

Challenges Faced by Students in Developing Mathematical Literacy Skills in the Indonesia-Malaysia Border Area

Totok Victor Didik Saputro^{1*}, Yosua Damas Sadewo², Pebria Dheni Purnasari³, Silvester¹, Felisitas Viktoria Melati¹ and Falenthino Sampouw⁴

¹Elementary Teacher Education, Institut Shanti Bhuana, Bengkayang, 79211, Indonesia

²Educational Technology, Universitas Negeri Jakarta, Jakarta, 13220, Indonesia

³Primary Education, Universitas Negeri Yogyakarta, Yogyakarta, 55281, Indonesia

⁴Mathematics Education, Universitas Papua, Papua Barat, 98314, Indonesia

ABSTRACT

Mathematical literacy skills play a crucial role in meeting the demands of the modern world. However, developing these skills causes significant challenges, particularly in the Indonesia-Malaysia border region. This study aims to identify and analyze the specific challenges prospective primary education teachers face in developing mathematical literacy skills while teaching basic mathematical concepts in the border area. The research employs a qualitative design using semi-structured interviews, focus group discussions, and classroom observations for in-depth data collection. The subjects of the study are 55 undergraduate students enrolled in the Primary Education Study Program, which takes the “Basic Concepts of Mathematics II course. The data were analyzed using thematic analysis to identify themes and patterns related to the challenges in developing mathematical literacy skills. The findings reveal that the challenges faced by prospective primary education students are centered on two aspects, namely, knowledge of mathematical literacy skills and the implementation of teaching methods in developing mathematical literacy skills.

Keywords: Border area, educational challenges, mathematical literacy skills

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E-mail addresses:

totok.victor@shantibhuana.ac.id (Totok Victor Didik Saputro)
yosuadamassadewo_9902921035@mhs.unj.ac.id (Yosua Damas Sadewo)

pebria.dheni@shantibhuana.ac.id (Pebria Dheni Purnasari)

silvester@shantibhuana.ac.id (Silvester)

felisitas@shantibhuana.ac.id (Felisitas Viktoria Melati)

f.sampouw@unipa.ac.id (Falenthino Sampouw)

* Corresponding author

INTRODUCTION

The Merdeka Belajar Kampus Merdeka (MBKM) policy is one of the initiatives being promoted by the government for implementation in higher education (Supriati et al., 2022). MBKM is an independent and versatile higher education learning model designed to create a creative learning community that does not impose limits and

meets students' needs (Danuwikarsa & Khoris, 2024). The MBKM program, mandated by the Minister of Education and Culture Regulation No. 3 2020, aims to create competitive individuals with diverse learning experiences and competencies, including mathematical literacy, promoting healthy, intelligent, adaptive, creative, innovative, skilled, dignified, and productive individuals.

Mathematical literacy is the ability to apply mathematical knowledge and skills in a variety of real-world contexts (Sitopu et al., 2024). It involves more than just solving equations or performing calculations; it encompasses understanding, interpreting, and communicating mathematical ideas effectively (Hwang & Ham, 2021). Students who excel in math can think critically, solve problems using math, and make decisions based on data. These skills are crucial in a data-focused world. Students along the Indonesia-Malaysia border face challenges due to limited resources, inconsistent teaching quality, and economic inequalities. (Nurmasari et al., 2024). Additionally, cultural and linguistic diversity can further complicate teaching and learning. Addressing these challenges requires targeted interventions such as teacher training, curriculum adaptation, and resource allocation to ensure that all students, regardless of location, can develop strong mathematical literacy skills.

Furthermore, mathematical literacy is about mastering content and students' abilities to analyze, reason, and solve daily mathematics problems (Hapsari et al., 2022). This study examines the challenges faced by prospective primary education students in developing their mathematical literacy skills, particularly in the Indonesia- Malaysia border regions, as they prepare to become future primary school teachers and significantly influence future students' abilities.

PROBLEM STATEMENT

This study aims to identify and analyze the challenges faced by prospective primary education teachers in the Indonesia-Malaysia border region in mastering and implementing mathematical literacy concepts while teaching basic skills in these challenging contexts.

RESEARCH QUESTIONS

How does the knowledge of mathematical literacy skills among prospective primary education teachers influence their ability to teach basic mathematical concepts effectively? This qualitative study explores the challenges elementary school teacher candidates face in developing mathematical literacy skills in the Indonesia-Malaysia border areas. It uses purposive sampling to select 55 university students, with 12 chosen for in-depth interviews. Data collection includes a questionnaire on students' self-perceived challenges and semi-structured interviews (Creswell & Poth, 2016; Merriam & Tisdell, 2015). Data analysis follows a three-step process—data reduction, display, and conclusion drawing—using open coding to identify themes. Validity is ensured through member checking and peer

review (Corbin & Strauss, 2014; Miles & Huberman, 1994; Patton, 2014). The study aims to uncover barriers affecting students' pursuit of mathematical literacy.

The study assessed students' mathematical literacy using various indicators, showing 25.45% understanding of quantity, number systems, and algebraic properties, 7.27% understanding of abstraction and symbolic representation, 20% understanding of mathematical structures, and 16.36% understanding of functional relationships. Low mathematical literacy impacts personal career growth and financial decision-making, and at the societal level, it affects economic productivity and social equity (Hoareau & Tazouti, 2024). Addressing this requires better education, teacher training, and early interventions (Callingham & Watson, 2024).

Implementing a curriculum to foster mathematical literacy requires several key elements: a focus on conceptual understanding, computational skills, and real-world applications of math (Copur-Gencturk & Li, 2023; Hapsari et al., 2022). Differentiated instruction should address diverse student needs, while technology can enhance learning through simulations and interactive tools. Assessment should cover all aspects of mathematical literacy, ensuring a holistic approach (Sreylak et al., 2022). Curriculum adaptation, teacher training, material access, community involvement, and student support are crucial for improving mathematical literacy in low-resource areas, especially border regions. (Purnasari et al., 2023; Saputro et al., 2024).

CONCLUSION

Primary teacher candidates in the Indonesia-Malaysia border regions face major challenges in developing mathematical literacy due to limited instructional materials, socio-economic disparities, and cultural differences. Their varying proficiency levels highlight insufficient support. To address this, schools must enhance resources, offer targeted teacher training, and adopt inclusive, culturally responsive practices to better support students and improve their mathematical literacy skills.

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