



## Exploring Early Childhood Teacher's Understanding of Numeracy Literacy at Raudhatul Athfal

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### ABSTRACT

Early childhood numeracy skills are important competencies for children, because these skills not only include problem-solving skills but also the application of mathematical concepts in everyday life. This study aims to explore teachers' understanding of numeracy literacy learning in early childhood at Raudhatul Athfal. This study uses a descriptive qualitative approach, the collection method uses semi-structured interviews developed based on PAUD teacher competency indicators and observations are carried out in a participatory manner using observation sheets containing indicators of literacy and numeracy learning activities. The analysis process begins with reducing data from the interview results to simplify the data so that it is easy to understand and analyze. Furthermore, the coding process is carried out to classify the data into main themes, then represent patterns in teacher perceptions and practices in literacy and numeracy learning. To ensure data validity, researchers apply data triangulation and checking with colleagues. The results of the study indicate that teachers do not yet have adequate competence in teaching literacy and numeracy. There are still challenges in its implementation, such as providing ongoing training, linearizing academic degrees in early childhood education, and facilities and infrastructure in improving teacher quality and learning in the classroom.

**Keywords:** Early childhood Education, Teacher Understanding, Numeracy Literacy

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## INTRODUCTION

Teacher competence is a global issue that has not been resolved until now. The government has opened schools but has not provided adequate facilities for PAUD teachers, especially those in remote and rural areas. This is certainly the government's responsibility to formulate a policy to improve the quality of PAUD. One of the ways in which Singapore improves the quality of schools is that staff must meet minimum qualifications (Biersteker, 2010), the minimum qualification referred to here is having an academic degree or certificate of competence in PAUD. China has also required teachers to have certificates in early childhood education, and principals must have academic degrees in PAUD (Poon, 2008; So, 2013). This shows that Singapore and China make teacher competence the main thing to create quality education. Several countries have set clear requirements for PAUD educators

(Benavot & UNESCO, 2015). However, many have not formalized minimum standards for PAUD teachers, including in Indonesia. Some schools have expanded their teaching staff with untrained candidates, especially in rural areas such as RA Al-Falah Mojoagung. Based on interviews with the principal, RA Al-Falah Mojoagung has set a standard for recruiting PAUD teachers below the minimum standard by ignoring PAUD academic degrees or having certificates in early childhood education. This is certainly a problem in creating quality early childhood learning.

Based on recent research, the impact of teachers who do not understand learning is very significant on child development, one of which is literacy and numeracy learning (Chang, 2023). Literacy and numeracy are two basic competencies that have a strategic role in determining children's academic success in the future. PAUD teachers who are competent in literacy and numeracy will provide quality educational stimulation, strengthening these competencies, especially in literacy and numeracy learning, in line with the achievement of the Sustainable Development Goals (SDGs), especially goal 4, namely "Ensure inclusive and equitable education and promote lifelong learning opportunities for all." In this goal, one of the main targets is to ensure that by 2030, all children have access to quality early childhood development, care, and preschool education to be ready to enter primary education (Unesco, 2019; Salminen et al., 2021).

In many education systems, literacy and numeracy at the PAUD level have not been an explicit priority. This results in teachers not having a clear pedagogical reference to develop these basic skills in a context that is appropriate to the child's age. One important aspect that teachers need to master is the ability to integrate basic literacy and numeracy into learning that is appropriate to the child's developmental stage (Logan et al., 2012). Literacy and numeracy are important foundations for children's readiness to face further education, so PAUD teachers are required to be able to design learning that is fun, contextual, and encourages children's active involvement (Bernstein et al., 2024).

Based on data from kompas.com in 2023 less than 50% of students in East Java have not reached the minimum competency limit for reading literacy and numeracy literacy. Nganjuk and Madura Regencies will be used as pilot projects to improve literacy and numeracy competencies because the two areas are red zones in reading and numeracy literacy. The data above shows that literacy in East Java, especially Nganjuk, still needs to be improved. The results of initial interviews at RA Al-Falah Mojoagung found that the educational background of teachers at RA Al-Falah Mojoagung had not reached the qualification standards, lack of school support for teachers for self-development activities such as seminars or similar events that provide a lot of knowledge about numeracy literacy, and limited teaching and learning facilities and infrastructure.

Based on the problems above, the competence of teachers at RA Al-Falah Mojoagung in teaching numeracy literacy needs to be explored again, because even with these conditions, this school experiences an increase in the number of students every year, indicating that the school is becoming more and more quantitatively existing. This study aims to analyze the understanding of PAUD teachers towards numeracy literacy learning. It is hoped that this study can provide further research in providing solutions to improve teacher competence in teaching literacy and numeracy to early childhood..

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## RESEARCH METHODOLOGY

This study uses a descriptive qualitative approach with the aim of exploring teachers' understanding of early childhood numeracy literacy. The data sources in this study were 5 teachers and the principal. The data in this study were collected through semi-structured interview techniques with interview guides developed based on PAUD teacher competency indicators and observations were carried out in a participatory manner using observation sheets containing indicators of literacy and numeracy learning activities. The indicators of teacher competency and children's literacy and numeracy learning activities will be displayed in the following table:

Table 1. Teacher competency indicators (Sudjoko, 2020)

No	Teacher competency indicators
1	Teachers master the subject matter they teach
2	Teachers master standard competencies and basic competencies
3	Teachers are able to develop learning creatively
4	Teachers are able to carry out reflective actions
5	Teachers are able to master information technology in carrying out communication

Table 2. Indicators of children's numeracy literacy (Wardhani, B., Adi, E., Rengganis, N., Chitra, W., & Pratiwi, 2021)

No	Indicators of children's numeracy literacy
1	Using a variety of numbers and symbols related to basic mathematics to solve practical problems in various contexts of everyday life.
2	Analyze information displayed in various forms (graphs, tables, charts, etc.)
3	Using interpretation of analysis results to predict and draw conclusions and decisions

The analysis process begins with reducing data from the interview results to simplify the data so that it is easy to understand and analyze. Furthermore, the coding process is carried out to classify the data into main themes, then represent patterns in the perceptions and practices of RA Al-Falah Mojoagung teachers in literacy and numeracy learning. To ensure the validity of the data, the researcher applied data triangulation (Braun & Clarke, 2006), and conducted member checks with two participants to confirm the interpretation of the data. In addition, the results of the analysis were discussed with colleagues in a peer debriefing session to reduce researcher bias.

## RESULTS AND DISCUSSION

### Limited teacher competency in numeracy literacy

Based on interviews with 5 teachers, RA Al-Falah Mojoagung admitted that they did not have sufficient knowledge and skills in introducing literacy and numeracy concepts systematically to early childhood. A teacher named AF said, "I only teach children mathematical concepts, but I don't know yet whether it is the same as the concept of numeracy literacy or not". This statement reflects the lack of professional training oriented towards a child development-based pedagogical approach. This confirms that the weak PAUD teacher training system is an obstacle to delivering a quality preschool curriculum (Neuman, 2015). A teacher named IDN said, "teachers have never received training on

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literacy and numeracy learning, so we don't understand the concept". Another teacher named LM said, "I usually learn through YouTube, then I practice it in class". This statement reflects the lack of self-development training by teachers.

The limitations of teacher competence in teaching literacy and numeracy to early childhood are not only caused by the lack of ongoing training, but are also influenced by educational backgrounds and teaching experiences that do not always meet professional standards. The findings of this study indicate that some PAUD teachers do not yet have the appropriate academic qualifications, especially in the field of early childhood education. Of the five teacher informants, three of them have been teaching for more than five years, while the other two have less than five years of teaching experience. Although teaching experience is important in competence, studies show that without the support of relevant formal education, work experience does not automatically result in improved teaching quality (Urban, 2008). This has an impact on indicator 1 (mastery of subject matter) and indicator 2 (mastery of competency standards and basic competencies).

Teachers who do not have an PAUD background tend to have less understanding of pedagogical approaches that are in accordance with the characteristics of early childhood development (Hu et al., 2024; Manning et al., 2017). In addition, their understanding of literacy and numeracy learning outcomes is still normative and has not been linked to curriculum standards. In addition, the principals at the institutions studied also do not have a specific background in early childhood education. This has the potential to affect the direction of teacher development policies and the implementation of appropriate curriculum. The lack of educational leadership that understands the characteristics of early childhood learning can weaken efforts to improve the quality of PAUD units as a whole (Neuman, 2015). This condition reflects the systemic challenges in fulfilling competent educators and education personnel in the early childhood education sector. Teachers who have high pedagogical skills and competencies have a significant relationship in building a solid educational foundation and producing competent and knowledgeable people (Gamayao, 2021; Humairah et al., 2024). This shows how important teacher competence is in the learning process. A study found that the level of competence of PAUD teachers not only considers external factors, but also internal factors, such as professional identity to encourage their development (Lei & Hu, 2020).

The professional identity in question is the teacher's belief in their competence and responsibilities. Teaching motivation can be understood as the internal drive and efforts that teachers have to achieve optimal performance in the learning process. This is reflected through innovation in teaching, interest in facing challenges, and commitment to developing knowledge and following advances in technology and science (Fajar et al., 2020). In classroom observations, it was found that only a small number of children were able to use various symbols and numbers correctly in the context of everyday life, such as counting concrete objects or mentioning number sequences. This is related to the first indicator of students' numeracy abilities, namely using various numbers and basic mathematical symbols that appear not to have developed evenly in groups of children.

Counting activities tend to be carried out repetitively and are not linked to the child's real context, for example through role-playing or exploring the surrounding environment.

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When asked to analyze simple information, such as matching the number of objects with numbers or understanding patterns from pictures, only a few children were able to do it correctly. This shows the weakness of the second indicator, namely analyzing information in various forms.

### **Teaching strategies that are not yet directed at literacy and numeracy goals**

Learning strategies used by PAUD teachers in introducing literacy and numeracy to early childhood are mostly not systematically directed and are still oriented towards spontaneous activities. Based on the results of interviews, many teachers use the play method as the main approach, but it is not accompanied by a deep understanding of literacy and numeracy achievement indicators according to the child's age stage. Activities such as role-playing, singing, or drawing are indeed carried out, but have not been explicitly designed to build basic reading, writing, and arithmetic skills. This shows that the relationship between teaching strategies and learning objectives has not been optimally internalized in the daily practice of teachers.

The results of classroom observations show that children are not yet able to make predictions based on the patterns or data displayed. For example, when the teacher provides an activity to guess the number based on the sequence of numbers or colors, most children still guess randomly. This reflects that teachers tend not to use an approach that encourages children's active reasoning. The lack of teacher understanding of the stages of literacy and numeracy development causes learning activities to be less than optimal (Afnida & Suparno, 2020). The ability of teachers to design literacy and numeracy activities is highly dependent on training and understanding of the curriculum (Handayani, 2021). In addition, the lack of support for specific training and curriculum guidelines is also an important factor. Several teachers admitted that they had never attended training that specifically discussed literacy and numeracy development strategies for early childhood. They rely more on experience or imitate the practices of other teachers. The lack of targeted training and professional development means that teachers do not have adequate strategic tools. Most PAUD teachers have not mastered the early literacy approach in a planned manner, so that learning activities do not fully support children's readiness to read, write, and count before entering elementary school (Yuliantina, 2023).

Furthermore, the learning planning document at RA Al-Falah Mojoagung has not explicitly stated the learning objectives of literacy and numeracy. This makes the strategies implemented by teachers less focused and not based on learning outcomes. As a result, the potential for early childhood development in the aspects of literacy and numeracy is not optimally facilitated.

### **Teacher awareness of the importance of literacy and numeracy in inclusive education**

Some teachers at RA Al-Falah Mojoagung showed awareness of the importance of literacy and numeracy as a foundation for children's readiness to face elementary education, especially for children from families with low socio-economic backgrounds. As conveyed by a teacher named LM: "Most of the children here come from simple families. If they don't come from PAUD, they might not know books or numbers at all.". The teacher's statement shows

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an understanding of the importance of their role in supporting children from underprivileged families, but reflection on their teaching practices is still limited. This shows that teachers' reflective abilities are still low, because teachers have not systematically conducted self-evaluations of the learning process and children's learning outcomes. In fact, reflective action is important so that teachers can improve their teaching approaches and methods continuously (Rudolph, 2019).

This is relevant to the targets of the Sustainable Development Goals (SDGs), especially target 4.2 which aims to ensure that all children have access to quality early childhood development, and target 4.c which emphasizes the need to increase the number of qualified teachers (Benavot & UNESCO, 2015). However, despite growing awareness among teachers, its realization is still limited if not accompanied by systemic support. Consistent training, provision of resources, and policies that support inclusive and competency-based learning practices are essential. Without such support, teacher awareness may not be able to drive optimal changes in classroom practices.

A study emphasized the importance of a systemic approach to ensure equal distribution of the quality of preschool education (Neuman, 2015). Increasing teacher awareness must be accompanied by real interventions, such as practice-based training and community involvement, especially in areas with limited resources (Hidayah et al., 2023).

## CONCLUSION

Teacher competence at RA Al-Falah Mojoagung in literacy and numeracy learning supports the achievement of sustainable development goals (SDGs), especially in the field of quality education. The research findings revealed that teachers do not yet have adequate competence in teaching literacy and numeracy. There are still challenges in its implementation, such as providing ongoing training, linearizing academic degrees in early childhood education, and infrastructure in improving teacher quality and classroom learning. Therefore, increasing teacher capacity through training, policy support, and providing adequate facilities is key to strengthening literacy and numeracy learning in PAUD. This research is still limited to general teacher competency in teaching numeracy literacy to early childhood. It is hoped that in further research, aspects of teacher competency will be studied specifically and in depth so that they can provide solutions to create the golden generation of 2040 in accordance with the government's expectations.

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