Investigating Moroccan Engineering Students’ Needs: A New Perspective for Quality Education in Moroccan ESP Contexts

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Abstract
This research aims to explore the needs of Moroccan engineering students at the level of language skills and soft skills. The objective of this paper is to find out the main skills that Moroccan engineering students wish to develop using two main approaches: target situation analysis and present situation analysis. This paper will answer the following research questions: 1) what are the Moroccan engineering students’ language needs? 2) What are the 21st-century skills that need to be improved among engineering students? To answer these questions, the researchers opted for a Mixed-method approach, and used two major instruments: questionnaire and interview. After gathering the data, the results were analyzed using descriptive statistics for the quantitative data and thematic analysis for the qualitative data. The results revealed that Moroccan engineering students put speaking as the most critical productive skill that should be given due concern. For soft skills, Moroccan engineering students would prefer to improve their creativity, leadership, critical thinking, teamwork, innovation, and problem-solving skills, respectively.

Keywords: ESP, needs analysis, soft skills, language skills
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Introduction

The situation of teaching foreign languages in Morocco after the independence tended to correspond to another reality especially at the level of language policy. The teaching of foreign languages played a very critical role. Recently, foreign languages have been given much importance in the Moroccan education system, namely in higher education, and this has led to the integration of foreign languages at the tertiary level. In doing so, English has given much importance in schools of business, engineering and faculties of medicine. Morocco has undergone a new reform, the main objectives of this reform is to bridge the gap between academia and the socio-economic sector. In this respect, students would be introduced to appropriate employability skills such as the mastery of foreign languages and soft skills. In the same vein, the constitution, the new reform, and the strategic vision emphasize and recommend that students should know and master the widely spoken foreign languages as a means of communication, engagement, and interaction with the knowledge society openness to different cultures, and contemporary civilization. Hence, this research aims to conduct a thorough needs analysis in order to find out the importance of English in the academic and the socioeconomic sector.

Literature review

Conducting needs assessment is of paramount importance in ESP contexts. Similarly, Needs Analysis aims to reveal what to teach and what not to teach so as to design an appropriate syllabus that meets students' expectations and target the academic objectives. According to Hyland (2006:73) needs assessment is:

The techniques for collecting and assessing information relevant to course design: it is the means of establishing the how and what of a course. It is a continuous process, since we modify our teaching as we come to learn more about our students, and in this way it actually shades into evaluation – the means of establishing the effectiveness of course. Needs is actually an umbrella term that embraces many aspects, incorporating learners’ goals and backgrounds, their language proficiencies, their reasons for taking the course, their teaching and learning preferences, and the situations they will need to communicate in.

Needs can involve what learners know, don’t know or want to know, and can be collected and analyzed in a variety of ways.

In the same track, Hutchinson and Waters (1987) point out that learners’ needs should be considered in the process of planning the content of a language program. One can notice that needs assessment is the first step before thinking about what to teach in ESP courses because it targets what skills to enhance and what content to teach. For example, engineering students may need to deepen their knowledge in engineering, business and academia and also enhance their speaking or listening skills.
In this regard, Basturkmen (2006) explains that engineering students may need to deal with written texts concerned with a technical matter but may want to read the topics in English on other general interest. By the same token, Long (2005) points that there are four main reasons for performing needs analysis: First, to determine the relevance of the material to the learners’ situations; second, to justify the material in terms of relevance for all parties concerned (teacher, learner, administration, parents); third, to account for differences in learner’s needs and styles, fourth, to create a syllabus which will meet the needs of the learners as fully as possible within the context of the situation.

Needs assessment is basically based on six main approaches: Target situational analysis, Present situation analysis, deficiency analysis, means analysis, Strategy Analysis, and Job and task analysis. All these approaches aim to find out the appropriate skills and content that should be addressed to the target group. The ultimate objective of adopting these approaches is to meet at first the needs of students, the socio-economic sector, teachers and sometimes the institution needs. In doing so, this research is meant to target the main language skills, soft skills and content that an ESP teacher should take into account while designing an ESP syllabus for engineering students in Morocco. It also aims to evaluate the overall ESP course in different engineering schools mainly testing students' satisfaction of teaching materials, teachers' teaching method, evaluation, and the time allotted to the English course.

Statement of the problem

It is very clear that teaching in an ESP course should take into consideration the needs of students through needs assessment. Needs Analysis aims at finding out relevant content and skills that students need to develop and that would help them to be trained academically and professionally. In this regard, some engineering graduates find difficulties to find jobs simply because of their poor proficiency in English. They also need to be-trained in soft skills such as communication, teamwork, leadership, problem solving and critical thinking skills. For instance, The British Council (2016) claims that to succeed in a job interview in Morocco, a candidate will often get a job with an intermediate knowledge of English and good communicative abilities. Similarly, Erling (2016) proclaims that a number of companies refuse to hire many fresh engineers because of their poor employability skills which include basic/foundation skills, technical or vocational skills, professional/personal skills and core work skills. Therefore, it is important to have clear cut objectives from the beginning in order to train students academically and professionally. Furthermore, some teachers do not set clear academic objectives and hence students fail in their attempt to acquire the basic knowledge of English that is needed in the labor market. As a result, there exists a gap between the achievement of the English instructional
program and the labor market’s requirements.

Research objectives

The objective of this research is to explore the needs of engineering students targeting their needs, wants and lacks. It is very clear that conducting needs analysis is very fundamental for the quality education in ESP contexts. It is also important to find out what language skills, soft skills and content that should be given more importance among Moroccan engineering students.

Research questions

This research strives to find answers to the following research questions:

1) What are the language needs of Moroccan engineering students?
2) What are the main soft skills that need to be improved most among Moroccan engineering students?
3) To what extent do ESP courses satisfy Moroccan engineering students?

Research design

The present research is conducted at the national level essentially in various Moroccan engineering schools in Morocco. The institutions are ENSAM, EMI, ENIM, and ENSA in Fes and, Oujda and Agadir. The researcher opted for a mixed-method approach where the researcher combined between the questionnaire as a quantitative data collection, and a semi-structured interview for qualitative data.

The primary objective of quantitative methods is to test the hypotheses and generate numerical data. Testing hypotheses involves using the questionnaire or doing experiment. This study tests three main research hypotheses through the questionnaire. This method aims to reveal the present and the target needs of Moroccan engineering students. For qualitative data, it aims to understand the world as it is from subjective experiences of individuals. It also allows to have deeper understanding of naturalist phenomena, yields delighting and insightful foundation and reliable results. It is more explanatory of the complexities and riches of naturalist phenomena. Therefore, the use of qualitative data collection techniques and interpretation of the findings are recommended, namely open ended questions for the interviews. To this end, the use of mixed method would enrich the results and broaden the scope of understanding.
Research instruments

Based on the research objectives of the study, the questionnaire and the semi-structured interviews were opted for as the appropriate research instruments for data gathering. Hutchinson and Waters (1987:56) view that “the choice of a method will depend on time and resources available and the procedures of each will depend on accessibility”. Likewise, Robinson (1991) clarifies that in needs analysis, the researcher can opt for a list of research methods including questionnaires, interviews, case studies, tests, and authentic data collection (e.g. analyzing actual manuals and written assignments). Jordan (1997) adds that in needs assessment, the researcher can rely on other research instruments such as language tests, self assessment, structured interviews and learner diaries. Thereby, the researcher is free to choose between the above research instruments and the validity of the results in needs assessment is based on triangulation.

The questionnaire is a widely used research instrument for quantitative data. Brown (2001) defined the questionnaire as “any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers” (p. 6). The main asset of choosing the questionnaire is that it is time saving and it targets a huge number of populations in a very limited period of time. Regarding the questions, the researcher can incorporate questions that give the chance to the respondents to answer questions freely especially questions for classroom management, motivation to learn, learners’ belief about learning, and students’ reaction to learning (Mackey & Gass, 2005).

The main attraction of the questionnaires is their unprecedented efficiency in terms of (a) researcher time, (b) researcher effort, and (c) financial resources (Dornyei, 2003, p. 9). Furthermore, Brown (2001) highlighted that questionnaires are more flexible and the respondents can fill out the questionnaire at ease and at their own place. Besides, the questionnaire is also versatile in the sense that it can be used successfully with a variety of people in a variety of situations targeting a variety of topics. As a result, “the vast majority of research projects in the behavioral and social sciences involve at one stage or another collecting some sort of questionnaire data” (Dornyei, 2003, p. 10).

The survey consisted of two fundamental sorts of questions: open ended and close ended questions. This research utilized the two types of questions so as to complement each other and target the objectives of the study. Furthermore, this questionnaire respected the rules of writing good items like being short and simple, and of course all the items in the questionnaire are easy to understand and read.
Data collection and analysis

The researcher administered the questionnaire to 300 Moroccan engineering students and interviewed ten university students. The data were inserted into SPSS and analyzed using descriptive and inferential statistics. Descriptive statistics include the mean and standard deviation and for inferential statistics, the Chi-square test of independence was used. In the same vein, thematic analysis was used to analyze the qualitative data.

Findings of the questionnaire

This part is devoted to the analysis of the language needs for Moroccan engineering students. The questionnaire is composed of forty two items. The items aims to target the degree of importance of language skills, sub-skills, soft skills, and content. The last item is devoted to test students' satisfaction with teaching materials used, time allotted to English courses, assessment, teachers teaching methods. After running the piloting test and testing the Chronbach Alpha (0.821), the results showed that Moroccan engineering students put speaking and listening as the most important language skills that should be given much importance (M=5.05, SD=1.02) (M=4.69, SD=0.66). For the importance of speaking sub-skills, the respondents put talking with professionals in real situations as the sub-skill that should be given much interest (M=4.29 SD=1.09) Also, delivering presentations in class is as important as talking with professionals in real life situations, M=4.29, SD=.958). As for other speaking sub skills, preparing for interviews rates (M=4.00, SD=1.17). In the same vein, this workplace skill is one of the skills that job market is in immense need. Building relationships rates the third (M=3.95, SD=1.22). Meetings rates (M=3.93, SD=1.16).

For reading sub-skills respondents consider reading technical articles as the most important reading sub-skill that students should enhance (M=4.7 SD 1.11). Reading graphs rates (M=3.71 SD= 1.17). Reading job applications rates (M=3.74 SD=1.13). Reading magazines rates (M=3.32 SD=1.25). Reading books rates (M= 4.02 SD= 1.13). In contrary, employers firmly believe that reading technical articles rates (M= 4.00 SD= 1.026). Reading job application rates (M= 3.75 SD =1.070). Reading magazines rates (M=3.30 SD 1.342). Reading books rates (M=3.25 SD 1.446).

As far as listening sub-skills is concerned, Moroccan engineering students believe that listening to presentations delivered by experts is the important listening sub-skill, it rates (M= 4.37 SD= 1.0) which is rated the highest among other listening sub-skills. Listening to understand the difference between American and British English rates (M=4.00 SD=13). Listening to native speakers rates (M= 3.85, SD=1.13). Listening to conversation rates (M=3.57 SD= 1.34). As for the writing skill, students consider writing CVs as the most important writing sub-skill which
rates (M=4.14 SD=0.17). The second main sub skill is writing business email which rates (M=4.12 SD=1.16). Writing motivation letter rates (M=3.99 SD=1.16). Writing business reports rates (M=3.86 SD 1.22).writing application letters rates (M=3.74, SD=1.22). Writing academic reports rates (M=3.43, SD1.30). Writing news papers articles rates (M=3.16, SD=1.34).

As far as soft skills are concerned, the table bellow apparently states the importance of soft skills. The results imply that engineering students would like to improve creativity as the most important soft skill that is rated higher than other soft skills which rates (M= 4.55 SD=0.86). Leadership is as very important sub skill as creativity (M=4.53 SD 0.901). Critical thinking rates (M= 4.52 SD= 0,856). Team work rates (M=4.47 SD=0,851). Innovation rates (M= 4.46 SD= 0,937). Problem solving rates (M= 4.44 SD= 0,940). Interpersonal skills rates (M=4.24, SD=0,996). It is noticeable that all these soft skills rate more than average so this explains that Moroccan engineering students give much importance to all these 21st century skills because they believe that they would help them in the recruitment process and they are aware that these skills are the most widely needed skills in the market place.

For testing students’ satisfaction of the ESP course at the level of teaching materials, teachers teaching method, time allotted to English, assessment, the Chi-square highlights the extent to which students are satisfied with the items mentioned earlier. The tables bellow about the Chi square test demonstrates students’ satisfaction of time allotted to English, assessment, teachers’ teaching methods and teachers’ teaching materials.

<table>
<thead>
<tr>
<th>Chi-square Test</th>
<th>Significance P value (2-tailed)</th>
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<td></td>
<td>0.391</td>
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*Table1 Chi-square test of students’ affiliation and their satisfaction of time allotted to English*

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<tr>
<th>Chi-square Test</th>
<th>Significance P value (2tailed)</th>
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<td>0.794</td>
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*Table2 Chi-square test of students’ affiliation and their satisfaction of teachers teaching method*

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<tr>
<th>Chi-square Test</th>
<th>Significance P value (2tailed)</th>
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<td></td>
<td>0.773</td>
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*Table3 Chi-square Test of students’ affiliation and their satisfaction of assessment of language skills*
Table 4. Chi-square test of students’ affiliation and their satisfaction of teachers teaching materials

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<th>Test</th>
<th>Significance P value (2-tailed)</th>
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<tbody>
<tr>
<td>Chi-square Test</td>
<td>0.320</td>
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The tables above reveal the results of association. The $P$ value is below the typical level 0.05. Thus, we accept the hypothesis and claim that students’ affiliation and their satisfaction of time allotted to English are not independent at the level of teachers the time allotted to English courses, teachers teaching method, assessment, and teachers’ teaching materials. It is therefore clear that students are not satisfied with the overall ESP course. More efforts should be invested in this context so as to meet students' needs such as giving more time to English courses, teachers should vary their teaching methods and use updated teaching methods such as Project-Based learning and Task-Based learning. Students would be also interested in using other teaching materials such as using ICT tools, updated textbooks in this regard, ESP teachers should not stick to only one Textbook.

Findings of the qualitative data

The results of the interview confirm the results found in the questionnaire. The main themes used in the interview are the usefulness of English in the professional context, the importance of soft skills, and syllabus design and materials selection.

The semi-structured interview was conducted among twenty engineering students from different engineering schools. They are males and females aged between twenty and twenty-four. The data obtained from the semi-structural interview prove that engineering students consider the mastery of English as an added value for their future career. It is no doubt that the industry sector takes into consideration the mastery of the English language as one of the requirements for getting a job, this entails that students have no choice but to enhance their level in English so that they can find jobs easily.

In regard to the question about students’ importance of knowledge and skills needed in the job market, students consider speaking and listening as the most important language skills that they need to develop because they do believe that these two skills are very fundamental and they need to be developed. As far as content is concerned, students are more interested in deepening their knowledge in issues related to English for engineering, business English, and intercultural communication.
As for the question about the importance of soft skills, students are very aware of these skills and how they are highly important in the job market. The results of this question revealed that students are very aware of the importance of the soft skills for students’ professional development and how they are critical for students’ professional career. All the respondents claim that critical thinking, problem-solving, collaboration are the main soft skills that need to be cultivated in ESP contexts. Hence, it is worth mentioning that holding these skills would help them get integrated in the socioeconomic sector.

Discussion and interpretation

The present study has indicated that Moroccan engineering students believe that they need to enhance their speaking and listening skills. The choice of speaking as the first important language skill to be enhanced among Moroccan engineering students is maybe explained with its importance in the job market. Students would like to develop their listening skills in order to understand native speakers. Moroccan engineering students will need to speak with their instructors fluently and be able to speak confidently. This skill is very significant because it can help them communicate in different situations. In the marketplace, for instance, engineers will deal with interview questions as well as speak with native managers and other managers who come from other nationalities and foreign colleagues or customers. Though some companies still use French as the language of communication, English is also given its due concern and sometimes some companies favor graduates who are good at speaking.

To enhance students’ listening and speaking skills, ESP teachers should use presentations delivered by experts in their domain. This can also be done through organizing seminars, workshops, and conferences. This would help engineers meet experts in different domains that are related to engineering. When engineers listen to experts, they sharpen their listening skill and they can exchange and update their knowledge related to engineering.

For course content, introducing English for civil engineering to civil engineers and English for mechanical engineering to mechanical engineers…etc is a sine qua non. Civil engineers must know things related to the construction of dams, bridges, tunnels… they must be introduced to vocabularies that would help them deepen their knowledge in their field of interest, technological advancement, equipment…etc. Mechanical engineers should know vocabulary related to their domain like: types of motion, machine components, wheel and Axle, Gears, Cams, design and application, the language of trends, types and characteristics of friction…etc. Therefore, the job of the ESP teacher is to facilitate and collaborate with teachers of
the content courses. For electrical engineering, students have to be taught things related to energy systems, communication systems, renewable energy, solar energy… etc. In computer engineering, engineers have to be introduced to subjects about instruments like software programs, gauging tools, material technology like the difference between metals and non-metals, how hackers work, difference between good and evil hackers etc. They should also know things related to control system and mechanical design. For those who are specialized in industrial engineering, they should understand things related to the components of cars and planes.

Moroccan engineering students should be introduced to courses related to their discipline. ESP teachers must teach topics related to engineering and use activities to help students understand deeply the job of an engineer, the tasks of engineers, the vocabulary related to engineering, and the main language skills that engineers have to improve. For that reason, ESP teachers have to teach this course content to all branches of engineering.

Furthermore, problem solving and critical thinking, innovation and creativity are the most effective skills that a fresh graduate should hold. 21st century skills are of vital importance for the profile of a fresh engineer. In regard to the TOEIC, it is one of the tools whereby companies measure students’ performance in the English language especially in business contexts. Some companies take the score of the candidates into account for evaluating their proficiency. So, this certificate is very meaningful for engineering students because it paves the way for a better place in the job market. Besides, the certificate can improve students’ linguistic abilities and raise their language proficiency in authentic situations. Therefore, the inclusion of the preparation for the TOEIC among engineering students would certainly raise students’ motivation and lead to a positive attitude toward the English course.

ESP courses are in fact addressed to intermediate levels, so students must meet this criterion before indulging in ESP course. The industry sector is in immense need of engineers who are good enough in English and are able to speak with clients, guests, and managers in English because the majority of multinational companies highly recommend engineers who have the qualities soft skills and the being fluent in English so that they can speak communicate with managers from different nationalities.

Conclusion

To conclude, the present study explored the needs of Moroccan engineering students which targeted the language skills, soft skills and content that should be taken into consideration in
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different Moroccan engineering schools. This work opted for the mixed method approach in data collection and data analysis using descriptive and inferential statistics in quantitative data and thematic analysis for qualitative data. The overall results showed strong foundation for enhancing students' speaking and listening skills as well as giving much importance to teaching issues related to their field of specialization and also deepen their knowledge in Engineering students are in dire need to discover their field of interest in English and to be able to deepen their vocabulary in engineering, and why not business.

References


