



## A Mismatch Between Course Content and Student Needs: Evaluating ESP Representativeness in a Moroccan Faculty of Sciences

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### Abstract

The importance that English is gaining as an international language has directed attention to its various aspects, among which teaching is one of the most essential. Recently, English for specific purposes (ESP) has gained attention due to the productivity it may offer for the efficient use of English in specialized fields. The present research paper examined the course content of a master's program at the Faculty of Sciences, University Mohamed the First in Oujda, Morocco. The study aimed to investigate the extent to which the course content responded to students' needs for English in relation to their field of study. A content analysis method was adopted to study the selected course content. The findings of the research showed that there was a disparity in meeting the needs of the different disciplines taught at the faculty. The study concluded that the course booklet addressed scientific English in general but failed to respond to the specific linguistic needs of each discipline, with general English items occupying the largest proportion (63.53%) while specialized fields such as mathematics received minimal attention (0.5%). This implies that current ESP instruction may not adequately prepare students for effective communication within their specific academic or professional communities. Therefore, it is recommended that each discipline be provided with a tailored syllabus, that productive skills (speaking and writing) be given greater emphasis, and that interactive and real-world simulation activities be integrated into course design.

**Keywords:** English for specific purposes (ESP), needs analysis, content analysis, curriculum evaluation, scientific English

### 1 Introduction

The transformation and change the world is witnessing has given privilege to some languages over others. English has gained more space thanks to its dominant use in different fields namely technology, research, media and business among others. This prevalent use in multiple realms has raised the question of the effectiveness of general English for each of the fields in which it is used and how it

can be useful for areas in which the language is specific to a particular domain. Hence, the need for English for specific purposes (ESP) has emerged especially that in many non-native contexts, “there is an increasing tendency to use English as the medium of instruction at different educational levels” (Chemir & Kitila, 2022, p.2). This need develops as the use of the language grows and the study of English for specific purposes gains more attention due to its necessity and popularity.

Giving more thought to teaching and learning English for specific purposes becomes a must as it imposes itself as a tool to optimize the efficiency and the employability of the language learnt. Course design is one of the means through which the instructor translates her/his objectives of teaching language into lessons and activities to help learners develop their English in relation to their fields of study. This research paper examines the extent to which the course content introduced to master students at the faculty of science, university Mohamed First, in Oujda, Morocco, meets learners’ specific needs.

### **1.1 Background of the Study**

Nowadays, science is taking the lead modifying the different spheres of life. Professionals with highly communicative skills are highly needed in the job market. Communicating effectively in English is one of the skills that may, on the one hand, allow learners have access to job market and on the other hand, reach the scientific community through their research products and exchange novelties and innovation up-dates.

In response to this urge, educational institutions reconsidered teaching programs to fit the present needs. English serving specific purposes for specific disciplines is installed and hence, course syllabi are designed to match the changes. Universities are some of the institutions responding to these changes and university Mohamed First is not an exception. However, designing a course which meets the criteria of ESP lesson may face some constraints which do not make the task easy.

### **1.2 Problem Statement**

A four-year observation of postgraduate students belonging to scientific streams revealed that they remain unable to communicate fluently with the anglophone academic community, particularly in academic events both within and outside Morocco. This issue raises questions about the effectiveness of their English language instruction during their education and training, specifically at the master's level, since it is at this stage that they study English for specific purposes (ESP). This instruction is intended to familiarize them with the jargon of their chosen specialties—whether biology, physics, geology, mathematics, computer science, chemistry, or others—yet student complaints suggest that this objective is not being met.

This observed difficulty is not unique to the Moroccan context. Research has documented similar challenges in various international settings. For instance, Gouabi (2023) found that postgraduate economics students in Algeria perceived their ESP courses as unsatisfactory and failing to meet their academic and professional needs, with instruction often remaining tied to general English rather than addressing specialized disciplinary requirements. Likewise, a study by Alim et al. (2025) revealed that mathematics education students struggled with speaking skills in academic contexts due to lack of confidence, grammatical inaccuracy, limited fluency, and difficulty pronouncing specialized terminology, highlighting how even students in scientific fields face barriers to oral communication. In the Estonian context, Meristo and colleagues (2025) reported that students across various disciplines

expressed a need for more speaking skill development and field-specific terminology acquisition, with many expecting ESP to resemble general English due to lack of prior exposure to specialized instruction. Furthermore, Zitouni (2025) found that PhD students felt unprepared for the interpersonal demands of academic and professional environments because ESP curricula inadequately addressed communication and teamwork skills. These findings across multiple contexts suggest that the gap between ESP instruction and students' actual communicative needs in scientific and academic settings is a widespread concern, not merely a localized issue at the Faculty of Sciences in Oujda.

### **1.3 Purpose and Scope of the Study**

The purpose of the present study is to investigate the reasons behind the lack of mastery of English language for specific purposes by master students within the faculty of sciences, Mohamed the First University. The research aims at examining whether master course content responds to students' needs of English for specific purposes through its elements or not. The importance of this research lies in the fact that knowing the reasons behind the problem of ESP mastery may help in finding adequate solutions assuming that the course content could be one of the factors.

## **2 Literature Review**

### **2.1 ESP Emergence and Definition**

ESP has gained scholars attention since the sixties. The field went through different historical periods and the perspectives about its meaning varied. Controversy has taken place also about its branches and the relationship between English for academic purposes and English for occupational purposes. Scholars from different areas of the world provided insights about cases they studied about ESP textbooks and previous experiences of teaching ESP.

ESP has emerged in the 1960s as a branch of English language teaching within applied linguistics (Liu et al., 2021). Since then, literature about ESP has been extending and research has linked “the old and the new” (Swales & Leeder, 2012, p. 145). The knowledge available on ESP is of a great use for researchers and practitioners. Nonetheless, most of reviews are traditional or narrative ones that depend on their writers' experiential and intuitive stand points (Petticrew & Roberts, 2006) or “the preferences and predilections of individual editors of edited collections” (Swales & Leeder, 2012, p. 145). While a limited number extant ESP works yielded objective and/or quantitative accounts, they were published in the early days of the field (e.g., Hewings, 2002; Robinson, 1991), focused on only a selected area such as genre analysis (Liu et al., 2021).

Perspectives about the definition of ESP differed. Robinson (1989) defines it as: “Goal oriented language learning”; this means that the learners have particular objectives to be achieved. “Those specific goals are closely linked with learners' interest in various disciplines, or faculties they are enrolled in” (Saliu, 2016, p. 746). Hutchinson and Waters (1987) present “ESP to be an approach not a product that means language learning and not language use is highlighted”. They add, it is a “learning centered approach” according to which “all decisions as to content and method are based on the learner's reason for learning” (Hutchinson & Waters, 1987, p. 19). In the same respect, Paltridge and Starfield (2013) define ESP as “the teaching and learning of English as a second or foreign language where the goal of the learners is to use English in a particular domain” (p. 2).

Robinson (1991) argues that what is considered as specific about ESP in a certain area in the world might not be regarded in the same way in another place. Hence, it is not easy to give a fixed definition for ESP which is correct everywhere. Hutchinson and Allan Waters (1987) would rather use the expression “what ESP is not” (p. 18) rather than what ESP is. They state that ESP does not mean using one special aspect of language, it is not teaching a series of words and structures and it is not different from other teaching methods, in terms of educational methods (Ahmadi & Rahimi Bajelani, 2012). Strevens (1977) bases the difference between general language teaching and ESP teaching on three fundamental criteria: paramountcy of language-using purposes, alignment of curricular content with the learner's purposes, and appropriateness of the employed methodology to the teaching/learning situation.

## **2.2 Historical Phases of ESP and its Branches**

Johns (2013) divided the history of ESP research into four periods: “the early years” (1962–1981) that moved away from text-based counts of grammatical features to rhetorical analysis, “the more recent past” (1981–1990) that introduced central ESP concepts (e.g., genre and rhetorical move) and widened the field's scope through the establishment and expansion of English for Specific Purposes Journal, “the modern era” (1990–2011) that was dominated by genre and corpus studies and ushered in another major outlet for ESP research (i.e., JEAP), and “the future” (2012-) that has been characterized by international authorship, varied methodologies, and growing attention to multimodalities. (Johns, as cited in Liu et al., 2021, p. 98)

English for Specific Purposes is a field that encompasses other sub-fields. Ahmadi and Rahimi Bajelani (2012) argues that:

ESP is a branch of English Language Teaching (ELT) which in its turn is divided into two main branches of English for Academic Purposes (EAP) such as Medicine, Engineering, Theology, etc. and English for Occupational Purposes (EOP) such as English for secretaries, technicians, etc. (p.793)

There is a debate among language academicians about if EAP is part of ESP or not. Some scholars think that ESP has two fundamental parts: English for academic purposes (EAP) and English for occupational purposes (EOP). In this respect, Robinson states that in EAP learners have educational objectives; whereas in EOP students have occupational objectives. “But EAP sounds to have an extensive range because the contents are considered for different courses of study. In this case, we can call EAP as an extensive expression with ESP being one of its branches” (Robinson, 1991, p. 100). In contrast, Hyland and Shaw argue that being part of ESP since the late 1970s, EAP “focuses on the communicative needs and practices of individuals working in academic contexts” (Hyland & Shaw 2016, p. 1). On another hand, Hamp-Lyons (2011), JEAP's co-founding editor, states that EAP can be seen as both a branch of ESP and a discipline in its own right in the field of language teaching.

## **2.3 ESP Experiences in Different Places**

Research raises debate about different experiences of ESP teaching. Experiences of teaching the four skills (listening, reading, speaking and writing) from an ESP angle varied. Buck (2020) argues that students’ “high school writing experiences did not prepare them for the writing tasks they would need to complete in college” (p. 42). In Brazil, Souza Gomes (2020) argues that ESP classes are not supposed to be exclusively technical. Instead, they should be in coherence with the critical literacy

perspective, ESP instructors are supposed to instil skills of reflection and critical thinking and tend to improve their learners' citizenship consciousness. In a Japanese context, Rubrecht (2020) looks into the causes behind an unsuccessful ESP syllabus in the School of Commerce English Concentration Program. He discusses a couple of weaknesses, encompassing not being able to control program conditions, not involving all department members in setting the map for the program, not considering learners' abilities each year. Kocol's (2020) Chapter 7 on the evaluation of an ESP course for student nurses showed that learners preferred language activities concerned with social competencies in ESP to typical language activities.

Furthermore, designing textbooks should be coherent with the objectives of teaching each course in terms of content and methods of compiling. Before designing EAP textbooks, an essential element should be taken into consideration and that is the learners' background knowledge of English. Ahmadi and Bajelani's (2012) own experience in teaching ESP for students of theology reveals that they do not have the basic knowledge when they study a course.

Ebrahim Zanjani (2003) evaluated ESP textbooks for B.A. learners of Liberal Arts (Persian Literature, Theology, and History) in Zanjan, Abhar, and Takestan Universities. The findings revealed that many parts of textbooks are irrelevant to learners and instructors and need revisiting immediately (as cited in Ahmadi & Rahimi Bajelani, 2012, p. 794). Hutchinson and Waters (1987) shed light on six inquiries about syllabus and elaborating contents for ESP textbooks:

Why do students need special English?

Who is involved in learning process?

Where does this process take place?

When does this process take place?

What do students need to learn?

How is this process accomplished?

The way to have successful content compilation is an accurate and appropriate response to these questions before taking any actions (Ahmadi & Rahimi Bajelani, 2012).

All in all, ESP implications and dimensions differ according to the discipline and the context in which it is taught. ESP went through growing phases throughout time and its branches are various, each needs a special scrutiny to have a global overview that may allow a better understanding of it. In this research we are going to focus on the issue from one angle which is the course content.

### 3 Research Questions

The present research is motivated by the following research question:

Does the course content presented to master students of the faculty of sciences respond to their needs?

#### 4 Methodology

To answer the research questions, the study adopts a qualitative method. A content analysis method is used to study the elements of the course syllabus. The reason this method is chosen is that content analysis is highly valuable and indispensable for curriculum designers and textbook authors (Manzoor, 2012). Bernard Berelson (1952) states that content Analysis is “a research technique for the objective, systematic, and quantitative description of the manifest content of communications”. Likewise, Manzoor Hussain (2012) argues that:

Content analysis is a research tool focused on the actual content and internal features of media. It is used to determine the presence of certain words, concepts, themes, phrases, characters, or sentences within texts or sets of texts and to quantify this presence in an objective manner (p. 8).

In our case, the content is that of the course booklet entitled Passport to Scientific English. we quantify the exercises items related to specific disciplines belonging to different departments of the faculty of science. Each unit of the course booklet is structured in the following way: an introduction, an entry test, exercises related to the lesson and an exit test. At the end of the course booklet language rules are provided with a list of irregular verbs.

The data is collected through meticulous observation of the course content. The course elements are categorized into units and department specialties, namely physics, chemistry, biology, geology, mathematics, computer science, general English and other. Exercises items are classified according to students’ specialties, and they are counted according to the major of departments as well. Excel software is used to have a better visualization of the data collected from the master course syllabus; and Zouali’s (2023) evaluation grid is depended on to give a potential evaluation to the course content. The grid consists of an overview, language focus, communication skills, real-world application, assessment, and effectiveness.

#### 5 Results

The content analysis of the course content of master students of the faculty of sciences yielded several findings. The outcomes are displayed in tables, graphs and an evaluation grid. The results are related to the frequency of teaching the four skills and language elements in the ESP syllabus, the frequency of ESP related items in the course exercises and the course booklet evaluation which focuses on the following elements: an overview, language focus, communication skills, real-world application, assessment, and effectiveness.

**Figure 1**

*The Frequency of Teaching the Four Skills and Language Elements in the ESP Course*

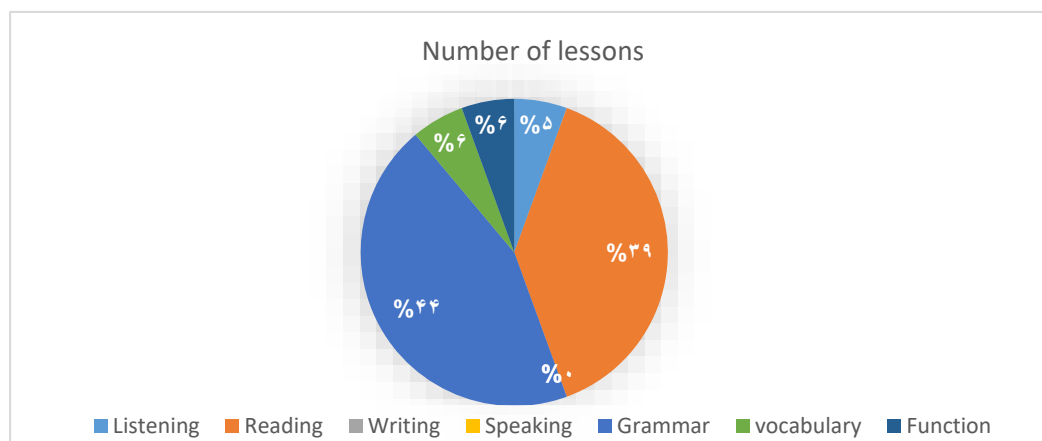


Figure 1 displays the frequency of teaching the four skills (listening, reading, speaking and writing) and language elements (vocabulary and grammar) in the ESP course. The analysis of the course content reveals that 44 % of the lessons and exercises is reserved for Grammar lessons; 39 % is reserved for reading; 6 % for listening, 6 % for vocabulary whereas speaking and writing exercises occupy the last position with the frequency of 0 %. The findings show an imbalance in introducing the four skills and language elements used to teach ESP. Table 1 shows the distribution of exercises' items related to ESP, namely, to physics, chemistry, biology, geology, mathematics, computer science, general English and other.

**Table 1**

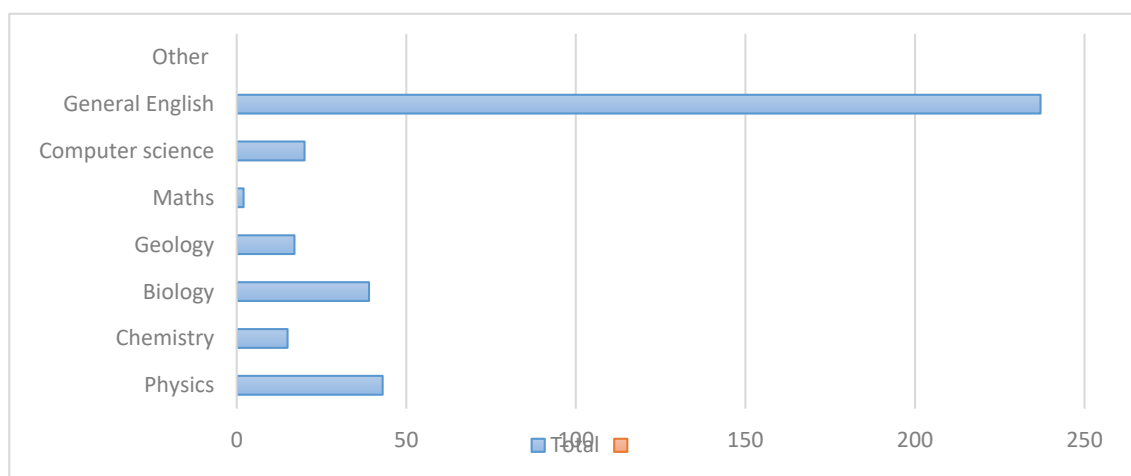
*The Frequency of ESP Related Items in the Course.*

|         | Physics | Chemistry | Biology | Geology | Maths | Computer science | General English | Other                             |
|---------|---------|-----------|---------|---------|-------|------------------|-----------------|-----------------------------------|
| Unit 1  | 4       | 3         | 14      | ---     | ---   | ---              | 27              | ---                               |
| Unit 2  | 9       | 8         | 10      | 1       | ---   | 3                | 17              | ---                               |
| Unit 3  | 2       | 1         | 9       | ---     | ---   | 1                | 3               | 5<br>(Medicine)<br>1 (science)    |
| Unit 4  | 5       | ---       | 1       | 15      | ---   | ---              | 1               | 10(Medi-<br>cine)                 |
| Unit 5  | 1       | ---       | 2       | ---     | ---   | ---              | 44              | 1 (science)                       |
| Unit 6  | 1       | 1         | 11      | ---     | 1     | ---              | 29              | 1 (science)<br>2<br>(Medicine)    |
| Unit 7  | 9       | ---       | 6       | ---     | ---   | ---              | 4               | 1 (science)                       |
| Unit 8  | 5       | 2         | 6       | 1       | 1     | 1                | 30              | ---                               |
| Unit 9  | ---     | ---       | ---     | ---     | ---   | ---              | ---             | ---                               |
| Unit 10 | 7       | ---       | 34      | ---     | ---   | 15               | 78              | ---                               |
| Total   | 43      | 15        | 39      | 17      | 2     | 20               | 237             | 17 (Medi-<br>cine)<br>4 (science) |

Likewise, the graph in Figure 2 displays the percentage each specialty takes as a share in the Passport to Scientific English course booklet. The two figures indicate a disparity in terms of the shares reserved to every major.

**Figure 2**

*The Frequency of Occurrences of Items Related to ESP According to the Field of Study*



Apparently, general English related items occupy the biggest part since 63.53 % of the items are linked to general life situations; the second position is reserved to Physics which takes 11.52 % as a share in the course booklet; while 10.45 % is given to Biology related items and 5.36 % is reserved to Computer science. Geology occupies 4.55 % of the space and Chemistry covers 4 %. The last position is reserved to Mathematics which covers 0.5 %. Other specialties like science in general and Medicine occupy 5.63 % of the exercises' items. Henceforth, the figures unveil a disparity in the percentages and the distribution of ESP related exercises items.

**Table 2**

*Course booklet Evaluation*

| Content analysis       | Effectiveness criteria   |
|------------------------|--|
| Overview               | The course booklet, to some extent, addresses the specific language needs of students of some specialties. However, it poorly addresses the needs of others.   |
| Language focus         | The course booklet succeeds in addressing the specific purpose of being scientific; nevertheless, the needs of each specialty aside are not met. Most of grammar exercises items belong to the general life situations. The course booklet provides opportunities to students to use language belonging to scientific field in general not to their own in particular. |
| Communication skills   | Communication skills are poorly addressed in the course booklet. activities such as role plays, presentations or simulations do not find their way to the course booklet.  |
| Real-world application | Through the course booklet, students have an idea about the jargon of scientific English, especially through reading texts. However, no extending to real world is made and no simulation to this real world.  |
| Assessment             | The course booklet encompasses assessment tools; namely, the entry test and exit test for each unit. This allows learners track their learning and know the language elements that they need to boost.   |
| Effectiveness          | The course booklet is generally effective in terms of teaching scientific English. It may help students develop their knowledge and skills in the field. However, it does not respond to the needs of each specialty aside.  |

## 6 Discussion

The findings of this study reveal a fundamental tension between the theoretical underpinnings of English for specific purposes (ESP) and the practical implementation observed in the course booklet *Passport to Scientific English*. While the booklet ostensibly aims to serve scientific students, it primarily exposes learners to general scientific English rather than to language items tailored to their individual disciplines. Consequently, the research hypothesis is only partially confirmed: students benefit from exposure to broad scientific jargon, yet their very particular linguistic needs remain unmet. This partial approval is, in itself, a critical finding, as it exposes a gap between the generic label of "scientific English" and the core principle of ESP, which, as Hutchinson and Waters (1987) argue, is fundamentally a learner-centered approach where "all decisions as to content and method are based on the learner's reason for learning" (p. 19). When a single course booklet serves disciplines as diverse as physics, biology, mathematics, and computer science without meaningful differentiation, it ceases to be "specific" in any operational sense.

The disparity in content distribution further underscores this problem. General English items occupy nearly two-thirds (63.53%) of the exercises, while mathematics receives a mere 0.5% of the dedicated space. Such imbalance raises serious questions about the needs analysis—or lack thereof—that preceded the course design. A robust ESP syllabus, as Ahmadi and Rahimi Bajelani (2012) emphasize, must begin with accurate responses to Hutchinson and Waters' (1987) six foundational inquiries, including why students need English and what exactly they need to learn. The current course booklet appears to have bypassed these questions, defaulting instead to a one-size-fits-all model that privileges certain disciplines while marginalizing others. This is not merely a matter of unequal representation; it reflects a deeper epistemological flaw: treating "science" as a monolithic discourse community when, in reality, the communicative practices of a mathematician differ profoundly from those of a geologist or a molecular biologist (Hyland, 2006).

Equally concerning is the near-total neglect of productive skills. The finding that speaking and writing account for 0% of the course activities is alarming from an ESP perspective. ESP, by definition, is goal-oriented language learning (Robinson, 1989), and for master's students who aspire to present at international conferences, publish in peer-reviewed journals, or collaborate with overseas research teams, the ability to produce coherent spoken and written discourse is not optional—it is central to their professional survival. As Meristo et al. (2025) found across multiple disciplines, students consistently express a need for more speaking skill development and field-specific terminology acquisition. When a course focuses exclusively on receptive skills such as reading (39%) and grammar (44%), it inadvertently trains students to be passive consumers of scientific English rather than active producers. This may explain, at least in part, the four-year observational finding that postgraduate students remain unable to communicate fluently with the anglophone academic community. One cannot reasonably expect learners to produce language that they have never been given the opportunity to practice.

The issue is further compounded by the nature of the grammar instruction itself. The evaluation grid indicates that most grammar exercises are drawn from general life situations rather than from authentic scientific discourse. This is a missed opportunity. Grammar taught in isolation, without disciplinary context, does little to develop what Strevens (1977) called "appropriateness of the employed methodology to the teaching/learning situation." A student of chemistry needs to master the passive voice not through sentences about daily routines but through descriptions of laboratory procedures. A

computer science student requires conditional structures not for hypothetical weekend plans but for algorithmic reasoning. When grammar is detached from disciplinary practice, it remains inert knowledge—technically acquired but functionally inaccessible.

The underlying causes of these deficiencies are likely structural. Gaye (2020) compellingly argues for the establishment of independent ESP departments dedicated to teacher training, noting that ESP instructors must enhance their teaching expertise and assessment skills to conduct thorough needs analyses and develop a more comprehensive understanding of discourse and genre studies. In many university contexts, however, ESP instruction is assigned to general English teachers who may lack both training in ESP methodologies and familiarity with the target disciplines. Ahmadi and Rahimi Bajelani (2012) observed that creating ESP textbooks for a specific field demands knowledge of that field, whereas such expertise is not essential when developing general English textbooks. The current course booklet exhibits precisely this limitation: it is the product of a well-intentioned generalist rather than a discipline-informed specialist.

Furthermore, the absence of real-world application and simulation activities, as noted in the evaluation grid, represents a failure to bridge the gap between classroom learning and professional practice. ESP is not merely about understanding the jargon of a field; it is about being able to do things with that jargon in authentic contexts (Paltridge & Starfield, 2013). Role plays, presentations, peer reviews, and collaborative projects are not ancillary activities—they are the very mechanisms through which learners internalize the discourse practices of their communities. Their complete absence from the course booklet suggests a fundamental misunderstanding of ESP as a "learning-centered approach" (Hutchinson & Waters, 1987) rather than a static collection of texts and exercises.

Finally, it is worth considering whether the course booklet's shortcomings reflect broader institutional constraints. Rubrecht (2020), in analyzing an unsuccessful ESP program in Japan, identified weaknesses such as the inability to control program conditions, failure to involve all department members in curriculum mapping, and neglect of learners' varying proficiency levels each year. Similar dynamics may be at play in the Faculty of Sciences, where the ESP course may be expected to serve too many disciplines with too few resources and without meaningful input from subject specialists. Until institutions recognize ESP as a discipline that requires specialized training, ongoing needs analysis, and collaboration with content faculty, course materials like *Passport to Scientific English* will continue to offer the appearance of specificity without its substance.

## 7 Conclusions and Implications

The primary aim of this research paper was to examine whether the course content presented to master's students at the Faculty of Sciences, University Mohamed the First in Oujda, Morocco, responds to learners' specific needs for English. Through a systematic content analysis of the course booklet *Passport to Scientific English*, the study has yielded several key conclusions.

First, the course material exhibits a clear disparity in meeting the needs of different scientific disciplines. While students in fields such as physics and biology receive moderate attention, others—most notably mathematics, which occupies only 0.5% of discipline-specific exercises—are largely marginalized. This uneven distribution contradicts the fundamental principle of ESP as a learner-centered approach in which content and method are determined by learners' reasons for learning (Hutchinson & Waters, 1987).

Second, the course booklet is oriented toward general scientific English rather than toward the specific linguistic demands of individual disciplines. Although the material is undeniably rich in scientific vocabulary and structures, this richness is broadly diffused across the sciences rather than concentrated in ways that serve each specialty's unique discourse practices. Consequently, a biology student and a computer science student receive substantially the same linguistic input, despite the vast differences in how English is used in their respective professional and academic communities.

Third, the near-total neglect of productive skills—speaking and writing account for 0% of course activities—represents a serious pedagogical limitation. ESP, by definition, is goal-oriented language learning (Robinson, 1989), and for master's students who aspire to present research, publish internationally, or collaborate across borders, the ability to produce language is as essential as the ability to comprehend it. A curriculum that emphasizes receptive skills at the expense of productive ones prepares students to read scientific texts but not to contribute meaningfully to scientific discourse.

Fourth, the course booklet demonstrates good intentions in its effort to address scientific English, and it does offer students valuable exposure to the jargon and conventions of science as a broad field. However, good intentions are insufficient when measured against the rigorous standards of ESP course design. Without systematic needs analysis, discipline-specific tailoring, and balanced skill integration, even a well-constructed course booklet risks becoming what Hutchinson and Waters (1987) warned against: a product-oriented collection of materials rather than a genuinely learning-centered approach.

The findings of this study carry significant implications for curriculum designers, ESP instructors, institutional policymakers, and future researchers.

For curriculum designers and ESP practitioners: The most immediate implication is the urgent need for discipline-specific syllabi. A single course booklet cannot adequately serve the diverse needs of physics, biology, mathematics, computer science, chemistry, and geology simultaneously. Each discipline possesses its own genres, rhetorical conventions, and communicative practices (Hyland, 2006). Curriculum designers should therefore develop separate modules or even separate courses tailored to each department, with content drawn from authentic disciplinary materials such as research articles, conference presentations, laboratory reports, and grant proposals.

For the integration of productive skills: The complete absence of speaking and writing activities from the current course booklet must be addressed. As Zouali (2023) argues, incorporating peer evaluation, feedback sessions, collaborative projects, and presentations can improve cooperation and create opportunities for meaningful group work. Beyond these, ESP courses should include role plays simulating conference discussions, jigsaw activities based on disciplinary reading, simulations of real-world professional situations (e.g., laboratory meetings, research consultations), and diverse writing tasks such as abstracts, literature reviews, and research summaries. These activities transform students from passive recipients of linguistic input into active participants in disciplinary discourse.

For teacher training and institutional support: Gaye (2020) highlights the urgency of establishing independent ESP departments for teacher training. The current study's findings support this recommendation. ESP instructors need more than general English teaching qualifications; they require training in needs analysis methodologies, genre analysis, corpus linguistics, and assessment design tailored to specific disciplines. Institutions should invest in continuous professional development and,

where possible, foster collaboration between ESP instructors and subject specialists from the science faculties.

**For the integration of technology:** Another implication concerns the use of online platforms to supplement face-to-face instruction. The course content could be significantly enhanced through interactive materials such as videos demonstrating scientific procedures, chat spaces for asynchronous discussion of disciplinary topics, forums for peer feedback on writing, and access to authentic online resources such as open-access journals and scientific podcasts. Technology, when thoughtfully integrated, can bridge the gap between classroom learning and real-world language use.

**For learner autonomy:** Sujannah et al. (2025) note that ESP often requires a high level of learning autonomy from students, as the language skills needed are highly specific to academic or professional contexts. The current course booklet does little to foster such autonomy. Future course designs should include explicit training in strategies for independent learning, such as using corpora to explore disciplinary language, identifying and learning from authentic texts, and self-assessing productive skills against disciplinary benchmarks.

**For policymakers at the university level:** Finally, this study implies that ESP cannot be treated as a peripheral service course delivered by a centralized language unit without input from the science faculties. Meaningful ESP requires institutional recognition of its specialized nature, adequate resources for materials development, and mechanisms for ongoing needs analysis and curriculum revision based on student and stakeholder feedback.

In spite of the informative results presented in this study, several limitations must be acknowledged. These limitations do not invalidate the findings but rather contextualize them and point toward directions for future research.

**Limitation of data sources:** The present study focused exclusively on the course booklet *Passport to Scientific English* as the primary artifact of ESP instruction. While content analysis of this material yielded valuable insights, the course booklet represents only one component of the overall teaching-learning process. It does not capture how the material is actually used in the classroom, which sections instructors emphasize or omit, how students engage with the exercises, or what supplementary materials or oral activities instructors may provide to compensate for gaps in the textbook.

**Absence of learner perspectives:** This study did not directly investigate students' perceptions of their ESP learning experiences. Students' own assessments of their needs, their satisfaction with the course content, their perceived progress, and their suggestions for improvement remain unexplored. Given that ESP is fundamentally learner-centered, the exclusion of learner voices is a significant gap.

**Absence of instructor perspectives:** Similarly, the study did not examine the instructor's stance, pedagogical decisions, or professional background. Whether the instructor has training in ESP, what challenges they face in delivering the course, how they adapt the course booklet to their students' needs, and what assessment practices they employ are all unknown. Understanding the instructor's role is essential for a complete picture of ESP instruction.

**Absence of classroom observation:** The study did not include observation of in-person delivered lessons. Classroom observation would reveal the extent to which the course booklet's limitations are

mitigated or exacerbated by instructional practices. For example, an instructor might compensate for the lack of speaking activities by incorporating oral discussions, or might inadvertently reinforce the booklet's imbalance by focusing only on certain units. Without observation, these dynamics remain invisible.

**Generalizability concerns:** This study was conducted at a single faculty within a single Moroccan university. While the findings may resonate with similar contexts in other universities or other countries, direct generalization should be made with caution. The specific disciplinary composition, institutional resources, instructor qualifications, and student populations vary considerably across settings.

**Limitation of the content analysis method:** Although content analysis is a systematic and replicable method, it is inherently limited to what is manifest in the text. It cannot capture implicit assumptions, omitted content, or the quality of student-text interaction. Furthermore, the quantification of exercise items, while informative, does not necessarily reflect pedagogical weight or instructional time. A single writing task, had it existed, might carry more educational significance than numerous grammar drills, but the current method treats each item as equivalent.

To address the limitations outlined above and to build upon the findings of the present study, several directions for future research are proposed.

**Multi-method approaches:** Future research should adopt a multi-method approach to gain a more holistic understanding of ESP teaching and learning. A comprehensive investigation might combine content analysis of course materials with surveys measuring student needs and satisfaction, interviews with instructors about their design decisions and challenges, classroom observations to document actual instructional practices, and analysis of student work products to assess learning outcomes. Such a holistic design would yield a far richer understanding of the ESP teaching-learning process and would provide course designers with more robust evidence for improving syllabi and materials.

**Inclusion of learner voices:** Future studies should prioritize the collection of student perspectives through questionnaires, focus groups, or semi-structured interviews. Understanding how students perceive their own needs, their satisfaction with current ESP provision, the challenges they face in using English academically, and their suggestions for course improvement is essential for learner-centered course design. Research could also investigate how students' needs vary according to their year of study, their prior English proficiency, and their specific career aspirations.

**Inclusion of instructor perspectives:** Research should also investigate the experiences, training backgrounds, pedagogical strategies, and challenges of ESP instructors. Such studies could reveal systemic barriers to effective ESP instruction, such as lack of institutional support, insufficient training opportunities, heavy teaching loads that limit time for materials development, or limited access to authentic disciplinary resources. Understanding these barriers is the first step toward addressing them.

**Classroom observation studies:** Future research should include systematic classroom observation to document how ESP materials are actually used in practice. Observation protocols could capture which activities instructors prioritize, how much time is devoted to productive versus receptive skills, what types of interaction occur between students and between students and instructor, and how students respond to different instructional approaches. Such observational data would complement content analysis by revealing the gap between the intended curriculum (the course booklet) and the enacted curriculum (classroom practice).

**Comparative studies:** Future research could extend beyond the local context to compare ESP provision across multiple Moroccan universities or across different countries. Comparative studies would help identify which challenges are context-specific and which are systemic to ESP instruction in scientific faculties more broadly. Such research could also highlight successful practices in other contexts that might be adapted locally. For example, researchers might compare ESP programs in Moroccan universities with those in Tunisia, Algeria, or Egypt to identify regionally effective approaches.

**Intervention studies:** Intervention studies could be designed to implement and evaluate discipline-specific ESP modules. For example, a researcher might develop a tailored ESP syllabus for physics students, deliver it over a semester, and measure its impact on students' communicative performance, confidence, and academic outcomes compared to a control group using the existing generic syllabus. Such studies would provide causal evidence about the effectiveness of discipline-specific approaches and would offer practical guidance for curriculum renewal.

**Longitudinal research:** Longitudinal studies tracking students from the beginning of their master's program through their early professional careers could illuminate how ESP instruction (or its absence) affects long-term outcomes such as conference participation, publication success, international collaboration, and career advancement. Such research would provide valuable evidence about the return on investment of ESP course design and could inform resource allocation decisions at the institutional level.

**Needs analysis research:** Future research should conduct systematic, large-scale needs analyses involving multiple stakeholders: students, alumni, content faculty, and potential employers. Such needs analyses would provide an empirical foundation for course redesign, ensuring that ESP instruction is genuinely responsive to the communicative demands students actually face in their target academic and professional communities. Needs analysis could employ questionnaires, interviews, observations of academic and professional settings, and collection of authentic target texts.

**Research on teacher training:** Given Gaye's (2020) emphasis on the need for independent ESP departments and specialized teacher training, future research should investigate the current state of ESP teacher preparation in Morocco and other contexts. What qualifications do ESP instructors currently hold? What training opportunities are available to them? What do they perceive as their most urgent professional development needs? Answering these questions would inform the design of effective teacher training programs.

**Research on assessment:** Finally, future research should examine assessment practices in ESP courses. How are students currently assessed? Do assessments measure the productive, discipline-specific skills that ESP aims to develop, or do they focus on receptive, general English knowledge? Research could develop and validate new assessment instruments aligned with ESP principles and evaluate their implementation in real classroom settings.

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All authors have conducted the study, collected data, analyzed and interpreted the data, and written up the manuscript.

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### **Conflict of Interest**

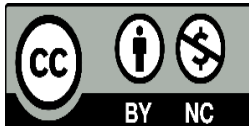
The authors declare that there is no conflict of interest.

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