

An Analysis of Algerian Manufacturing and Engineering Master's Students' Needs

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Abstract

Needs analysis is considered as an effective tool to design a course of English for Specific Purposes (ESP) that best fits the students' needs. Thus, the present paper responds to a main research question focuses on what the Algerian Manufacturing and Engineering Master's students need English for. It aims at investigating the students' language needs and identifying the stakeholders' perceptions of the ESP course. For this purpose, this research is based on a case study design through which a target situation, a present situation, a learner factor and teaching content analyses were undertaken. In fact, this is done in order to help teachers and education leaders in Algeria to draw a clear policy to ensure successful implementation of ESP courses. Two questionnaires and two semi-structured interviews were addressed to Algerian Engineering Master's students, English language teachers, subject-specialists and administrators. The results revealed that Engineering students were highly motivated to learn English. They also indicated that there is an absence of an adequate proficiency level of English from the part of the students as they are unable to practice effectively the four skills namely listening, speaking, and communication. This is why they need to learn English in order to write exam answer, read textbooks, course handouts, follow lectures, and listen to instructions and explanations. Finally, designing a more focused English language course, training teachers, and providing financial support are highly recommended.

Key words: English for Specific Purposes (ESP), Manufacturing and Engineering students, needs analysis, present situation, target situation

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Introduction

In today's world, the globalization process has reinforced the status of English as a global language through which world trade, business, international law, education and new telecommunication technologies are conducted. To be fully integrated in such highly impressive world, Algeria, like many other nations, has integrated English teaching in national instruction including ESP with its sub branches including English for Science and Technology (EST), English for Business and Economics (EBE) ,... etc in higher education.

The department of Manufacturing and Engineering Sciences at Tlemcen University, like all the departments in Algerian Universities, devotes sessions of English teaching within its curriculum to prepare students to act as global citizens and train them to join the workforce. However, this English course is not based on a carefully undertaken needs analysis. Teachers use a traditional way of teaching based on providing the students with some grammar blocs, and building lexical items and vocabulary luggage through translating texts, thus excluding the communicative function of English in these courses. Moreover, ESP teachers in the Department of Manufacturing and Engineering Sciences use self-designed materials or select some lectures adapted from commercial books for teaching English for Manufacturing and Engineering Sciences. However these materials do not seem to answer their students' needs as teachers complain about facing significant problems of low proficiency level, communication problems, lack of motivation, and absence of opportunities to use the language in daily life.

Accordingly, the present study aims at analyzing the ESP teaching and learning situations in the Department of Manufacturing and Engineering Sciences at Tlemcen University, Algeria, in addition to investigating the students' language needs and identifying the stakeholders' perceptions of the ESP course. This is done in order to help teachers to design an appropriate ESP/ EST course and education leaders in Algeria to draw a clear policy to ensure successful implementation of ESP/ EST courses.

1. Literature Review

1.1.English for Specific Purposes

The reason that led to the emergence of English for Specific Purposes (ESP) in the late 1960's was the development in language theory which put so much focus on individual learners' specific needs (Hutchinson & Waters, 1987, p. 8). Furthermore, the status of English as a global language also helped the materialization of ESP as explained by Bottery (2000) "the development of globalization has been associated with the dominance of the English language. The power and influence of English have been widely recognized nowadays in the context of globalization" (p.6).

English for Specific Purposes (ESP) refers to "the area of inquiry and practice in the development of language programs for people who need a language to meet a predictable range of communicative needs" (Swales, 1992, p. 300). This means that ESP teaching is a needs-based approach that associates the teaching and learning of English to what learners need from the English course so that they reach a certain degree of proficiency in communication in any academic or vocational prescribed task (Sabet & Daneshvar, 2010, p. 2). In other words, a set of skills that is required by ESP learners in their studies or in their professional careers (Alharby, 2005, p. 10) is emphasized in the ESP teaching operation.

As far as Manufacturing and Engineering studies are concerned, the content and procedures of the ESP course, or more precisely the EST course, are associated to the students' reasons to learn. In fact, EST courses focus on scientific English and selection of communicative situations which are appropriate for scientific and technological fields (Dorrity, 1983). Particularly, students should be able to recognize, exploit and evaluate the materials related to science and technology.

1.2. Needs Identification and Analysis in ESP

In the field of education in general and ESP teaching in particular, more importance is given to investigations in learners needs as "a prerequisite for effective course design" (Long, 2005, p. 1). These needs are identified through the process of "needs analysis" (NA) or "needs assessment" which is defined differently by several scholars. Brown (1995) posits that NA refers to "the activities involved in gathering information that will serve as the basis for developing a curriculum that will meet the learning needs of a particular group of learners" (p. 35). For this reason, the process of needs analysis plays an important role in the ESP teaching operation. It is considered as the starting point in the process of designing and carrying out any ESP course. Indeed, Hutchinson and Waters (1987) insist on the fact that any language course design should be based on needs analysis through which the teacher will gather and collate relevant data about his students' reasons for learning English. This latter will be interpreted to define the objectives and the principles for more focused course design and teaching materials.

To conduct a Needs Analysis, different approaches must be taken into account. As a first step, Present Situation Analysis (PST) is undertaken to "establish what the students are like at the beginning of their language course, investigating their strengths and weakness" (Robinson, 1991, p. 9), to determine the students' previous learning experiences, and to identify their proficiency level to perform related activities and tasks in relation to the target situation. This is what Hutchinson & Waters (1987) refer to as '*lacks*'. Target Situation Analysis (TSA) is suggested as the next stage. According to Dudley-Evans & St. John (1998, p. 124), TSA refers to "tasks and activities learners are/will be using English for target situation". This means that TSA aims to identify "*the necessities*" and/or measure to what extent an adequate proficiency level for a profession or a study situation is reached. Over time, the scope of NA widens its scope to include the assessment of the learners' expectations, reasons for attending the course, attitudes towards English, preferred ways of learning, styles and strategies, and their perceptions of needs and / or "*wants*" in relation to the ESP course. This, therefore, pinpoints the stage of Learning Situation Analysis (LSA). Thus, in order to bridge the gap between the starting point, i.e. PSA to destination or TSA, learning needs as being a neglected terrain in ESP must be taken into account to determine the course content in response to *psychological* and *cognitive needs*, i.e. motivational, recreational and emotional needs, *sociological needs* which include the teacher's role, subject valence, social responses...etc, and *methodological needs*, that is, classroom teaching, techniques, skills and strategies. This stage known as Teaching Situation Analysis makes ESP a *learner-centered* approach, i.e., concerned not with *knowing* or *doing*, but with *learning*. In fact, the rationale for needs analysis process can be summarized in the following figure:

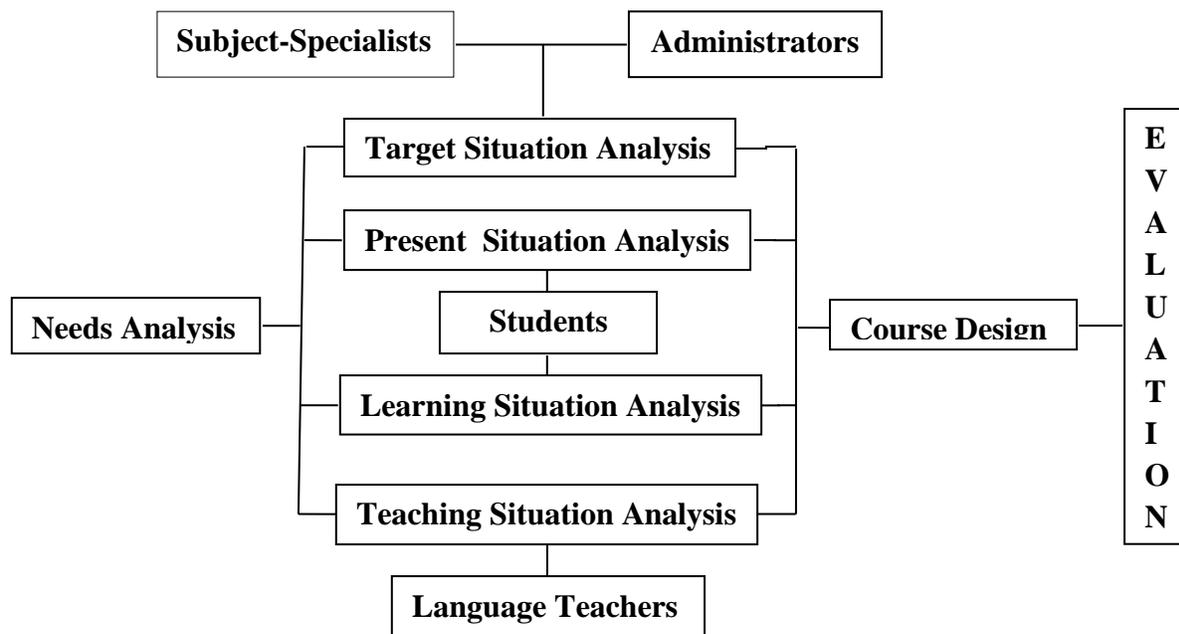


Figure 1: Rational for Needs Analysis

As far as the present research work is concerned, the researchers opt for Basturkmen's (2013) integrated approach to needs analysis which combines *Target Situation Analysis* to identify what students should realistically be able to do after attending the English course, *Present Situation Analysis* to portray the students' immediate and current needs, *Learner Factor Analysis* to investigate the students' motivation, learning styles and strategies, and the reason for learning English, and *Teaching Content Analysis* to investigate the content that should be included and offered in the English course.

2. Methodology

2.1. Participants

To obtain valuable information about the ESP situation and the students' needs in the Department of Manufacturing and Engineering Sciences at Tlemcen University, the researcher collected data from multiple sources: Manufacturing and Engineering Master's students, English language teachers, subject specialists and administrators.

2.2. Method

In this study the researcher opted for a case study research which "focuses on understanding the dynamics present in a management situation" (Eisenhardt 1989, p. 34) and through which detailed data was gathered to describe and analyze the ESP situation in the Department of Manufacturing and Engineering Sciences at Tlemcen University, students' needs and stakeholders' attitudes towards the ESP/ EST course.

2.3. Instrumentation

The students' questionnaire was designed to investigate the English language needs of Manufacturing and Engineering Master's Students at Tlemcen University, and to identify their attitudes towards the English course. It was submitted during the second term of the academic year 2015-2016 to two hundred (200) students, but only one hundred twenty (120) students returned it. The questionnaire was translated into Arabic in order to avoid any kind of misunderstanding of the questions and to allow the respondents to answer as clearly as possible.

Another questionnaire was submitted to eight English Language Teachers. It was carried out to have an overview of the teaching of the English language at the Department of Engineering and Manufacturing Sciences at Tlemcen University and to identify the language teachers' attitudes towards the English course.

Moreover, the investigator used two semi-structured interviews. They were conducted with three administrators and ten subject-specialists in French and lasted for about forty-five minutes. While the first one intended to check the subject-specialists' views and attitudes towards English language instruction in the Department of Manufacturing and Engineering Sciences, the second one shed light on the objectives of this course in the same Department.

3. Results

3.1. Master Students' Questionnaire

Though the questionnaire was submitted to two hundred (200) students, only one hundred twenty (120) of them answered and gave it back. It revealed very important data that allowed the researcher to identify and analyze the students' needs and draw clear conclusions about the target situation.

➤ Target Situation Analysis

1. Importance of learning English

While 99.17% confirmed the importance of the English language as being the language of development and technology, only two students denied its utility in their studies.

2. Reasons for learning English

Regarding the reasons for learning English, the majority of informants showed a great awareness about the status of English as a global language. Indeed, they agreed on the fact that the latter is the language of science, technology, international communication, economy and policy. The students also confirmed that they learned English in order to read books and articles in their specialty since the majority of documents in their field of study are published in English. They also used it to communicate on the web and interact with native speakers. Other reasons are to conduct scientific research and mainly find a job in international companies or abroad as having a certain proficiency level in English is considered as one of the most important requirements to be recruited. They strongly agreed on the fact that they learned English to pass international tests such as Test of English for International Communication (TOEIC).

➤ Present Situation Analysis

3. Students' level in different English skills

The highest proportion of students considered their proficiency level as average in speaking (54.16%), grammar (41.66%) and pronunciation (39.16%), good in vocabulary (77.5%), and very good in reading (45.83%). They considered their achievement to be weak in writing (35.83%) and very weak in listening and communication with 35% and 37.5% respectively. This is confirmed in the figure below:

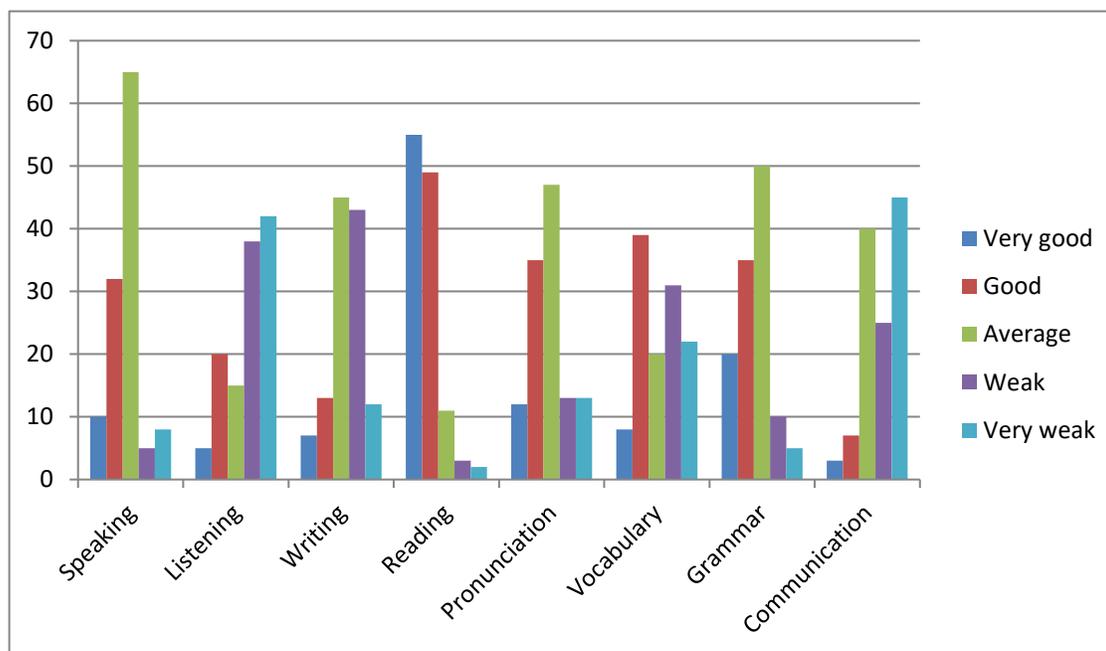


Figure 2: Students' level in different English skills

4. Importance of English sub-skills

Concerning the reading sub-skills, the results revealed that the most important ones are reading study notes and reading technical manuals (83.33%).

As for the writing skills, writing lab reports is perceived as very important (85%), writing assignments as important (35.83%).

Regarding the listening and speaking sub-skills, listening to spoken presentations (58.33%) and giving spoken presentations (68.33%) are recognized as very important, listening to instructions for assignments (45.83%) and participation in discussions (55%).

5. Students' proficiency level in English

As it is presented in the figure below, almost all students, 83.4 % confirmed that they are beginners as they stopped learning English at university for one year. 12.45% students argue that they have an intermediate level and only 4.15% students consider themselves as advanced.

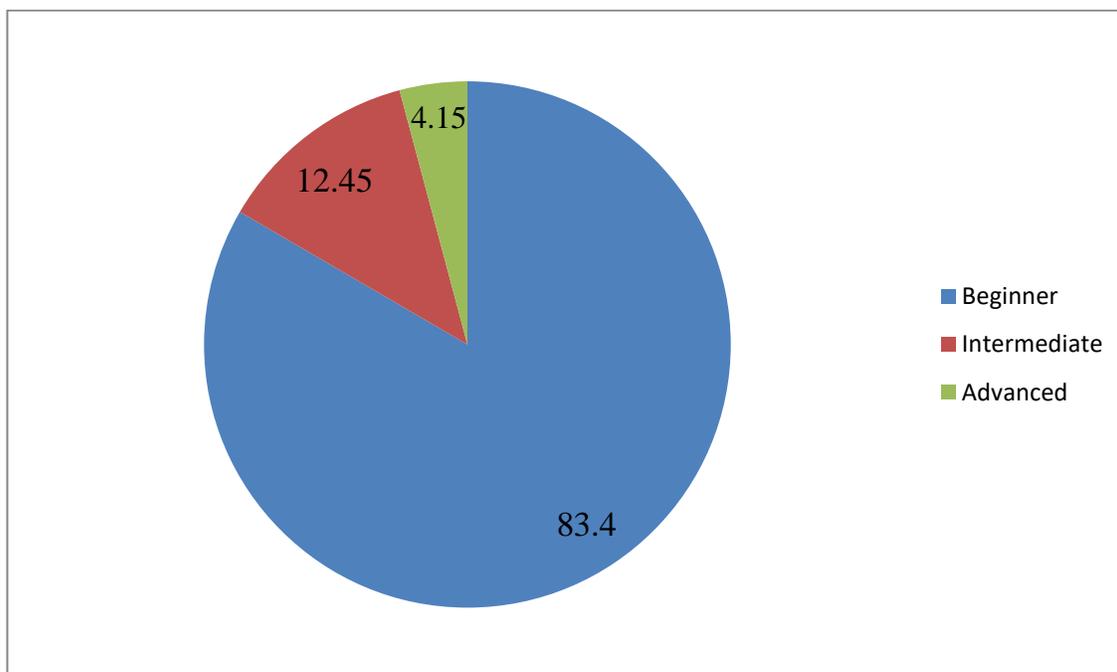


Figure3: Students' proficiency level in English

6. Students' need for training

The informants confirmed that they need to be trained in how to communicate effectively in real situations, i.e. they want to improve their speaking and listening skills rather than reading and writing which they consider as not important. They asserted that they need to improve their ability to speak about Engineering and Manufacturing related topics in English. 97.5% of them want to write about Engineering and Manufacturing related topics in English and pass English examination, followed by 91.6% who need to Read Engineering and Manufacturing related books and articles.

7. Classroom Teaching Practices

Concerning the aspects of English that need more teaching, the majority of the informants gave priority to technical vocabulary at the expense of grammar and speaking skills respectively. They asserted that they prefer that the English course comprises both English for academic purpose (research and studies) and English for occupational purposes (work).

3.2.English Language Teachers Questionnaire

The English language teachers' questionnaire revealed very important data that will help the investigator in designing the course.

➤ Teaching Situation Analysis

1. English language Instruction

The majority of the informants posited that they did not follow a precise method in teaching English. They confirmed that they combined the Grammar Translation Method, Communicative

Language Teaching and the Audio-lingual method depending on the type of the task. They argued that they were given a syllabus designed by the teacher in charge of the English course at the department of Manufacturing and Engineering Sciences, but no one of them used it because of its grammatical nature. They also confirmed that the English language course took the form of 'Cours /TD', i.e. a lesson followed by different activities such as grammar exercises, reading a text aloud, etc. The English language teachers asserted that most of the time they relied on self-designed materials and / or the use of textbooks related to both science and General English.

2. Course Content

The informants insisted that they taught more often General English and English for Manufacturing and Engineering. They revealed that they concentrated on both general grammatical notions and lexical items related to science in their teaching without denying the importance of including Lexical items related to GE and Grammatical structure related to science in the English course.

Concerning the importance of the language skills, all the teachers believed that the four language skills were important. In fact, they ranked Writing and Reading at the top followed by Speaking then Listening.

The great majority of the teachers agreed on the use of translation of lexical items in the English course mainly from English into Arabic or vice versa and sometimes from English to French though they showed a high degree of awareness about the idea that translation cannot be useful to create a target situation.

➤ Learning Situation Analysis

3. Students' Motivation

The teachers stated that at the beginning of their university studies, the students were moderately motivated because they emphasized more on their field of study. This was proved by the significant rate of absences noticed by the teachers from the part of the learners though attendance in the English language course is compulsory. But after graduation their motivation increased because they faced real situations where English becomes a necessity mainly when writing reports and conducting scientific research.

4. Instructional recommendations

All the teachers acknowledged the efforts made by the Department of Manufacturing and Engineering Sciences either by recruiting qualified teachers, or providing the most suitable materials to create a supportive environment for teaching and learning English. They strongly agreed on the fact that more time should be allotted to English instruction as three hours per week are insufficient, and disagreed on the idea that teaching should focus on General English. They also emphasized the importance of collaboration between language teachers and subject-specialists because only few of them meet with teachers of Manufacturing and Engineering to discuss and comment their course content according to the whole program of specialty.

3.3 Subject-specialists Interview

The subject-specialists' interview revealed important data about teaching and learning English in the Department of Manufacturing and Engineering Sciences.

➤ **Target Situation Analysis**

1. Importance of English

All the informants were aware of the status of English as being the global language of world economy, technology and science. They confirmed that a great number of documents in their area of specialism and conferences are published and conducted in English.

2. Situations where English is needed

The subject-specialists stated that they faced many situations in which English is used such as reading texts and manuals, writing articles, using the Internet .They added that they needed English also to undertake research and attend international conferences.

3. Language Problems encountered by students

The teachers asserted that the students encountered many problems mainly in writing about topics, reading books and articles, and translating materials related to Engineering and Manufacturing Sciences.

They also confirmed that lack of English competence constituted a handicap in their professional career. They stated that they faced several difficulties to speak with and understand foreign colleagues speaking about Manufacturing and Engineering sciences, do research, publish scientific articles and attend international conferences.

4. Importance of English in workplace

Regarding the importance of English in workplace, the teachers argued that knowledge of English is considered as a favorable factor in the labour market. They confirmed that one of the requirements to have a job is to be communicatively skillful apart from knowledge and expertise in their field of specialism.

5. Students' readiness for professional life

The informants posited that the students were not well prepared to use English to meet their work requirements because they don't have enough knowledge about English for Occupational Purposes .They added that what they received at university is just initials about the language.

6. Subject-specialists' suggestions

The subject-specialists are well-aware of the vital role that the English language is playing nowadays. They suggested that the English course should be varied in order to meet both the students' current needs and the requirements of the target situation.

3.4 Administrators Interview

The administrators' interview exposed valuable data about English language instruction in the Department of Manufacturing and Engineering Sciences at Tlemcen University.

➤ **Target Situation Analysis**

1. Work conducted in English

All the informants posited that a great amount of work in the Department of Manufacturing and Engineering Sciences at Tlemcen University is conducted in English as there is collaboration

between the aforementioned department and the Department of Management Engineering at Missouri Rolla University (USA) since 2003.

2. Objectives of teaching English

The administrators pointed out that the main objective of teaching English in the Department of Manufacturing and Engineering Sciences at Tlemcen University is to keep pace with nowadays world changes which require a high command of English. When learning English at university, students are expected to be fluent communicant who have a set of skills covered in English either in speech or technical writing in order to succeed as engineering professionals.

3. Language Problems encountered

All the informants agreed that students in the Department of Manufacturing and Engineering Sciences encountered many problems when learning English because of lack of practice. They outlined that the learners found themselves dealing with grammar blocs rather than communication activities.

4. Evaluation criteria

The administrators confirmed that there are no clear criteria which allow them to evaluate the success of the English course. However, they asserted that it is noticeable from the students' grades and their achievement in real situations where English is required that there is a gap between the objectives drawn for this course and what is taught in reality.

5. Administrators' suggestions

The administrators suggested that a specialised training should be provided for ESP teachers. They called for an official programme provided by the government in order to rule the teaching and learning of English in the Department of Manufacturing and Engineering Sciences at Tlemcen University.

4. Discussion

The collected data revealed very important information which allowed the researcher to draw a clear picture about English language teaching and learning situation in the Department of Manufacturing and Engineering Sciences at Tlemcen University. They also enabled her to analyze the students' needs and identify not only their needs but also their attitudes towards the English course delivered in their department.

Regarding the present situation analysis, the findings showed that the students possessed a beginner level of English language proficiency as they stopped learning English for one year, and this affects their learning continuum. Students and teachers asserted that a great number of books and articles in the field of manufacturing and engineering sciences were in English. So it is important to have a certain command of this language for better understanding and easy use of the related documents written in English. The findings also revealed that the students could not understand native speakers of English. They were also unable to recognize the technical vocabulary used in Manufacturing and Engineering Sciences, and produce correct discourse. For these reasons, students need to develop the four language skills with more focus on speaking and

listening in order to speak, write and read Manufacturing and Engineering related topics, books and articles.

As far as the target situation analysis is concerned, the subject-specialists and administrators raised the necessity to be proficient in English because the nature of Manufacturing and Engineering profession requires high knowledge in this language. In fact, it serves to develop a career and international relations, writing business documentations and reports, decoding devices' rules and regulations which are written in English, and using English communication skills effectively to negotiate with other professionals in the world in terms of technological advances. They stated that nowadays English speaking professionals were more demanded in the work market because companies ask for some mastery of English an essential requirement to be recruited. In fact, English learning is no longer a luxury, but a necessity.

Concerning the teaching and learning analysis, the results obtained from language teachers' and students' questionnaires revealed that the English language course in the Department of Manufacturing and Engineering Sciences at Tlemcen University took the form of "*Cours / TD*". Though it is compulsory a great number of absences is noticed. The time allotted to the course is three successive hours per week starting from the second year and this was assumed to be insufficient to cover many aspects related to the English language. The language teachers relied on self-designed materials and textbooks related to science in the light of the absence of an official programme delivered by the department.

As far as the learning factor analysis is concerned, the data gathered showed that the students at the Department of Manufacturing and Engineering Sciences at Tlemcen University are motivated to learn English though their attitudes towards this course is described as unfavorable at the beginning. Among the reasons that the students mention for learning English is that they need it both in their studies and target career. Another important reason is to pass international tests such as TOEIC which becomes a trend nowadays to gain a job and urges the students to be fluent communicants in English.

Conclusion

The current study aimed at portraying the present situation of ESP teaching in the Department of Manufacturing and Engineering Sciences, at Tlemcen University. Moreover, the purpose of this research work was to analyze the students' needs in the English language throughout the use of a triangulation of research instruments including questionnaires submitted to ESP students and English language teachers, and semi-structured interview conducted with subject-specialists and administrators. In fact, interesting results were achieved. The stakeholders agreed on the importance of English in the field of manufacturing and engineering. They also confirmed that there was an urging need for a more focused ESP courses related to the target discipline. As far as the students' needs are concerned, different expectations were noticed to use English either for academic or professional purposes. This includes reading books, writing articles and reports, giving presentations, and undertaking exams such as the TOEIC. In fact, students were highly motivated to learn English as this language plays an important role in their vocational career and were namely in need of reading and writing scientific articles.

About the Authors

Ms. Nouria MESSAOUDI holds a Master's degree in Language Sciences and she is currently a 3rd year doctorate student at Tlemcen University, Algeria. She is a high school teacher. She worked as part time teacher in the Department of English and the Department of Manufacturing and Engineering Sciences at Tlemcen University, Algeria. Her main interests include didactics, needs analysis, Legal English, English for Specific Purposes (ESP) and course design.

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