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Investigating the Academic and Professional Needs of Chemistry Master Two Students at Hamma

Lakhdar University of El Oued, Algeria.

تقصي الإحتياجات الأكاديمية والمهنية لطلبة الثانية ماستر كيمياء في
جامعة حمة لخضر بالوادي، الجزائر

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Abstract

Conducting a needs analysis holds utmost significance in the design and development of English for Specific Purposes (ESP) courses. It represents the initial phase wherein educators identify the requirements of their learners before introducing the course. Within this framework, the current study focuses on investigating the academic and professional needs of second-year chemistry master's students at Hamma Lakhdar University El Oued, Algeria. To accomplish this objective, a mixed methods research approach was employed. A questionnaire was distributed to 45 students randomly selected from the target group, and a semi-structured interview was conducted with 05 English teachers specializing in ESP at the Chemistry department of the university. The findings revealed that students require English for both academic and professional purposes, particularly in comprehending chemistry-related terminologies, reading scientific articles and books, and professional purposes,

mainly for communication and laboratory skills. In conclusion, the research culminates with several pedagogical implications that can aid ESP teachers, practitioners, and researchers in conducting an effective needs analysis. These insights aim to enhance the overall quality of ESP courses and ensure they align closely with the identified requirements of the learners.

Keywords: Academic and Professional Needs, Chemistry Master Two Students, ESP, Needs Analysis.

المخلص

إن إجراء تحليل الاحتياجات له أهمية قصوى في تصميم وتطوير دورات اللغة الإنجليزية لأغراض محددة (ESP) وهي تمثل المرحلة الأولية التي يحدد فيها المعلمون متطلبات المتعلمين قبل تقديم الدورة. وفي هذا الإطار، تركز الدراسة الحالية على التعرف على الاحتياجات الأكاديمية والمهنية لطلبة ماستر الكيمياء بالسنة الثانية بجامعة حماة الأخضر بالوادي. ولتحقيق هذا الهدف، تم استخدام منهج بحثي مختلط. تم توزيع استبيان على 45 طالبًا تم اختيارهم عشوائيًا من المجموعة المستهدفة، كما تم إجراء مقابلة شبه منظمة مع 5 مدرسي لغة إنجليزية متخصصين في تعليم اللغة الإنجليزية لأغراض خاصة في قسم الكيمياء بالجامعة.

كشفت النتائج أن الطلاب يحتاجون إلى اللغة الإنجليزية للأغراض الأكاديمية والمهنية، خاصة في فهم المصطلحات المتعلقة بالكيمياء كقراءة المقالات والكتب العلمية، والأغراض المهنية، خاصة لمهارات الاتصال والمختبر. في الختام، يتوج البحث بالعديد من الآثار التربوية التي يمكن أن تساعد معلمي وممارسي اللغة الإنجليزية لأغراض تخصصية والباحثين في إجراء تدريب فعال لتحليل الاحتياجات. تهدف هذه الأفكار إلى تعزيز الجودة الشاملة لدورات اللغة الإنجليزية لأغراض

خاصة (ESP) والتأكد من أنها تتوافق بشكل وثيق مع المتطلبات المحددة للمتعلمين.

الكلمات المفتاحية: الاحتياجات الأكاديمية والمهنية، طلاب الثانية ماستر كيمياء، تعليم اللغة الإنجليزية لأغراض خاصة، تحليل الاحتياجات.

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Introduction

As English has evolved into an international language for communication, business, finance, medicine, law, engineering, chemistry, and various other fields, the integration of this language into educational courses has become imperative. English for Specific Purposes (ESP), as a learner-centered approach, has emerged in response to the advancements in science and technology. This is because General English fails to align with learners' specific communicative needs, particularly those in specialized disciplines.

English for Specific Purposes (ESP) simply refers to “a movement based on the proposition that all language teaching should be tailored to the specific learning and language use needs of identified groups of students (Johns & Price-Machado, 2001, p. 43). It is clear that ESP is an approach centres on the idea that teaching language should be adapted to meet specific students' language needs. Hence, this approach involves teaching students specific language skills and competencies required to communicate successfully in their academic, professional, or vocational settings.

The development of an effective ESP course necessitates teachers to carefully consider the unique needs of their learners

and gain a comprehensive understanding of them. This process is facilitated through a needs analysis, which outlines the inclusion of materials, content, tasks, aims, and objectives within the course. According to Johns (1991), needs analysis helps in establishing aspects of students' target English environments and incorporating them in EAP/ ESP teaching. Thus, teachers can equip students with the language necessary for success in their academic and professional journeys. To round up, by conducting a needs analysis, teachers ensure the attainment of their goals and the fulfilment of their learners' specific requirements.

It has been observed that second-year master's chemistry students at El Oued University face numerous challenges while learning English. These challenges not only contribute to their low competence in the language but also pose hindrances to their future employment prospects. This predicament arises from the fact that their courses were not designed based on a needs analysis. In light of this situation, the present study seeks to investigate the academic and professional needs of these students, aiming to answer the question: What academic and professional English language skills are essential for chemistry master's students?

Based on this research question, we hypothesize that the improvement of English language skills among second-year chemistry master's students is achievable if teachers incorporate their specific needs into the course development process. This study endeavours to shed light on the critical aspects that can enhance the language learning experience and future prospects of these students.

1. Literature Review

From the very first days of ESP, needs analysis has been over-studied by many researchers (Allison et al., 1994;

Basturkmen, 2003; Hyland, 2006; Munby, 1978; Richterich & Chancerel, 1987). It is the methodology adopted by the ESP teachers to gather data about their students' needs and goals (Richards, 2001). Needs analysis is the primary stage in ESP course development. It is conducted to establish the methodology and the content of a course (Flowerdew, 2013). This method can be achieved through a set of tools, including questionnaires, tests, discourse analyses, case studies, interviews, observations, surveys, data collection (like gathering texts), informal consultations with sponsors, learners and others, and many other instruments (Dudley-Evans & St John, 1998 ; Hutchinson & Waters, 1987; Robinson, 1991).

Additionally, the concept of needs analysis first appeared in the literature of ESP in the 1970s. At this era, it was broadly conceptualized regarding the target situation analysis (TSA) which centres on what learners are needed to accomplish with the foreign or second language in their specific target contexts (West, 1994). Over time, needs analysis has its special significance in the process of teaching ESP courses. It is also called needs assessment which refers to the process of determining the needs for which a learner or group of learners requires a language and arranging the needs according to priorities" (Richards & Schmidt, 2010, p.389). This entails that ESP teachers should define learners' language needs and classify them according to precedence.

Although researchers do not agree on a standard definition for the concept of needs, Hutchinson and Waters (1987) proposed two kinds of them: target needs and learning needs. The first type of needs is categorized into three parts: necessities, lacks and wants. Necessities are known as the objective needs, lacks are the gap between students' prior knowledge and their necessities, whereas wants are the motives

behind their learning of language. However, the second type refers to the needs both lacks and necessities depend on (Jordan, 1997).

Hutchinson's and Waters's Model (1987) of Needs Analysis was based on two important approaches: Target Situation Analysis (TSA) and Present Situation Analysis (PSA). The first approach sheds light on learners' needs when they finish the ESP course, while the second one focuses on the students' background knowledge when they start the course (Jordan, 1997). In addition to these approaches, Dudley-Evans and St John (1998) developed their model of Needs Analysis, which covers the TSA and the PSA, deficiency analysis, linguistic analysis, discourse analysis, genre analysis, and means analysis.

According to Songhori (2008), the (TSA) incorporates objective, perceived and product-oriented needs. The (PSA) estimates strengths and weaknesses in language, skill, and learning experience. The Deficiency Analysis considers learners' current needs and wants. The Discourse Analysis examines how sentences combine into discourse. The Genre Analysis Approach concentrates on the patterns of structure that distinguishes one type of text from another. Means Analysis involves gathering data about the environment where the course will occur. In conclusion, course designers had better vary in their methodologies and models of analysis to ensure the validity of needs analysis process and reach accurate results.

2. Research Method

This section provides a comprehensive overview of the research methodology, including details on sampling procedures and the tools employed for data collection in the execution of this study.

2.1. Research Method

The present study seeks to identify the students' academic and professional needs of learning English language. To attain this aim and to answer the research question, we used mixed methods research. In simple terms, mixed methods research refers to the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches" (Johnson et al., 2007, p.123). Obviously, this research method involves the researcher combining both qualitative and quantitative methods to gather information, analyse the results, and draw conclusions.

2.2. Sampling

In this study, our target population are Chemistry master two students at Hamma Lakhdar University, El Oued. We randomly opted for 45 students, 32 females and 13 males between the ages of 24 and 26, to have an insight into their academic and professional needs while learning English language. Moreover, we conducted a semi-structured interview with five teachers of English at the Department of Chemistry at the University of El Oued.

2.3. Data Gathering Tools

Concerning the data collection instruments, a questionnaire was distributed to students to have an idea about their academic and professional needs of English. It consists of three sections. Each section includes multiple choice questions, close and open-ended questions. Furthermore, a semi-structured interview that combine ten questions, ranging from open-ended to close-ended questions, was held face-to-face with teachers of English.

3. Data Analysis

3.1- Students' Questionnaire

Item 1: Which of the following language skills do you find difficult to master?

Table 1.Students' Most Difficult Skills

Options	Frequencies	Percentages (%)
Speaking	22	48.89
Listening	6	13.33
Reading	4	8.89
Writing	13	28.89
Total	45	100

The results showed that the majority of participants have problems with the productive skills, speaking (48.89%) and writing (28.89%). However, only 6 informants find difficulties in listening and 4 of them face challenges in reading skill. Therefore, they cannot express and communicate their ideas and thoughts orally and in written forms due to the lack of vocabulary, reading, practice, confidence, misuse of language and other factors. They also do not have the appropriate skills, abilities, and strategies that enable them to communicate the topic effectively and fluently.

Item 2: According to you, what is the best way for learning English courses?

Table 2.Students' Preferred Types of English

Options	Frequencies	Percentages (%)
General English	33	73.33
Specific English	12	26.67
Total	45	100

As shown in the table above, (73.33%) of the questioned students said that they prefer learning general English, while (26.67%) stated that they favour specific English because they do not want to stay restricted in their chemistry specialty. Thus, they need to broaden their English use by being exposed to

various contexts and situations. In general, the majority of population under investigation preferred general English rather than specific one because the former is characterized by being practical and feasible, including unlimited topics and valuable in various personal and professional interactions.

Item 3: As a chemistry student, do you think that the course contents suit your academic needs?

Table 3.Course Contents Suitability

Options	Frequencies	Percentages (%)
Yes	5	11.11
No	40	88.89
Total	45	100

The findings revealed that almost students (88.89%) viewed that the content of their course is not suitable to their needs. On the other hand, only (11.11%) considered it relevant to their needs and goals. They justified their answers by saying that learning grammatical items as well as specific lexis and terminologies are not enough to make them fluent in English. Consequently, chemistry syllabus adjustments have become a necessity to equip learners with the effective skills, strategies, and competencies that can help them be good communicators in English.

Item 4: Academically, what do you need the English course for?

Table 4. Students’ Academic Needs

Options	Frequencies	Percentages (%)
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Research skills (Writing essays, reports,...),	8	17.78
Technical terminology	21	46.66
Writing dissertations	0	0
Reading scientific articles and books.	16	35.56
Total	45	100

This question sought to know the respondents’ academic needs. (46.66%) of them declared that they need the English course to learn technical terminologies since fields such as chemistry requires students to be precise and competent in them. Conversely, (35.56%) asserted that it helps them in reading scientific articles and books. (17.78) of them affirmed that it improves their research skills (writing essays, reports, emails,...).

Item 5: What do you think would benefit your future career as a chemist?

Table 5.English for the development of a Future Career

Options	Frequencies	Percentages (%)
General English	18	40
Specific English	27	60
Total	45	100

As can be noticed, more than half of the informants (60%) thought that specific English benefits their future career as it enhances the language they commonly use in their

workplaces. Nevertheless, (40%) considered that general English can help them later on when they will be involved in the job market.

Item 6: Professionally, what do you need the English course for?

Table 6. Students' Professional Needs

Options	Frequencies	Percentages (%)
Communication skills	23	51.11
Laboratory skills	12	26.67
Safety knowledge	2	4.44
Problem-solving skills	8	17.78
Total	45	100

The aim of this question was to find out the students' professional needs in chemistry. The vast majority of students (51.11%) confirmed that communication is their top professional need because through it they can share data, collaborate with colleagues, manage presentations or projects.(26.67%) of them told that acquiring laboratory skills in English is necessary for their professional life. (17.78%) of them responded that they need English for solving chemical complex problems to understand a certain phenomenon. Only (4.44%) of them mentioned that being aware of the safety knowledge and regulations in English is important in their daily job.

3.2. Teachers' Interview

Question One: What do you think of your students' level in English?

The obtained results revealed that four teachers regarded the level of their learners as below average. They justified this low competence by the lack of practice and exposure to language, as well as the lack of motivation and willingness to improve their level in English. Besides, the course content and objectives are not always compatible with the students' abilities, needs, and expectations. Only one teacher perceived that the level of learners is moderate since they are not natives and they demonstrate great potential and performance.

Question Two: In your point of view, which skill do you think an ESP learner needs more?

All the interviewees viewed that speaking is the most needed skill among the English language four skills because effective communication is crucial in academic as well as professional contexts. In academic settings, students use the language to discuss, interact and share their opinions. Professionally, speaking is important in conducting positive meetings, presentations, debate, and training. Teachers also stated that ESP learners need the writing skill in producing technical reports, documentation, e-mails, memos, and many other written forms. However, they reported that the receptive skills are not as required as the productive ones.

Question Three: Is the content of the course relevant to your students' needs?

According to the interviewees, the content of the chemistry course is not relevant and suitable to their learners' needs because of several factors. To start with, time is never enough to tackle all the students' language needs and lacks. Then, learners' limited prior knowledge affects their

engagement in the course. In addition, course content mismatches the students' learning styles, preferences, and wants. Moreover, syllabus developers tend to select narrow and out dated themes that do not align with what is going on in the scientific domain. Furthermore, they put much emphasis on learners' academic needs and they slightly neglect the professional ones.

Question Four: Do you take into your account students' academic and professional needs, wants, and lacks?

The five teachers that have been interviewed said that they indeed take into consideration students' academic and professional needs, wants, and lacks. Therefore, they begin with analysing the students' lacks and addressing gaps in their knowledge and skills. Then, they focus on their needs while selecting and adapting materials, designing courses, and adopting teaching methodologies. By doing so, students will develop academic skills and be prepared for their future career. They also help create positive learning environment, and thus build a good rapport between them and their teachers. As a result, teachers will be able to fulfil students' wants and help them reach their objectives and goals.

4. Discussion of the Study Results

The discussion of the questionnaire findings provided us with an answer to the research question (What are the academic and professional English language skills needed by chemistry master two students?) revealing that they need a set of academic skills ranging from learning technical jargon, reading scientific articles and books, to mastering research skills. They also showed that they need job-related skills, including communication, laboratory, and problem-solving skills, and safety knowledge.

The last question in the interview enabled us to accept our stated hypothesis: Chemistry master two students would improve their English language if teachers take into their consideration those students' needs while developing courses. This was realized when teachers paid attention to their learners' lacks, needs, and wants. Thus, students will improve their educational skills and be ready to embark on their occupational journey.

5. Conclusion and Recommendations

The purpose of this study was to probe the academic and professional needs of chemistry master two students at Hamma Lakhdar University, El Oued. The findings unveiled that students' major goal of learning English is to develop their academic competences (acquiring domain-specific terms, reviewing scientific texts and papers, and developing research techniques), as well as attempting to enhance their professional skills (interactive, laboratory, and analytical skills, and safety awareness)

Needs analysis is a cornerstone and a starting point for designing an ESP course. Hence, teachers, practitioners, syllabus designers, and researchers should take into their account the following recommendations that they may need them while undertaking it.

- Teachers should teach English in context where students are exposed to an authentic language rather than teach them separate grammatical items.
- It is better for teachers to focus on productive skills more than the receptive ones by mainly designing activities that emphasize oral communication.
- It is necessary for teachers to make a balance between academic and professional needs while preparing their courses.

- Teachers should adapt the syllabus content based on their learners' target needs: lacks, needs, and wants.
- Syllabus designers had better select updated and relevant themes that fit 21st century generation.
- Practitioners ought to avoid using other languages (Arabic and French) within an ESP course.
- More studies should be conducted to investigate the gap found between the educational and occupational needs. This is done by a thorough needs analysis.

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