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Teacher Information Literacy for Inclusive Early Childhood Education (ECE) to Provide Literacy and Numeracy for Special Needs Children in Central Java-Indonesia

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Abstract. Digital teaching emphasises information literacy as one of the competencies critically required in the education community. It marks the starting point of information management to acquire comprehension and achieve learning objectives, as an attempt to support individual abilities in facing any challenges. The increasing number of special needs children at inclusive schools challenges teachers to provide the best education services. Teachers are urged to learn in diverse ways to acquire skills in handling special needs children in their classrooms. This study used a mixed methods approach, using quantitative data to present participants' demographic data and observation on literacy-numeracy skills of special needs children and qualitative data on the teachers' information literacy for facilitating literacy-numeracy activities for special needs children in inclusive classrooms. This study purposively selected 20 Early Childhood Education teachers from five regions in Central Java who were experienced in handling inclusive classrooms. The data were collected through interviews, observations and documentation studies. Meanwhile, the data analysis interpreted all aspects that correlated to each other. The findings confirmed that teachers with information literacy on special needs children could facilitate play-based activities for literacy-numeracy skill learning. Teachers used the outcome of this information literacy to manage learning, starting from identifying the learning needs, designing learning programmes, implementing programmes, to conducting evaluations. Therefore, teachers urgently require necessary training that supports their information literacy in managing classroom learning, especially for special needs children.

Keywords: Early childhood education teachers; information literacy; learning management; special needs children

1. Introduction

Literacy is interpreted as thinking skills that use sources of knowledge in print, visual, digital and auditory forms (Setyanta, 2020). Literacy skills are needed in all aspects of human life, including education which requires a range of complex understanding and thinking skills for both educators and students. The success of the educational process is determined by the literacy competencies of the learners (Anggraeni & Rola, 2018). Information literacy skill supports lifelong learning as an essential ability to cope with an environment laden with information. Its comprehensive foundations are fostered at schools, not only for librarians but also for teachers who control the learning process (Mahardhini & Sanny Rahmawati, 2021). This idea considers the role of teachers as information sources for children during the classroom-based learning process in Early Childhood Education (ECE) institutions, especially in Indonesia.

Teachers who handle inclusive classes are required to demonstrate good information literacy skills to improve educational services for special needs children in their classes. Teachers in inclusive education services with information literacy can design play-based activities that nurture the basic abilities of special needs children to prepare them for education at higher levels. However, ECE educators may face challenges in providing activities that contain suitable elements to reflect the developmental stages and needs of respective children. Teachers should have information literacy to enhance the quality of learning, yet technological skills still appear to be an issue among ECE educators.

Teachers with information literacy skills will positively contribute to the conduct of their learning designs (Fatmawati & Safitri, 2020; Haerudin, 2018; Ningsih et al., 2022). Teachers demonstrate their fundamental proficiency and expertise in learning management, especially in inclusive classrooms. They can optimally use information literacy in various ways to help children with certain obstacles, disorders and limitations to develop their potential (Education Alberta, 2019). This notion is supported by Selvi (2010) stating that teachers must enhance their knowledge of instructional skills and management to support their teaching practice development and exploration, thus reaffirming their obligations as educators to reinforce their knowledge capacities and teaching skills and create a meaningful learning process for students (Jurmang, 2014). Teachers require information literacy skills to improve their knowledge in managing learning (Kurnianingsih, et al., 2017; Sanches, 2018). They are mandated to have this ability, considering the diverse classroom conditions and characteristics that every child demonstrates.

Diana et al. (2020) found that 80 per cent of 138 preschool teachers who served in inclusive classes in Central Java had yet to attend training related to inclusive education and programmes. This figure illustrates a low level of information literacy in inclusive education, especially regarding knowledge and learning management.

The overview leads to the question, "Do teachers who serve in inclusive classrooms have adequate information literacy skills to facilitate special needs

children during their learning process, especially for developing children's literacy and numeracy skills?". This study explores information literacy among teachers in facilitating learning activities, especially in developing literacy and numeracy skills for special needs children distributed in five regions in Central Java. The findings of this study will provide the basis for further research in improving teachers' competencies in managing inclusive education and developing best practices, especially for inclusive classrooms.

2. Literature Review

2.1 Information Literacy

As a concept, information literacy has emerged since the early 1970s. The term was used for the first time by Paul Zarevski in 1974 (Tatkovic et al., 2006). An information-literate person has learned how to learn, how to find needed information and specific knowledge, and how to use it.

The education community recognises the twenty-first century as the "century of knowledge" or "knowledge society". Therefore, digital teaching requires information literacy as a core skill (Trujillo-Torres et al., 2020, p. 49; United Nations ECLAC, 2021). This skill includes a set of abilities to find, retrieve, analyse, and use information that will enable students to search, filter, apply, write, fluently complete research, and grow as true lifelong learners (Grizzle et al., 2013, p. 47).

Information literacy is an important skill for an individual to know where to obtain, access and assess the best and most usable information based on its accuracy, appropriateness, and effectiveness (Association of College & Research Libraries, 2000).

2.1.1. *Information literacy model*

Ojaranta (2019) describes four information literacy models:

A. *Kuhlthau's information-seeking process*

This approach has been broadly implemented and acknowledged as a process approach that describes how to properly search for information amidst secure learning activities. Kuhlthau's information search process (ISP) model consists of initiation, selection, exploration, formulation, collection and presentation. This model highlights the first four phases as the planning phase.

B. *Association of College and Research Libraries (ACRL's) information literacy competence standards*

American Library Association through the ACRL's Division explained that individuals with information skills should be able to analyse essential information efficiently and effectively; access information and understand the ethical codes of information usage; provide critical responses to the information and sources of information; transform knowledge-based information; and understand the application of the stored information for various purposes in the economic, legal and social contexts.

C. *Christine Bruce's seven faces of information literacy*

Compared to the other models, Bruce's seven faces of information literacy emphasise several methods to develop information literacy skills. This model requires several elements, including technology, computer literacy and media literacy (Heng et al., 2018). It consists of the use of technology as a source of information and communication; the search for information sources; the execution of an information process; the control of the literacy process during the execution stage; the construction of new knowledge; the extension of knowledge to offer learners with new insights; and the prudent use of information.

D. *Online reading comprehension*

Leu, Jr. et al. (2005) presented a new literacy model that describes online reading comprehension as a problem-based inquiry process across diverse online information sources that requires several recursive reading practices; including the identification of important questions; the search for information; the evaluation of critical information; the synthesis of information; and the communication of information.

2.1.2. *Information literacy skills of Early Childhood Education teachers*

Specific skills in information literacy include a) information navigation, search and screening, b) information evaluation, and c) information retention and retrieval. Chang (2012) divided information literacy into information perception, selection, use and evaluation.

- a. Information perception includes a fundamental introduction to hardware equipment, software systems, internet resources, information security and computer information ethics regulations.
- b. Information selection demonstrates the use of information from appropriate sources, data classification, and resource-searching methods, including recognising and understanding requests for personal information and effectively stating information problems.
- c. Information use shows the comprehension of the content of collected data, the analysis and organisation of data into useful information, the accurate application of information for effective and creative decision-making, the organisation and combination of new knowledge with previous knowledge, and knowledge transformation into business tasks.
- d. Information evaluation critically analyses and evaluates the collected information by evaluating and modifying personal conditions during information search and use, scrutinising the adequacy of the collected information, and measuring the information's effectiveness and efficiency for problem-solving.

2.2 **Pre-literacy and Pre-numeracy Skills in Children**

Early childhood marks the development of the informal numeracy stage, where children should be able to count numbers and recognise the nature of objects. Numeracy is an activity in counting and identifying the number of objects. Early childhood requires an understanding of writing and reading information in written numerical forms (Wahyuni, 2022). Numeracy skill marks the recognition and application of mathematical concepts in daily life. They involve the ability to understand numbers; count and solve numerical problems; measure and estimate

numbers; sequence and notice numerical patterns; and add and subtract numbers (Yuliantina, 2022).

Pre-literacy and pre-numeracy skills mark an important first step in literacy and numeracy development skills that refer to the basic skills and understanding that children should have before actually mastering reading, writing and calculating skills. Pre-literacy skills are the foundational skills underlying the ability to read and write. It involves understanding language, phonics and alphabetical symbols. Some key aspects of pre-literacy skills include:

- a. Phonemic awareness: the ability to understand and manipulate the sounds in spoken language. This involves recognising the different sounds in language.
- b. Word awareness: the ability to understand that words consist of sounds and are divisible into smaller parts.
- c. Vocabulary awareness: the ability to recognise commonly used words and to understand what they mean.
- d. Syntactic awareness: the ability to understand sentence structure and how words are organised in language.
- e. Listening and speaking skills: the ability to understand and communicate through spoken language.

Pre-numeracy ability is the basic skill to prepare the understanding of formal maths concepts. It involves recognising numbers, shapes, sizes and basic mathematical relationships. Some key aspects of pre-numeracy skills include (Wardhani et al., 2021):

- a. Number recognition: the ability to recognise numbers and understand what each number means.
- b. Comparison and contrast: the ability to understand concepts, such as bigger than, smaller than, more than and less than.
- c. Shapes and colours: the ability to recognise geometric shapes and colour differences.
- d. Patterns: the ability to understand simple patterns in sequences of numbers or objects.
- e. Early measurement skills: the basic understanding of size and comparison.

Pre-literacy and pre-numeracy skills must be adjusted for special needs children to the level of their respective developmental achievements. Some of those children who are cognitively and linguistically unconstrained will potentially master the above abilities, yet some children with cognitive and language barriers require specific timelines and strategies during the learning process.

For this reason, this research explores teacher literacy in developing pre-literacy and pre-numeracy skills for early childhood with special needs.

3. Methodology

This study used a mixed method of quantitative and qualitative models with an exploratory sequential design. The quantitative data consisted of teacher demographics, which were obtained from interviews and observations regarding their proficiency in executing literacy and

numeracy learning for special needs children. Meanwhile, the qualitative data covered the teachers' information literacy skills related to managing learning for inclusive classrooms, which were collected through the interviews.

3.1 Population and Sampling

This research was conducted in five regions in Central Java, including Semarang City, Solo City, Jepara Regency, Kendal Regency and Wonosobo Regency. Due to the limited number of inclusive institutions in the five regions, only two institutions were selected from each region. This research involved a total of 20 teacher respondents who served in inclusive classrooms. Table 1 displays the distribution of respondents in the five regions:

Table 1. Distribution of respondents in five regions in Central Java

No.	Region	Number of Teachers
1	Surakarta City	
	a. TK AL Firdaus	2
	b. Smart Preschool	2
2	Jepara Regency	
	a. PAUD Semai	2
	b. PAUD Matahari	2
3	Semarang City	
	a. PAUD Labschool	2
	b. TK Talenta	2
4	Wonosobo Regency	
	a. TK Universal	2
	b. TK AGAPE	
5	Tegal Regency	
	a. TK Bisa Inklusi	2
	b. TK Tarbiyatul Athfal	2
Total		20

3.2 Data Collection

The data were collected through interviews, observations and documentation studies from both primary and secondary data sources. The interview and observation sessions used guidelines related to teacher information literacy, including classroom management, teaching strategies and evaluation and monitoring, especially literacy and numeracy skill development activities for special needs children. Primary data included teachers who served in inclusive classrooms, in addition to play-based activities that contained literacy and numeracy elements. Meanwhile, the secondary data included learning instruments planned by teachers who served in inclusive classrooms.

3.3 Data Analysis

Data analysis was performed during the collection process and followed by the interpretation of all aspects to understand the relationship among variables. The data were analysed through reduction, presentation, conclusion and clarification of validity using source triangulation.

4. Results

Information literacy is an important achievement that helps an individual determine how to obtain the most valuable information, how to access it and how to assess its accuracy, appropriateness and effectiveness (Ranaweera, 2008; Sanchez-Ruiz & Blanco, 2018). Information literacy is a skill in digital teaching competencies (Stopar & Bartol, 2019; Haleem et al., 2022; Wijayati et al., 2023). The presence of this skill in the education community is critical and is considered as the starting point of information treatment to achieve knowledge and respond to the prevailing challenges of the rapidly evolving digital age and information-driven society. Teachers' ability to access and process information for designing materials and improving the learning quality is becoming increasingly important. The increasing number of special needs children in schools challenges teachers to provide the best education services, in which they are required to learn various methods in dealing with special needs children.

The results of this study describe the information literacy of ECE teachers who served in inclusive classrooms. A complete description of the demographic data among the teachers is detailed in Table 2.

4.1 Teacher Respondents by Age

Table 2 presents the demographic data of teachers' ages.

Table 2. Teacher respondents by age

Age (Years)	Frequency
21-30	2
31-40	7
41-50	8
51-60	3
Total	20

Most of the respondents consisted of kindergarten teachers aged 41-50 years and the lowest number of respondents were those aged 51-60 years. Younger teachers have a greater ability to process and use information than older teachers due to their familiarity and adaptability to newer technologies and changing educational methodologies. As a consequence, they will more quickly adapt and modify the information during the implementation process. Education should empower people, in this case, teachers, to turn information into new knowledge (Yunus, 2021). Teachers face challenges to help students understand and recognise the term 'information overload' (Saadillah et al., 2023).

4.2 Characteristics based on academic backgrounds

Figure 1 reflects the characteristics of teacher respondents based on their educational backgrounds.

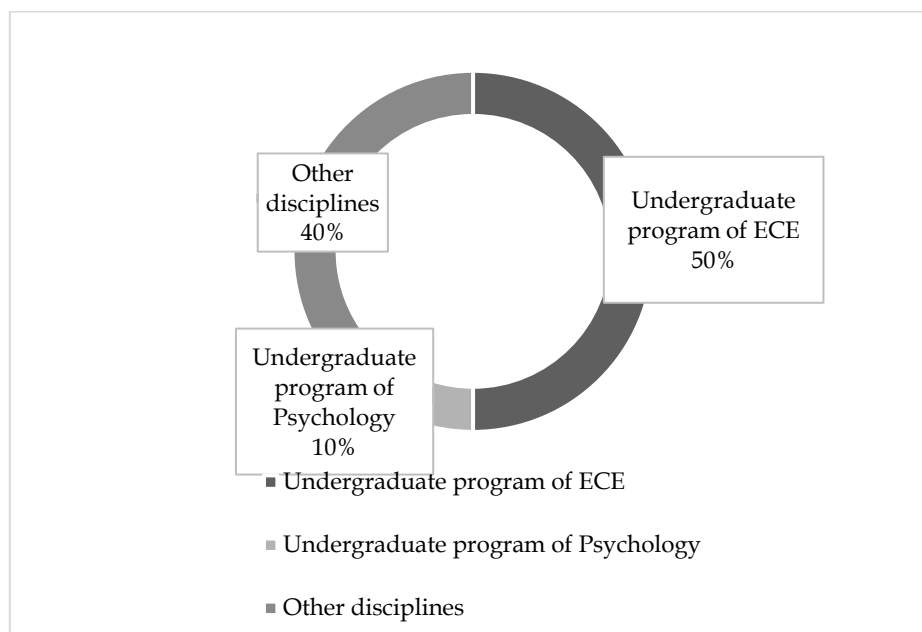


Figure 1. Respondents based on their academic backgrounds

From a total of 20 teacher respondents that were involved in this study through purposive sampling from the five regions in Central Java, most of them had an educational background of an undergraduate degree in ECE with a total of ten respondents, followed by psychology with a total of two teachers, and other majors with a total of eight teachers, including those from family science, civic education, economic education and guidance and counselling. The teachers' educational backgrounds impact their basic knowledge related to children's development and needs, especially in identifying special needs children and providing relevant services for them.

4.3 Characteristics based on experience in teaching special needs children

Table 3 shows the characteristics of teacher respondents with experience in teaching special needs children:

Table 3. Teacher respondents based on experience in teaching special needs children

Duration (Years)	Frequency
1-8	10
9-16	7
17-24	3
Total	20

The majority of respondents had experience in teaching special needs children for 1-8 years with a total of 10 teachers, followed by 9-16 years with a total of seven respondents, and 17-24 years with a total of three teachers. Based on the collected data, all respondents had experience in teaching special needs children.

Teachers' ability to process information offers them knowledge in implementing the information they receive. Information literacy related to special needs children will equip teachers with an understanding of who special needs children are, what

characteristics may arise among them, and how to handle them during the learning process. Twenty-first-century teachers see information literacy as a crucial tool in teaching (Rosidin, 2021). This competence allows them to organise, retrieve and determine practical strategies for developing the learning process. The following descriptions present the results of research regarding information literacy among teacher respondents who served in inclusive classrooms.

4.4 Finding Information

Experience in teaching children with special needs provides both opportunities and challenges for teachers in identifying, designing and implementing learning programmes and conducting evaluations.

Teachers attempt to find information related to the development of literacy and numeracy skills of special needs children, including performing initial identification through observation and screening at the time of enrolment, observing during lessons, conducting psychological test analysis and collecting necessary information from parents. The initial identification evaluates the children's abilities to determine their needs for classroom-based learning.

We conduct observations and initial diagnostic assessments to determine the children's abilities, communicate with parents, as well as collaborate with psychologists, growth experts and specialised doctors to review the diagnoses.-KMS

Our school, in particular, assigns a coordinator who will share information about handling special needs children. We also perform several workshops every few months by inviting an expert.-MF

In addition, teachers obtain information about the needs of special needs children from various sources. Teachers collect their references from school workshops, teacher training, expert-led discussions (including therapists, psychologists and other experts), and information from the principals of colleagues.

4.5 Selecting Information

Following the information collection related to the children's conditions, teachers should accept them and confirm the diagnoses with an expert. Teachers identify the children and provide solutions to deal with their problems. Teachers should also develop necessary approaches to better understand the children, as the basis for providing the facilities that they need during the learning process.

It is our responsibility if there is a child with a special condition. We need to talk to him. If he starts to call us, it is our opportunity to extract necessary information about him by persuading him to talk about his home environment. We must be familiar with the children in the very first place, then we can understand their subconsciousness. The implementation of this strategy offers an easier introduction to literacy and numeracy- YZ.

Teachers provide play-based facilities relevant to literacy and numeracy skills which are also given to regular children with an adjustment to the levels of difficulty based on the abilities of special needs children. Teachers provide a

special space to allow special needs children to learn and avoid distraction. This statement is confirmed by the results of an interview with one of the teachers.

Children's play activities are adjusted to the diagnoses that have been compiled in the Individual Learning Plan by referring to their physical and psychological conditions. So, every child receives different treatments.-LM

Teachers' ability to select information refers to their strategies in facilitating the students' needs based on their characteristics, personal barriers and disorders, which are analysed during the previous identification attempt (Kartini & Aprilia, 2022). To optimise play activities for children with disabilities in inclusive ECE, teachers should perform initial assessments, modify teaching plans, and tailor activities for special needs children to allow them to play properly and improve their abilities (Diana et al., 2022; McGowan et al., 2023; Movahedazarhouli, 2018).

4.6 Creating Information and Communicating Information

Individual lesson planning for special needs children and regular children in each school is different. Although not all schools have lesson plans, the levels of learning outcomes are still adjusted to the children's abilities. Schools that offer lesson plans should consult with the inclusive classroom coordinator and homeroom teacher. These lesson plans should be designed by teachers who teach in inclusive classrooms.

We share the lesson plans in common, yet the implementations are designed with some adjustments to the different levels of play activities for numeracy and literacy skills based on the conditions of every special needs child.-JF

Play activities for developing literacy and numeracy for special needs children have yet to be specifically designed. However, the variety and frequency of play are adjusted to the requirements of individual special needs children. Meanwhile, the learning model remains the same for regular children.

Play activities to improve literacy and numeracy skills of special needs children are not designed specifically or separately, rather by providing a variety of plays that can facilitate both special needs children and other regular children at different levels of difficulty.-MS

They share learning models in common. However, it requires more intensive supervision to handle special needs children. Assistant teachers are assigned to classes with special needs children who often experience temper tantrums.-D

Referring to the findings, some teachers have designed play activities to develop children's pre-literacy and pre-numeracy skills through individual learning plans. However, others only differentiate the play activities based on the abilities of special needs children in using the same learning facilities. A similar condition was highlighted by Chasanatun & Afifah (2008), stating that early literacy learning through play activities was hindered by various problems in its application. Learning to read, write, and count (*calistung*) should be performed through an approach appropriate to the children's developmental stage.

Therefore, those activities are not given to kindergarten children. The context of *calistung* for kindergarten students should represent the holistic framework of children's development, which is implemented through a play approach and adjusted to the children's developmental tasks. Creating an environment rich in literacy will further encourage children's readiness to embark on *calistung* activities. Meanwhile, the play approach as the principle of early childhood learning is also applied in teaching *calistung* for kindergarten, as an attempt to develop children's psychological and physical aspects (Ranti et al., 2016).

4.7 Evaluating Information and Using Information

Evaluation of children's literacy and numeracy skills is performed by teachers through daily observations to assess the development of literacy and numeracy skills in special needs children, in addition to the use of regular reports. The forms of assessment can consist of checklists, anecdotes and performance results.

The teacher gives the parents daily reports regarding their children's activities.-A

If the stimulation of literacy and numeracy in children is not optimal, teachers conduct self-reflection and research and consult with the inclusive classroom coordinator to modify and communicate the new approach to the parents, as a strategy to support children's activities.

Reflecting on what is good and what is still lacking can serve as an improvement to the literacy and numeracy activities that I provide in my classes. I also collect feedback from colleagues and parents before executing the next plans based on the prevailing needs.-KMS

The information evaluation process in this study shows that teachers evaluate the design and implementation of learning activities in developing literacy and numeracy skills for special needs children. Based on the results, teachers have produced evaluations based on their daily observations of the achievement of children's development. In addition, teachers reflect on the development activities based on personal evaluations and inputs from colleagues and parents for their education service improvement.

This research provides an overview of special needs children who were involved in learning activities where the research was conducted. These highlights inform the participation of special needs children and the achievements of their pre-literacy and pre-numeracy skills during learning in inclusive classrooms. The data were collected through observations and interviews with teachers on items of pre-literacy and pre-numeracy ability indicators that were not displayed during the research.

4.8 Demographic Data of the Student Respondents

A total of 10 ECE institutions located in five regions in Central Java had special needs children with different disorders. Table 4 displays the demographic data of the aforementioned special needs children.

Table 4. Demographic data of student respondents

No.	Disorders	Frequency
1	Speech Delay	2
2	Hearing-impaired	5
3	ADHD	5
4	Cerebral Palsy	1
5	Down Syndrome	1
6	Autism	6
7	Slow Learner	1
Total		21

The majority of special needs children in this study had autism with a total of six children, hearing impairment and ADHD with a total of five children respectively, speech delay with a total of two children, in addition to cerebral palsy, down syndrome and slow learner with a total of one child respectively.

4.9 Literacy and Numeracy Skills of Special Needs Children

Numeracy literacy in children has several indicators, consisting of communication, relationships, reasoning and presentation. The following data present the literacy and numeracy scores of 21 special needs children.

Table 5. Pre-literacy and pre-numeracy skills

Indicator	Min. Score	Max. Score	Average
Communication	30	80	54
Relationships	20	80	53
Reasoning	25	80	51
Presentation	20	80	52
Total score	30	78	53

The average score of literacy and numeracy skills of special needs children is 53. Communication had the highest average score, followed by relationship, presentation and reasoning as the indicator with the lowest score.

Teachers use various methods to foster communication skills in special needs children, such as using concrete media, pictures and symbols and body language. Meanwhile, children connect objects by manipulating artefacts. Teachers can use various activities to reinforce presentation skills and help children to understand simple concepts of cause and effect to encourage reasoning skills. These activities will allow teachers to generate concepts for developing the children's abilities.

5. Discussion

Teachers' knowledge, skills and attitudes in performing their duties to improve learning quality are the results of the information literacy they acquire. Teaching special needs children is a challenge for professionals due to the uniqueness of every child in the classroom. This situation generates the need for specialised training that integrates a variety of skills in pedagogy, knowledge, attitudes, social service and subject content knowledge (Mumpuniarti, 2017). It has led to the introduction of various pedagogical strategies to support the learning process and enhance the children's literacy and numeracy skills. One of the most well-

known learning models in teaching special needs children is the Universal Learning Design (McGuire-Schwartz & Arndt, 2007). In the instructional design process, the UDL framework proactively designs lessons that incorporate inclusive options and strategies to encourage every learner in the classroom (Rao, 2021). However, not all teachers can design quality learning to serve special needs children in inclusive classrooms.

Teachers' backgrounds also influence their basic knowledge regarding the development and characteristics of early childhood, especially special needs children (Purwanta, 2010; Suharsiwi, 2017). Teachers' involvement with special needs children will boost their ability to recognise the children's characteristics and influence their attitudes towards inclusive education (Fellianti & Billah, 2017). Teachers' teaching experience with special needs children will improve their professional skills in facilitating learning for children in inclusive classrooms (Wiranti, 2021).

The ACRL has issued a framework to measure the levels of information literacy. The framework is designed for all information literacy actors and consists of five indicators, including searching for information, selecting information, communicating information, evaluating information and using information (Terral, 2013). This research explored teachers' information literacy skills using these five indicators in managing learning for special needs children in inclusive classrooms and found that it is necessary to strengthen teachers' information literacy, considering that they are held to be the information centre to support children in early childhood.

Teaching experience is a substantial factor that affects teachers' professionalism, especially teaching competence. Experiences outside the classroom activities greatly encourage innovations for generating learning scenarios and advancing teachers' ability to professionally plan and manage learning (Sahalessy et al., 2022; Subekti et al., 2019).

6. Conclusion and Implications

Information literacy is a complex process experienced by an individual. Teachers who teach early childhood programmes, especially inclusive classrooms, should be equipped with information literacy to strengthen knowledge and skills in providing services for special needs children. They should receive practical training in managing learning and organising inclusive education both for special needs children and regular children. Several institutions have yet to explicitly offer specific plans through information search for developing lesson plans and improving children's literacy and numeracy skills instead of analysing suitable programmes for children with the adjustment of learning outcomes based on their abilities. Schools that provide individualised learning plans assign assistant teachers to handle special needs students. They are responsible for designing learning activities based on the consultation with the inclusive classroom coordinator and homeroom teacher. As part of the evaluation, where the development of literacy and numeracy in children is not optimal, teachers will conduct self-reflection, search for information online, consult with the inclusive

classroom coordinator, remodify the learning plans and communicate with parents to support children's activities.

Teachers' information literacy in improving literacy and numeracy skills for special needs children should be reinforced, considering the urgency of both skills for special needs children. Special needs children should be equipped with literacy and numeracy, as part of their fundamental abilities to understand and master reading, writing and counting skills with the adjustment to their developmental achievements. Special needs children in an inclusive environment need instructional information to support their information literacy (Zagona et al., 2021). Teachers in inclusive classrooms must have extensive knowledge, skills and creativity to manage and facilitate children's needs (Rashid & Ghani, 2023). This research contributes to providing an overview of information literacy for ECE teachers who teach inclusive classes in developing literacy and numeracy skills that have not been widely researched, especially in Indonesia.

7. Limitations and Recommendations

The limited number of ECE units that provide services for special needs children in the Central Java regions led to the inclusion of a minimum number of teacher respondents in this study. Therefore, it is necessary to disseminate the research to other institutions, in an attempt to promote information literacy skills for teachers to allow them to better facilitate special needs children. Strong information literacy for teachers can have a positive impact on the learning process. To achieve inclusive literacy teaching, literacy development must be targeted to meet the different needs of every student instead of only stimulating personal interest and motivation.

This study only qualitatively explored teachers' information literacy in providing services for special needs children in inclusive classrooms, so it has not quantitatively measured the information literacy of teachers. Future researchers could quantitatively research the information literacy skills of teachers more broadly.

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