or inclusive schools. The results of this study confirms the finding that teachers in inclusive schools, especially at the early childhood education level, still lack the experience to design special/individualized activity programs for special needs children in their classrooms. Teachers should receive education or training on assisting special needs children, so they can work together with other collaborators in properly accommodating learning activities, as a strategy to foster children's initial abilities during their transition process from early childhood education to primary education level.

5 CONCLUSION

Children with special needs have different abilities, including their preliteracy and prenumeracy skills. ECE teachers in inclusive schools perform the same learning activities for children with special needs as for regular children, yet they should modify these activities based on the achievements that the children are expected to have and should be adapted to their needs. Teachers feel that their abilities to provide education to children with disabilities in inclusive schools, especially in preliteracy and prenumeracy skills still have many shortcomings. Teachers expect supports in the form of training, references for learning activities, and guidance to improve their abilities in providing stimulation to children with disabilities, thus they will be able to facilitate optimum education to children with disabilities in inclusive schools.

6 ACKNOWLEDGEMENT

This research is one of the national grant research from the Directorate of Research, Technology, and Community Service of the Directorate General of Education by Contract Number: 144/E5/PG.02.00.PL/2023 dated 19 June 2023.

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