ANALYSIS OF ENGLISH LANGUAGE SKILLS
OF MATHEMATICS EDUCATION STUDENTS: DETERMINING
FACTORS AND SOLUTIONS

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ABSTRACT
This study aims to analyze the determinants of English skills of Mathematics Education students and identify solutions that can improve them. The research method used was qualitative by involving prospective mathematics teacher students from one of the universities in the city of Madiun. Data collection instruments include questionnaires, interviews, and TOEFL tests. The results showed that factors such as previous educational background, learning motivation, exposure to English, and learning methods affected students’ English skills. Lack of motivation to learn English and inadequate level of English skills are the main obstacles faced by students. Few students reach the adequate TOEFL test threshold. Limitations of this study include limited samples, data collection methods that can create bias, the specific context of Mathematics Education, time constraints, and other possible factors that are not taken into account. Awareness of these limitations is important in interpreting research results and formulating appropriate recommendations to improve the English skills of Mathematics Education students.

Keywords: Mathematics Education students, English, ability.
INTRODUCTION

English Language Proficiency is a skill that covers various aspects that allow individuals to interact with English (Bunau et al., 2022). This includes an in-depth understanding of grammar, vocabulary mastery, proper pronunciation skills, and the ability to communicate effectively in English, both in oral and written form (Desta et al., 2021). English isn't just about mastering basic skills like grammar comprehension and vocabulary use, it also includes the ability to articulate ideas clearly, craft strong arguments, and communicate with a variety of contexts, especially in academic settings (Arbainsyah et al., 2023). In the context of mathematics education, the importance of English language skills cannot be ignored. English is often used as a medium to convey mathematical concepts in scientific literature, textbooks, and academic communication. Mathematics Education students need to be able to understand and communicate in English in order to access mathematical resources, keep up with the latest developments in the discipline, and contribute to global scientific discussions. More than just a communication tool, English language skills also play a central role in the teaching and learning process of mathematics, such as in material delivery, assignment writing, and presentation (Alawerdy & Alalwi, 2022; Asiyah, 2018).

However, in reality, many Mathematics Education students face various obstacles in understanding and using English well. Factors such as previous educational background, learning methods used, level of exposure to English, and level of motivation in learning the language, all play a role in shaping a student's English skills (Dalilah & Sya, 2022; Ma'rifatulloh & Fajarina, 2022). Therefore, this study has an important goal, which is to identify factors that affect their English skills and find solutions that can help improve the English skills of Mathematics Education students. With a better understanding of these challenges and with the right solutions in place, mathematics education can be improved, and students can be better prepared for their role in an increasingly connected global society. A number of previous studies have tried to reveal the challenges and factors that affect the English skills of Mathematics Education students (Chan et al., 2022). Some of these studies focus on aspects such as previous educational background, learning methods, exposure to English, and learning motivation. These studies have provided insight into the extent to which English language skills can influence the quality of mathematics education and student readiness to face the challenges of globalization. However, more in-depth analysis is still needed to understand these factors holistically and identify relevant solutions to improve English skills (Farrell & Jacobs, 2020; S. Fatimah, 2021).

This study in addition to aiming to analyze the determinants of English skills of Mathematics Education students also to identify solutions that can improve their English skills. With a better understanding of the factors that affect English Language skills, we can develop more effective strategies to improve the quality of mathematics education for Mathematics Education students.

This research has significance in several aspects. First, it will provide insight into how English language skills affect mathematics education, and thus, can help improve the quality of mathematics education. Second, this research will provide direct benefits to Mathematics Education students by providing a better understanding of the factors that affect their English Language skills. Third, the results of this research can help universities and lecturers in supporting students in improving their English skills. Lastly, this research is relevant in the context of globalization, where English language skills are key to participating in the global scientific community and contributing to the development of international mathematics.

The formulation of this research problem includes questions about what factors affect the English skills of Mathematics Education students, including previous educational background,
learning methods, exposure to English, and learning motivation. In addition, this research will also look for solutions that can be proposed to improve the English skills of Mathematics Education students.

This research holds a very important urgency because its impact if this research is not carried out can affect several significant aspects in the context of mathematics education. First of all, this study identifies determining factors and solutions to improve the English skills of Mathematics Education students. Without a deep understanding of these factors, the quality of mathematics education can be hampered (L. S. Fatimah & Fatayan, 2022). Students may face difficulties in understanding the material and scientific resources available in English, so the process of learning and teaching mathematics can be disrupted. In addition, better English proficiency among Mathematics Education students is a key factor in their preparation to become qualified mathematics teachers. Without adequate English language skills, the qualifications of mathematics teachers can be threatened, which in turn can affect the development of mathematics education at the national level (Maskar et al., 2022; Wijirahayu & Irawan, 2018). Competent mathematics teachers in English can have a positive impact on students' learning process and their contribution to the development of mathematics curriculum. Globalization in mathematics education requires students to participate in the global scientific community. Students who do not have adequate English language skills may face obstacles in accessing the latest research, participating in international conferences, or contributing to the development of mathematics on a global level (Shaikh et al., 2023). This can reduce the impact and contribution that Indonesian students may make in the context of mathematical sciences of an international nature. In addition, lack of English language skills can also affect students' ability to compete in the global job market. In an increasingly connected world, English language skills have become a key competency sought after by many industries and organizations (Morris et al., 2021). Students who are less proficient in English may face difficulties in finding a job or career, especially in mathematics and education (Widayat et al., 2021; Wijayanti et al., 2022). Finally, the results of this study also have the potential to influence the development of education policy. Decision making in the development of effective education policies requires a deep understanding of the factors that affect students' English skills (Department of English Education & Salsabila, 2023). Without relevant research, education policy development may be poorly informed, which can have a negative impact on the mathematics education system in Indonesia.

Therefore, this research has a high urgency in supporting the improvement of the quality of mathematics education, the preparation of more competent mathematics teacher candidates, and the preparation of students to face global competition in the world of mathematics education. If this research is not conducted, the negative impacts mentioned above are possible, and the challenges in overcoming globalization in mathematics education may be even greater.

The concept framework of this study includes key variables such as English proficiency, determining factors, and solutions. English proficiency is the dependent variable, while determining factors include educational background, learning methods, exposure to English, and learning motivation. Solutions are variables that include various strategies that can be proposed to improve English skills. This research will focus on the relationship between the determinants and English skills of Mathematics Education students and identify relevant solutions to improve their English skills.

METHODS
This research methodology involves a qualitative approach that allows in-depth analysis of factors that affect the English skills of Mathematics Education students. The population that is the focus of this study is prospective mathematics teacher students at one of the universities in Madiun City. The data collection instrument consists of questionnaires, interviews, and TOEFL test results. Data collection began with the distribution of questionnaires to prospective mathematics teacher students in the study population. Questionnaires are used to understand previous educational background, learning motivation, and other factors that may play a role in influencing students' English skills. Next, in-depth interviews were conducted with a number of randomly selected respondents to gain deeper insight into their English learning experience, the obstacles they experienced, and the solutions they deemed relevant.

The data obtained from TOEFL test results is also an important part of this study, because it provides an objective picture of the level of English proficiency of students. TOEFL test results are used to compare and measure students' English skills quantitatively. All data collected from questionnaires, interviews, and TOEFL test results were analyzed qualitatively. Qualitative data from interviews were analyzed with a thematic approach, which allowed the identification of key themes and patterns in student responses. The results of the analysis of the three instruments are used to identify factors that affect students' English skills, as well as to formulate relevant solutions in an effort to improve the English skills of Mathematics Education students.

The research steps are depicted in the diagram in Figure 1.

![Figure 1. Research Flowchart](image-url)
RESULT AND DISCUSSION

Based on the interviews, it was seen that only a small percentage of students were proficient in English, while some had basic understanding but had difficulty responding. The results of the questionnaire revealed that motivation to learn English is still lacking among students, especially because they consider English as a difficult language to master. Regarding the TOEFL test results, of the 35 students who took the test, only 7 managed to reach the TOEFL score threshold of 450, and only 1 student achieved a score of 500. Figure 2 is a presentation of the TOEFL scores of mathematics education students.

![Gambar 2. Nilai Toefl](image)

The figure shows that the majority of students do not reach the expected level of English proficiency, which can potentially hinder their academic performance, especially in the context of teaching mathematics where English language skills are very important. These findings emphasize the importance of addressing students' English learning motivation and improving their language skills to improve overall academic performance.

Discussion

The results of the analysis of the determinants of English Language Proficiency of Mathematics Education students show that the factors that affect their English skills involve previous educational background, learning motivation, exposure to English, and learning methods. Students who have a previous educational background that is less supportive in developing English language skills tend to face more obstacles. In addition, low motivation to learn and the perception that English is difficult are also obstacles. Less exposure to English in the surrounding environment also has a negative impact. Learning methods that are less effective in developing English skills are also a determining factor.

To improve the English skills of Mathematics Education students, a number of solutions have been proposed. First, the development of an integrated learning program between English lessons and mathematics materials is an important step. This kind of program will create opportunities for students to be more comfortable using English in academic contexts, reduce the separation between mathematics and English, and strengthen their language skills.

Furthermore, it is important to provide training to Mathematics Education teachers who focus on developing teaching methods that support the development of students' English skills. Teachers also need to understand the importance of motivating students to learn English more intensely.

Increasing students' exposure to English through extracurricular activities, seminars, or English workshops is also an effective step. Through active participation in these activities,
students will have more opportunities to improve their language skills naturally.

In addition, the establishment of an English mentoring program, where students who are proficient in English can help their peers who face difficulties, will create an environment of support and collaboration among students. This will provide opportunities for students to practice speaking and communicating in English in a more structured manner.

Finally, ongoing evaluation and constructive feedback on students' English skills are essential. With regular evaluations, students will be able to see their progress and feel motivated to continue improving their English skills. By implementing these solutions, it is hoped that Mathematics Education students will experience significant improvements in their English skills, so that they can be more successful in facing the challenges of globalization in the world of mathematics education.

The results of this study provide an important picture related to the determinants of English language skills of Mathematics Education students. It was found that previous educational background, learning motivation, exposure to English, and learning methods play a role in shaping students' English skills. This is in accordance with Fan, (2023); Wijirahayu & Irawan, (2018) Educational background affects English language skills. What's more, lack of motivation to learn English seems to be a major obstacle that needs to be overcome. TOEFL test results also indicate that the majority of students have not reached an adequate level of English proficiency. According to Tenison et al., (2022) The TOEFL test is used as a reference for basic English language skills. To address this issue, a number of solutions are proposed, including integrated learning programs, focused teacher training, English exposure activities, English mentorship, and periodic evaluations. The implementation of these solutions will help Mathematics Education students to overcome obstacles in their English skills and improve language skills significantly. These findings provide an in-depth and relevant look at this issue, which has a major impact on the quality of mathematics education and students' preparation for global challenges.

The implications of the results of this study have a significant impact on the context of mathematics education and the development of students' English language skills. First, the results of the study provide an important foundation for improving the quality of mathematics education. By identifying factors that affect students' English language skills, universities and educational institutions can design more integrated learning programs, enabling students to overcome barriers to understanding and using English in academic contexts. Second, the implications of the results of this study are related to improving English language skills. Mathematics Education students will benefit from the proposed solution, which includes integrated learning programs, focused teacher training, English exposure activities, English mentorship, and periodic evaluations. By implementing these solutions, they will be better prepared to face global competition and communicate more effectively within the global scientific community. Third, the results of this study have an impact on the development of mathematics teacher qualifications. Better English Language Proficiency among Mathematics Education students will help them meet the requirements to become qualified mathematics teachers. They will be better prepared in teaching in English and contribute to the improvement of mathematics education at national and international levels. Fourth, the role of teachers and lecturers in supporting students to develop English skills is becoming increasingly important. The results of this study show the need for them to receive training that supports the development of teaching methods that are more effective in developing students' English skills. In addition, they need to play an active role in motivating students to study English harder. Finally, the results of this study can influence education policy. These findings can be used by governments and educational institutions in identifying critical aspects of students' English
language development. Thus, these findings have the potential to improve relevant curricula and educational programs, which will have a positive impact in the development of quality mathematics education. Through attention to the implications of the results of this study, it is hoped that appropriate steps will be taken to advance the English skills of Mathematics Education students, which will ultimately support the development of better mathematics education and prepare students to become competent mathematics teacher candidates at the global level.

This study has a number of limitations that need to be recognized in evaluating the results. First, the study sample was limited to students from one university in the city of Madiun, so the results may not be directly applied to the wider Mathematics Education student population. This limitation may affect the degree of generalization of the findings. Second, data collection methods involving questionnaires, interviews, and TOEFL tests can create bias or imbalance in responses, and TOEFL test results may not fully reflect a student's English proficiency. Third, the study was conducted in the specific context of Mathematics Education, which means the findings may have limitations in their applicability to other disciplines or different educational contexts. Fourth, research time limitations also need to be considered, because longer studies may allow for more comprehensive data collection and more in-depth analysis. Fifth, in the dynamics of change, the determinants of English language ability and English language ability itself can change over time, so the findings of this study only reflect the conditions at the time the research was conducted. Finally, there may be other factors that were not taken into account in this study that could affect students' English skills, but were not identified or described in the study. Awareness of these limitations is an important step in evaluating research results and determining the direction of further research.

CONCLUSION

The conclusion of this study is that factors such as previous educational background, learning motivation, exposure to English, and learning methods affect the English skills of Mathematics Education students. The study also revealed a lack of motivation to learn English as a major obstacle faced by students, and a large number of them have not reached an adequate level of English proficiency. To address these challenges, several solutions are proposed, including integrated learning programs, focused teacher training, English exposure activities, English mentorship, and periodic evaluations. In order to improve the English skills of Mathematics Education students, we recommend the following steps. First, universities need to consider developing learning programs that integrate English lessons with math material. This will help students feel more comfortable using English in an academic context. Second, teacher training should be an important focus in supporting the development of students' English skills. Mathematics Education teachers must be equipped with skills and knowledge to support students' English development. Third, English exposure activities, such as seminars and workshops, should be enhanced to give students hands-on experience in communicating in English. Fourth, English mentoring programs can help create an environment of support among students. Finally, regular evaluations and feedback on students' English skills are important to help them see progress and stay motivated. By implementing these solutions, it is hoped that the English skills of Mathematics Education students can be improved, helping them in facing the challenges of globalization in the world of mathematics education. This will support the development of higher quality mathematics education and prepare students to become competent mathematics teacher candidates at the global level.

REFERENCES

students’ writing through explicit instruction of conjunctions as cohesive devices:


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Swasti Maharani, Widia Yunita
Vol. 4, No. 3, December 2023 hal. 1666-1674
DOI Artikel: 10.46306/lb.v4i3.460