

## Adaptation of syllabus design to improve the proficiency of English for engineering

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### Abstract

With a rapid change in the world industry, higher institutions and universities are asked to adapt their syllabus design, particularly in the field of engineering. This study deals with the curriculum addressed to industrial engineering students at the Higher School of Applied Sciences, Tlemcen, Algeria. This investigation was divided into three parts; the first one was to collect data through the identification of students' needs through an experimental group of 30 participants who were administered a questionnaire. A teacher Interview was added to complete the research. The second part was to analyze the questionnaire and the interview, it was necessary to evaluate the relevance of the syllabus according to learners' requirements and ESP teachers. And the last part was to propose a syllabus suitable to Industrial engineering students. The findings revealed that a suitable syllabus design is necessary to improve students' English learning for specific work-related functions and helps develop necessary skills such as communication

**Keywords:** Engineering; ESP; learners' needs; syllabus design; world job.

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## 1. Introduction

In all ESP teaching courses, we have to set up the needs of the learners to improve the teaching of English for specific purposes more particularly English for science and technology (Vickery et al., 2023). Therefore, it is important to plan a course design and structure it taking into consideration the given syllabus, available materials, and methodology of the teacher to reach a particular knowledge (Byrne & Prendergast, 2020). According to Richards (2001), Xu & Xiao (2023), Some key factors of the success of learning English are learning objectives, the learner, the teacher, materials, methods, and environment.

The emergence of English language learning around the world is principally due to the process of globalization. According to Hutchinson and Waters (1987, p.6-7), « ESP emerged due to the development of the world's economy, which entailed (involve) the progress of technology, the economic power of oil-rich countries, and the increasing number of overseas students in English-speaking countries”. It means that the reasons for the emergence of ESP are the development of the world economy, technology, and the increasing number of students who want to learn English in English- speaking countries.

ESP has grown since the early 1960s, it started as a separate discipline. Many universities all over the world were developing courses in ESP for every field of life because of the globalization of the English language for academic and professional needs. Being aware of the necessity of ESP, Algeria decided a few years ago to adopt English at tertiary-level institutions. In this sense, Kennedy *et al* (1984, p.1) wrote: « The growth of business and increased occupational mobility is resulting in a need for English as a common medium of communication, and access to much scientific and technical literature is difficult for those with no knowledge of English.

### 1.1. Literature Review

With the growing popularity of English for specific purposes, considerable work has been done at the level of universities and higher institutions, and the courses have been oriented towards learners' professional needs (Over the last three decades, ESP has developed into a profitable area (Ramirez, 2015; Van Orma, 2021).

English is learned for numerous reasons, many of which are because a wide range of occupations requires the use of ESP, making it one of the most important disciplines in higher education (Mostafavi, Mohseni & Abbasian, 2021; Rahmati & Izadpanah, 2021). Hutchinson and Waters (1987) rooted in one of the most well-known and useful theories, regarding English language teaching branches within the “tree of ELT”, in which they divided ESP into three types: English for Science and Technology (EST), English for Business and Economics (EBE), English for Social Studies (ESS).

The requirement to use English for particular reasons has different aspects. Learning English for science and technology purposes is one of the benefits, as in the case of this research project. ESP can be further classified into two basic types that can be differentiated based on the needs of the learners. It implies that ESP can be used for academic learning or work-related applications. The purpose of the ESP course is to encourage students to use English in various contexts, including academic and professional environments. As a result, ESP classes and materials focus on learning about the needs of the pupils (Basturkmen, 2006). Consequently, the pedagogical approach of ESP is limited to the results of linguistic research conducted within the subject of study under consideration (Basturkmen, 2006). In other words, the ESP teaching approach is restricted to the results and findings of linguistic research. Today, ESP is established as an important area of applied linguistics and English language studies. (Bolton & Jenks, 2022)

Stevens (1988, p. 2) asserted that “ESP is a particular case of the general category of special-purpose language teaching; the same principles apply no matter which language is being learned and taught”. The scholar proposed two distinctive characteristics of ESP which are: absolute (invariable)

characteristics and variable characteristics. According to him, the absolute characteristics of ESP comprise English language teaching which are:

- Designed to meet the specified needs of the learners;
- Related to content, to particular disciplines, occupations, and activities;
- Centered on the language appropriate to those activities, in syntax, lexis, discourses, semantics, and so on, and analysis of the discourse,
- In contrast with "General English" According to Stevens, ESP teaching should be related to the course content; According to the researcher, learners can be taught a limited language competence (reading, speaking, writing, or listening) using the varied properties of ESP.

#### *1.1.1. Need analysis in ESP*

Need analysis is the initial stage in the procedure of designing any kind of language course (Li, & Fu, 2021). The requirements that students must meet to communicate effectively in the target environment are referred to as needs analysis. They are additionally described as what students must learn to acquire the language. In all ESP teaching situations, we must start by considering the needs of the learners and what they have to do in the target situation (Flook, 1993). Through the ESP movement, needs analysis has been introduced into language education in the 1960s. It is a series of processes for gathering data regarding the needs of students.

Researchers in ESP developed different kinds of models to conduct the analysis (Robinson, 1991; Jordan, 1997; Dudley-Evans & St. John, 1998). The model developed by Dudley-Evans and St. John (1998) is considered to be the most complete for exploring the needs for ESP courses (Rahman, 2015)

As in any ESP course, a need analysis is required taking into consideration many aspects such as learners' needs. The course syllabus is made including selected materials stated by Saragih (2014, p. 59) states that needs analysis is vitally important in designing teaching materials for English for Specific Purposes. As is any research study, An ESP course benefits the students since it is based on the needs analysis.

#### **1.2. Background of the study**

The term ESP is to help language learners to build up the needed abilities to use them in a specific field of study, occupation, or workplace/job. These definitions were stated according to ESP evolution through time. According to Anthony (1998, p.9), some described ESP as simply being the teaching of English for any purpose that could be specified. Others, however, were more precise, describing it as the teaching of English used in "academic" studies or the teaching of English for vocational or professional purposes. In other words, ESP is taught for specific purposes either for academic studies or professional aims. As mentioned by Mackay and Mountford (1978, p.2). ESP is generally used to refer to the teaching of English for a utilitarian purpose. It means that English should be taught to achieve specific language skills using real situations (Wilson-Lopez & Acosta-Feliz, 2022), in a manner that allows them to use English in their future profession, or to understand English discourse related to their area of specialty.

As ESP has developed all over the world as a significant discipline, the higher school of Applied Sciences of Tlemcen is concerned too with the emergence of this new field. Therefore, the main objective of teaching ESP is to make the students able to use the English language from different skills to get either a scholarship or enter the job market. Therefore, English becomes an important tool to succeed in studies or employment.

General English has been used in Algeria for many years and the use of ESP is gradually taking place in higher schools and universities. However, the teaching of general English differs from ESP. ESP learners in general are adults who already have acquired certain knowledge of English and their learning of the language was to perform particular job-related functions and to acquire a set of professional skills. That is why, Robinson (1991, 2-4) suggests that « in an ESP class, language is as a

“service” rather than a “subject” in its own sake. In addition, EGP learners studied the four language skills equally whereas ESP learners studied the skill they need more according to the needs analysis established to design the ESP course. From the table below, we can observe the distinction between ESP and EGP:

**Table 1**  
*The difference between ESP and general English*

	Learners	Aims	Concerns
ESP	specifically designed for (working) adults	The objective is to meet the needs of particular learners	to design suitable courses for different types of groups of learners following their needs
EGP	specifically designed for high school students	To improve overall English competence involving a range of skills (reading, writing, speaking, listening, vocabulary, grammar, pronunciation, etc.)	designing courses targeting vocabulary work, spelling, grammar, pronunciation, Language function, etc

To explore the reliability of the course design for engineering students at the higher school, one has to take into consideration the different features for successful teaching of ESP as the syllabus design, the need analysis, and methodology. However, some challenges are faced in teaching ESP for engineering. Table 1 above includes all the features that should be taken into consideration for the successful teaching of ESP.

Algeria like any other country is concerned with the implementation of ESP at universities and higher schools, however, it is still facing some pedagogical problems at the level of dealing with ESP courses. In this sense, this study sets the following questions:

1. Is the syllabus adapted to students' needs?
2. What are the limitations of the present syllabus for engineers concerning their educational and professional learning
3. What changes should be brought to the syllabus at the higher school to improve students' mastery of the language and prepare them for employability?

### **1.3. Purpose of study**

Our main concern in this research work is to develop a course design for engineering students at the higher school of Applied Sciences, Tlemcen where the investigation took place. It also discusses the reliability of the syllabus according to students' requirements for their studies and future job.

## **2. Materials and Methods**

This study was conducted at the higher school of applied sciences, Tlemcen, and it concerned the third-year level specialty of industrial engineering. The data was collected by using students' questionnaires and teacher interviews.

### **2.1. Data collection instruments**

A questionnaire was administered to the students taking into consideration the different difficulties and lacks that they encounter with the syllabus design during their studies and more particularly for future employment.

Another tool was needed to provide more clarifications to this study. An interview is one of the most important tools to collect data from individuals through conversation either to understand a situation or a topic that the researcher is interested in (Mebtil 2011).

Two types of tools were used for the data collection namely questionnaire and interview. The questionnaire consists of 10 sections including direct and indirect questions which were administered during the English lecture. The students were asked to complete the questionnaire and to give information about their needs and expectations. An interview was added to provide this research work with more specific information about the syllabus design. The tools were carefully selected to provide precise information about the syllabus design.

## **2.2. Participants**

The subjects of this investigation were a group of thirty participants. They were baccalaureate holders from scientific streams and their knowledge of the English language varies from one learner to another. They did two years in the preparatory cycle and then specialized in Industrial engineering at the Higher School of Tlemcen.

## **2.3. Procedure**

The survey was carried out at the beginning of the year 2022, where a questionnaire was distributed to the industrial engineering participants. It contains direct and indirect questions. This study aimed to propose a syllabus design by collecting data through various tools such as a questionnaire and interviews. The syllabus is designed to rely on learners' needs and expectations for their studies as well as employment. The information gathered will be studied and analyzed to determine the relevance of the syllabus for industrial engineering students and thus, to promote the learning of ESP. Of course, the participants were asked to propose what should be important for them, and their perceptions were considered to be the starting point in designing a syllabus model. Here is a sample unit of the questionnaire used in this survey.

**Table 2**

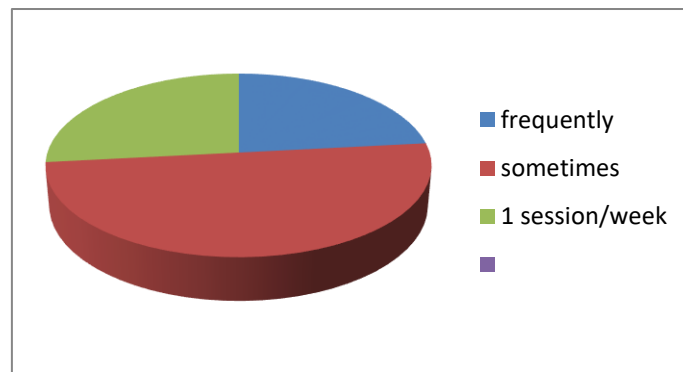
*Sample unit of the questionnaire*

<b>1</b>	How much time do you spend learning ESP?
<b>2</b>	What is your attitude towards the English course?
<b>3</b>	How interested are you in the English course?
<b>4</b>	To what extent do the English courses satisfy your needs in your field of study?
<b>5</b>	Which sources/ materials do you rely on to learn English?
<b>6</b>	What is your level of proficiency?
<b>7</b>	Which skill do you need to improve your language?
<b>8</b>	Is the syllabus design suitable?
<b>9</b>	Which exercise would you like to do in communication?
<b>10</b>	How important do you find English for a future job and study?

## **3. Results**

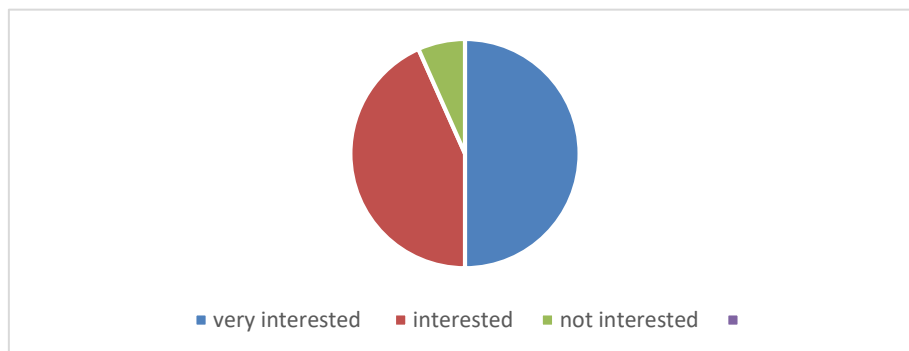
This investigation is particularly significant since it deals with a crucial element in ESP course design which is a syllabus design. Therefore, the researcher re-considers the adequacy of the syllabus in the higher school. Here are the most important questions submitted to the participants.

**Figure 1**  
*Frequency for learning ESP?*



According to the result obtained the students' frequency to learn ESP varied, therefore, 17% asserted that they learn it frequently, 65% from time to time, and the remaining 18% one session per week (figure 1).

**Figure 2**  
*Attitudes toward the English course*



The personal attitudes of the students about the English course are the focus of this investigation. According to the majority, the respondents all said that the course is either very important or at least important (50% & 43%, respectively). One may say that English is crucial for their education and that it keeps them motivated except for 7% who are not interested (figure 2).

**Figure 3**  
*How interested are you in the English Language?*

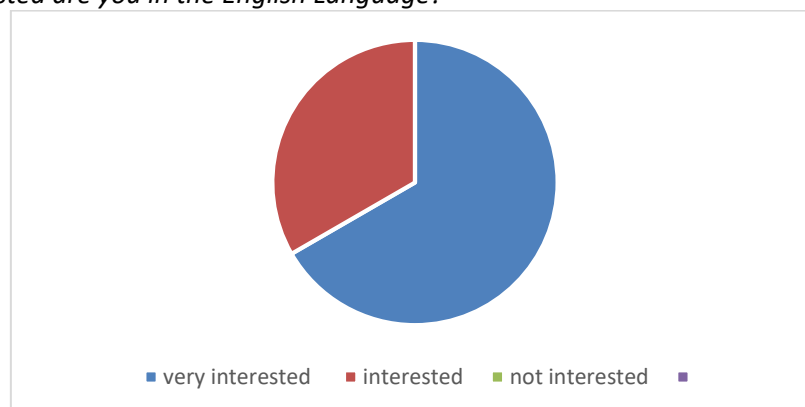


Figure 3 indicates that 67% of respondents answered 'very important' while 33% answered "important". Since a large proportion of third-year students answered "Yes", one can conclude that English is very important for their studies, and therefore they are highly motivated to study the English course.

**Figure 4**

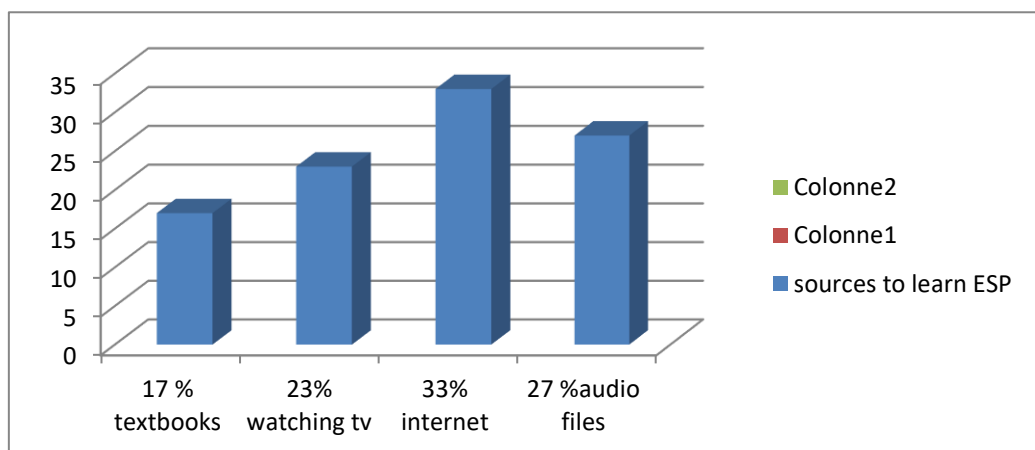
*To what extent do the English courses satisfy your needs in your field of study?*



Some students (28%) said they were satisfied with the course. While 35% of the sample rejected all forms of fulfillment, 37% of the sample reported being entirely satisfied. This may indicate that the course has to be developed in terms of curriculum design, resource selection, and teacher selection (figure 4).

**Figure 5**

*Sources/Materials Used to Learn English*



From Figure 5 above, students proposed different sources and the most used one is the internet with 33%, followed by audio files with 27% and watching TV with 23% respectively. A minority relied on textbooks with 17%.

**Figure 6**

*Level of proficiency in ESP*

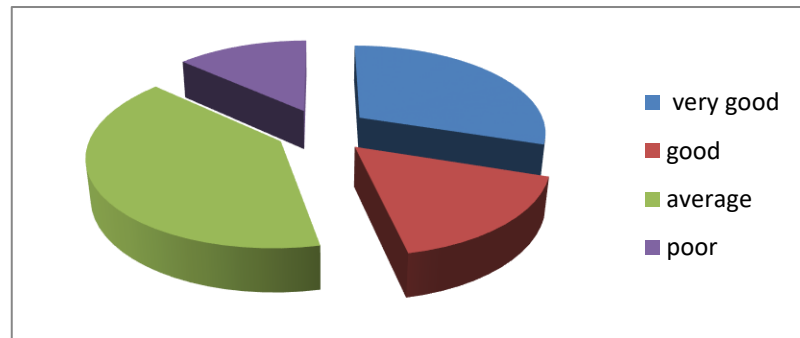
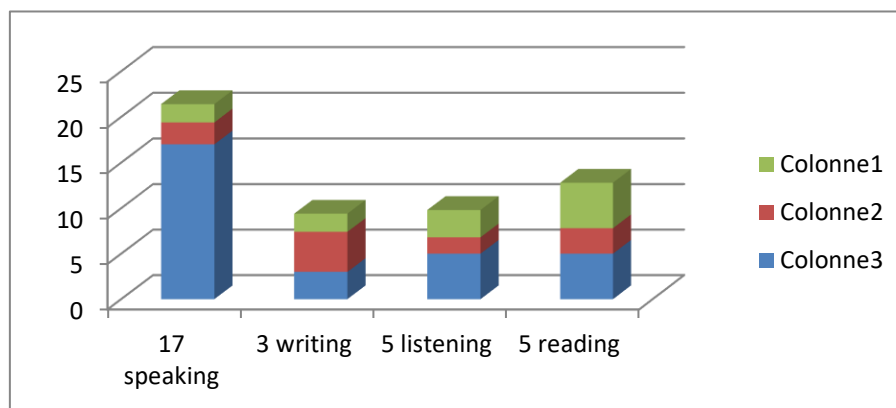


Figure 6 demonstrated that the students have different levels of proficiency, the majority of the learners have an average level of 40% followed by a good level of 30%.

**Figure 7**

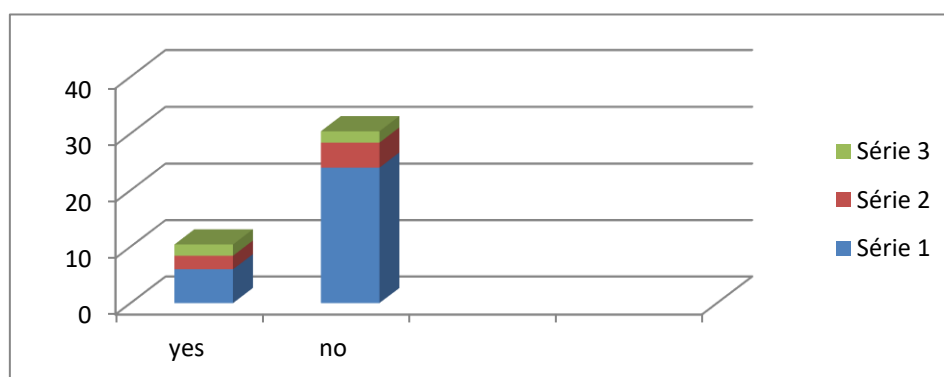
*Preferences for learning skills*



This question aimed to investigate which skill needs to be focused on in the English courses. The majority of the respondents selected the speaking, listening, reading, and writing skills in this order. The majority of students prefer to focus on speaking skills (figure 7).

**Figure 8**

*Is the syllabus design suitable?*

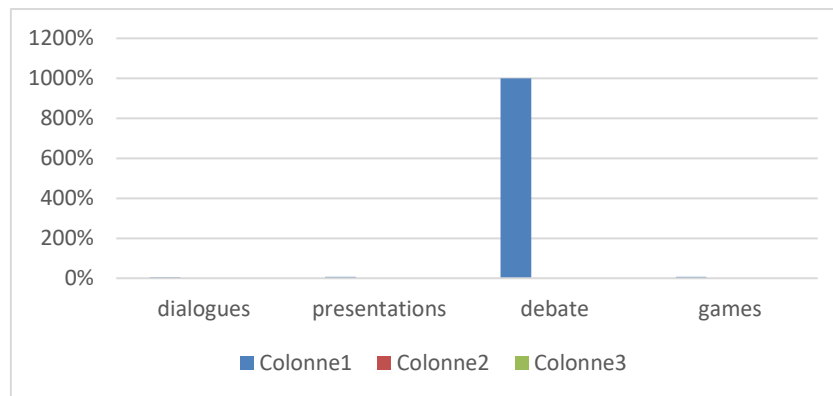


The majority of the participants found that the syllabus is not adequate for their studies and future employability with 80 %. They suggested to re-consider it taking into account their needs and requirements (Figure 8).



**Figure 9**

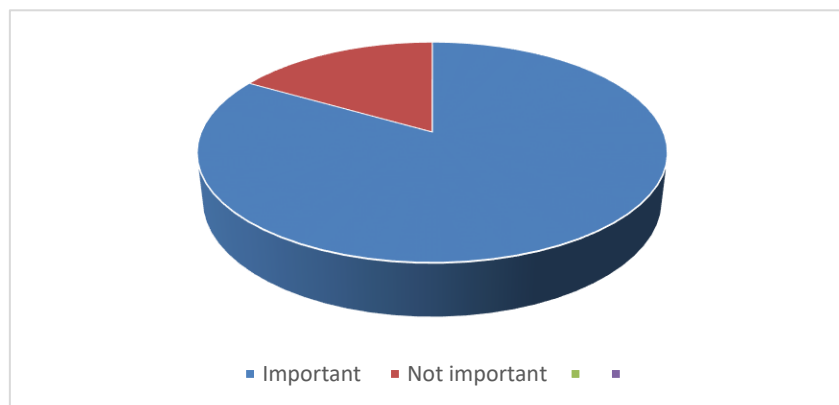
*Which exercise would you like to do in communication?*



Concerning the activities that the students want to practice in communication, the majority of the students preferred making debates about a chosen topic (figure 9). However, concerning presentations, dialogues, and oral games, the answers varied.

**Figure 10**

*Importance of English for future Jobs*



The figure shows that 26 of the students from the whole sample stated that the English courses are important for their future careers and thus because of the status of English all over the world and recently in Algeria. On the other hand, 4 stated that English courses are not important since we still use French as a foreign language.

After administrating the questionnaire to the participants and collecting the necessary data, the investigator proposed to put into effect two steps for the achievement of this research work. The first stage is to propose a syllabus adapted to the needs of industrial engineering students based on their responses to the questionnaire and interview. And the second stage was to put it to work and verify its reliability. We can summarize the stages of development in the following table 3.

**Table 3**

*Development stages of syllabus design*

Stages	Description
Need survey	Conducting questionnaire Analyzing data collection
Describing the purpose	Determining students' needs Determining the objective of the program
Selecting syllabus type	Selecting the appropriate items
Production of the pedagogical syllabus	Workout the selected pedagogical syllabus
Evaluation	Revise the syllabus based on feedback

From the results obtained in this survey, it can be concluded that the students are required to provide the investigator with information about English.

#### 4. Discussion

Based on the data obtained from the students' questionnaire, it is found that the learners are aware of their needs, have a positive attitude, and are interested to learn the English language. The results obtained show that the majority of the participants study English at the higher school which is one hour and a half per week. This is not sufficient for them this is why the most assiduous try to rely on other sources such as videos, audio, or the internet to improve their learning.

Concerning the level of proficiency in ESP, here the students said that they have some lacks and want to improve their level, particularly in speaking, so the participants encounter difficulties in speaking English and hope that they may be resolved. Based on the competencies that should be fulfilled by the students, they find that the existing syllabus has some gaps and that some topics do not fit with their needs and expectation for their studies. Here are some suggestions proposed by the participants:

- Provide students with some useful links to study at home
- Focus on speaking (Giving presentations/ discussing subject-related topics).
- Introduce some useful points which are necessary as (learning how to write a CV/ e-mail/ cover Letter/ training report)
- Introduce dialogues to improve pronunciation and speaking
- Discuss youth problems (unemployment/ violence/drug)
- Make debate
- Introduce instructive games

The interview was selected as the second tool to gather additional and complementary information from the teachers of English in the higher school of applied sciences. The interview was done after the teacher's lectures. The interview aimed at highlighting the difficulties that teachers faced in teaching ESP. The type of interview selected for this research study was the structured one. Moreover, this research aimed to interview two English teachers who are in charge of the ESP module. The interview was done during the teacher's free time and both of them were willing to collaborate. We can summarize the findings as follows:

- Teachers' years of teaching ESP and qualifications
- Training for ESP teaching
- Difficulties encountered in teaching ESP
- Approaches to syllabus design
- Based on skills
- Teachers' suggestions and recommendations.

Q 1 aimed to know how long has the teacher been teaching English for Engineering. It is found that they have 10 years of teaching experience. Q 2 aimed to know if the teacher had any training to teach ESP. It is confirmed that no teacher at school had ESP training, especially concerning teaching engineering. In Q3, ESP classes focused primarily on the material; the teachers encountered numerous difficulties. Insufficient teaching time and student level prevent level improvement. However, the major challenge encountered by the teachers was the learner's average level. In Q4, as the school provided the teachers with an established program for the first and second years, therefore, the teachers had to respect it. However, in some cases, teachers were free to add some lessons which seem interesting or important to improve student level. In this case, all the ESP teachers stated that they relied on the program. However, concerning the 3<sup>rd</sup>-year industrial engineering, the teachers were not provided with any syllabus. It is the task of the teachers to establish the program based on the

communicative approach to design their courses. The teachers believed that this approach was the most suitable one to meet their learners' needs as well as their future job requirements.

Q 5 was based on skills, and the teacher focused on communication when they designed their courses. they believed that it helped the students to improve their level of English since they adopted the communicative approach. Q6 focused on teachers' suggestions and recommendations. The analysis of the teachers' interviews allows us to collect necessary data about teaching English for engineering and highlight difficulties encountered by the students.

Based on the data obtained from the teachers' interviews, it is found that;

- The teacher had the experience of teaching English which is 10 years
- However, teachers had not been trained to teach ESP before
- The teachers focused on communication (communicative approach) in their courses.
- The teachers faced different obstacles such as the absence of a suitable syllabus and it is their job to make a continuing process of evaluation of the courses to know students' needs and requirements.

The analysis of the teachers' interviews permits us to know more about the needs of the students for their studies and future employment. It may reinforce the research study and provide some useful information concerning the syllabus design and how it should be prepared to meet learners' needs through continuous evaluation of the courses and by asking for the assistance of professionals in ESP.

After bringing some changes to the existing syllabus relying on students' needs and requirements, the program was evaluated for a second time and the learners revealed that the latest changes brought helped a lot to meet their needs. The course was found more attractive because the method used focused more on communication which can be useful for their studies and employment. It can be concluded that the proposed syllabus is more appropriate to be implemented than the existing one. The differences between the syllabi are presented in Table 4 below:

**Table 4**

*Revision of syllabi*

<b>THE EXISTING SYLLABUS</b>	<b>THE PROPOSED SYLLABUS</b>
General topics	Specific topics
School proposition	Need survey
Stressed about reading comprehension	Focus on speaking/ listening skills
Focus on language/grammaire	Focus on ESP content

## **5. Conclusion**

Teaching ESP in Algeria faces many challenges and as the ESP courses are not still a priority in our technical schools and institutions, the teacher encounters many difficulties. The students are required to have professional knowledge in their field of study. However, this is not enough as ESP is taking a larger field in the world job, so the students are asked to get certain abilities in English as communication, performing well in dealing with technological developments, and exchanging information by using English as a primary tool.

Therefore, the investigator has to reconsider the usefulness of the syllabus design focusing on the specific needs of the learners to acquire a set of professional skills. So, the proposed syllabus is a combination of learners' expectations for particular job-related functions and helps to improve the required skills such as communication.

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