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Article

Web-based learning management system as media in teaching ESP for mathematics students in higher education

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ABSTRACT

This study examines the techniques used by ESP Math lecturers, the challenges they have in providing ESP learning materials, how they overcome these challenges, and the implications for ESP design. This study employed a qualitative research design by interviewing five ESP Mathematics lecturers teaching at STKIP PGRI Sidoarjo in the 2022-2023 academic year. 15 items of interview guidelines were prepared to gain a deeper understanding of what respondents have done in implementing the techniques of teaching ESP for Mathematics. The data were then examined using an interactive analysis process. The survey found that several of the lecturers had issues with vocabulary, pronunciation, grammar, and speaking fluency. The instructors overcame the obstacles by working together with other instructors and studying from printed and digital resources to better their command of the English language. Additionally, they utilized a web-based learning management system to aid in their education and facilitate the creation of instructional materials. It meant that the development of ESP for math educators had to concentrate on four areas: vocabulary, pronunciation, grammar, and fluency. The ESP curriculum might be developed using any number of platforms, including ones that cater to linguistics and mathematics.

Keywords:

Web-based learning,
Teaching ESP,
Higher education

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Introduction

As a field of study, English for Specific Purposes (ESP) has been growing at a consistent rate due to the fact that the objective is to employ English in a variety of fields (Paltridge, B. & Starfield, 2013), to determine as much accuracy as is possible what students will anticipate, as it is common knowledge that students' success is directly correlated to their level of English comprehension (Kenny, 2016; Mahaputri & Taslim, 2014; Medrea & Rus, 2012). ESP is also known as a process that, despite this, satisfies the requirements of a specific student community. In this instance, the students who are interested in acquiring some professional skills and engaging in work-related practices are the individuals who are the focus of this particular student community (Hüttner et al., 2009). Since its inception and subsequent rise to popularity in the late 1960s, ESP has been subjected to a continuous process of development. This process has included the following steps: defining its scope, improving its methodology, reshaping its objectives and orientation, and increasing the number of coursebooks designed to assist program objectives (Mahaputri & Taslim, 2014; Paltridge, B. & Starfield, 2013). Scientists don't conceive of ESP as a product, but rather as a holistic strategy, which they use to show

can be learned with no special language, textbooks, or methods (Hutchinson, T, & Waters, 1987; Kennedy, C., & Bolitho, 1991).

Learning design, theory, and practice, is a major challenge in teaching. Due to the fact that students engaged in ESP learning are expected to achieve clear goals from the outset, which are directly related to their practical, work-related, or professional needs, designing a course should not be too difficult (Desi Rizma Yanti & Azis Hariyadi, 2019; Medrea & Rus, 2012). Compared to regular English educators, ESP educators have different needs, as pointed out by (Kennedy, 2012), Educators of ESP should be able to: perform and interpret a needs analysis, choose and adapt appropriate teaching materials, design courses and syllabi, develop interesting and relevant activities, and know their subject matter thoroughly. Therefore, it is claimed that teachers should cater lessons to student's needs and interests, which will naturally highlight the crucial part played by ESP students.

ESP is currently taught at universities around the world to train future professionals in various fields and is also promoted by multinational companies through the organization of specialized courses designed to enhance their employees' English proficiency and professional acumen (Fălăuş, 2017). ESP instructors need to be prepared to ask some questions and gather information in the field to build an important database that can be used for future development (Fatmawati et al., 2018; Nezakatgoo & Behzadpoor, 2017). This is necessary to ensure that all potential factors that will be considered during the course development process are addressed. In terms of developing course frameworks, books on the other hand, have been created with the aim of freeing educators from the stress associated with the task of searching for authentic materials (Dewi et al., 2019). By providing original material, it will provide convenience in teaching because ESP educators certainly know more about the condition of students.

Swales was the first practitioner to acknowledge the importance of approaching the ESP program from a multidisciplinary perspective (Swales, 1988). Collaboration, collaboration, and team-teaching are three types of collaboration that are appropriate for ESP teaching. In line with this opinion, (Dudley-Evans, T., & St. John, 1998) suggest using for the work of certain subjects, in this case ESP. Collaboration requires ESP educators to consult with faculty members about many academic areas and work together to build syllabus and activities appropriate for ESP teaching and learning. Team teaching is a teaching method in which two or more educators work together to deliver instruction to a group of learners in a single classroom setting. Thus, the academic goals of the planned ESP can be achieved optimally.

ESP instruction in universities presents its own unique set of challenges. For instance, English as a Second Language (ESP) teachers have to deal with a variety of issues, such as students not being encouraged to learn new topics (Kubanyiova, 2006). This means that ESP students are not only required to be able to demonstrate their competence in English related to certain domains, but they are also required to be acquainted with broad English terminology. In the context of ESP, the constraints mentioned above are considered unique; however, there are also other challenges that ESPs seem to be experiencing. When (Abdulaziz, M. & Shah, S., Mahmood, R. & Fazel e Hagh, 2012) comparing ESP teaching with general English teaching, they found that there are similarities between the two types of teaching as well as differences. The main difference between the two types of English educators is that those who teach general English usually have undergone training to become English educators, but most of those who teach ESP do not. Therefore, ESP educators need to orient themselves to new contexts for which in many cases they have not been prepared. An additional problem that is closely related to language problems is that of grammatical structure and function which tends to be identified as specific to a particular topic. In fact, when developing an ESP course, one will usually focus their attention on specific vocabulary as well as grammatical structures that seem to emerge with some regularity (Fălăuş, 2017).

For educators of ESP, one of the most important considerations that needs to be given is the significance of method in the classroom. Previous researchers have conducted a wide range of experiments relating to ESP, and those investigations have been demonstrated to be successful. As a result, the findings from those studies have provided knowledge to the instruction of ESP. For

instance, with relation to the requirements assessment and instruction within the framework of ESP for Engineering students, which has been carried out by (Alsamadani, 2017; Pollard, D., & Olizko, 2019; Rybushkina, S. V., & Sidorenko, 2015) shows that ESP is a determinant of academic achievement for Engineering students especially in terms of motivating their learning. Development of learning designs, materials and ESP teaching for pharmacy students that has been reported by (Suwandi, E., & Wafa, 2020; Syakur, A., Zainuddin, H. M., & Hasan, 2020) have a positive impact on student learning outcomes majoring in pharmacy. In addition, ESP teaching for Physical Education and Health students conducted by (Mezei, 2016; Pranoto, B. E., & Suprayogi, 2020) prove that ESP is indispensable in improving English learning skills. The development of materials for teaching ESP to Mathematics students has been carried out and the results of developing the module as a product are very effective to apply (Dmitrenko et al., 2020). Teaching in an ESP context has been shown to be applicable to a wide range of scientific disciplines, and it offers students benefits in terms of both the motivation they feel to learn and the academic success they experience as a result of doing so. Some of these findings are presented in the previous section. This study focuses on ESP teaching techniques for students majoring in Mathematics. This is due to the lack of literature that examines or conducts research in the field of Mathematics that focuses on ESP teaching techniques for Mathematics. To fill the gap in previous research, this study focuses on ESP teaching techniques for students majoring in Mathematics. Therefore, conducting research of this nature is of the utmost significance.

Because numbers are often used in mathematical procedures, people often refer to mathematics as a "universal language". Problems that arise in mathematics can be solved by anyone, regardless of their linguistic background (Adoniou, M., & Qing, 2014). However, in order to teach ESP to their students in Mathematics properly, teachers must not only be able to understand the procedure itself, but also to present and explain concepts in English. This presents another obstacle. It is possible that some words and ideas used in mathematics have completely different connotations or applications than they do in everyday language (Halladay & Neumann, 2012). For instance, the word "root" as it is used in mathematics, such as in the expression "square root", refers to an entirely different concept than when it is used in science to refer to the ideas of "root" and "stem" in plants. In both contexts, the word "root" is the same word. Therefore, when it comes to learning ESP Mathematics, it is essential to make use of concepts and to select the appropriate words to explain things.

Mathematics educators who use English as the main language of instruction have unique challenges (Kurniawati, 2021). Teaching mathematics in English has a unique set of challenges, one of which is the need to compete with specialized Mathematical terminology and the expression of educational endeavours which varies widely between Indonesian and English. If students can show that they have reached a certain level of language competence, then learning activities must run smoothly (Adoniou, M., & Qing, 2014). However, in Indonesia, where English is considered a foreign language, classrooms usually feature students with varying levels of English proficiency. This can make learning and communication more difficult. The inability to communicate effectively in English causes challenges in the educational environment (Freeman, 2012). It is clear from the lack of conversations that occur in mathematics lectures that the medium language serves to hinder communication (Waswa, 2020). There are also times when educators have difficulty dealing with themselves, such as when they feel insecure about their English skills due to a lack of information or the lack of amount of training received during their pre-service education (Othman & Saat, 2009). Therefore, ESP for Mathematics educators have an extra responsibility to provide the necessary educational materials to all their students and ensure that communication goes smoothly.

To suit the needs of learners, ESP teaching methods or techniques must be based on the core language demands of the target learners and supported by teaching materials and practices. (Bathia, V., Anthony, L., & Noguchi, 2011). Learner-centred and communicative activities should be emphasized in ESP instruction. The teaching of ESP in the classroom is student-centered, so that the reason for the learner to study a particular field of English in the shortest possible time becomes the basis of teaching so that one of the components of education, namely the curriculum, is the strategy of content and learning materials that guide the teaching and learning process (Kennedy, 2012; Swales, 1988). The curriculum guides the educational system or study program of the institution.

Educators and students must follow the curriculum to meet national education goals. Designing a syllabus for a particular group in a particular context involves designing ESP learning objectives based on the learner's needs and targets. The syllabus reflects the designer's understanding and talent and how to acquire, teach and produce them during learning (Tahir, n.d.). Academics and professionals, especially in ESP for Mathematics, need to select appropriate resources based on demand analysis and syllabus design. The right material offers a stimulus and motivator for learning. Teaching materials are selected, reviewed and rearranged to suit the needs, abilities, and interests of students (Hutchinson, T, & Waters, 1987; Paltridge, B. & Starfield, 2013).

Various Mathematics teaching techniques have been carried out by previous researchers, such as instructional design teaching (Dmitrenko et al., 2020), development of cognitive skills in decoding and coding mathematical problems (Malasari et al., 2021) as well as direct discussion models (Kindsvatter, R., Wilen, W., & Ishler, 1996). Thus, to fill the gap, the research focused on ESP Mathematics teaching techniques in universities. Reasoning and application of techniques in teaching ESP in the educational process of prospective ESP Mathematics lecturers, in our opinion, will contribute to the growth of students' foreign language competence in understanding. Thus, the main objective in this study is to describe learning techniques in English for Specific Purposes (ESP) for learning Mathematics in universities (PT) where ESP for Mathematics is one of the courses (MK) that must be taken as one of the graduation requirements at the strata 1 (S1) level at STKIP PGRI Sidoarjo.

Method

Qualitative research methods were used for this research. The data was obtained by conducting interviews with five ESP Mathematics lecturers at STKIP PGRI Sidoarjo in the 2022-2023 academic year. These lecturers teach ESP Mathematics to students in different classes, namely morning class and evening class. Qualitative techniques are used to generate multiple realities, each of which is investigated from various points of view held by research participants (Casas Anguita et al., 2003; Poedjiastutie, 2017). Information was collected between January and May 2022. After that, interactive analysis was used to check the data according to the research objectives, and this process continued until conclusions were reached. Because this study uses a qualitative methodology, the data collection methods that can be used include observation, interviews, documentation, and a combination or triangulation (Hardani, H., Andriani, H., Istiqomah, R. R., & Ustiawaty, 2020). The information used in this study came from interviews conducted with five lecturers of the ESP Mathematics course at STKIP PGRI Sidoarjo. This instrument consisting of fifteen questions is designed to collect information related to the subject of the investigation. We contacted five different ESP Mathematics lecturers and asked them to guide us through the process and scope of the research. They all gave their consent to participate in this study as respondents. After that, we move on to online interviews. The poll results are evaluated using a technique called interactive analysis.

In this study, we used interactive analysis, which consisted of four steps: data collection, data reduction, data presentation, and drawing conclusions. This study also uses interactive analysis. Interviews were used to collect data for this study. After that, a summary of the data is made to highlight the most significant aspects and highlight the most important elements. It aims to find recurring themes and patterns that will provide clearer data and assist researchers in gathering and finding information. It was a process of bringing everything down. Furthermore, data presentation is carried out with the aim of producing a brief description, a complete collection of facts, and an opportunity to draw conclusions. After all data has been collected and processed, the last stage is drawing conclusions.

Results and Discussion

As discussed in more detail in the previous section, instructing ESP for Maths is a tough task that requires the attention of the subject professor. The level of difficulty may vary depending on a number

of circumstances, including the level of English language proficiency of lecturers and students, level of pedagogic competence of lecturers and students, facilities available at the institution, and so on. However, the scope of this research is limited to the perspective of ESP Mathematics lecturers on the methods they use to present ESP Mathematics learning materials. This section of the findings shows the results of data analysis on the problems and strategies of lecturers in teaching, as well as their techniques for overcoming them. In addition, the consequences of the findings are discussed as factors to be taken into account when designing ESP courses for mathematics lecturers. The main objective which also answers the questions in this qualitative research is to describe the learning techniques in the English for Specific Purposes (ESP) course for Mathematics at STKIP PGRI Sidoarjo. This research was conducted for 5 (five) months, namely in January-May 2022 where lecture activities at the Mathematics ESP MK have been carried out.

Difficulty of Teaching ESP Mathematics by Lecturers

Lecturers apply direct teaching methods when they are in class with students to educate them. They apply this form of teaching technique to provide students with a comprehensive understanding of the topics they are studying. According to the researcher's observations, this approach involves lecturers who orientate the material, and lecturers ensure that students continue to participate and be active in the learning process. From their responses through the interview section, it can be concluded that in general the ESP Mathematics lecturers are not very confident in their ability to teach ESP for mathematics because they are not confident in their own English language skills. Meanwhile, everything related to mastery of the material, lecturers believe that they have mastered these skills. This can be seen in the following interview results:

> *"Karena bahasa saya, saya tidak merasa sangat percaya diri. Saya tidak punya masalah besar dengan konten."* (Because of my language, I didn't feel very confident. I don't have any major issues with the content.) (Respondent 2)

In addition, they lack the concepts of language and mathematics, which contributes to their lack of confidence. There are times when they cannot find an idea that matches the mathematical phrases used in reference books written in Indonesian. They found various terms in English which all refer to the same idea. They face challenges on occasion when trying to communicate ideas to students who have lower levels of English proficiency.

> *"Buku referensi dan situs web masing-masing menggunakan rangkaian terminologi unik mereka sendiri, yang merupakan sumber kesulitannya. Saya hampir selalu menggunakan kata dari buku. Pada kesempatan lain, saya menemukan kata lain untuk ide yang sama, seperti kata "pangkat" yang kami gunakan dalam Bahasa Indonesia. Frase dapat dinyatakan sebagai indikator, kekuatan, atau eksponen ketika berbicara bahasa Inggris."* (The reference book and website each utilize their own unique set of terminology, which is the source of the difficulty. I almost always use the word from the book. At other occasions, I discovered other words for the same idea, such as the word "pangkat" that we use in Bahasa. The phrases can be expressed as indicator, power, or exponent when speaking English.) (Respondent 3)

In addition, the instructors worry that they will stumble on their pronunciation and construct their sentences incorrectly. These circumstances, in some ways, create an obstacle to their natural fluency in speech. Because students don't usually pronounce terms or use them outside of class, and because some terms are foreign to them, pronouncing them correctly becomes even more challenging. In addition, they do not have clarity regarding the construction of the statement. The reason for this is because they are not familiar with grammatical norms or they have a tendency to organize sentence structures based on how they are translated into Indonesian. These factors, no doubt, affect their performance in terms of providing teaching materials.

> *"Ketika saya mendapat dorongan untuk berbicara, peran tata bahasa adalah hal pertama yang muncul di pikiran saya. Pikiran saya secara otomatis mengembara ke kosakata yang menantang dan struktur frasa yang berbelit-belit. Selain itu, ada beberapa komponen yang saya tidak sepenuhnya jelas. Oleh karena itu, ya, itu bisa menjadi sumber pertengkaran bagi saya di kelas."*

(When I get the urge to talk, the roles of grammar are the first thing that come to my thoughts. My mind automatically wanders to challenging vocabulary and convoluted phrase structures. In addition to that, there are several components that I'm not entirely clear on. Therefore, yes, it can be a source of contention for me in the classroom.) (Respondent 1)

Finally, in addition to their concerns over students' language proficiency, they also had concerns about their performance in the ESP for Mathematics class. They are not sure whether students will be able to understand the information presented to them or not. It is possible that this is due, in some ways, to the lecturers' lack of confidence in their ability to present MK, as well as the lecturers' language and students' lower levels of English proficiency. When the lecturer begins to speak Indonesian with students, the lecturer sees that students respond more effectively to the communication that occurs in the classroom.

Lecturers' Strategies to Overcome Difficulties

The challenges for ESP lecturers, especially ESP for Mathematics, are caused by the lack of English fluency in various fields, including vocabulary, pronunciation, and grammar. As a result, educators have applied various techniques to overcome these problems. For the purpose of increasing their vocabulary knowledge, they consult various dictionaries, but dictionaries are their main focus. Usually, lecturers use online dictionaries, listen to the pronunciations in the dictionary, and then practice them to improve their pronunciation. Also helpful in improving pronunciation are peer school instructors and English lecturers. They realized that pronunciation played an important role in conveying the teaching in the classroom and explaining the material. In addition, they practice English using multiple platforms, such as Google Translate, to verify the English expressions they will use in class.

"Saya mulai dengan mempersiapkan diri dan memastikan bahwa saya telah menguasai materi yang akan saya ajarkan. Saya mempelajari kata-kata matematika spesifik topik dan berusaha mengucapkannya dengan tepat. Sebagian besar, saya menonton video YouTube untuk mendengar bagaimana kata-kata diucapkan atau konsep dijelaskan. Saya meminta akademisi bahasa Inggris lainnya untuk memeriksa pengucapan saya." (I begin by preparing myself and ensuring that I have mastered the material I will be teaching. I study the topic's specific mathematical words and attempt to pronounce them appropriately. Mostly, I watch YouTube videos to hear how words are spoken or concepts are explained. I requested other English academics to check my pronunciation.) (Respondent 2)

In developing content, they refer to reference books recommended curriculum from well-known publishers, such as Cambridge or Macmillan. In addition, they borrow from various sources, both written and digital. mathisfun.com, mathgames.com, and online quiz platforms are examples of online math learning resources that include course materials and exercises or quizzes.

"Saya memanfaatkan buku referensi matematika terbitan Cambridge dan buku MacMillan. Terkadang saya mengambil materi dan kegiatan pembelajaran seperti game dari website lain seperti mathisfun.com, mathgames.com, dan nlinemathlearning.com. Situs web ini berspesialisasi dalam pendidikan matematika. Saya menggunakan Google Form, Live-Worksheet, dan Quizizz setiap kali saya perlu melakukan tes atau evaluasi." (I utilize mathematics reference books published by Cambridge and MacMillan book. Sometimes I take the materials and learning activities such as games from other websites such as mathisfun.com, mathgames.com, and nlinemathlearning.com. These websites specialize in mathematics education. I utilize Google Form, Live-Worksheet, and Quizizz whenever I need to do a test or evaluation.) (Respondent 5)

To prepare for students' answers and performances in asking questions in the ESP for Mathematics class, they prepare themselves to master the learning materials and English terms and sentences that they will talk about in class. If the content is presented correctly, it will be easier for students to understand what is being taught. The lecturers are also prepared to teach the various forms of media

they will use in the classroom as part of their pedagogical tactics. The forms of media include PowerPoint files, online quizzes, learning videos, and various electronic devices.

> *"Saya menyiapkan media, seperti PowerPoint dan pena digital pencatat. Selain itu, saya mempelajari materi, mempelajari kalimat yang mungkin saya gunakan saat menjelaskan materi, dan melatih motivasi saya berbicara kapan pun ada waktu yang cukup."* (I get the media ready, such as PowerPoint and a note-taking digital pen. In addition to this, I study the materials, study the sentences that I might use when describing the materials, and practice my motivational speaking whenever there is adequate time.) (Respondent 3)

This tactic appears to have been effective in helping lecturers overcome their challenges. For the purpose of providing students with a more rewarding educational experience, they use a variety of learning methods and resources.

Direct instruction is an instructional technique that is utilized by lecturers in the classroom with the purpose of imparting knowledge to the pupils. They utilize this method of teaching strategy in order to provide students a full comprehension of the subject matter that they are currently learning about. The findings of the research indicate that this strategy calls for lecturers to orient the information, and lecturers also ensure that students continue to participate and be active in the learning process. Follow (Halladay & Neumann, 2012; Kurniawati, 2021; Majid, 2013; Saienko, N., Olizko, Y., & Arshad, 2019), We can say that the direct teaching strategy is when the lecturer takes control and assumes that the students would actively participate in the learning process. This approach to teaching is known as "command and control" teaching. The majority of the instruction in this format is led by lecturers, who are tasked with creating an environment in the classroom that places an emphasis on students' potential to achieve academic success.

They facilitate student learning and practice in the process of completing their projects. After that, evaluate and test students' level of understanding by asking questions about the content as they engage in class activities and giving short and straightforward individual assignments. When students have problems or problems with courses (MK) and assignments, the lecturer will provide feedback and corrections to these students. After that, the lecturers provide opportunities for students to continue their education according to their individual learning philosophies. The findings in this study are in line with the concept proposed by (Kindsvatter, R., Wilen, W., & Ishler, 1996) The list of six instructional functions that are fundamental to the teaching framework is consistent with this approach. This list includes daily review, organizing and presentation, hands-on instruction, feedback and corrective, student self-practice, and weekly and monthly evaluations.

Grammar is closely related to aspects. The ability to compose well-structured phrases is an important talent for instructors in general, and not just in mathematics; this applies to both oral and written communication. This has a significant impact on the performance of educators and ultimately leads to increased understanding among students (Dmitrenko et al., 2020). Mathematics uses some standard terminology throughout its operations. Therefore, lecturers need to be aware of it and explain it to students. The development of the cognitive skills necessary to decode and encode mathematical problems and to communicate solutions in a mathematically acceptable manner is a prerequisite for success in the mathematics classroom (Malasari et al., 2021; Waswa, 2020).

Language skills affect math achievement. Fluency increases self-confidence. Educators with mathematical confidence have an effect on students' learning motivation, especially in high school (Dmitrenko et al., 2020; Kubanyiova, 2006). A mathematics teacher's ESP program must include speaking classes. The speaking course aims to improve students' speaking skills for future professional problems (Malasari et al., 2021). According to the findings, ESP course design should include ICT to facilitate learning. ICT can help with pronunciation, vocabulary, and grammatical structures. This helps educators provide interesting learning resources for students. According to research, ESP learners have a good attitude towards the use of ICT where the ESP curriculum recommends using ICT to complement textbooks (Waswa, 2020).

Considering the Implications of Findings for the Development of Mathematical ESP Design

In light of these findings, there are a number of inferences that may be made concerning the structure of the ESP class. Before teachers can effectively communicate mathematical content in English, they need to be prepared in a variety of different methods first. These techniques involve improving instructors' English proficiency as well as producing educational tools and media for both teaching and learning. When it comes to ESP lessons, there are a few distinct factors to take into consideration that can help with their level of proficiency. These aspects include having a strong command of vocabulary, pronunciation, and grammar, as well as having fluency in one's speech. Once the instructor has demonstrated that they have a prior understanding of this component, it is required of them to construct a suitable and efficient information presentation utilizing any medium. As a direct result of the advancements in technology, lecturers now have access to a greater selection of learning tools and activities. Platforms that support linguistic aspects and platforms that help with mathematical abilities are two examples of the types of platforms that can be utilized in the creation of ESP courses. There are also a variety of other platforms that can be employed.

Conclusion

Lecturers at many universities are required to have a strong command of the English language because those universities either teach in English or embrace foreign curricular models. Because not all universities provide appropriate ESP (MK) courses, issues can occur while graduates are already working in the teaching profession. According to the findings of this research project, ESP for Mathematics lecturers experience a variety of difficulties and roadblocks in terms of their vocabulary, pronunciation, syntax, and fluency in English. They have a variety of coping methods at their disposal. In the beginning, they work on improving their English fluency by interacting with peer lecturers and reference resources. They conduct their research and preparation on several web sites. The use of ESP lectures for mathematics can have a number of different effects. Vocabulary, pronunciation, grammar, and fluency should all be covered in ESP for mathematics. The development of a framework for students' academic accomplishment can be supported by the use of linguistic and mathematical platforms that can be considered in the design of ESP courses.

In this study, the strategies that ESP Mathematics lecturers use to educate their students are analyzed from the perspective of the lecturers themselves. Ignoring the resources available at the university as well as the feedback of the students. The development of ESP curriculum in the subject areas of history or mathematics in junior and senior secondary schools could be the focus of further research.

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