ELTIN JOURNAL:
Journal of English Language Teaching in Indonesia
p-ISSN 2339-1561
e–ISSN 2580-7684

TEACHERS' CHALLENGES ON TEACHING MATHEMATICS IN ENGLISH AT BILINGUAL SCHOOLS

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ABSTRACT

This research aimed 1) to identify the challenges faced by mathematics teachers when delivering material by using English in international school. 2) Teachers' strategies to overcome the challenges used by the teachers to overcome these challenges; and 3) the implications of the teachers' perspective for ESP design. The study was conducted at a bilingual school in Medan that follows the Cambridge Curriculum and involved five mathematics teachers from this school. This study used Qualitative Method. Data were collected through interviews to obtain in-depth insights and an interactive analysis method was used for data analysis. The research findings reveal that mathematics teachers encounter several challenges when presenting mathematical materials in English. These challenges revolve around English proficiency, articulation, construction of the sentences and the afraid of mistake in pronunciation. In response to these challenges, teachers employ strategies to enhance their English language skills by learning from various sources, including applications, reference of books, and both printed and online materials. Additionally, they collaborate with their fellow teachers and utilize online platforms to support their learning and prepare instructional materials. These findings underscore the importance of incorporating four key aspects, namely vocabulary mastery, pronunciation, grammar proficiency, and speaking fluency, into the ESP course design for mathematics teachers.

Keywords: Bilingual School, Challenges, ESP, Teaching Mathematics

A. INTRODUCTION

In the ever-globalizing landscape of education, bilingual schools play a pivotal role in equipping students with the linguistic and intellectual dexterity needed for the 21st century. One prominent aspect of bilingual education is the teaching of mathematics in English, a practice that brings with it a unique set of challenges for both educators and students. This research delves into the multifaceted challenges faced by teachers when instructing mathematics in an English-language environment at bilingual schools. It explores the complexities that arise from the intersection of language, culture, and subject matter, ultimately highlighting the significance of tailored ESP courses as a proactive response to

these challenges. The ability to teach mathematics effectively in an English medium is not only a pedagogical challenge but also a broader reflection of the evolving educational landscape (Apsari et al., 2020).

Teaching mathematics is often considered a universal language, a discipline with its symbolic notation that transcends linguistic barriers. However, when mathematics education is conducted in a language other than the student's native tongue, the process becomes considerably more intricate. This complexity is accentuated in bilingual schools, where students are expected to learn mathematical concepts and skills in English alongside their primary language.

One of the primary challenges that educators confront is the varying levels of language proficiency among students. Bilingual schools typically enroll students with diverse language backgrounds and proficiencies. Some students may be fluent English speakers, while others may be at the early stages of language acquisition. This heterogeneity in language skills necessitates adaptive teaching strategies to ensure that all students can access and comprehend mathematical content (AlMarwani, 2020).

The use of specialized mathematical terminology adds another layer of complexity. Concepts like "quadratic equation," "cosine," or "calculus" have precise meanings in English, but these terms may not have direct equivalents in the students' native languages. Consequently, educators must find effective ways to convey these concepts while ensuring that students grasp their significance.Cultural differences also come into play. The cultural context in which mathematics is taught can significantly impact the way students perceive and engage with the subject. Educators must be aware of these differences and adapt their teaching methods to accommodate the cultural diversity present in bilingual classrooms. Furthermore, educators are challenged with the task of translating mathematical symbols and notations from one language to another. While some symbols may have universally accepted translations, others might not, leading to potential misunderstandings and confusion among students (Nguyen et al., 2019).

In addition to these pedagogical concerns, teachers may encounter a lack of appropriate resources, including textbooks, teaching materials, and assessment tools in English. This scarcity can hinder effective instruction and assessment in a bilingual math classroom. To address these challenges comprehensively and empower educators in bilingual schools, the development of ESP courses is imperative. These courses must be tailored to the specific needs of mathematics teachers, providing them with the skills and strategies required to navigate the intricacies of teaching mathematics in an English-language environment.

Prior analysts have examined the usage of English in arithmetic homerooms. In a review led by Kurniawati (2021) at Flores College, innovative work were embraced to plan educational materials for science understudies. An English textbook was produced as a result of the study, which included conducting a need analysis and concentrating on particular subjects (Kurniawati, 2021). Dmitrenko et al. (2020) explored the theoretical justification and development of a self-directed learning approach designed for an English for Specific Purposes (ESP) course tailored for prospective mathematics teachers. The study identified essential components, including the primary objectives (such as goals, objectives, social demand, and requirements), methodology (principles and approach), process (technology and content), and assessment (control and results), as integral elements of the systematic approach to self-directed ESP learning.

Apsari et al. (2020) carried out a study to analyze requirements with the goal of creating an English textbook for mathematics. The investigation utilized a methodology of research and development and engaged 27 students from the mathematics education department. In a distinct examination, Poedjiastutie and Oliver (2017) investigated the difficulties encountered in English for Specific Purposes (ESP) courses at a private institution in Malang, Indonesia. The findings underscored four crucial components frequently lacking in ESP classes: instruction centered on learners, genuine materials, an emphasis on communication, and teaching that is interactive and collaborative (Poedjiastutie & Oliver, 2017).

The majority of the research that have been done have focused on the context of higher education; however, no study has focused on the actual teaching and learning at the Elementary school level. Students at lower educational levels differ from those at higher levels in terms of baseline knowledge, prior learning experiences, cognitive growth, and responsibility for their own learning. They also have various needs, such material covering, on the other hand. To adapt their teaching methods to the needs of their students, lecturers or teachers need to consider these factors. In Indonesia, the mandate that content-area classes be taught in English at the primary, secondary, and tertiary levels has come under scrutiny. However, there are still few research in this area at the Elementary school level (Safnil, 2001).

This article delves into the heart of these challenges, exploring the multifaceted landscape of teaching mathematics in English at bilingual schools. By highlighting these issues and underscoring the critical role of ESP courses, the aim of this research to contribute to the ongoing conversation surrounding bilingual education and the integration of language and subject matter, ultimately striving to enhance the educational experience for both teachers and students in this unique academic setting. With the rise of bilingual programs worldwide, it becomes increasingly important to bridge the gap between language and content knowledge through this exploration, the aim from this article to shed light on the challenges faced by educators and the innovative solutions that ESP courses can provide, ultimately enhancing the learning experience for both teachers and students.

The language-related challenges in mathematics instruction significantly influence students' performance, with research indicating that English language learners may face a disadvantage of up to 15% in mathematics due to language issues. Mathematics, often considered a universal language, primarily relies on numerical operations that transcend linguistic boundaries. However, the challenge arises when teachers are tasked with not only comprehending mathematical operations but also effectively conveying and explaining these concepts in English to their students (Kinnear, 2020).

Further complexity arises from the fact that mathematical terminology can carry different meanings or concepts in contrast to everyday language usage or various contexts. For instance, the term 'root' in mathematics, such as in 'square root,' diverges from its usage in science, where it pertains to 'roots' and 'stems' (Ghasemi & Mozaheb, 2020)

Strategies for Enhancing Mathematics Instruction in English

To mitigate these challenges, educators have devised various strategies to make mathematical concepts more accessible to students. Teachers may employ narrative or procedural contexts that relate to real-life applications, bridging the gap between

mathematics and everyday experiences, such as sports, recipes, entertainment, transport, and technology (Jiang et al., 2020). Furthermore, mathematics teachers must ensure that students are equipped with the necessary vocabulary specific to new topic areas. Vocabulary proves to be pivotal in reading comprehension, even within the realm of mathematics, as students progress through their educational journey, encountering increasingly idiosyncratic terms and abstract concepts.

In addressing the challenges of teaching mathematics in English, educators have adopted pedagogical strategies and techniques from English classrooms that can be effectively implemented in mathematics instruction. These strategies encompass practices such as reading aloud, utilizing authentic materials, allowing moments of teacher silence, engaging in question-and-answer exercises, encouraging peer correction, and utilizing the translation of literary passages (Ahmed, 2014).

By exploring these challenges and the strategies employed to address them, this study aims to provide valuable insights into the dynamic field of teaching mathematics in English at bilingual schools.

English Specific Purpose

ESP, a distinct branch within the realm of English language instruction, is primarily designed to enhance students' proficiency in a specific linguistic domain. Its primary aim is to empower learners with the ability to effectively communicate in English, tailored to their specific needs. ESP, as a pedagogical approach, typically encompasses a thorough needs analysis that identifies the language requirements specific to the students' field of study or workplace. A fundamental aspect of communication competence within ESP also involves understanding the discourse practices that characterize the language's use, an essential skill for learners operating in their respective domains (Ahmed, 2014).

Through needs analysis, educators ascertain the dimensions of language that warrant study within the framework of ESP. This analysis addresses critical questions such as the extent of language proficiency required by students and the underlying reasons for their language study. Neglecting these considerations can potentially pose challenges to educators' roles, as it may lead to dissatisfaction among students and institutions

According to Poedjiastutie & Oliver (2017), A comprehensive examination of the need analysis for both pre-service and in-service teachers in Europe identified several crucial requirements. These encompass the improvement of their understanding of theoretical and methodological aspects, broadening their range of teaching resources, enhancing their linguistic and intercultural competence, and promoting continuous professional development. The study emphasizes the importance of teacher readiness in ensuring the effectiveness of English-medium learning processes, ultimately highlighting the responsibility of educational institutions to facilitate such preparedness.

The purpose of this study is to gather empirical data from Elementary school mathematics teachers regarding their experiences presenting instruction and learning materials in English. The purpose of this study is to determine the level of English proficiency required of mathematics teachers in order to effectively provide instructional materials in English. This study has three main focuses: 1) the challenges experienced by math teachers in providing instruction in English; 2) teacher’s strategies to overcome the challenges used by the teachers to overcome these challenges; and 3) the implications of the teachers' perspective for ESP

design. The findings of this study will be advantageous in a number of ways. It provides guidance for creating ESP courses for mathematics for the English department or other departments involved with it. This study is an accurate reflection of actual classroom instruction. As a result, math educators and future math educators can improve their English proficiency.

C. METHOD

This study employs a qualitative research methodology, which involved conducting interviews with five mathematics teachers from the Islamic School Al Azhar Asyyarif School who specialize in teaching Cambridge mathematics. The qualitative approach was utilized to uncover diverse perspectives and realities as perceived by the research participants, as outlined by Poedjiastutie & Oliver (2017). Data collection took place in October 2023, followed by an in-depth analysis of the collected data using an interactive approach aligned with the research objectives, ultimately leading to the formulation of conclusions.

In this study, the participants consisted of five female mathematics teachers working at Al Azhar Asyyarif bilingual Elementary school, where they taught mathematics using the Cambridge curriculum. Their age range falls between 23 and 25 years. These individuals are all native speakers of Indonesian, with none of them having resided in English-speaking countries for more than six months. Furthermore, they have not participated in any intensive English courses lasting at least one month. The foundation provides weekly English language programs, and pedagogy training sessions are conducted every semester. While their prior teaching experiences varied, it's noteworthy that all participants have been teaching mathematics in Cambridge classes since 2022.

The data collection method was an interview. In this study, the data was acquired through interviews conducted with five mathematics teachers at the bilingual Elementary school Al Azhar Asyyarif. The interview instrument consisted of some questions to elicit information about the research topic.The researchers reached out to five mathematics teachers from Al Azhar Asyyarif School, providing them with a clear explanation of the research's scope and procedures. All of them willingly agreed to participate as participants in the study. Subsequently, an online interview was conducted, and the responses obtained were subjected to analysis using interactive analysis methods.

This approach involves a sequence of four key steps: data collection, data reduction, data presentation, and drawing conclusions. The initial phase involves gathering data through interviews. Subsequently, the data is condensed to extract essential elements and emphasize significant details, with the goal of identifying overarching themes and patterns that enhance data clarity and facilitate researchers in gathering and discovering insights. This process constitutes data reduction. Following this, the data is presented in a concise format, comprising a summary of information, thus allowing for the potential derivation of conclusions. The final stage is drawing conclusions, which occurs once all the data has been fully collected and analyzed.

C. FINDINGS AND DISCUSSION

1. The challenges faced by mathematics teachers when delivering material by using English in international school

As outlined in the preceding sections, instructing mathematics in English poses challenges that require careful attention from subject matter experts. Various factors, such as the proficiency levels of both teachers and students in English, their pedagogical expertise, and the school's facilities, can influence the level of difficulty. However, this study exclusively focuses on the perspective of teachers in providing English-language learning resources. This section presents the results of the data analysis concerning the challenges faced by instructors and their strategies for teaching mathematics in English. Furthermore, the implications of these findings are discussed in the context of developing English for Specific Purposes (ESP) courses tailored for mathematics teachers.

The challenges faced by teachers in teaching mathematics in English can be attributed to several factors, as indicated by the responses of the teachers.

a. The teachers' lack of confidence with their English proficiency in teaching

They felt unsure about their language skills, but they were generally comfortable with their grasp of the mathematical content as stated by participant 4 below:

> "I didn't feel confident because of my language, but I think the material is okay" (Participant 4)

One significant challenge they faced was a deficiency in vocabulary and familiarity with English mathematical terms. They frequently encountered difficulties in identifying the corresponding terms for concepts present in the original Bahasa Indonesia Cambridge reference book. Additionally, they confronted numerous English terms representing the same mathematical concept, complicating the explanation of these concepts to students with limited proficiency in English. As participant 1 pointed out below:

> "The issue arises from the variations in terminology between the reference book and the website. I typically adhere to the book's terminology. At times, I come across several terms for the same concept, such as 'pangkat' in Bahasa, which can be 'index,' 'power,' or 'exponent' in English" (Participant 1)

b. Teachers' lack of articulation and the construction of sentences in English.

They worried about committing errors in these aspects, impeding their proficiency in verbal expression. Articulating words correctly posed a specific challenge, given their infrequent use of mathematical terms outside the classroom, and some terms remained unfamiliar. Additionally, uncertainties about English sentence structure often led them to rely on the patterns from their translations from Bahasa Indonesia, or they grappled with grammatical rules. These language-related challenges adversely affected their ability to convey instructional content effectively. As clarified by participant 5 below:

> "When attempting to communicate, my focus is on adhering to grammar rules. I tend to contemplate intricate words and sentence structures. Some materials are also not entirely clear to me. Indeed, it can pose challenges in my class" (participant 5)

c. Afraid in making pronunciation mistakes

They were uncertain if the students could comprehend the provided learning materials. This uncertainty stemmed from the instructors' hesitancy in conveying content in English and the students' restricted proficiency in the language. Teachers noted that students displayed improved engagement in classroom communication when the instruction transitioned to Bahasa Indonesia.

> "Teaching a Cambridge class poses significant challenges, but it also motivates me to continue learning. I sometimes fear making spelling or pronunciation mistakes, and I worry about whether my students will understand my explanations or if I can effectively convey the materials. Typically, they have better comprehension when I switch to using Bahasa Indonesia." (Participant 3)

> R: "Can you describe some specific challenges you encounter when delivering instructional content in English as a mathematics teacher?"
> P 1: "One major challenge is ensuring that students understand complex mathematical concepts when presented in a language that may not be their first. It requires a careful balance between language proficiency and content comprehension." (Participant 1)

Upon analyzing the three elements contributing to the difficulties of instructing mathematics in English, it is evident that these challenges stem from both the viewpoints of educators and students. To sum up, it was predominantly the educators' standpoint that assumed a more substantial role. Their indecision and diminished confidence impeded their teaching effectiveness, eventually influencing the students' accomplishments. The instructors' capacity to convey the material adeptly and employ fitting language could significantly enhance the students' understanding of the educational materials.

2. Teachers' Strategies to Cope with the Difficulties and Challenges

The difficulties encountered by the mathematics teachers primarily stemmed from their limited English proficiency, encompassing challenges in vocabulary, pronunciation, and grammar. Consequently, these educators employed various strategies to address these difficulties.

In their efforts to enhance their vocabulary mastery, they focused on verifying terms, particularly those found in the Cambridge reference book. To improve their pronunciation, they frequently resorted to online dictionaries, listened to the correct pronunciation, and practiced it. They also sought assistance from colleagues, including English teachers, who played a valuable role in rectifying pronunciation errors. The teachers acknowledged the crucial role pronunciation played in delivering classroom instruction and explaining concepts. Moreover, they honed their English language skills through the use of various platforms like Grammarly and Flitto to ensure the accuracy of their English expressions in the classroom.

In the words of one teacher, "First and foremost, I prepare myself thoroughly and ensure my mastery of the materials I intend to teach. I delve into the specific mathematical terminology relevant to the topic and make an effort to pronounce them correctly. I often turn to Youtube videos to hear the proper pronunciation of words and to gain insights into how concepts are

explained. Additionally, I seek assistance from English teachers to refine my pronunciation." (Participant 5).

> “To enhance my everyday vocabulary, I verified my sentences by using platforms like Flitto or Grammarly. As for mathematical terminology, I relied on the terms provided by Cambridge. (Participant 4).

In terms of improving their general vocabulary, they mentioned utilizing platforms like Flitto or Grammarly to ensure the accuracy of their sentences. When it came to mathematical terminology, they primarily referred to the terms found in the Cambridge reference book

Regarding their instructional materials, these educators relied on a reference book published by Cambridge, which was recommended by the curriculum. They also supplemented their materials with content from other sources, both in print and online. Various online platforms offered mathematical resources, including materials, exercises, and quizzes, such as mathisfun.com, mathgames.com, onlinemathlearning.com, and online quiz platforms (Participant 2).

In managing the students' reactions and outcomes in their mathematics classes, the educators ensured complete proficiency in the educational materials and the English vocabulary and sentences they planned to employ during teaching. They acknowledged that skillful delivery of the learning materials was crucial for fostering student understanding. As a component of their instructional approaches, they also readied the instructional materials and media they would utilize in the class, such as PowerPoint demonstrations, digital quizzes, educational clips, and pertinent devices.

> "I prepare the necessary teaching aids, such as PowerPoint presentations and a stylus pen for notes. Additionally, I study the materials thoroughly, familiarize myself with the sentences I'll use to explain the content, and practice my speaking if time allows." (Participant 1)

> R. “What strategies do you use to overcome challenges related to vocabulary mastery when teaching mathematics in English?”
> P 3: "I actively expand my math-related vocabulary through continuous learning and use of resources such as specialized applications, reference books, and online materials. I also integrate new words into my lesson plans to reinforce understanding."

"In light of the aforementioned data, it becomes evident that addressing challenges such as insufficient articulation, sentence construction difficulties, and apprehension regarding pronunciation errors during the educational process necessitates collaborative efforts among educators. The collaborative approach involves teachers working collectively to surmount these challenges. Furthermore, educators employ technology-driven solutions, such as applications and online platforms, to enhance their proficiency in articulation, refine sentence construction, and alleviate concerns associated with pronunciation errors."

In the realm of language education, addressing challenges related to articulation, sentence construction, and pronunciation is imperative for effective learning. One innovative approach to overcoming these hurdles involves the integration of applications into the educational process. These applications are designed to provide targeted exercises and

interactive experiences, offering learners a digital platform to enhance their linguistic skills. This discussion focuses on the significance of utilizing such applications to mitigate difficulties associated with the lack of articulation, sentence construction, and the fear of pronunciation errors.

The core function of language-learning applications is to provide a dynamic and adaptive environment for learners to refine their articulation and sentence construction. Through interactive exercises, users can actively engage with content that addresses specific linguistic challenges. Furthermore, these applications often incorporate features that allow individuals to practice and improve their pronunciation skills, alleviating the anxiety associated with potential errors. The structured nature of these digital tools enables learners to receive instant feedback, facilitating a targeted and efficient approach to skill enhancement.

3. The implications of the teachers' perspective for ESP design.

The findings have implications that should be taken into account when developing an English for Specific Purposes (ESP) course. The findings have important implications for the development of English for Specific Purposes (ESP) courses. Several key considerations arise from these findings to enhance teachers' abilities in delivering mathematics instruction in English. This involves addressing their English language proficiency and the preparation of teaching materials and media. Within the context of ESP courses, several factors should be taken into account to bolster their proficiency, which includes mastering vocabulary, improving pronunciation, gaining competence in grammar, and enhancing speaking fluency. Once teachers have a firm grasp of these aspects, they are expected to create effective and appropriate material presentations through various media. The advancement of technology has opened up opportunities for educators to access diverse learning resources and activities. Moreover, various platforms are available for designing ESP courses, encompassing support for both linguistic skills and mathematical knowledge.

English for Specific Purposes (ESP), particularly for mathematics teachers, is a crucial factor contributing to the success of the learning process, especially in international or bilingual schools, which are on the rise. As educators, teachers are responsible for conveying and explaining learning materials to facilitate students' understanding of concepts. This necessitates effective communication in which language plays a pivotal role. However, not all higher education institutions offer comprehensive courses to equip teachers with the necessary language skills. Consequently, many teachers encounter challenges when presenting materials in English. In such cases, there is a pressing need for appropriate training.

According to AMRI (2021) proposed that students are inclined to attain heightened levels of academic literacy when subject educators receive ample training, allowing them to communicate proficiently through all four language skills and intentionally develop practical language skills within the framework of their subject classrooms.

The findings highlight the importance of focusing on four crucial aspects—vocabulary mastery, pronunciation, grammar proficiency, and speaking fluency—when designing English for Specific Purposes (ESP) courses tailored for mathematics teachers. Particularly, emphasis on vocabulary is essential due to the unique nature of mathematical terms that may differ from everyday language. Some terms might be entirely unfamiliar to students who

have not been previously exposed to English-medium content. Therefore, teachers should ensure a strong command of the vocabulary they plan to use, including understanding word classes and forms. This knowledge is vital for students to comprehend the relationships between word concepts and the corresponding mathematical tasks. For instance, 'multiple' functions as an adjective, 'the multiples of 10' as a noun, 'multiply' as a verb, and 'multiplication' as a noun (Alsamadani, 2017).

On the flip side, a single mathematical concept might be articulated using various terms, depending on the source of reference. To tackle this, teachers need to have a comprehensive knowledge base and enlighten students about the interchangeability of these terms for the same concept. Introducing the pertinent vocabulary and its application is crucial, consistently integrating it into the teaching and learning procedures to bolster students' comprehension. Once the language is well-grasped and routinely employed in the mathematics classroom, it can contribute to enhanced learning outcomes (Fălăuş, 2017).

The second aspect pertains to pronunciation. Previous studies primarily concentrated on creating learning materials for English for Specific Purposes (ESP) courses in mathematics, often neglecting the importance of assessing or enhancing pronunciation when delivering these materials. ESP courses in higher education institutions are generally designed to support students in comprehending the learning materials independently. As a result, pronunciation practice often does not receive sufficient attention, even though it requires significant training to become proficient.

The third aspect concerns grammar, which is a crucial skill for teachers, applicable not only to mathematics but also to general communication, both in spoken and written forms. It significantly impacts teachers' performance and contributes to better comprehension by students. Mathematics employs a distinct language in its operations, and teachers must identify and introduce this language to their students. Teaching mathematics demands additional efforts to foster cognitive competencies for decoding and encoding mathematical problems while using appropriate mathematical language(Alsamadani, 2017).

The fourth aspect focuses on speaking fluency. Fluency is essential for effective communication, as speakers who are not fluent may struggle to maintain their interlocutors' attention. This difficulty can, in turn, have a negative impact on successful communication and hinder the interaction process. Speaking fluency is characterized by four criteria: the ability to speak at length without excessive pauses, the capacity to construct coherent and meaningful sentences, the proficiency in using appropriate expressions across various contexts, and the demonstration of creativity and imagination in language usage (Septiana, 2019).

Competence in language significantly influences students' achievements in mathematics classes. Elevated proficiency in speaking contributes to increased confidence, and educators who confidently teach mathematics play a pivotal role in inspiring students, especially during the shift from upper elementary to middle school. Thus, it is imperative to incorporate speaking courses into the English for Specific Purposes (ESP) program designed for mathematics teachers. These speaking courses are designed to improve students' speaking abilities and equip them for the professional challenges they may face in their future careers (Indrasari & Indrasari, 2016).

Additionally, based on the results, the structure of the ESP program should incorporate Information and Communication Technology (ICT) to improve the learning encounter. ICT, accessible through various platforms, can support individual learning in pronunciation, vocabulary mastery, and grammatical structure. It also aids instructors in delivering educational materials that can engage students effectively. This corresponds with earlier research indicating that learners have a positive inclination toward employing ICT for ESP learning. Therefore, it is recommended to include ICT tools in the ESP curriculum to supplement conventional textbooks (Poedjiastutie & Oliver, 2017).

D. CONCLUSION

The growing prevalence of schools adopting international curricula or utilizing English as the medium of instruction emphasizes the necessity for educators proficient in English, particularly those teaching mathematics. However, not all higher education institutions have implemented comprehensive English for Specific Purposes (ESP) courses for their students. This gap becomes apparent when graduates enter real-world teaching environments. The study indicates that mathematics teachers faced various challenges, such as English proficiency including the acquisition of vocabulary, pronunciation, grammar proficiency, and speaking fluency. In response, educators employed diverse strategies to address these issues. They endeavored to improve their English proficiency by studying reference materials from various sources, both in print and online, and collaborating with their peers. Additionally, they utilized online platforms to support their learning and generate teaching materials.

Numerous insights can be gleaned from these findings for the development of English for Specific Purposes (ESP) courses tailored for mathematics teachers. Principally, the structure of ESP courses for mathematics educators should encompass four essential components: proficiency in vocabulary, pronunciation, grammar, and speaking fluency. Moreover, a variety of platforms is available to assist in the formulation of ESP courses, including those that enhance both linguistic skills and mathematical knowledge.

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