

## ETHNOPEDAGOGY-BASED TEACHING MATERIALS TO IMPROVE ELEMENTARY SCHOOL TEACHERS' LITERACY AND NUMERACY: A PRELIMINARY STUDY

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**Abstract:** This study aims to identify teachers' perceptions and needs for the development of ethnopedagogy-based teaching materials to improve literacy and numeracy. The study employed a quantitative descriptive approach, utilizing data collection techniques that involved distributing questionnaires to elementary school teachers from diverse cultural backgrounds. Data were analyzed using descriptive statistics to examine the tendency of respondents' answers regarding aspects of literacy and numeracy, as well as local cultural integration in the learning process. The results show that the majority of teachers are aware of the importance of literacy and numeracy and support the implementation of ethnopedagogy; however, they encounter obstacles in the availability of relevant teaching materials and limited professional development opportunities. These findings suggest a pressing need for the development of teaching materials that not only enhance literacy and numeracy skills but also foster students' cultural identities through contextual learning. This study is an initial contribution to the development of an ethnopedagogy-based teaching material model as a strategic solution in improving the quality of numeracy learning in elementary schools while supporting the preservation of local culture in education.

**Keywords:** Literacy, Numeracy, Ethnopedagogy, Preliminary Study

**Abstrak:** Penelitian ini bertujuan untuk mengidentifikasi persepsi dan kebutuhan guru terhadap pengembangan bahan ajar berbasis etnopedagogi dalam rangka meningkatkan literasi numerasi. Penelitian menggunakan pendekatan deskriptif kuantitatif dengan teknik pengumpulan data berupa penyebaran kuisioner kepada guru SD dari berbagai latar wilayah budaya. Data dianalisis menggunakan statistik deskriptif untuk melihat kecenderungan jawaban responden terhadap aspek literasi numerasi dan integrasi budaya lokal dalam proses pembelajaran. Hasil menunjukkan bahwa mayoritas guru menyadari pentingnya literasi numerasi dan mendukung penerapan etnopedagogi, namun mengalami kendala dalam ketersediaan bahan ajar yang relevan dan keterbatasan pelatihan profesional. Temuan ini mengindikasikan adanya kebutuhan nyata terhadap pengembangan bahan ajar yang tidak hanya meningkatkan kemampuan literasi numerasi, tetapi juga memperkuat identitas budaya siswa melalui pembelajaran yang kontekstual. Studi ini sebagai kontribusi awal terhadap pengembangan model bahan ajar berbasis etnopedagogi sebagai solusi strategis dalam meningkatkan kualitas pembelajaran numerasi di sekolah dasar sekaligus mendukung pelestarian budaya lokal dalam pendidikan.

**Kata Kunci:** Literasi, Numerasi, Etnopedagogi, Studi Pendahuluan

### INTRODUCTION

Basic education is one of the main elements in shaping students' literacy and numeracy skills for learning at the next level. However, the results of the 2023 National Assessment released by the Kemdikbudristek show that more than 53% of elementary school students have not achieved minimum competency in numeracy (Kemdikbudristek, 2023). This indicates a fundamental challenge

in the elementary-level numeracy learning process. One of the contributing factors is the low level of teacher literacy and numeracy, which has a direct impact on teaching strategies by teachers and student mastery of the material (Saputra et al, 2023). Thus, it is essential to provide students with a more contextual and relevant learning approach, one of which is through ethnopedagogy-based teaching materials.

The concept of ethnopedagogy is an alternative learning approach that applies cultural and local community values. This approach emphasizes that local culture is not only a context for learning but also a source of learning itself (Sari, 2023). In mathematics learning, integrating numeracy with local culture can create a more meaningful learning experience, increase learning motivation, and foster a sense of ownership over the material being taught (Puspita et al., 2023). Thus, the development of ethnopedagogy-based teaching materials is not only pedagogically relevant but also strategic in overcoming students' difficulties in numeracy lessons.

Although various studies have demonstrated the effectiveness of ethnopedagogy in enhancing students' understanding of concepts and character (Yulia et al., 2023; Nugrahanta et al., 2024), research on the implementation of ethnopedagogy-based teaching materials specifically designed to improve elementary school teachers' literacy and numeracy remains limited. Most studies focus on developing modules or learning media for students, rather than improving teachers' pedagogical capacity in teaching numeracy in a contextual context (Yuliana et al., 2025; Lestari & Maulida, 2022). In fact, teachers are the spearhead in developing students' literacy and numeracy, so improving teacher competence is a strategic priority. For example, research by Sari et al (2024) shows that teacher training using a local cultural approach can improve their ability to prepare lesson plans and contextual teaching materials. However, the study has not specifically examined the literacy and numeracy aspect. On the other hand, Mariana et al (2023) found that ethnopedagogical modules designed without considering teachers' cognitive structures were not effective enough in improving the quality of numeracy teaching. In other words, there is a gap in the study regarding how ethnopedagogy-based teaching materials can be developed to facilitate teachers' systematic and contextual understanding of numeracy.

Based on these problems, this study aims to conduct a preliminary investigation of the needs, structure, and characteristics of ethnopedagogy-based teaching materials relevant to enhancing elementary school teachers' literacy and numeracy. This study emphasizes the importance of integrating aspects of basic numeracy content with local cultural values in the form of teaching materials that are applicable, communicative, and in accordance with the Merdeka Curriculum policy. This study also explores teachers' understanding of literacy and numeracy and their perceptions of the potential for integrating local culture into the mathematics teaching process in elementary schools. This study is expected to contribute to the development of ethnopedagogy studies that focus on developing cognitive aspects of numeracy. The results of this study are expected to contribute to curriculum developers, compilers of teaching materials, and implementers of teacher training programs in the development of effective teaching materials. By strengthening the foundation of numeracy from an early age through competent teachers and relevant teaching materials, the quality of Indonesian basic education will be increasingly competitive globally but still firmly rooted in local values.

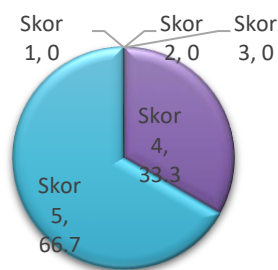
## RESEARCH METHODS

The research method employed is a descriptive qualitative approach, which aims to provide an overview of teachers' perceptions and experiences with the application of ethnopedagogy-based teaching materials in enhancing literacy and numeracy in elementary schools. The subjects in this study were 15 elementary school teachers from SDN 27 Cakranegara, comprising both class teachers and subject teachers. The data collection technique employed a questionnaire instrument in the form of a Google form, consisting of 9 closed-statement items. The instrument focuses on 3 main aspects, namely understanding of literacy and numeracy, knowledge of ethnopedagogy, readiness and needs in developing teaching materials. The instrument employs a Likert scale to measure respondents' attitudes towards statements in a structured and measurable manner, ranging from a level of

disagreement (1) to strongly agree (5) with the given statements (Gay et al., 2019). This study employs descriptive analysis techniques to describe the patterns of respondents' views and responses to instrument statements, which are presented systematically to facilitate understanding (Gay et al., 2019; Creswell & Poth, 2018).

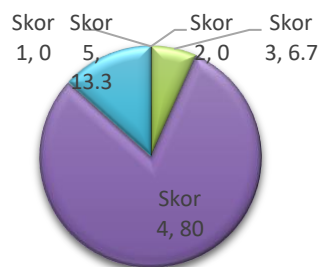
**RESULTS AND DISCUSSION**

This study aims to determine the initial response of elementary school teachers to training on the development of ethnopedagogy-based teaching materials, to improve literacy and numeracy. The integration of cultural elements in the learning process makes learning more enjoyable, meaningful, and easy to understand. The ethnopedagogical approach not only improves cognitive understanding but also fosters students' positive attitudes towards learning, (Witdarko et al, 2024; Suanda & Subrata, 2024; Khatimah & Fatimah, 2023). In addition, ethnopedagogy fosters a love for local culture while promoting the inclusivity of humanistic education, where teachers play a crucial role in designing contextual and meaningful learning strategies (Yuliana et al., 2025; Ali et al., 2023). The results of the data analysis from the questionnaire, with the statement "In my opinion, literacy and numeracy skills are very important for elementary school students," are presented in Figure 1.



**Figure 1.** The importance of Literacy and Numeracy for Elementary School Students

The figure above shows that 66.7% of respondents strongly agree and 33.3% agree that literacy and numeracy is very important for elementary school students. This illustrates that teachers' awareness of the importance of literacy and numeracy in elementary education is very high. As is known, literacy and numeracy is not only related to the ability to calculate, but also includes understanding and implementing mathematical concepts in real-life contexts. Understanding basic numeracy concepts in a contextual context is an important foundation in the mathematics learning process that has a direct impact on children's cognitive development (Prediger et al., 2005; Siegler, 2025).



**Figure 2.** Understanding the concept of literacy and numeracy according to the Merdeka curriculum

The results of the data analysis, based on the statement "I understand the concept of literacy and numeracy according to the applicable curriculum," are shown in Figure 2 above. The figure shows that the level of teacher understanding of the concept of literacy and numeracy, as outlined in the applicable curriculum, is high, with 80% of respondents demonstrating a high understanding,

13.3% a moderate understanding, and 6.7% a low understanding. These results suggest that most teachers have recognized the importance of literacy and numeracy in their pedagogical competence. School characteristics and teacher quality play crucial roles in the learning process for achieving early childhood education literacy and numeracy (Ansari et al., 2025; Azubuikie et al., 2024).

The Merdeka Curriculum emphasizes contextual and flexible learning, where numeracy and literacy interactions enable students to build competencies in critical thinking and reasoning. The results of data analysis from the third statement, "I often integrate literacy and numeracy in the learning process," are presented in Figure 3 below.

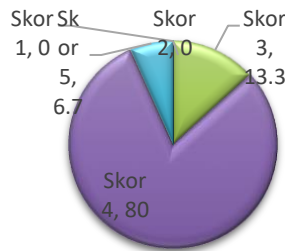


Figure 3. Integration of Literacy and numeracy in the Learning Process

The figure above shows that 80% of respondents (12 out of 15 teachers) often integrate literacy and numeracy in the learning process (score 4 out of 5), while 13.3% chose a score of 3, and only 6.7% rated it very often (score 5). No respondents gave a score of 1 or 2, indicating that in general, numeracy integration is quite strong in their learning practices. This reflects a good understanding of the importance of literacy and numeracy in the context of basic education. According to Ernawati et al. (2022), the integration of numeracy in thematic learning can improve students' critical thinking and problem-solving skills. Support for this practice aligns with the ethnopedagogical approach, which emphasizes the local cultural context to strengthen the understanding of mathematical concepts in a contextually and meaningfully relevant way.

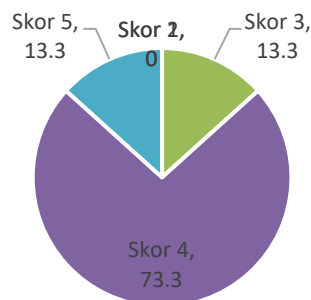


Figure 4. Access to numeracy teaching materials

The results of data analysis from the statement "I have access to learning resources or teaching materials to teach literacy and numeracy" in Figure 4 above show that 73.3% of respondents have access to learning resources or numeracy teaching materials (score 4), while 13.3% stated that they had very good access (score 5), and the rest (13.3%) were at a moderate level (score 3). This indicates that most teachers have access to adequate learning resources to support their teaching of numeracy and literacy. Access to relevant teaching materials, particularly those grounded in local contexts or ethnopedagogy, significantly enhances the quality of numeracy instruction (Nugroho, 2024).

The ability of teachers to design learning activities that support literacy and numeracy is closely related to access to relevant learning resources. Not only the ability to utilize, but also to develop access to learning resources, so that they can be meaningful to students. The results of data

analysis from statement 5, "I can create questions or activities that support students' literacy and numeracy skills," are presented in Figure 5.

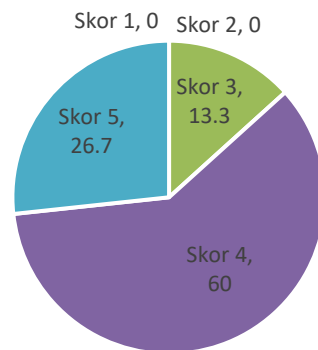


Figure 5. Teachers' ability to design learning activities that improve literacy and numeracy

Based on the results of the questionnaire that has been distributed, it shows that 60% of respondents agree that they can create questions or activities that support students' literacy and numeracy skills, while 26.7% disagree and 13.3% are neutral, so it can be concluded that the majority of teachers are confident in their ability to design learning activities that support literacy and numeracy. However, the percentage of those who disagree and are neutral indicates a need for increased capacity and support in the development of learning materials. The development of valid and practical literacy and numeracy modules improves students' ability to understand mathematical concepts (Kusuma et al, 2023). In addition, the development of ICT-based literacy and numeracy instruments can help students in facing minimum competency assessments (Ginting et al, 2022).

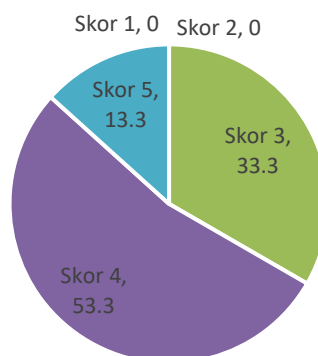


Figure 6. Understanding the Concept of Ethnopedagogy in Learning

The results of data analysis from statement 6 "I understand the concept of ethnopedagogy as a learning approach based on local culture or local wisdom" show that 53.3% of respondents agree and 13.3% strongly agree that teachers have understood the concept of ethnopedagogy as a learning approach based on local culture, and 33.3% are neutral. This indicates that ethnopedagogy is not a new concept for most teachers. However, a significant proportion of respondents who are neutral indicate the need to improve the understanding and application of this concept in learning practices. The ethnopedagogical approach in learning can enrich students' understanding of culture and science, as well as increase the relevance of learning to everyday life, thereby shaping students' character through the integration of local culture in the learning process (Hidayati et al., 2024; Fakhroh et al., 2020).

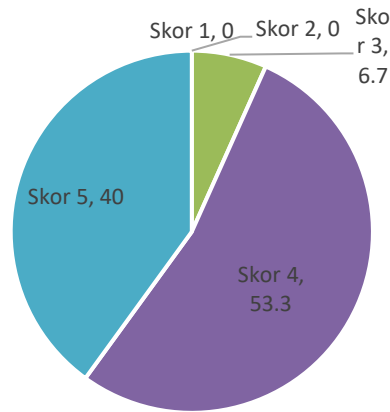


Figure 7. Ethnopedagogy increases students' interest in learning

The results of data analysis from statement 7, "I believe that local cultural values can increase students' interest in learning." Figure 7 shows that 53.3% of respondents agree and 40% strongly agree that local cultural values can increase students' interest in learning, while only 6.7% are neutral. This indicates that the majority of respondents recognize the significant role of local culture in fostering more contextual, relevant, and meaningful learning. The local wisdom-based learning approach has been shown to strengthen student identity, increase emotional involvement, and foster a sense of ownership of the material being studied. Research by Hidayati et al. (2024) confirms that integrating local values in science learning can enrich students' understanding and build a bridge between science and everyday life. Local culture-based learning makes a positive contribution to improving students' literacy and character by increasing cultural awareness within a multicultural educational context (Suratmi et al., 2024; Fatima et al., 2024).

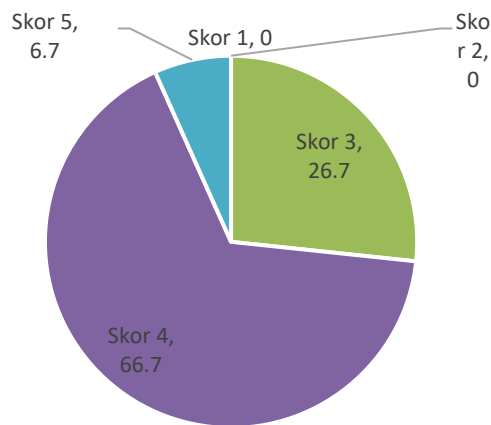


Figure 8. Integration of ethnopedagogy in learning

Figure 8 presents the results of data analysis from the statement "I have integrated local wisdom in classroom learning," indicating that 66.7% of respondents agreed, 6.7% strongly agreed, and 26.7% were neutral. These results indicate that the majority of teachers have made efforts to integrate local cultural values into the learning process, although some have not fully implemented them consistently. The integration of local wisdom is crucial for fostering contextual and meaningful learning, as well as enhancing students' cultural identities. The integration of local wisdom culture into the Merdeka Curriculum can encourage learning innovations that are more relevant to students' lives (Shufa et al., 2024).

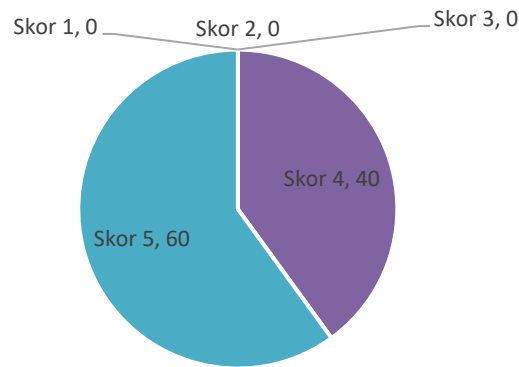


Figure 9. Training needs for compiling teaching materials

The results of the data analysis from the statement "I feel the need to receive training on the application of ethnopedagogy in numeracy learning" (Figure 10 above) show that 40% of respondents agree and 60% strongly agree with the need for training in compiling teaching materials based on local culture. This demonstrates the high awareness among teachers of improving their competence by compiling teaching materials based on ethnopedagogy. The development of teaching materials based on local wisdom in the Islamic religious education curriculum can enrich learning materials and improve students' understanding of local cultural values (Rifa'i, 2023). In addition, training in creating teaching materials based on local wisdom, conducted by Ekwandari et al. (2024), showed that teachers who received this training were able to produce teaching materials relevant to the local context and increased student involvement in learning. Thus, structured and ongoing training is necessary to equip teachers with the skills and knowledge to integrate local culture into teaching materials, thereby creating a more meaningful and contextual learning process for students.

## CONCLUSION

Based on the results of a preliminary study, which involved distributing questionnaires to elementary school teachers, it can be concluded that the majority of teachers are aware of the importance of improving literacy and numeracy as part of the basic competencies in learning in elementary schools. However, respondents were still found to face obstacles in integrating local cultural elements into teaching materials, which indicates a lack of understanding or teaching materials that are in accordance with the ethnopedagogy approach. Thus, ethnopedagogy-based training in teaching material development can be a strategic solution to overcome the literacy and numeracy gap while strengthening education rooted in culture.

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