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Analysis of Literacy and Numeracy Levels Based on AKM for Students of CLC Budi Luhur 1 Biah Based on Demographic Factors

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ABSTRACT: This study aims to analyze the level of reading literacy and numeracy skills of students at the Budi Luhur 1 Biah Community Learning Centre (CLC), Sabah, Malaysia, based on the Minimum Competency Assessment (AKM) standards, and to examine the relationship between demographic factors and the achievement of these competencies. This research is important considering that CLC acts as an alternative educational institution for children of Indonesian migrant workers who have limited access to formal education. This study uses a quantitative approach with a descriptive correlational design. The research subjects were 26 fifth-grade students at CLC Budi Luhur 1 Biah. Data on literacy and numeracy skills were obtained through AKM-based tests, while data on demographic factors were collected through questionnaires. Data analysis was conducted using descriptive statistics to describe the level of student ability and correlation tests to identify the relationship between demographic factors and literacy and numeracy skills. The results of the study indicate that students' reading literacy skills are in the sufficient (proficient) category, indicating that students have been able to understand explicit information, identify main ideas, and draw simple conclusions from the text. In contrast, students' numeracy skills are in the basic category, indicating limitations in mathematical reasoning and contextual problem solving. Demographic factors did not significantly correlate with reading literacy skills, indicating that literacy learning experiences in CLC environments developed evenly. However, family characteristics significantly correlated with numeracy skills, while socioeconomic status showed a trend toward a near-significant relationship. These findings suggest that the family environment plays a crucial role in providing contextual numeracy experiences for students. This study concluded that students' literacy skills developed more effectively than their numeracy skills, highlighting the importance of the family's role in supporting the numeracy development of migrant children.

KEYWORDS: Literacy, numeracy, migrant children, Community Learning Center (CLC), demographic factors

INTRODUCTION

Literacy and numeracy are fundamental skills that occupy a crucial position on the global education development agenda in the 21st century. UNESCO emphasizes that literacy and numeracy are not merely reading and counting skills, but also serve as essential instruments for active participation in modern digital society (UNESCO, 2021). However, reality shows that this challenge remains significant. UNESCO data from 2023 revealed that approximately 771 million adults worldwide have not mastered basic literacy and numeracy skills, and 98% of them live in developing countries (UNESCO Institute for Statistics [UIS], 2023). The concept of literacy has undergone significant developments in meaning over time. Initially, literacy was understood simply as the ability to read and write. However, the concept has now evolved into a more complex and multidimensional concept. UNESCO (2004) defines literacy as the ability to identify, understand, interpret, create, communicate, and calculate, using printed and written materials related to a variety of contexts. Literacy involves continuous learning that enables individuals to achieve their goals, develop their knowledge and potential, and participate fully in the wider community and society. In the context of modern education, literacy is no longer seen as a set of separate technical skills, but rather as a complex social practice involving language, cognition, and socio-cultural skills.

Similar challenges are even more complex for Indonesian children living abroad, particularly in Sabah, Malaysia. The high rate of Indonesian labor migration to Sabah creates a need for educational services that can ensure the continuity of education for the children of migrant workers. The presence of the Community Learning Center (CLC) in Sabah represents a collaboration between the Indonesian and Malaysian governments to ensure the educational rights of migrant children are guaranteed.

Analysis of Literacy and Numeracy Levels Based on AKM for Students of CLC Budi Luhur 1 Biah Based on Demographic Factors

In the context of the CLC, demographic factors play a significant role in student literacy and numeracy outcomes. The occupational characteristics of parents, who predominantly work in the plantation, construction, and industrial sectors, have implications for residential location and access to learning resources. For example, students living in plantation areas tend to have limited access to additional educational facilities such as libraries or information technology, compared to those living in urban areas. Although the CLC has been operating for a long time, studies on the literacy and numeracy of Indonesian students in Sabah are still limited.

UNESCO (2005) views reading literacy as a fundamental human right and a foundation for lifelong learning, encompassing the ability to identify, understand, interpret, create, and communicate meaning from a variety of texts in diverse contexts. In an educational context, reading literacy serves as a key foundation for academic success because nearly all learning activities rely on the ability to comprehend texts. UNESCO (2021) emphasizes that strong reading skills enable individuals to access knowledge, develop critical thinking skills, and support lifelong learning. Research shows that students with high levels of reading literacy tend to have better academic achievement, stronger analytical skills, and more effective problem-solving skills (Mullis & Martin, 2021). Reading literacy also serves as a means to develop empathy, social understanding, and reflective skills through interactions with various types of texts (Mullis, I. V. S., & Martin, M. O. 2021). Reading literacy measurement is a systematic process for assessing an individual's ability to understand, use, evaluate, and reflect on written texts in various life contexts. The OECD (2019) emphasizes that reading literacy measurement not only assesses the ability to recognize words or understand explicit information, but also assesses the ability to interpret, critically evaluate, and reflect on text. Therefore, reading literacy measurement instruments are designed to measure various levels of understanding, from finding information and understanding meaning to evaluating and integrating information from various sources. This approach emphasizes that reading literacy is a higher-order thinking skill relevant to the needs of a knowledge-based society. Comprehensive measurement enables educators to identify students' reading levels, understand literacy gaps, and design appropriate learning strategies to continuously improve reading literacy skills.

Numeracy is distinct from mathematics, although the two are interrelated. According to Geiger et al. (2015), numeracy is the ability to use mathematics in everyday life contexts. While mathematics focuses more on abstract concepts, numeracy emphasizes the practical application of mathematical understanding. This definition emphasizes that numeracy is not limited to the ability to calculate, but includes the ability to think logically, interpret data, understand quantitative relationships, and use numerical information to solve real-world problems. Thus, numeracy is an essential competency that enables individuals to function effectively in a modern society filled with data-based information. In an educational context, numeracy plays a crucial role in developing critical thinking and problem-solving skills. UNESCO (2021) emphasizes that numeracy is a fundamental skill that supports decision-making in everyday life, such as managing finances, understanding statistical information, and interpreting risks and opportunities. Strong numeracy skills help individuals understand graphs, tables, percentages, and probabilities, which are frequently used in various fields of life, including health, economics, and technology.

A Community Learning Center (CLC) is a non-formal educational institution that provides educational services to communities in need of education as a substitute for, supplement to, and/or complement to formal education (Ministry of Education of the Republic of Indonesia, 2018). This educational institution plays a strategic role as an educational alternative for the children of Indonesian migrant workers who do not have access to formal education in Malaysia. In the context of education for the children of Indonesian migrant workers abroad, CLCs play a crucial role in ensuring the continuity of education for children who face limited access to formal schooling. The Ministry of Education, Culture, Research, and Technology explains that CLCs provide educational services equivalent to primary and secondary schools, using a national curriculum tailored to local conditions and student needs (Kemendikbudristek, 2020). In addition to providing academic services, CLCs also function as centers for character development, strengthening national identity, and developing life skills relevant to the lives of migrant communities. CLCs are characterized by flexible, contextual, and community-based learning.

RESEARCH DESIGN

This study used a quantitative approach with a descriptive correlational design. The quantitative approach was used to obtain numerical data on students' literacy and numeracy levels based on the Minimum Competency Assessment (AKM)..

Participant

In this study, the population was all 5th grade students of CLC Budi Luhur 1 Biah Elementary School, totaling 26 students, and this study used total sampling, where the entire population became the research sample.

Analysis of Literacy and Numeracy Levels Based on AKM for Students of CLC Budi Luhur 1 Biah Based on Demographic Factors

Procedure

In this study, a written test was used to collect data on students' literacy and numeracy skills. After the written test, the sample was directed to complete a questionnaire to collect demographic data.

Research Instrument

This study used two types of research instruments: the AKM test and a questionnaire. The AKM test was used to determine students' literacy and numeracy scores, while the questionnaire was used to collect student demographic data.

Data Analysis Techniques

This study uses quantitative data analysis to describe and compare the literacy and numeracy levels of CLC Budi Luhur 1 Biah students based on AKM standards and demographic factors through a descriptive and comparative approach with the help of SPSS ($\alpha = 0.05$). Descriptive analysis was carried out by calculating the mean, median, mode, minimum-maximum value, and standard deviation, then the scores were classified into AKM levels and analyzed for their percentage distribution in each demographic category and presented in tables and graphs. Before analyzing differences between groups, prerequisite tests were carried out in the form of normality tests (Kolmogorov-Smirnov/Shapiro-Wilk) and homogeneity tests (Levene) to determine the hypothesis tests used.

RESULT

The results of the study show that students' reading literacy skills are in the sufficient (proficient) category.

Descriptive Statistic

The research results are presented in the form of descriptive statistics, variable distribution, and correlation tests to describe the level of literacy and numeracy based on AKM.

Table 1. Descriptive Statistics of Literacy and Numeracy Scores

Variable	N	Min	Max	Mean	SD
Literacy	26	46	86	61.23	12.40
Numeracy	26	31	64	46.88	9.67

Table 2. Distribution of Student Literacy Levels

Category	Amount	Percentage
Base	9	34.6%
Capable	12	46.2%
Proficient	5	19.2%
Needs Intervention	0	0%

Based on Table above , the analysis results show that the majority of students are in the proficient category (46.2%), indicating that their ability to understand text information and draw simple conclusions has developed well. A further 19.2% of students are in the advanced category, demonstrating the ability to understand complex information and integrate text meaning. However, 34.6% of students are still in the basic category, indicating limitations in understanding implicit information and connecting ideas within the text.

Table 3. Distribution of Students' Numeracy Levels

Category	Amount	Percentage
Base	20	76.9%
Capable	6	23.1%
Proficient	0	0%
Needs Intervention	0	0%

Analysis of Literacy and Numeracy Levels Based on AKM for Students of CLC Budi Luhur 1 Biah Based on Demographic Factors

The analysis results showed that the majority of students (76.9%) were in the basic category, indicating that their numeracy skills were still limited to understanding simple concepts and procedures. Only 23.1% of students reached the proficient category, and none reached the advanced category. These findings indicate that students' numeracy skills still require serious attention, particularly in mathematical reasoning and contextual problem-solving. This situation indicates the need for more contextual and experience-based learning strategies to improve students' numeracy skills.

Table 4. Correlation of Demographic Factors with Literacy Ability

No	Demographic Factors	r	Sig. (p)	Description	Strength of Relationship
1	Parents' Age	0,244	0,230	Not Significant	Weak
2	Gender	0,275	0,174	Not Significant	Weak
3	Socioeconomic Status	0,258	0,203	Not Significant	Weak
4	Family Characteristics	0,181	0,376	Not Significant	Very Weak
5	Geographic Location	-0,256	0,207	Not Significant	Weak
6	Ethnicity & Culture	-0,141	0,491	Not Significant	Very Weak
7	Migration Status	-0,233	0,251	Not Significant	Weak
8	Health	-0,117	0,568	Not Significant	Very Weak
9	Parents' Education	0,222	0,275	Not Significant	Weak
10	Parents' Occupation	-0,088	0,669	Not Significant	Very Weak

Based on Table 4, All demographic factors had a significance value >0.05, indicating no significant relationship between demographic factors and student literacy skills. The correlation coefficient value showed a very weak to weak relationship, indicating that student literacy skills were relatively unaffected by differences in demographic characteristics. This condition indicates that literacy learning experiences at CLC were relatively uniform, so differences in student backgrounds did not result in significant differences in literacy achievement.

Table 5. Correlation of Demographic Factors with Numeracy Ability

No	Demographic Factors	r	Sig. (p)	Description	Strength of Relationship
1	Parents' Age	0,061	0,766	Not Significant	Very Weak
2	Gender	0,248	0,223	Not Significant	Weak
3	Socioeconomic Status	0,387	0,051	Not Significant	Weak–moderate
4	Family Characteristics	0,443	0,024	Significant	Moderate
5	Geographic Location	0,107	0,601	Not Significant	Very Weak
6	Ethnicity & Culture	0,001	0,995	Not Significant	Very Weak
7	Migration Status	0,114	0,580	Not Significant	Very Weak
8	Health	-0,137	0,505	Not Significant	Very Weak Weak
9	Parents' Education	0,266	0,189	Not Significant	Very Weak
10	Parents' Occupation	-0,074	0,721	Not Significant	

The analysis results show that family characteristics have a significant relationship with students' numeracy skills ($p < 0.05$) with a moderate strength of relationship. This suggests that family structure and support play a role in the development of children's numeracy skills. Socioeconomic status shows a near-significant value, indicating a tendency for economic conditions to influence numeracy skills, particularly related to access to learning resources and educational support at home. Other demographic factors do not show a significant relationship, likely due to similarities in social conditions and learning environments among CLC students.

DISCUSSION

Students' Reading Literacy Ability Level

The results of the study indicate that the reading literacy skills of CLC Budi Luhur 1 Biah students are in the proficient category, characterized by the ability to understand explicit information, identify main ideas, and draw simple conclusions from texts, thus

demonstrating an adequate literacy foundation for developing higher-order thinking skills and cognitive readiness to face more complex learning; reading literacy not only functions as a basic academic skill, but also as a means of acquiring knowledge, understanding information, and developing 21st-century critical thinking skills. In a contemporary literacy perspective, reading is understood as a social practice that develops through interactions with cultural environments, languages, and social experiences (Street, 2020); in migrant communities such as CLC, the simultaneous use of Indonesian and Malay creates unique literacy practices, where multilingual exposure increases linguistic flexibility and metalinguistic awareness that support a deeper understanding of text meaning (García & Kleifgen, 2022), so that students' literacy skills can be understood as the result of the interaction of formal learning and language practices in social life. In addition to language factors, family and community literacy practices play an important role in reading development; A family environment that supports reading activities, active verbal communication, and interaction with texts improves reading comprehension (Azizah, 2024), and family literacy practices have been shown to be significantly related to vocabulary development and text comprehension in elementary school-aged children (Sénéchal & Young, 2021), indicating that literacy develops through the school, family, and community ecosystem. Contextual and meaningful literacy learning also improves reading skills because connecting texts to students' real-life experiences increases cognitive engagement and reading motivation (Afflerbach & Cho, 2021); in the context of CLC, reading materials relevant to migrant students' lives foster deeper text comprehension and enhance inferential and reflective skills (Kim & Park, 2022). However, some students remain in the basic category, demonstrating gaps in understanding implicit meaning and integrating text information. Inferential and evaluative skills, as indicators of higher-order thinking, require in-depth reading practice and systematic learning strategies (Mullis & Martin, 2021). Therefore, literacy development needs to be directed at improving understanding of implicit meaning, information evaluation, and critical thinking through in-depth reading strategies and reflective discussions.

Students' Numeracy Ability Level

The results of the study indicate that students' numeracy skills are still in the basic category, with most students only able to perform simple arithmetic operations and understand basic numerical concepts, thus reflecting limitations in mathematical reasoning and contextual problem solving; numeracy is a complex competency that includes understanding quantitative relationships, data interpretation, and the use of mathematical concepts in real situations (OECD, 2023), so low achievement indicates that students' quantitative thinking skills have not developed optimally. Unlike reading literacy which develops through everyday language interactions, numeracy requires consistent practical experience in various life contexts, such as counting money, measuring food ingredients, or reading simple graphs that strengthen understanding of mathematical concepts (Hidayah & Retnawati, 2024); in migrant communities, limited contextual numerical experience can hinder the development of numeracy skills. Global research shows that migrant populations and vulnerable groups often experience numeracy gaps due to limited access to education, learning resources, practical numerical experience, socioeconomic conditions, high mobility, and limited access to learning technology (UNESCO, 2022; Patterson, 2025). Numeracy demands abstract thinking and logical reasoning skills that develop through systematic and contextual learning. Learning that focuses on routine procedures tends to limit numeracy development, whereas real-world problem-based approaches and concrete representations enhance conceptual understanding and problem-solving skills (Boaler, 2022; Niss & Højgaard, 2021). The differences in achievement between literacy and numeracy indicate that reading develops through intensive, natural language interaction, while numeracy requires more intensive practical experience and ongoing contextual learning. Therefore, integrating numeracy into everyday activities is crucial for improving students' mathematical reasoning.

The Relationship between Demographic Factors and Literacy Ability

The results of the study showed that demographic factors did not have a significant relationship with students' reading literacy skills, indicating that literacy skills develop relatively evenly despite differences in socioeconomic background, family structure, and other demographic characteristics. From a sociological perspective, reading literacy is influenced by social practices and language experiences within the social environment. When students receive uniform literacy experiences, equal access to reading materials, and intensive language interaction, the influence of demographic factors on literacy achievement tends to decrease (Snow, 2021). This condition can be explained through the concept of *opportunity to learn*, namely equal learning opportunities provided by CLC through a homogeneous curriculum, learning methods, and literacy activities, so that an inclusive and adaptive learning environment can reduce literacy gaps due to socioeconomic differences (OECD, 2022). Furthermore, literacy develops through repeated language practice and consistent social interaction; intensive communication within families and migrant

communities contributes to increased vocabulary, language comprehension, and text comprehension (Sénéchal & Young, 2021), so that social literacy practices can compensate for limited formal educational resources. These findings also align with Bronfenbrenner's ecological theory of education, which emphasizes the interaction of various environmental systems. The school environment, as a microsystem, is the dominant factor providing consistent literacy experiences, thus minimizing the influence of family background (Reardon, 2022). Furthermore, reading literacy develops more easily through exposure to everyday language and communication than numeracy, which requires specialized cognitive experience. Therefore, a communicative migrant community environment can be a protective factor for students' literacy development. These findings underscore the strategic role of CLC in creating educational equity and reducing literacy gaps. When learning experiences are provided equitably and with quality, differences in demographic background are no longer a determinant of students' literacy achievement.

The Relationship between Demographic Factors and Numeracy Ability

The results of the study indicate that family characteristics have a significant relationship with students' numeracy abilities, while other demographic factors are not significant and socioeconomic status shows a tendency to approach significance, thus confirming that numeracy as a cognitive competency is strongly influenced by the family environment and daily experiences involving the use of numbers and mathematical concepts. Numeracy develops through contextual experiences such as counting money, measuring groceries, reading timetables, and comparing prices, and children's involvement in family numeracy activities contributes to the development of mathematical abilities and quantitative reasoning (Cosso et al., 2025). This finding is in line with the concept of the *home numeracy environment*, namely a home environment that provides numerical interactions and daily calculation activities that enhance the understanding of mathematical concepts (Susperreguy et al., 2020), while limited time, resources, and parental involvement—especially in migrant families with long working hours—can limit children's numeracy experiences (UNICEF, 2023). The approaching significance of socioeconomic status indicates that access to learning resources and educational facilities also influences numeracy development (OECD, 2022). Unlike reading literacy, which develops through natural language interaction, numeracy requires specific cognitive experiences, repeated practice, and systematic, contextual learning (Niss & Højgaard, 2021), making family support a crucial factor in strengthening mathematical understanding. These findings confirm that numeracy improvement cannot depend solely on schooling but requires family involvement and the integration of numeracy activities into everyday life.

CONCLUSION

This study aims to analyze the reading literacy and numeracy skills of students at CLC Budi Luhur 1 Biah and the relationship between demographic factors and the achievement of these competencies. The results indicate that students' reading literacy skills are in the sufficient (proficient) category. Most students are able to understand explicit information, identify main ideas, and draw simple conclusions from texts, demonstrating an adequate literacy foundation. Conversely, students' numeracy skills remain in the basic category. The majority of students are limited to understanding simple numerical concepts and are not yet optimal in mathematical reasoning and contextual problem solving.

Demographic factors do not have a significant relationship with reading literacy skills, indicating that literacy learning experiences in the CLC environment are relatively evenly distributed. However, family characteristics have a significant relationship with numeracy skills, while socioeconomic status shows a trend toward a near-significant relationship. These findings emphasize the important role of the family environment in supporting the development of students' numeracy skills.

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