



Need Assessment of English for Specific Purposes Learning Materials

Mukhayyarotin Jauhariyah¹(✉), Maharani Putri², Sharvina Yudatika³, Dhita Sari⁴,
Evangelista Palupi⁵, Nur Qomariyah^{1,2,3,4,5}, and Muchlis^{1,2,3,4,5}

¹ Department of Physics, Faculty of Math and Science, Universitas Negeri Surabaya, Surabaya, Indonesia

mukhayyarotinjauhariyah@unesa.ac.id

² Department of Science Education, Faculty of Math and Science, Universitas Negeri Surabaya, Surabaya, Indonesia

³ Department of Mathematics, Faculty of Math and Science, Universitas Negeri Surabaya, Surabaya, Indonesia

⁴ Department of Biology, Faculty of Math and Science, Universitas Negeri Surabaya, Surabaya, Indonesia

⁵ Department of Chemistry, Faculty of Math and Science, Universitas Negeri Surabaya, Surabaya, Indonesia

Abstract. It is a preliminary study to analyze the need assessment of learning materials in English for Specific Purpose (ESP) courses in Faculty of Mathematics and Natural Science (FMNS) Universitas Negeri Surabaya. Using an explanatory type of research regarding the need for teaching materials in the ESP course. The research subjects are students of FMNS Unesa who have programmed the ESP (English for Math, English for Physics, English for Chemistry, English for Biology, and English for Science) course. Collected data using a questionnaire on the need for teaching materials carried out by an online survey. In learning English for Specific, the majority use the discussion learning model, direct instruction, and cooperative learning. Based on the results of the survey questionnaire, 90% of students experienced the greatest difficulties when explaining the material and practice during the learning process. These obstacles can be overcome when learning applies innovative learning models such as Problem Based Learning, Project Based Learning and Inquiry Learning. However, this has not received great attention and has not been resolved, especially if ESP learning is done online. The suggested alternative solution is to use teaching materials in the ESP learning process. The teaching materials used are in the form of modules.

Keywords: Need assessment · English for Specific Purposes · Learning Materials

1 Introduction

1.1 English for Specific Purposes as the Important Subject in Math and Science

The progress of a nation can be determined and seen based on the formation of the character of its people. In building character, it is very important because the quality

of the character of the community will affect the dignity and progress of a country [1]. English as international language is one of the important communications to understand everything in global community. Not only in everyday life but also in specific purposes, such as in academic or professional career.

The purpose of teaching English in Indonesia has been stated in the Decree of the Minister of Education and Culture No. 096/1967 December 12, 1967, namely developing communicative skills students' English which includes listening, reading, write, and speak. At the college level, students are expected to already have knowledge of English grammar and then apply this knowledge in communication and interact in life [2]. English is an international language and is needed to study various learning resources. The application of English in education often comes from books, journal articles, internet media and other relevant learning resources [3]. Although they both use English, when studying a specific field of study will experience a different experience.

General (language for no purpose) courses at any proficiency level almost always teach too much, e.g., vocabulary, skills, registers or styles some learners do not need, and too little, e.g., omitting lexis and genres that they do [4]. In contrast to general English, English for special needs is studied to understand certain special fields in academic and professional terms. At the college level, now, general English does not need to be repeated. Moreover, English is needed to understand certain academic fields. It will be better if students are taught to apply general English that has been learned for certain academic purposes. In the faculty of Mathematics and Natural Sciences, English is one of the compulsory subjects in accordance with their respective fields. In this case there are English term used for special purposes in studying a particular field known as English for Specific Purposes (ESP).

Hutchinson & Waters (1987) define ESP as an approach to language teaching in which all decisions as to content and method are based on the learners' reason in learning [2, 6–11]. Knowing English and using English for specific purposes is a challenge [4]. ESP is an approach in language learning method that takes all its decisions from the teaching material and in general the learning method is based on the reasons students learn the English language material. ESP learners are adult learners who have experience learning English with the aim of being able to communicate professionally. Therefore, learning ESP was developed based on an analysis of needs, objectives, and learning activities [12]. ESP has developed into one of the fields of teaching English as Foreign Language (EFL) is the most prominent [7].

Teacher skills in using ESP learning materials are very important so that problems do not arise related to language teaching. Learning ESP must be communicative and there is a need for an understanding of the principles. Basically, ESP currently has three specific references in the world of English language education, including the following: (1) certain subsets of English that are needed to perform certain tasks to achieve a certain goal, (2) a branch of language education that studies and teaches a subset of the language English to assist students in successfully carrying out certain tasks to achieve a certain goal, (3) A movement in popularizing the profession ESP [13]. Besides that, specific – purpose of English includes not only knowledge of a particular part of the English language but also competence in the skills necessary to use this language, as well as an adequate understanding of the context in which it is located.

To understand the learning resources for Mathematics, Physics, Chemistry, Biology and Science using English with the specific terms, students need not only the general English but also the ESP. So, students can practice the English skills like reading, listening, speaking, and also writing to know and understand the theory, laws, concepts, also facts in the field of Mathematics, Physics, Chemistry, Biology and Science. So, in Faculty of Mathematics and Natural Sciences (FMNS) Universitas Negeri Surabaya, ESP divided into several types of subjects, namely: English for Mathematics, English for Physics, English for Chemistry, English for Biology, English for Science. However, this is different, based on the results of temporary observations, the special teaching materials used by FMNS students in the English for Specific Purposes lecture have not been found. Students are only trained in English language skills with reading or audio materials as well as data provided during lectures.

1.2 The Learning Materials Need for English for Specific Purposes

In making in ESP program, it is necessary to pay attention to several things including: (1) teaching guidelines, (2) syllabus, (3) the best choice of material for the ESP program, (4) learning objectives and students. That way, teachers are able to prepare all teaching and learning activities and make evaluations for teaching materials. In learning activities, teaching materials play an important role for teachers and students. Without these teaching materials, the effectiveness of learning will be less so that students will experience difficulties in learning.

Therefore, teaching materials were developed to improve the quality of learning. The process of teaching and learning activities must be able to create meaningful learning through the models, strategies and learning methods used. Teachers also need interesting and relevant teaching materials. With the interesting and relevant teaching materials, it is able to create attraction for students and the enthusiasm of students in teaching and learning activities. In addition, it is also able to improve student learning outcomes in mastering certain competencies, and add information about the material to be studied [14].

Teaching materials are a set of subject matter that contains the curriculum used in order to achieve competency standards and basic competencies that have been determined by the material to be taught [7]. In general, teaching materials can be in the form of textbooks, modules, handouts, worksheets, models or packages as well as audio teaching materials.

However, teaching materials can also contain information, tools and texts that are needed by teachers in designing and planning the implementation of learning in the classroom. Interesting and relevant teaching materials are teaching materials that are uniquely designed and not monotonous and contain material presentations that are summarized in detail using simple and easy-to-understand language.

As the preliminary study, the authors want to know the need assessment from the FMNS's students for ESP learning materials. Through the questionnaire, FMNS's students can give the information about their learning experience and also their need when study ESP on the field of Mathematics, Physics, Chemistry, Biology, and Science.

Table 1. Questionnaire of Teaching Material Need

Kind	Question	Answer Choice
Statement	I have programmed the English for Specific Purposes (ESP) course	a. Already b. Not yet
Survey	What learning models are often used in the learning process of your English for Specific Purposes course?	a. Direct Instruction b. Indirect Instruction c. Inquiry Learning d. Discovery Learning e. Project Based Learning f. Problem Based Learning g. Cooperative learning h. Discussion learning
Statement	During the learning process, you enjoy the learning model applied	a. Strongly Agree b. Agree c. Disagree d. Strongly Disagree
Statement	During the learning process, I had a hard time.	a. Strongly Agree b. Agree c. Disagree d. Strongly Disagree
Survey	What difficulties did you experience when using the learning model?	a. Explanation of the material is lacking b. Lack of practice c. Lack of interaction between lecturers and students d. Others (please write down your difficulties)
Survey	Based on your opinion, what are alternative solutions to overcome difficulties in learning English for Specific Purposes (ESP) courses?	Brief description by college students
Survey	Based on your experience, how do you respond to learning English for Specific Purposes (ESP) courses?	Brief description by college students
Survey	Write down criticisms and suggestions about learning the English for Specific Purposes (ESP) course that you have been participating in for one semester.	Brief description by college students
Survey	What learning media have been used in English for Specific Purposes (ESP) courses?	Brief description by college students

(continued)

Table 1. (continued)

Kind	Question	Answer Choice
Survey	How have the advantages of learning media been used in English for Specific Purposes (ESP) courses?	Brief description by college students
Survey	How has the lack of learning media been used in English for specific purposes (ESP) courses?	Brief description by college students
Survey	Have you ever known about the English for Specific Learning Book in Faculty of Math and Science, before?	a. Yes b. Not
Survey	Have you ever received learning with the English for Specific Learning Book in Faculty of Math and Science, before?	a. Ever b. Never
Statement	How important do you think is the development of books in English for Specific Purposes (ESP) learning specifically for FMIPA students who focus on each major?	a. Very important b. Important c. Not important d. Very not important
Survey	If there is a book development in English for Specific Purposes (ESP) learning specifically for FMIPA students that focuses on each major, what do you think?	Brief description by college students
Survey	What kind of book form do you want to support English for Specific Purposes (ESP) learning specifically for current FMNS students?	Brief description by college students
Statement	English for Specific Purposes (ESP) courses require English for Specific Learning Book for FMIPA students	a. Strongly Agree b. Agree c. Disagree d. Strongly Disagree

2 Method

2.1 The Method

This research utilized an explanatory research design to investigate the need for teaching materials in ESP course at FMNS Universitas Negeri Surabaya. The subject of this study are the FMNS's students who have programmed ESP courses on their study program. An online survey collects data in the form of questionnaires for the needs of teaching materials. There are 100 FMNS's students who are willing to fill out an online questionnaire

Table 2. The internal validity of questionnaire instrument

Assessment Aspect	Score	
	Validator 1	Validator 2
Clarity of instructions on the questionnaire instrument	4	4
Clarity and legibility of the questionnaire instrument presented	4	3
The suitability of the sentences used with the rules of language	4	4
The language used is communicative	4	
The suitability of the contents of the questionnaire with the research objectives	4	3
The suitability of the contents of the questionnaire with the questionnaire grid that has been prepared	3	4
Average Score	0.96	0.92
Validator decision	feasible	feasible

Table 3. The internal validity of questionnaire instrument

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N-Items
0.652	0.652	4

which is presented in the form of a google form link and distributed through each representative lecturer of the department in this research team. The data collected is then analysed and the results are explained to determine the extent to which students' needs for ESP teaching materials are based on the learning experiences that have been passed.

2.2 The Questionnaire

The questionnaire rubric for the need assessment for ESP teaching materials is shown in Table 1. The questionnaires are open and closed, and there are several consolidation statements regarding the need for ESP teaching materials.

2.3 The Validity and Reliability of Instrument

Before the questionnaire link is shared to the FMNS's students, it has validated by the two persons as the validator. The validators give the score for validation with the Likert's scale [15] and give the decision that the questionnaire is feasible to use. Table 2 give the information for the questionnaire instrument's internal validation.

Based on Table 2, both of validators give the decision that the questionnaire instrument is feasible with the percentage score of 96% for validator 1 and 92% for validator 2. It means that the questionnaire instrument that has been developed is declared suitable to be used for data collection of needs assessment of the need for ESP teaching

materials based on the learning experiences of students who have programmed ESP courses (English for Mathematics, English for Physics, English for Chemistry, English for Biology, and English for Science).

Data collection through the use of Google Forms link and shared to the FMNS's students. Using SPSS 26, closed questions were tested for the reliability data using the Cronbach's Alpha statistic. If Cronbach's Alpha score is greater than 0.6, the questionnaire is considered reliable [16]. The reliability data analysis for the questionnaire for need assessment result shows in Table 3.

Table 3 shows the scores for the reliability test results showing that Cronbach's Alpha scores are greater than 0.6. So that the questionnaire data for the needs of ESP teaching materials is reliable.

3 Results and Discussion

3.1 The Response Data

Based on the data obtained through the online questionnaire in the form of Google Forms, there 100 respondents from various departments were shown in Fig. 1. Data obtained during 24 June 2022 until 29 June 2022.

Figure 1 shows that students who are willing to fill out an online questionnaire came from all of department on FMNS Universitas Negeri Surabaya. There are 62% Biology students, 25% Physics students, 6% Mathematics students, 4% Chemistry students, and 3% Science students.

3.2 Learning Model for ESP

ESP is interpreted by the 'purpose' and 'specificity' of the aim of educating English as needed. It emphasizes the significance of the needs of English learners in responding to

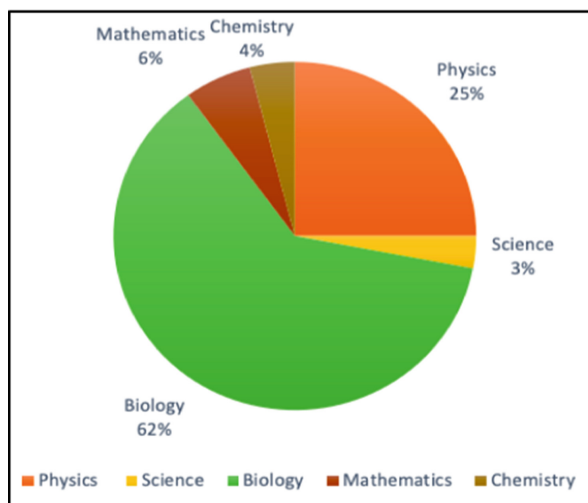


Fig. 1. Distribution of respondents

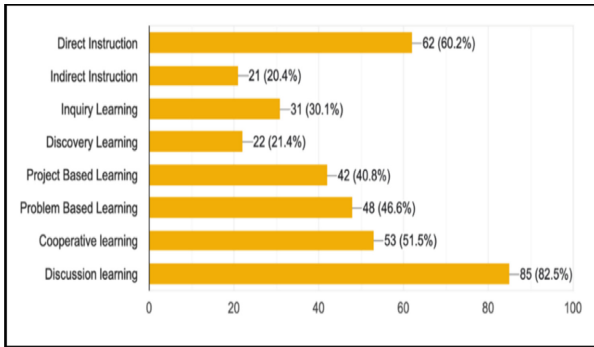


Fig. 2. ESP learning model

the specific requirements of the target situation in which they must use English in their daily activities [12]. ESP learning primarily aims to improve communication skills, such as (listening, speaking, and reading) [17]. The ability to communicate is regarded as a critical skill; those who possess effective communication abilities will be able to support the profession [18]. FMNS's students desperately need ESP courses to prepare them for the future.

According to the survey results, the majority of ESP learning on FMNS incorporate discussion learning, direct instruction, and cooperative learning models (see Fig. 2). The improvement of the Student's English skills is as much as physical training, which emphasizes a continuous and gradual training process, and the result is the natural result of the process, whereas instrumentality determines that the learning process requires repeated practice rather than comprehension [19]. The Discussion Learning method necessitates the formation of a learning community comprised of students, lecturers, and fellow students. In general, the discussion method will work well if the learning community collaborates with one another to improve communication skills and exchange ideas or experiences [20].

3.3 Student's Responses During ESP Learning

Empirical research was carried out to assess the learning needs of students enrolled in ESP courses. Most students enjoy the learning process and can navigate it successfully. However, up to 46% of students admitted to having difficulty learning ESP. Although nearly 90% of students stated that they enjoyed the learning process, they also revealed the challenges they faced while learning ESP. Figure 3 depicts the data pertaining to this subject. The orange bar indicates that the student enjoys the learning process, while the yellow bar indicates that the student encounters some difficulties during the learning process.

More than 90% of students are struggling. According to the survey results, the greatest difficulty is a lack of explanation of the content and practice during learning. Other innovative learning models, such as problem-based learning, project-based learning, and inquiry learning, have helped to overcome obstacles related to a lack of explanation and practice when learning ESP. However, this issue was not properly addressed and received

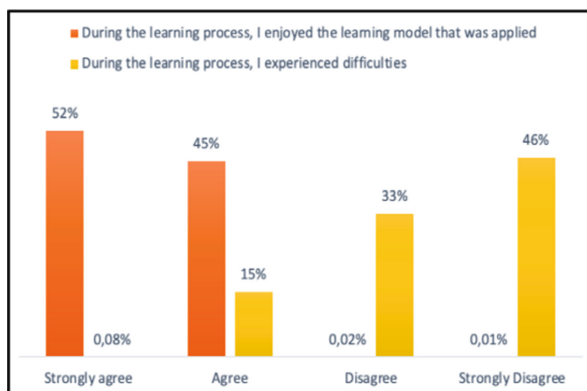


Fig. 3. Results of a survey on ESP learning

a lot of attention in this study. According to some respondents, if ESP learning takes place online, interaction between learning communities is limited.

The 27th student stated *“what I experienced came from myself because at first I was embarrassed and lacked confidence in my abilities, so I felt less when practicing speaking in English.”* Correspondingly, the 41st student experienced something similar *“The difficulty is due to the lack of practice in learning, so speaking and listening skills are still lacking when compared to reading skills”*. The 78th student stated that, *“The explanation of the material is actually quite good, because it will use a foreign language (English for a specific purpose) so that sometimes there is material that cannot be reached because it has to interpret a foreign language (the process of understanding the material is lacking).”*

Students’ alternative solutions for ESP learning include: The 32nd student claims that *“The existence of books or teaching materials that are useful to make it easier for students to learn material that will be given during the lecture is an alternative solution to overcome learning English for Specific Purposes (ESP) courses.”* In addition to the 65th student, the 63rd student revealed, *“The alternative I can provide based on my difficulties is to always invite students to find new words that are relevant to daily life so that they can be easily accepted by students.”* One is using a metacognitive strategy. Students can associate KWL (Know-Want-Learn) with learning activities based on what they will learn.

3.4 The Needs of ESP Learning Materials for FMNS Students

Figure 4 depicts how power point slides are used as teaching material in the majority of ESP learning. The selection of ESP teaching materials is based on the material’s needs, student ability, and ease of access [18].

According to student responses, the benefits of ESP learning teaching materials include, *“The teaching materials used are quite varied and always include power points where it is very helpful for students to be able to relearn the teaching materials.”* *“The teaching materials used are extremely beneficial to students’ knowledge development.*

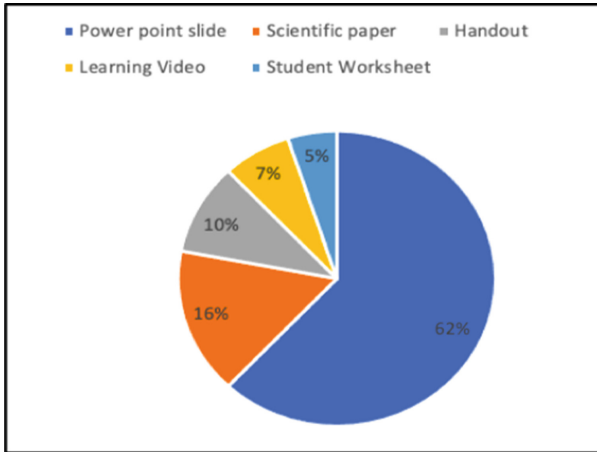


Fig. 4. Teaching materials that have been used in ESP learning

These teaching materials can help students improve their ability to read, listen, write, and speak in English. Furthermore, the teaching materials used are easily accessible. However, the selection of teaching materials also has shortcomings including being less practical, ineffective and uninteresting, this is supported by student responses. *“The teaching materials used are in the form of soft files, so they require a lot of memory to access them. However, I can overcome this by saving the file given to google drive.”* and *“It is only suitable for practicing passive ability in English, while what is needed in the future also needs active skills such as presentations, listening to seminars, and discussions.”*

Over than 95% of respondents agreed that FMNS Universitas Negeri Surabaya desperately needs learning materials for ESP courses in all departments. Some students disagreed, *“It is, in my opinion, perfectly legal to use. Because each major has different requirements for English courses for this purpose. As a result, if there are teaching development materials that will be extremely beneficial to each major.”* Another student stated, *“The development of teaching materials in ESP learning is very much needed by students, especially FMNS students, because there are teaching materials as one of the conditions for realizing good and successful ESP learning, students tend to understand the material provided if they get teaching materials that are in accordance with their skills or teaching materials that are easy to understand by them while receiving the material provided, the teaching materials are like the existence of a special book for the ESP course itself”* (Fig. 5).

Even though the form of teaching materials desired by students is in the form of, *“The teaching materials that are effective for me personally are in the form of print modules from ESP, as befits some course modules in the form of print media. Nowadays, everything can be done with the help of technology, but in this case, I think it will be more convenient to use printed books that can be marked or hyphenated directly by students”* and *“Teaching materials that are in accordance with the major and help students in*

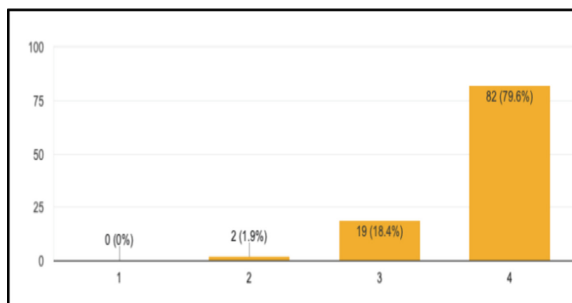


Fig. 5. Response to the urgency of ESP learning materials need

solving problems in English, such as reading graphs in English, providing arguments for a contextual problem in English, read sharing symbols and equations in English.”

4 Conclusion

Based on the result of the questionnaire, the FMNS's students passed the ESP courses with several learning models such as discussion learning, direct instruction, and cooperative learning models, problem-based learning, project-based learning, inquiry, and others. Most of students enjoy the learning model that was applied (51% strongly agree and 46% agree), but the greatest difficulty is a lack of explanation of the content and practice during learning. Most of the respondents need teaching materials for ESP courses in all departments (79.6% strongly agree and 18.4% agree). It shows that students need teaching materials to help ESP lectures at FMNS Universitas Negeri Surabaya.

Acknowledgments. This research is part of the preliminary research in the basic research of FMNS Unesa through Unesa's PNB (Non-Tax State Revenue) funding. Thanks are given to FMNS Unesa for opening the opportunity to carry out the research through the FMNS's policy research scheme with basic research type in 2022. The implementation of this research is based on the number of research contracts: B/36612/UN38.3/LK.04/00/2022.

Authors' Contributions. The contributions of all authors are described as follows. Mukhayarotin Niswati Rodliyatul Jauhariyah as the first author that write the outline of the article, analyze the data, discuss the finding, and make a conclusion. Maharani Ayu Nurdiana Putri as the questionnaire instrument maker for this research and data analyzer. Sharvina Yuditikaas data collector in Department of Physics and data analyzer. Dhita Ayu Permata Sari as data collector in Department of Science Education and data analyzer. Evangelista Lus Windyana Palupi as data collector in department of Mathematics and data analyzer. Nur Qomariyah as data collector in Department of Biology and data analyzer. Muchlis as data collector in Department of Chemistry and data analyzer.

References

1. N. Apriyanti, M. S. N. Shaharom, S. S. A. Rahim and R. A. Razak, Needs Analysis of Infographic Media Using Technology for Learning Physics, *Malaysian Online Journal of Educational Technology*, 2020, 8 (1)48–62.
2. F. N. Hamidahand D. Yanuarmawan, Penerapan English for Specific Purposes Untuk Meningkatkan Pengajaran Bahasa Inggris Pada Guru Sekolah Menengah Kejuruan, *Jurnal ABDINUS: Jurnal Pengabdian Nusantara*, 2019,2 (2) 236–247.
3. C. S. D. Kusuma, Integrasi Bahasa Inggris Dalam Proses Pembelajaran, *Jurnal Efisiensi-Kajian Ilmu Administrasi*, 2018, XV (2)43–50.
4. L. Beshaj, The Growing Importance of English for Specific Purposes (ESP) In Albanian Higher Education. *International Journal on Studies in English Language and Literature (IJSELL)*, (2015), 3 (6)10-13.
5. T. Agustina, English for Specific Purposes (ESP): An Approach of English Teaching for Non-English Department Students, *Beta*, 2014, 7 (1)37-63.
6. E. Donesch-Jezo, English for Specific Purposes: What does it mean and why is it different from teaching General English? *CONFLUENCE*, 2012, 24 -25 February 2012.
7. R. Asfihana, Teaching English for Specific Purposes (ESP) in EFL Context. *LET: Linguistics, Literature, and English Teaching Journal*, 2013, 3 (1)1–9.
8. P. Galina, The Essence of English for Specific Purposes. Conferința științifică internațională “Perspectivele și Problemele Integrării în Spațiul European al Cercetării și Educației”, Universitatea de Stat “B.P. Hasdeu” din Cahul, 2016, Volum II.
9. N. Indrasari, English for Specific Purposes: A Need Analysis at The Second Semester of Physics Education Students of IAIN Raden Intan Lampung in The Academic Year of 2015/2016. *English Education: Jurnal Tadris Bahasa Inggris*, (2016), 9 (1)161-172.
10. M. Nur, ESP Application at Non-English Majors of Higher Education Through CBT Approach, *Mabasan*, 2018,12 (1)86-103.
11. I.A. Musikhin, English for Specific Purposes: Teaching English for Science and Technology. *SPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 2016, III(6)29-35.
12. M.A. Salmani-Nodoushan, English for Specific Purposes: Traditions, Trends, Directions. *Studies in English Language and Education*, 2020, 7 (1)247-268.
13. T. Hutchinson and A. Waters, *English for Specific Purposes: A Learning-Centered Approach*, Cambridge: Cambridge University Press, 1987.
14. E. W. Pratama, Moejiono, and P. Sulistyowati, Pengembangan Bahan Ajar IPA Berbasis Ensiklopedia Pada Materi Sifat-Sifat Benda Dan Perubahan Wujud Benda Kelas III Sekolah Dasar. *Seminar Nasional PGSD Unikama*, 2020, 4 391–401.
15. A. Joshi, S. Kale, S. Candel, and D.K. Pal, Likert Scale: Explored and Explained. *British Journal of Applied Science & Technology*, 2015. 7 (4), 396-403.
16. M. N. R. Jauhariyah, Wasis, T. Sunarti, W. Setyarsih, A. Zainuddin, and S. Hidayat, Need Assessment of Physics Learning Evaluation Course on COVID-19 Pandemic Era in Bloom’s Taxonomy Topic. *Berkal Ilmiah Pendidikan Fisika*, 9 (1), 67–71.
17. E. Megawati, Penggunaan Model Pembelajaran Peer Teaching Dalam Pengajaran Tenses Pada Mahasiswa EFL, *DEIKSIS*, 11 (01), 39–50.
18. E. R. Febriyanti, Identifikasi Analisis Kebutuhan Pembelajar Bahasa Inggris (Non Program-Studi Bahasa Inggris) pada Mata Kuliah Bahasa Inggris ESP di Lingkungan FKIP Universitas Lambung Mangkurat Banjarmasin, *Jurnal Vidya Karya*, 2017, 32 (2), 123-138.
19. Y. Du, Discussion on Flipped Classroom Teaching Mode in College English Teaching. *English Language Teaching*, 2018, 11 (11). Canadian Center of Science and Education: 92. doi:<https://doi.org/10.5539/elt.v11n11p92>.

20. E. Syatriana and G. Sakkir, Implementing Learning Model Based on Interactive Learning Community for EFL Students of Muhammadiyah University. *ELT Worldwide*, 2020, 7 (1)2503-2291.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

