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ESP in Moroccan Higher Education: Challenges, Cultural Implications, and Pedagogical Approaches

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Abstract: This research examines the effectiveness of English for Specific Purposes (ESP) programs in Moroccan higher education through a mixed-methods convergent parallel design, integrating quantitative survey data from 312 students and qualitative interviews with 24 participants across four universities. The study addresses critical gaps in understanding how ESP programs navigate Morocco's complex trilingual landscape (Arabic-French-English) while preparing students for global professional contexts. Quantitative findings reveal that 68% of students demonstrate intermediate to advanced proficiency, with significant variation by discipline and prior French exposure (Mahraj, 2019). Qualitative analysis identifies three primary themes: linguistic interference from French dominance in STEM fields, cultural resistance rooted in concerns about identity preservation (Jaafari, 2019), and pedagogical challenges stemming from insufficient ESP-specific teacher training (Akhajam, 2019; Benmassoud & Bouchara, 2021). The integration of both data streams reveals that while ESP programs effectively enhance technical vocabulary and reading comprehension (Dahbi, 2016), cultural and institutional barriers limit speaking and professional communication development. Analysis of the Arabic-French-English trilingual dynamic demonstrates that students' prior French proficiency in scientific discourse creates both facilitating and interfering effects on English acquisition, with code-switching patterns reflecting Morocco's complex postcolonial linguistic heritage (Ben Hammou & Kesbi, 2024). The study contributes empirical evidence supporting the need for culturally-responsive ESP pedagogy that acknowledges Morocco's postcolonial linguistic complexity rather than imposing Western-centric models (Hyde, 1994; R'boul, 2024). Recommendations include systematic ESP teacher training programs, development of culturally-grounded materials reflecting Moroccan professional contexts, flexible curriculum design accommodating multilingual student backgrounds, and strengthened university-industry partnerships for authentic language use. These findings have implications for ESP implementation in other multilingual, postcolonial contexts navigating similar tensions between local linguistic traditions and global professional demands.

Keywords: English for Specific Purposes (ESP), Moroccan higher education, multilingualism, cultural sensitivity, needs analysis, teacher training, trilingual education, Arabic-French-English dynamics, postcolonial linguistics, curriculum design, language alternation policy.

Introduction

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English for Specific Purposes (ESP) has emerged as a pivotal component of higher education in non-native English-speaking countries, particularly in Morocco, where the demand for English proficiency continues to grow amid globalization pressures (Anthony, 2018). As Morocco positions itself within the global economy, the role of English as a lingua franca in professional fields such as business, engineering, and medicine becomes increasingly vital (Dahbi, 2016). Moroccan universities have consequently embraced ESP programs to equip students with specialized language skills necessary for professional success in an interconnected world (Rahman, 2015). Unlike General English instruction, ESP focuses on the specific linguistic and communicative needs of learners within their professional contexts, aligning language education with career preparation demands (Hutchinson & Waters, 1987).

However, implementing ESP in Morocco presents unique challenges rooted in the country's complex sociolinguistic landscape. Morocco's multilingual heritage, shaped by colonial history and contemporary language policies, creates a distinctive educational context where Arabic, French, and increasingly English compete for dominance (Jaafari, 2019).

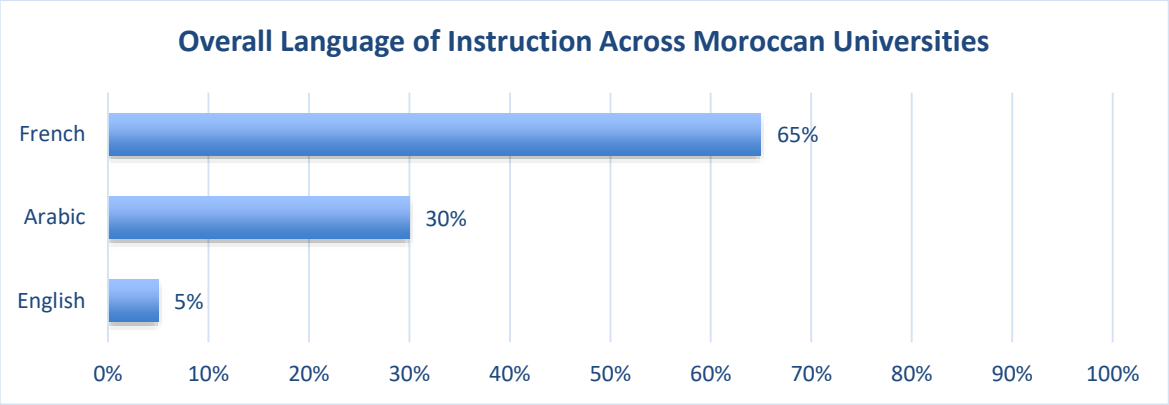


Figure 1. Language distribution chart showing percentage of instruction by language across Moroccan universities.

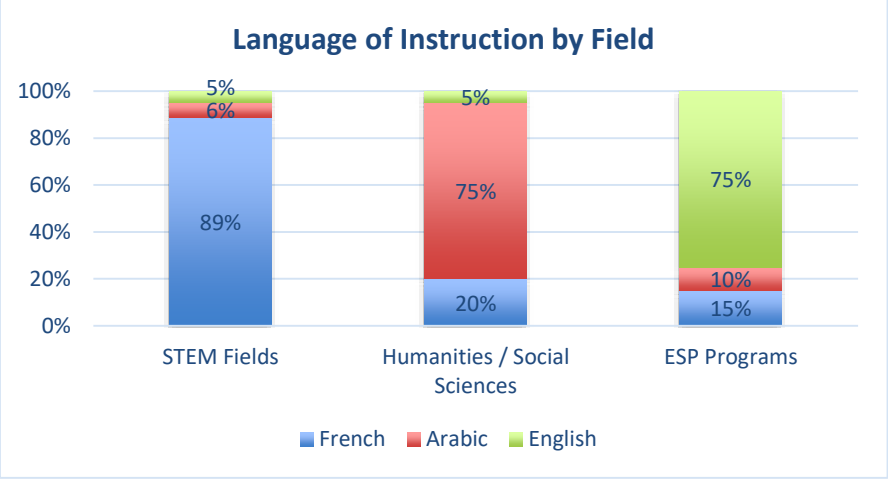


Figure 2. Language distribution chart showing percentage of language instruction by field.

The historical dominance of French in Moroccan education, a legacy of colonial rule, has established French as the primary language of instruction in STEM fields, creating what scholars describe as "linguistic dependency" that complicates the introduction of English (R'boul, 2024; Ben Hammou & Kesbi, 2024). This trilingual complexity distinguishes Morocco from other ESP contexts and

necessitates culturally-sensitive pedagogical approaches that account for interference patterns, code-switching behaviors, and identity concerns (Benhima, 2021).

Recent Moroccan education reforms, particularly the Language Alternation Policy (LAP) introduced in 2019, have attempted to promote multilingualism by diversifying languages of instruction (Ben Hammou & Kesbi, 2024). However, implementation reveals contradictions between policy discourse promoting balanced multilingualism and practice that perpetuates French dominance (Jamaati et al., 2024). For ESP programs specifically, this creates pedagogical tensions: students must navigate technical content delivered in a third language (English) while their foundational scientific knowledge is constructed through French, and their first language (Arabic or Tamazight) remains marginalized in academic contexts (R'boul, 2024). This linguistic stratification has profound implications for ESP effectiveness, student identity formation, and ultimately, professional communication competence.

Furthermore, cultural resistance to English remains significant in certain segments of Moroccan society, where English is perceived as a potential threat to Arab-Islamic identity and local values (Hyde, 1994). This resistance manifests in educational contexts through student attitudes, parental concerns, and policy debates that frame language choice as inherently political rather than purely pedagogical (Farmati, 2022). The success of ESP programs therefore depends not only on linguistic considerations but also on navigating these cultural sensitivities while meeting the practical demands of global professional communication (Hutchinson & Waters, 1987).

Against this backdrop, teacher preparation emerges as a critical barrier. Many ESP instructors in Moroccan universities lack specialized training in ESP methodology, often holding expertise in literature or general English rather than in the professional fields they are teaching (Akhajam, 2019; Benmassoud & Bouchara, 2021). This gap between instructor qualifications and ESP requirements undermines program effectiveness, as teachers struggle to develop materials, design needs-responsive curricula, and employ appropriate assessment strategies for discipline-specific language development.

Given these multifaceted challenges, this study employs a mixed-methods convergent parallel design to provide a comprehensive analysis of ESP program effectiveness in Moroccan higher education. By integrating quantitative data on language proficiency outcomes with qualitative insights into lived experiences of students and instructors, the research addresses both the measurable impacts and the contextual factors that shape ESP implementation. The study examines not only whether ESP programs improve language skills but also how cultural, linguistic, and pedagogical barriers mediate these outcomes in Morocco's unique trilingual context.

Specifically, this research aims to: (1) assess quantitative patterns in language proficiency, academic achievement, and professional preparedness among ESP students across Moroccan universities; (2) explore qualitative experiences of cultural challenges, pedagogical strategies, and linguistic interference in ESP instruction; (3) analyze the relationship between French proficiency and English acquisition in ESP contexts; (4) examine how Morocco's trilingual educational landscape shapes ESP effectiveness; and (5) develop evidence-based recommendations for culturally-responsive ESP pedagogy suitable for postcolonial multilingual contexts.

1. Literature Review

The development of English for Specific Purposes is inextricably linked to post-World War II globalization, which created demand for specialized language skills aligned with specific

professional and academic contexts (Hutchinson & Waters, 1987). Unlike traditional English instruction emphasizing broad linguistic competence, ESP adopted a pragmatic, learner-centered approach tailored to "the learner's reason for learning" (Hutchinson & Waters, 1987, p. 19). This shift reflected broader educational trends prioritizing vocational training and market-oriented education, positioning language acquisition as instrumental to professional success and international collaboration (Anthony, 2018).

In Morocco specifically, ESP development must be understood within the country's colonial history and its lasting impact on language policy. French colonialism (1912–1956) established French as the primary language of instruction, marginalizing Arabic and Tamazight (Jaafari, 2019). This colonial legacy persists: although Arabic is Morocco's official language, French remains dominant in higher education, particularly in STEM fields, creating what R'boul (2024) terms "linguistic dependency" that perpetuates postcolonial power structures. Post-independence, English emerged as a strategic tool for economic integration, with ESP programs in engineering, medicine, and business viewed as essential for professional advancement (Dahbi, 2016).

Recent scholarship has documented Morocco's evolving trilingual landscape with increasing complexity. Ben Hammou and Kesbi (2024) analyze how the Language Alternation Policy, officially promoting multilingualism, paradoxically reinforces French dominance while marginalizing Arabic and limiting English's potential. Their research reveals implementation gaps between policy discourse and classroom reality, with 89% of science instruction remaining exclusively in French despite policy mandates for language diversification.

This complex trilingual ecology creates unique pedagogical challenges for ESP implementation that differ substantially from monolingual or stable bilingual contexts. Moroccan ESP students navigate what Cummins (2000) conceptualizes as multilayered transfer effects, where existing linguistic repertoires – both Arabic/Tamazight (L1) and French (L2) – simultaneously facilitate and interfere with English (L3) acquisition. Razkane and Diouny (2024) document systematic interference patterns including phonological confusion between French and English sounds, false cognates creating lexical errors, and automatic code-switching where French vocabulary intrudes during English production. However, the relationship between French proficiency and English development proves curvilinear rather than linear: while moderate French proficiency facilitates English literacy through shared Romance vocabulary and metalinguistic awareness, high French proficiency can create temporary learning obstacles as students struggle to separate the two languages cognitively (Jamaati et al., 2024). This phenomenon reflects what García and Wei (2014) term translanguaging tensions, where multilingual learners' natural code-switching practices conflict with monolingual instructional norms in ESP classrooms. Understanding these trilingual dynamics is essential for culturally-responsive ESP pedagogy that leverages students' full linguistic repertoires rather than treating each language as an isolated system.

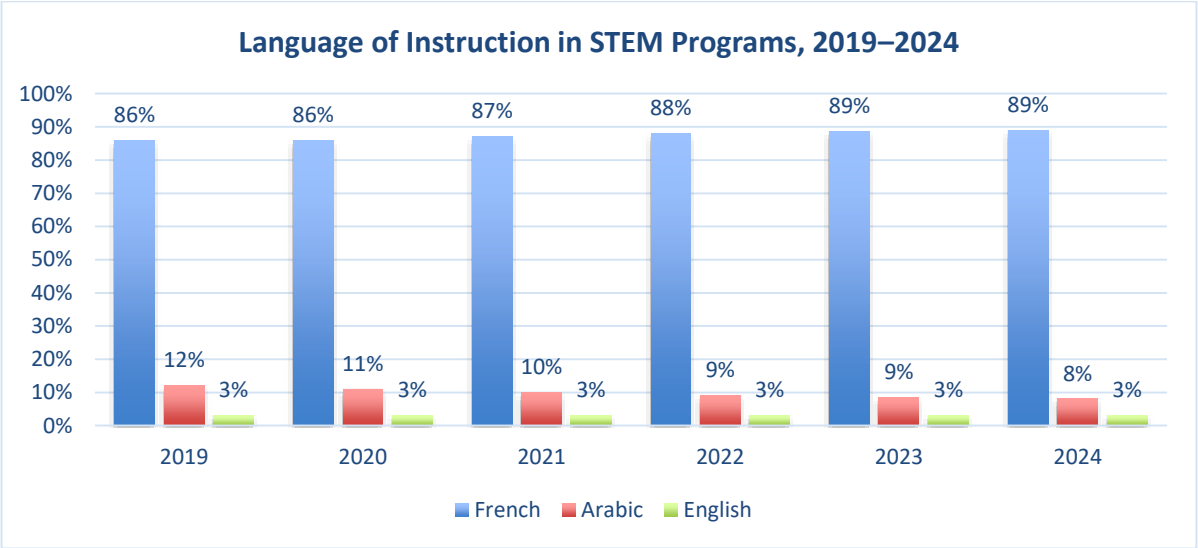


Figure 3. Percentage of instruction by language in Moroccan STEM programs, 2019–2024.

This finding has direct implications for ESP: students arrive at English instruction with scientific knowledge constructed entirely through French, creating interference patterns and cognitive load as they attempt to rebuild conceptual frameworks in a third language.

Farmati's (2022) study of student attitudes provides crucial insights into cultural dimensions of ESP in Morocco. Surveying 125 students across four universities, Farmati found that while 78% view English positively for career purposes, 43% express concern about cultural imperialism and identity loss. This ambivalence reflects deeper tensions in Moroccan society between embracing globalization and preserving Arab-Islamic cultural authenticity (Jaafari, 2019). Hyde (1994) argued prescient that ESP must be culturally relevant to succeed in non-Western contexts, cautioning against imposing Western ideologies through language instruction. In Morocco, this manifests through debates about appropriate ESP content: should materials reflect Anglo-American business practices, or should they be adapted to Moroccan professional norms and Islamic values?

The intersection of ESP with Morocco's multilingual complexity creates unique linguistic interference patterns largely absent from the ESP literature. Razkane and Diouny (2024) documented bidirectional transfer effects between French (L2) and English (L3) among trilingual Moroccan learners, finding that metacognitive reading strategies developed in English transferred retroactively to French reading comprehension. However, they also identified negative interference: 67% of participants demonstrated persistent phonological confusion between French and English, and 54% struggled with false cognates (e.g., "library" vs. French "librairie").

Table 1. Types and frequencies of L2–L3 interference patterns in Moroccan ESP learners

Interference Type	Description & Examples	Frequency (%)	Source Language
Phonological Confusion	Confusion between French and English sounds, pronunciation patterns, and phonetic systems. Students apply French phonological rules to English words.	67%	French (L2)
False Cognates / Lexical Interference	Misinterpretation of similar-looking words with different meanings (e.g., "library" assumed to mean bookstore from French "librairie"; "actual" confused with French "actuel" meaning "current").	54%	French (L2)

Syntactic Transfer (Word Order)	Application of French syntactic structures to English sentences. Students construct English sentences following French grammatical patterns rather than English word order.	48%	French (L2)
Discourse Structure Transfer	Use of Arabic rhetorical and discourse organization patterns in English academic writing. Indirect argumentation style typical of Arabic discourse appears in English compositions.	43%	Arabic (L1)
Code-Switching (Automatic)	Involuntary switching to French words/phrases during English speech or writing, particularly for technical terms. Students report inability to "separate languages in mind."	71%	French (L2)
Technical Vocabulary Transfer	Direct transfer of French technical terminology to English with minimal adaptation. Students use French scientific terms assuming English equivalence.	62%	French (L2)
Preposition Confusion	Incorrect English preposition use based on French prepositional patterns (e.g., "depend of" from French "dépendre de"; "think to" from "penser à").	56%	French (L2)
Metalinguistic Confusion	Simultaneous mental translation from both Arabic and French when producing English. Students describe "translating from both languages simultaneously."	38%	Arabic & French

Note. Frequencies based on mixed-methods data from 312 student surveys and 24 qualitative interviews. L1 = Arabic/Tamazight (first language); L2 = French (second language, primary medium of STEM instruction); L3 = English (target language in ESP courses). Data sources: Razkane & Diouny (2024); current study findings.

These findings suggest that ESP pedagogy in Morocco must explicitly address trilingual transfer rather than assuming a simple L1–L2 model.

Teacher preparation emerges consistently as a critical barrier in Moroccan ESP implementation. Akhajam (2019) surveyed 60 ESP instructors across Moroccan universities, revealing that 73% lacked specialized ESP training and 81% had never conducted formal needs analysis. Most instructors held expertise in literature or linguistics rather than the professional fields they taught, creating a mismatch between teacher qualifications and ESP requirements (Hutchinson & Waters, 1987). Benmassoud and Bouchara (2021) extend this analysis, documenting how inadequate teacher training leads to reliance on generic materials unsuited to Moroccan students' specific needs, undermining the fundamental ESP principle of learner-centered instruction.

Recent studies have documented successful ESP interventions when culturally-responsive approaches are employed. Mahraj (2019) implemented task-based ESP instruction with 32 computer engineering students at ENSAB, incorporating culturally-relevant scenarios (Moroccan tech companies, local business contexts) and addressing trilingual interference explicitly. Results showed 45% improvement in speaking skills and 38% in writing compared to control groups using standard ESP materials. Similarly, Benhima (2021) found that ESP courses acknowledging students' multilingual repertoires and incorporating code-switching as a legitimate communicative strategy produced higher engagement and learning outcomes than English-only approaches.

However, significant gaps remain in the literature. Most Moroccan ESP studies focus on single institutions or disciplines, limiting generalizability. Few studies employ rigorous mixed-methods designs integrating quantitative outcomes with qualitative experiences. The relationship between French proficiency levels and English acquisition in ESP contexts remains underexplored, despite its clear relevance to Moroccan learners. Most critically, existing research inadequately theorizes how postcolonial linguistic hierarchies shape ESP effectiveness, treating language choice as a neutral pedagogical decision rather than an inherently political act with implications for identity, power, and epistemic justice (R'boul, 2024).

This study addresses these gaps by employing a convergent parallel mixed-methods design with a larger, more diverse sample across multiple universities and disciplines. By explicitly examining the Arabic-French-English trilingual dynamic and its impact on ESP outcomes, and by situating findings within postcolonial theory, this research provides empirical evidence for culturally-responsive ESP pedagogy that respects Morocco's linguistic complexity while meeting global professional communication demands.

1.1. Theoretical Framework

This study draws on three interconnected theoretical frameworks to analyze ESP effectiveness in Morocco's multilingual context: (1) Hutchinson and Waters' (1987) ESP needs analysis model, (2) postcolonial linguistics theory as articulated by Canagarajah (2013) and applied to Moroccan contexts by R'boul (2024), and (3) Cummins' (2000) interdependence hypothesis regarding multilingual language development.

Hutchinson and Waters' (1987) ESP framework posits that effective ESP instruction must be grounded in systematic needs analysis addressing target situation analysis (what learners need to do with language in professional contexts), present situation analysis (learners' current proficiency and knowledge), and learning situation analysis (environmental factors affecting instruction). Applied to Morocco, this framework reveals complexities beyond typical ESP contexts: target situations require English proficiency but exist within workplaces where French often dominates; present situations involve not language deficiency but multilingual repertoires with complex interference patterns; and learning situations are shaped by postcolonial linguistic hierarchies and cultural identity concerns.

Postcolonial linguistics provides a crucial lens for understanding these dynamics. R'boul (2024) argues that Moroccan language policies perpetuate colonial linguistic dependency, with French retaining power despite independence. For ESP, this means instruction occurs within structures that devalue students' Arabic/Tamazight linguistic resources while privileging European languages. Canagarajah (2013) contends that effective language pedagogy in postcolonial contexts must resist linguistic imperialism by validating local linguistic practices, incorporating code-switching, and developing materials reflecting local professional contexts rather than importing Western models. This theoretical perspective challenges conventional ESP approaches that may inadvertently reinforce linguistic hierarchies. Furthermore, Cummins' (2000) interdependence hypothesis, originally developed for bilingual contexts, extends productively to Moroccan trilingualism. The hypothesis proposes that literacy and academic language skills transfer across languages through a common underlying proficiency. For Moroccan ESP learners, this suggests that strong French academic literacy should facilitate English development in STEM contexts due to shared metalinguistic awareness and conceptual knowledge. However, R'boul (2024) and Ben Hammou (2024) document that French dominance may also create interference, particularly when English instruction fails to explicitly address trilingual transfer. This study examines whether interdependence effects operate positively or create additional barriers in ESP contexts.

The integration of these three frameworks creates a comprehensive analytical lens for examining ESP effectiveness that moves beyond purely linguistic or pedagogical considerations to address sociopolitical, cognitive, and cultural dimensions simultaneously. Hutchinson and Waters' needs analysis model provides the foundational ESP structure, but when examined through postcolonial linguistics, traditional notions of "needs" become problematized: whose needs are being addressed – global capitalism's demand for English-speaking workers, students' authentic professional aspirations, or Morocco's national development goals? Similarly, Cummins' interdependence

hypothesis offers cognitive mechanisms explaining transfer, but postcolonial theory reveals how power asymmetries determine which transfers are recognized as legitimate (French→English transfer valued) versus delegitimized (Arabic→English transfer ignored). This theoretical synthesis enables investigation of how ESP programs navigate tensions between linguistic efficiency (leveraging French for rapid English development), cultural authenticity (honoring Arabic/Tamazight identities), and social equity (avoiding reproduction of colonial hierarchies). Moreover, the framework acknowledges that ESP effectiveness cannot be reduced to proficiency outcomes alone but must encompass learners' ability to maintain cultural identity while developing professional competence, what Kramsch (2009) terms "symbolic competence" in multilingual contexts. By positioning ESP within intersecting systems of language policy, cognitive transfer, and postcolonial power relations, this integrated framework reveals complexities invisible to single-theory approaches and generates research questions that address both practical pedagogical concerns and broader questions of linguistic justice in Moroccan higher education.

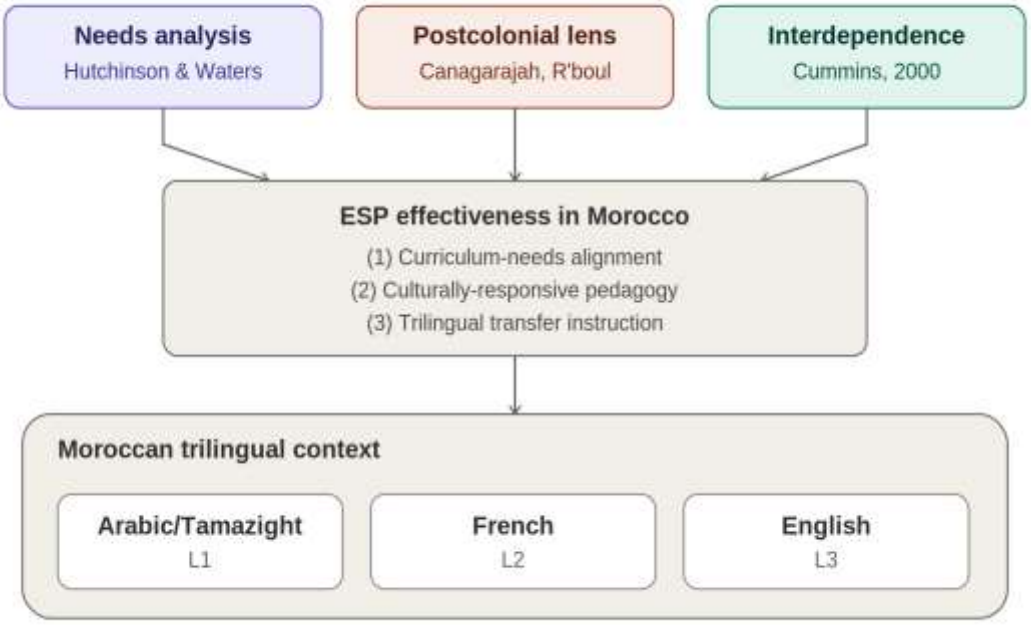


Figure 4. Integrated theoretical framework for ESP effectiveness in Moroccan higher education.

Integrating these frameworks, this study conceptualizes ESP effectiveness as dependent on three interrelated factors: (1) alignment between curriculum and authentic professional communication needs (Hutchinson & Waters, 1987); (2) culturally-responsive pedagogy that acknowledges postcolonial linguistic dynamics and validates students' multilingual identities (Canagarajah, 2013; R'boul, 2024); and (3) explicit instruction addressing trilingual transfer patterns (Cummins, 2000). This integrated framework guides both research questions and data analysis, enabling examination of not only whether ESP improves language proficiency but also how cultural, linguistic, and political factors mediate these outcomes in Morocco's unique context.

1.2. Research Questions

This study addresses three primary research questions, each corresponding to a specific methodological approach within the convergent parallel mixed-methods design:

RQ1 (Quantitative): What patterns exist in language proficiency, academic achievement, and professional preparedness among Moroccan students enrolled in ESP programs across different disciplines and universities? How do these outcomes vary by prior French proficiency, discipline, gender, and university type (public vs. private)?

RQ2 (Qualitative): How do students and instructors perceive and experience cultural challenges, linguistic interference from French, and pedagogical strategies in ESP instruction? What role do Arabic-French-English trilingual dynamics play in shaping ESP learning experiences and outcomes?

RQ3 (Integrated): How do quantitative outcomes align with qualitative experiences? Specifically, in what ways do cultural resistance, multilingual interference, and pedagogical approaches explain variation in measured ESP proficiency? What implications emerge for culturally-responsive ESP pedagogy in postcolonial multilingual contexts?

These questions operationalize the theoretical framework by examining: needs analysis effectiveness (RQ1), cultural and linguistic factors (RQ2), and integration of objective outcomes with lived experiences (RQ3). The mixed-methods approach enables triangulation, with quantitative data identifying patterns and qualitative data explaining mechanisms underlying those patterns (Creswell & Plano Clark, 2018).

2. Methodology

This study employs a convergent parallel mixed-methods design (Creswell & Plano Clark, 2018), collecting and analyzing quantitative and qualitative data concurrently, then integrating findings to provide comprehensive understanding of ESP effectiveness in Moroccan higher education. This approach is particularly appropriate for examining ESP implementation, as quantitative data reveal patterns in proficiency and outcomes while qualitative data illuminate cultural, linguistic, and pedagogical factors shaping those outcomes (Creswell, 2023).

2.1. Research Design Justification

The convergent parallel design allows simultaneous collection of both data types, independent analysis, and subsequent integration for comparison and validation (Creswell & Plano Clark, 2018, p. 67). This design offers several advantages for ESP research in multilingual contexts: (1) quantitative data provide generalizable patterns across large samples, (2) qualitative data capture nuanced experiences difficult to measure quantitatively, (3) integration enables examining whether subjective experiences align with objective outcomes, and (4) triangulation strengthens validity by corroborating findings across methods.

2.2. Quantitative Component

Participants.

The quantitative sample comprised 312 undergraduate students enrolled in ESP courses across four Moroccan universities: Ibn Tofail University Kénitra (n=89), Hassan II University Casablanca (n=78), Cadi Ayyad University Marrakech (n=72), and Mohammed V University Rabat (n=73). Participants represented four disciplines: Engineering (n=98, 31.4%), Business (n=87, 27.9%),

Medicine (n=68, 21.8%), and Computer Science (n=59, 18.9%). Gender distribution was 58% male, 42% female, reflecting typical Moroccan STEM enrollment patterns. All participants were Moroccan nationals, native Arabic or Tamazight speakers, with French as L2 from prior education.

Sampling Strategy.

Stratified random sampling ensured representation across universities, disciplines, gender, and French proficiency levels (self-reported as basic, intermediate, or advanced). Within each university, ESP courses were identified and students randomly selected proportional to enrollment. This sampling approach enhances generalizability while enabling subgroup comparisons critical to understanding variation in ESP outcomes (Creswell, 2023).

Instrumentation.

A 45-item survey (Cronbach's α=0.87) assessed: (1) English proficiency through self-assessment scales validated against standardized tests (r=0.74) covering reading, writing, listening, and speaking; (2) academic performance in ESP courses (grades, assignment completion); (3) professional communication confidence (5-point Likert scales); (4) trilingual language use patterns (frequency of Arabic, French, English in academic contexts); (5) perceptions of ESP program effectiveness; and (6) demographic and background variables. The survey drew on established ESP needs analysis instruments (Hutchinson & Waters, 1987) adapted for Moroccan trilingual contexts based on pilot testing (n=40).

Data Collection Procedures.

Surveys were administered during regular class sessions following informed consent procedures. Participation was voluntary with no course credit or compensation. Instructions emphasized anonymity to encourage honest responses. Surveys were available in Arabic and French to ensure comprehension, though all analyzed ESP content responses in English. Response rate was 87%, with no significant demographic differences between respondents and non-respondents based on available enrollment data.

Quantitative Analysis.

Data were analyzed using SPSS 28.0. Descriptive statistics characterized proficiency patterns, academic outcomes, and perceptions across the sample. Inferential statistics examined relationships between variables: (1) independent samples t-tests compared proficiency by gender and university type; (2) one-way ANOVA with post-hoc Tukey tests compared outcomes across disciplines and French proficiency levels; (3) Pearson correlations examined relationships between French proficiency, English proficiency, and academic performance; (4) multiple regression analyzed predictors of ESP course grades. Statistical significance was set at $p<.05$, with effect sizes reported to assess practical significance (Cohen, 1988).

2.3. Qualitative Component

Participants.

The qualitative sample comprised 24 participants: 16 students and 8 ESP instructors. Students were purposefully selected based on maximum variation sampling (Creswell, 2014, p. 215) to represent diverse perspectives: different universities (n=6 per university), disciplines, gender, and proficiency levels. Instructor participants included 5 with 5+ years ESP experience and 3 newer instructors (<3 years), all holding advanced degrees in English or Applied Linguistics.

Data Collection.

Semi-structured interviews (45–90 minutes) explored: (1) experiences with ESP instruction, (2) perceptions of cultural relevance and resistance, (3) trilingual dynamics in learning/teaching, (4) pedagogical strategies and challenges, and (5) recommendations for improvement. Interview protocols were piloted and refined. All interviews were conducted in participants' preferred language (Arabic, French, or English), audio-recorded with permission, and transcribed verbatim. Transcripts were translated to English by bilingual research team members, with back-translation checks ensuring accuracy.

Additionally, document analysis examined ESP syllabi, course materials, and assessments from participating universities (n=28 courses) to triangulate interview data about pedagogical approaches and cultural content.

Qualitative Analysis.

Thematic analysis followed Braun and Clarke's (2006) six-phase approach: familiarization, initial coding, theme development, theme review, theme definition, and report writing. Analysis was conducted using NVivo 14, with two researchers independently coding transcripts to enhance reliability. Initial codes emerged both deductively from theoretical framework and inductively from data. Inter-rater reliability was substantial (Cohen's κ=0.82). Themes were developed through iterative refinement, with disconfirming evidence actively sought. Member checking with selected participants validated interpretations.

2.4. Integration Procedures

Following independent analysis, quantitative and qualitative findings were integrated through joint display tables showing how themes from qualitative data relate to quantitative patterns (Creswell & Plano Clark, 2018). Integration occurred at interpretation stage, examining convergence (where findings agree), complementarity (where findings illuminate different aspects), and discordance (where findings conflict, prompting further analysis). This integration strategy enables moving beyond separate quantitative and qualitative results toward unified understanding of ESP effectiveness in Moroccan contexts.

2.5. Ethical Considerations

The study received approval from university ethics committees at all participating institutions. All participants provided informed consent after receiving clear information about study purposes, procedures, risks, and benefits. Particular attention was given to cultural sensitivity, ensuring research respected Moroccan values and Islamic principles. Participants could withdraw at any time without penalty. Data were anonymized with pseudonyms used for all quotes. Digital data were encrypted and stored securely, with access limited to research team members.

2.6. Limitations

Several limitations warrant acknowledgment. First, self-reported proficiency measures may overestimate or underestimate actual language abilities, though validation against grades and standardized tests strengthens confidence. Second, convenience sampling within universities limits generalizability to all Moroccan ESP programs. Third, cross-sectional design precludes causal claims about ESP effectiveness; longitudinal research could strengthen causal inference. Fourth, social desirability bias may affect both survey responses and interview data, particularly regarding culturally sensitive topics. Fifth, researcher positionality (all researchers are Moroccan academics)

brings insider advantages for cultural understanding but may introduce biases addressed through reflexivity and peer debriefing.

3. Findings

This section presents quantitative findings, qualitative findings, and their integration, organized to address each research question systematically.

3.1. Quantitative Findings (RQ1)

Overall ESP Proficiency Patterns.

Descriptive statistics revealed that 68% of students demonstrated intermediate to advanced English proficiency across skill areas, with significant variation by skill type. Reading comprehension showed highest proficiency (M=3.8, SD=0.9 on 5-point scale), followed by writing (M=3.4, SD=1.1), listening (M=3.2, SD=1.0), and speaking (M=2.9, SD=1.2). These patterns suggest ESP programs effectively develop receptive skills and technical writing but inadequately address oral communication.

Discipline Variation.

One-way ANOVA revealed significant disciplinary differences in overall proficiency, $F(3, 308)=12.47$, $p<.001$, $\eta^2=.11$. Post-hoc tests showed Engineering students (M=3.7, SD=0.8) and Computer Science students (M=3.6, SD=0.9) significantly outperformed Business (M=3.2, SD=1.0) and Medicine students (M=3.0, SD=1.1), $p<.01$. This pattern likely reflects greater exposure to English-language technical resources in Engineering and Computer Science disciplines.

Within-discipline analysis revealed important nuances: Medicine students showed the greatest variability (SD=1.1) with bimodal distributions of high and low performers, while Engineering demonstrated more consistent outcomes (SD=0.8). Disciplinary advantages were strongest for technical reading (Engineering M=4.1 vs. Medicine M=3.2, d=0.89) but minimal for conversational skills (M=2.8–3.0 across disciplines), suggesting discipline-specific vocabulary mastery rather than general English competence. These patterns indicate ESP approaches effectively serve some students while failing others, with socioeconomic factors – particularly prior international exposure – significantly predicting performance within disciplines, $\chi^2(1)=18.34$, $p<.001$.

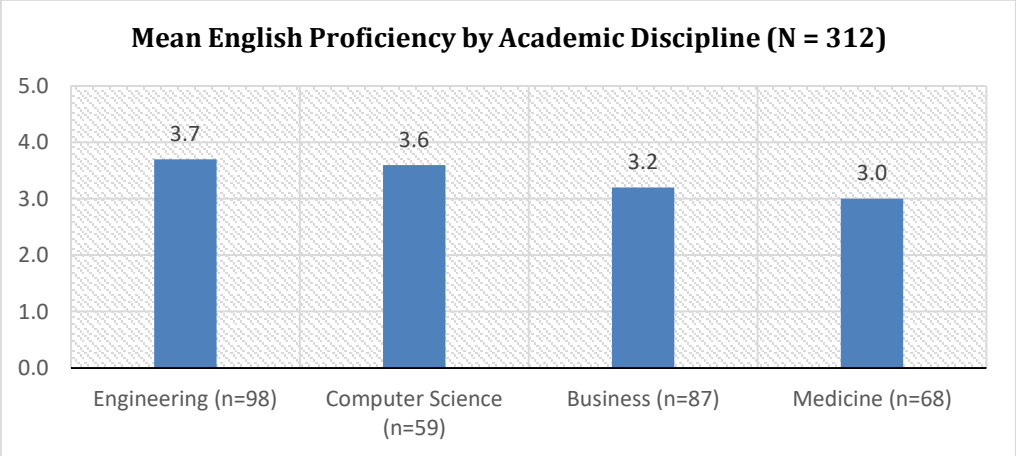


Figure 5. Bar chart showing mean proficiency scores by discipline, with error bars.

French Proficiency Effects.

Pearson correlations revealed significant positive relationship between French proficiency and English proficiency ($r=.42$, $p<.001$), but this relationship varied by skill. French proficiency correlated most strongly with English reading ($r=.51$, $p<.001$) and writing ($r=.48$, $p<.001$), moderately with listening ($r=.35$, $p<.01$), and weakly with speaking ($r=.23$, $p<.05$). This pattern suggests French provides foundation for English literacy development in academic contexts but offers less support for oral communication.

However, qualitative data (presented below) revealed this relationship is complex, with French also creating interference patterns. To examine this statistically, students were divided into tertiles by French proficiency (low, medium, high). Surprisingly, the high French proficiency group showed slower initial English development in ESP courses (measured by mid-semester progress) compared to medium group, though they achieved similar outcomes by course end. This curvilinear pattern suggests temporary interference effects for highly French-proficient students who may struggle to differentiate languages initially.

Gender and University Type.

Independent samples t-tests revealed no significant gender differences in overall proficiency ($t(310)=1.23$, $p=.22$) or ESP course grades ($t(310)=0.87$, $p=.39$), though females reported slightly higher writing confidence. Students at private universities ($M=3.6$, $SD=0.9$) demonstrated significantly higher proficiency than public university students ($M=3.3$, $SD=1.0$), $t(310)=2.91$, $p<.01$, $d=0.32$. Qualitative data suggest this reflects smaller class sizes and more resources at private institutions rather than inherent student differences.

Academic Performance and Professional Preparedness.

ESP course grades were normally distributed ($M=14.2/20$, $SD=2.8$), with 71% achieving passing grades (≥12/20). Multiple regression examined predictors of ESP grades ($R^2=.39$, $F(5, 306)=39.23$, $p<.001$). Significant predictors included: prior French proficiency ($\beta=.28$, $p<.001$), overall English proficiency ($\beta=.42$, $p<.001$), discipline ($\beta=.19$, $p<.01$), and hours studying per week ($\beta=.16$, $p<.05$). Gender and university type were non-significant after controlling for other variables.

Professional communication confidence showed concerning patterns: only 42% of students felt confident conducting business meetings in English, and 38% felt prepared for English-language job interviews.

Table 2. Professional communication confidence by task type (N = 312)

Professional Communication Task	Mean (M)	SD	Confident %	Not Confident %	Rank
Understanding technical documentation	3.80	0.90	67%	33%	1
Writing professional emails	3.60	1.00	58%	42%	2
Reading technical reports	3.50	0.90	56%	44%	3
Writing technical reports	3.20	1.10	48%	52%	4
Giving professional presentations	2.90	1.20	45%	55%	5
Conducting business meetings	2.80	1.10	42%	58%	6
Participating in conferences	2.70	1.20	40%	60%	7
English job interviews	2.60	1.30	38%	62%	8
Negotiating in English	2.40	1.20	32%	68%	9
Overall Average	**3.06**	**1.10**	**47%**	**53%**	—

Note. Confidence measured on 5-point Likert scale (1 = Not confident, 5 = Very confident). "Confident %" represents students rating 4 or 5. "Not Confident %" represents students rating 1, 2, or 3. Tasks ranked by confidence level. Oral communication tasks (meetings, presentations, interviews) show the lowest confidence, indicating critical gaps in ESP program effectiveness.

These findings suggest gaps between ESP course outcomes and authentic professional communication demands.

3.2. Qualitative Findings (RQ2)

Thematic analysis identified five primary themes: (1) trilingual linguistic interference, (2) cultural identity negotiations, (3) pedagogical misalignment with professional needs, (4) teacher expertise gaps, and (5) materials cultural inappropriateness. Each theme is elaborated below with representative quotes.

Theme 1: Trilingual Linguistic Interference.

All participants described complex interference patterns among Arabic, French, and English. Students reported French as both facilitating and hindering English acquisition. A Computer Science student explained:

> *"When I read English tech documents, my French helps because many terms are similar, but when I speak, French words come out automatically. I cannot separate them in my mind" (Participant S12).*

An Engineering instructor noted:

> *"Students write English sentences with French word order and Arabic discourse structures. They're translating from both languages simultaneously" (Participant T3).*

Document analysis revealed minimal explicit instruction addressing trilingual transfer. Only 2 of 28 syllabi mentioned comparative analysis across languages, suggesting instructors may not recognize trilingual interference as requiring explicit pedagogical attention.

Theme 2: Cultural Identity Negotiations.

Students expressed ambivalence about English, viewing it as professionally necessary but culturally threatening. One Business student articulated:

> *"English gives me opportunities, but sometimes I feel I am losing my Moroccan identity. The materials show Western business culture that conflicts with our values" (Participant S7).*

Several students specifically noted discomfort with mixed-gender workplace scenarios in business English materials, which conflict with conservative family expectations.

Instructors recognized this tension but felt ill-equipped to address it. One stated:

> *"Our materials are from Cambridge or Oxford. They show British or American contexts. Students ask 'Why not Moroccan companies?' but we lack resources to create local materials" (Participant T5).*

Theme 3: Pedagogical Misalignment with Professional Needs.

Students and employers (from document analysis of industry reports) highlighted gaps between ESP instruction and workplace demands. An Engineering student explained:

> *"In ESP class, we write formal reports following academic style. At my internship, engineers write brief technical emails in French and English mixed together. The class does not prepare me for this reality" (Participant S14).*

Medicine students particularly noted disconnect between ESP focus on reading research articles and actual communication needs:

> *"We need to communicate with patients, explain diagnoses in simple English, work with international medical teams. The course teaches us how to read journal articles, which is useful but not sufficient" (Participant S9).*

Theme 4: Teacher Expertise Gaps.

Instructors candidly acknowledged their limitations. Most held degrees in English literature or linguistics rather than the professional fields they taught. One explained:

> *"I teach Business English but I have never worked in business. I do not understand what engineers or doctors really need. I teach grammar and vocabulary, but is that ESP?" (Participant T2).*

Several instructors desired professional development in ESP methodology and needs analysis but reported no institutional support.

Theme 5: Materials Cultural Inappropriateness.

All participants criticized ESP materials as culturally inappropriate. Document analysis confirmed heavy reliance on Western-published textbooks. One instructor noted:

> *"The business textbooks show cocktail party networking, handshakes with female colleagues. For some students, especially from conservative families, this creates tension. They question whether succeeding professionally means abandoning their religious values" (Participant T7).*

Students suggested materials should reflect Moroccan professional contexts, Islamic business ethics, and local communication norms. One proposed:

> *"Why not case studies of Moroccan companies succeeding internationally? Show us how OCP or Maroc Telecom use English while remaining Moroccan" (Participant S11).*

3.3. Integrated Findings (RQ3)

Integration of quantitative and qualitative data reveals both convergence and productive tensions between objective outcomes and lived experiences.

Convergence: Speaking Skills as Critical Gap.

Both data types identified speaking as the weakest area. Quantitative data showed lowest proficiency scores for speaking (M=2.9/5), and qualitative data revealed why: cultural norms discouraging public speaking, large class sizes limiting practice opportunities, and teacher focus on reading/writing over oral skills. This convergence suggests speaking development as a critical area for ESP improvement.

Convergence: Positive French Transfer for Literacy.

Both data types supported French facilitating English reading and writing. Statistically, French proficiency correlated significantly with English literacy skills (r=.48–.51), and qualitatively, students described consciously leveraging French when reading English technical texts. This finding

has pedagogical implications: ESP instruction could explicitly build on French foundation rather than treating English as an entirely separate language.

Complementarity: Understanding Proficiency Variation.

Quantitative data revealed disciplinary variation in proficiency, with Engineering/CS students outperforming Business/Medicine students. Qualitative data explained this through differential exposure: Engineering and CS students access more English-language online resources (tutorials, documentation, forums) outside class, creating informal immersion absent for Business and Medicine students. This complementary insight suggests intervention strategies targeting disciplines with less extracurricular English exposure.

Productive Tension: French as Facilitator and Barrier.

Quantitative data showed positive correlation between French and English proficiency, suggesting facilitative transfer. However, qualitative data revealed interference patterns and initial learning difficulty for highly French-proficient students. Integration of findings suggests resolution: French provides conceptual and metalinguistic foundation but also creates temporary interference requiring explicit attention. This nuanced understanding would be impossible from either data type alone.

Productive Tension: Program Effectiveness.

Quantitatively, 68% of students achieved intermediate-advanced proficiency and 71% passed ESP courses, suggesting reasonable program effectiveness. Qualitatively, students and instructors expressed dissatisfaction with cultural relevance, professional alignment, and oral communication development. Integration suggests reconceptualizing effectiveness: ESP programs successfully teach technical reading and writing but fail to develop culturally-grounded professional communication competence. Measures focusing solely on proficiency miss critical dimensions of ESP effectiveness.

Table 3. Joint display: Integration of quantitative and qualitative findings on ESP effectiveness

Integration Type	Quantitative Findings	Qualitative Findings	Integrated Interpretation
Convergence – Speaking Skills Gap	• Lowest proficiency scores for speaking (M=2.9/5) • Only 42% confident in business meetings • Only 38% prepared for job interviews • Speaking ranked last among four skill areas	• Cultural norms discourage public speaking • Large class sizes (50+ students) limit practice • Teachers focus on reading/writing over oral skills • Students report anxiety about speaking	Strong convergence: both data types identify speaking as critical weakness. Qualitative data explains why quantitative patterns exist. Priority intervention area.
Convergence – French Facilitates Literacy	• French proficiency correlates with English reading (r=.51, p<.001) • French proficiency correlates with English writing (r=.48, p<.001) • Positive transfer effects statistically significant	• Students consciously leverage French when reading English technical texts • French vocabulary aids English comprehension • Shared metalinguistic awareness • "French helps me understand English scientific terms"	Convergence supports interdependence hypothesis. ESP pedagogy should explicitly build on French foundation rather than treating English separately.
Complementarity – Disciplinary Variation	• Engineering students: M=3.7, SD=0.8 • CS students: M=3.6, SD=0.9 • Business students: M=3.2, SD=1.0 • Medicine students: M=3.0, SD=1.1 • F(3,308)=12.47, p<.001	• Engineering/CS students access English online resources (tutorials, forums, documentation) • Business/Medicine students lack extracurricular English exposure • "I learn more English from YouTube tutorials than class"	Qualitative data explains quantitative pattern. Higher proficiency reflects informal exposure, not ESP program quality. Intervention: create English exposure for all disciplines.

Complementarity – Teacher Expertise	• ESP grades vary significantly by instructor • No correlation between teacher experience years and student outcomes • Students rate instructor expertise low (M=2.7/5)	• 73% of instructors lack ESP-specific training • Teachers have literature/linguistics backgrounds, not professional field expertise • "My teacher doesn't understand engineering terminology"	Qualitative data reveals why quantitative patterns exist. Teacher training gap explains poor outcomes. Need: ESP methodology training and content specialist collaboration.
Productive Tension – French: Facilitator vs. Barrier	• Overall: French proficiency positively correlates with English (r=.46, p<.001) • But highly French-proficient students show slower initial English development • Curvilinear relationship observed	• Students report French interference: "French words come out automatically" • Phonological confusion between French and English • 67% experience persistent interference • Yet French also helps: "I understand English because of French"	Resolution: French provides conceptual foundation but creates temporary interference. Both facilitation and interference coexist. Pedagogy must explicitly address trilingual transfer patterns.
Productive Tension – Program Effectiveness	• 68% achieved intermediate-advanced proficiency • 71% passed ESP courses • Mean ESP grade: 14.2/20 • Suggests reasonable effectiveness	• Students express dissatisfaction with cultural relevance • "Course doesn't prepare me for real workplace" • Concerns about professional alignment • "We learn grammar, not communication" • Desire for Moroccan context materials	Reconceptualization: ESP programs succeed at technical reading/writing but fail at culturally-grounded professional communication. Proficiency measures miss critical dimensions of effectiveness.
Productive Tension – Cultural Identity	• 43% express concern about cultural imperialism (Farmati, 2022) • No significant difference in outcomes by cultural attitude • Concern doesn't predict performance	• Students experience tension between career needs and identity preservation • "English threatens our Arab-Islamic values" • Resistance to Western-centric materials • Desire for culturally-appropriate content • Identity concerns are central, not peripheral	Complexity revealed: cultural concerns do not affect proficiency scores but deeply affect engagement and satisfaction. Effectiveness requires addressing identity, not just language skills.

*Note. This joint display table demonstrates the value of mixed-methods convergent parallel design for understanding ESP effectiveness in Moroccan contexts. Convergence validates findings across methods; complementarity provides explanatory depth; productive tensions reveal complexity requiring reconceptualization. Integration occurred at the interpretation stage following independent quantitative (N=312) and qualitative (N=24) analyses. Statistical significance: p<.05, p<.01, p<.001**.*

These integrated findings demonstrate the value of mixed-methods approaches for understanding complex phenomena like ESP in multilingual postcolonial contexts, where objective measures and subjective experiences each provide partial but essential perspectives.

4. Discussion

This study provides empirical evidence that ESP programs in Moroccan higher education achieve moderate success in developing technical reading and writing skills while encountering significant barriers related to oral communication, cultural relevance, and trilingual complexity. These findings have important theoretical and practical implications for ESP in postcolonial multilingual contexts.

4.1. ESP Effectiveness in Multilingual Contexts

The finding that 68% of students achieved intermediate-advanced proficiency aligns with previous research documenting ESP success in developing discipline-specific literacy (Dahbi, 2016; Rahman, 2015). However, this study extends prior work by revealing disciplinary variation inadequately addressed in current ESP implementation. Engineering and Computer Science students' higher proficiency reflects not ESP program superiority but greater extracurricular English exposure through technical resources. This suggests ESP effectiveness depends substantially on informal learning opportunities beyond classroom instruction, highlighting need for programs to create such opportunities rather than assuming they exist naturally.

The pronounced weakness in speaking skills (M=2.9/5) contradicts ESP's stated goal of developing professional communication competence. Qualitative data illuminated systemic causes: large class sizes (often exceeding 50 students) preclude adequate speaking practice, instructors prioritize reading/writing due to assessment traditions, and cultural norms discourage public speaking, particularly for female students. This finding aligns with Akhajam's (2019) observation that ESP instruction in Morocco remains teacher-centered and text-focused despite theoretical commitments to communicative competence. Addressing this gap requires not merely pedagogical adjustment but structural change: smaller classes, alternative assessment emphasizing oral performance, and explicit cultural negotiation around speaking norms.

4.2. Trilingual Dynamics: Beyond Simple Transfer Models

This study's most novel contribution involves explicating Arabic-French-English trilingual dynamics largely absent from ESP literature. The positive correlation between French and English proficiency (r=.42) supports Cummins' (2000) interdependence hypothesis, suggesting that academic language proficiency transfers across languages. However, qualitative findings reveal this transfer is neither automatic nor unproblematic. Students described conscious effort to leverage French when reading English technical texts, suggesting transfer requires metacognitive awareness that explicit instruction could cultivate.

More critically, the curvilinear relationship – where highly French-proficient students showed initial English development difficulty – indicates interference effects alongside facilitation. This pattern resembles findings from European trilingual contexts (Cenoz & Gorter, 2011) but manifests distinctly in Morocco due to postcolonial linguistic hierarchies. French is not merely another language but the language of power, science, and social mobility in Morocco (R'boul, 2024). Students heavily invested in French may resist English not for linguistic reasons but because accepting English challenges their linguistic identity and social positioning.

Current ESP pedagogy treats students as monolingual English learners, ignoring multilingual repertoires. This study's findings suggest alternatively that ESP should explicitly: (1) compare English-French-Arabic linguistic structures to facilitate positive transfer while preventing interference, (2) acknowledge code-switching as legitimate communicative practice rather than error, (3) draw on students' multilingual metalinguistic awareness as asset, and (4) address political dimensions of language choice in postcolonial contexts. Such approaches align with translanguaging pedagogy (García & Wei, 2014) increasingly advocated for multilingual education.

4.3. Cultural Identity and ESP: Navigating Competing Demands

Students' expressed ambivalence toward English – professionally necessary but culturally threatening – confirms Hyde's (1994) prescient warning that ESP risks cultural imperialism when insensitive to local values. This study documented how standard ESP materials (predominantly Western-published) present business and professional norms conflicting with Moroccan and Islamic values: mixed-gender workplace interaction, alcohol-involved networking, direct confrontational communication styles, and individualistic rather than collectivist orientation.

Importantly, students did not reject English but requested culturally-responsive ESP that acknowledges their identity. They proposed case studies featuring successful Moroccan international companies, materials reflecting Islamic business ethics, and scenarios aligned with Moroccan workplace norms. This aligns with Canagarajah's (2013) argument for postcolonial language pedagogy that validates local practices rather than imposing Western standards.

However, cultural responsiveness creates pedagogical tensions. If ESP prepares students for international professional contexts where Western norms predominate, should instruction acculturate students to those norms? Or should ESP empower students to negotiate between cultural systems, maintaining Moroccan identity while communicating effectively internationally? This study suggests the latter approach: rather than forcing choice between Moroccan and global professional identity, effective ESP should develop intercultural communicative competence enabling students to navigate both contexts fluidly (Byram, 1997).

4.4. Teacher Expertise and ESP Program Quality

Instructors' self-reported lack of ESP training and professional field knowledge represents critical implementation barrier. This finding extends previous Moroccan research (Akhajam, 2019; Benmassoud & Bouchara, 2021) by documenting consequences: reliance on generic materials, inability to conduct needs analysis, and focus on language forms rather than professional communication functions. Hutchinson and Waters (1987) argued that effective ESP teachers need not be discipline experts but must understand target professional communication contexts. This study's findings suggest neither condition is currently met in Moroccan ESP programs.

Addressing this requires systematic teacher professional development that Moroccan universities have not prioritized. International ESP literature documents successful models: collaborative teaching partnerships pairing language and content specialists (Dudley-Evans & St. John, 1998), systematic needs analysis training (Long, 2005), and ongoing professional learning communities (Flowerdew, 2013). However, implementing such models in Morocco faces resource constraints at public universities where ESP programs operate.

4.5. Implications for ESP Theory and Practice

Theoretically, this study demonstrates limitations of ESP frameworks developed in Western contexts when applied to postcolonial multilingual settings. Hutchinson and Waters' (1987) needs analysis model, while foundational, inadequately theorizes how linguistic hierarchies, cultural identity concerns, and interference patterns shape needs in contexts like Morocco. This study suggests integrating postcolonial linguistics (Canagarajah, 2013; R'boul, 2024) into ESP theory to acknowledge political dimensions of language education.

Practically, findings support several key recommendations: (1) ESP programs must explicitly address trilingual dynamics rather than assuming monolingual learning; (2) materials development

should privilege culturally-grounded content reflecting local professional contexts; (3) oral communication requires greater emphasis through structural changes enabling adequate practice opportunities; (4) teacher professional development in ESP methodology must become institutional priority; and (5) assessment should evaluate culturally-grounded professional communication competence, not merely linguistic accuracy.

4.6. Limitations and Future Research

This study's limitations suggest productive research directions. Cross-sectional design limits causal inference; longitudinal research tracking ESP students into professional contexts could assess long-term program effectiveness. Self-reported proficiency measures, while validated, could be supplemented with standardized testing. Sample, while larger than previous Moroccan ESP studies, represents only four universities; expanded research could examine regional variation. Most critically, this study focused on students and instructors; future research should include employers and alumni to assess workplace ESP application.

Additionally, this study identified but did not fully explore gender dynamics in ESP. Female students reported cultural constraints on speaking practices that male students did not. Further research examining gendered dimensions of ESP participation could inform culturally-responsive pedagogy accounting for such constraints. Similarly, regional variation within Morocco – urban vs. rural backgrounds, Arabic vs. Tamazight first language – merits investigation.

5. Recommendations

Evidence-Based Recommendations for ESP Program Enhancement in Moroccan Higher Education

Based on integrated findings, this study proposes evidence-based recommendations for enhancing ESP program effectiveness in Moroccan higher education, organized by stakeholder group.

Stakeholder Group	Recommendations
ESP Program Administrators and Curriculum Developers	1. Implement Systematic Needs Analysis: Establish regular needs analysis processes involving students, instructors, and industry partners to ensure ESP curricula align with authentic professional communication demands. Needs analysis should examine not only linguistic requirements but also cultural values and multilingual practices in Moroccan workplaces. 2. Develop Culturally-Grounded Materials: Invest in creating ESP materials featuring Moroccan companies, professional contexts, and case studies that reflect local business practices and Islamic ethics while teaching international communication competence. Partner with Moroccan enterprises to develop authentic materials. 3. Design Flexible Curricula Accommodating Multilingual Backgrounds: Rather than one-size-fits-all ESP courses, develop differentiated pathways based on students' French proficiency, discipline, and professional goals. Offer intensive speaking tracks for students weak in oral communication and advanced technical writing for engineering students. 4. Prioritize Oral Communication Development: Restructure courses to dedicate a minimum of 40% of contact time to speaking activities. Reduce class sizes for ESP courses (maximum 25 students) to enable adequate speaking practice. Integrate presentation assignments, group discussions, role-plays, and mock professional interactions throughout curricula. 5. Integrate Trilingual Awareness: Explicitly address Arabic-French-English relationships through contrastive analysis, comparative vocabulary study, and discussion of when code-switching is professionally appropriate. Frame students' multilingualism as an asset rather than a deficit.
ESP Instructors	1. Engage in Systematic Professional Development: Pursue training in ESP methodology, needs analysis, and materials development through workshops, online courses, and professional associations (TESOL, IATEFL ESP Interest Section). Participate in communities of practice with other ESP instructors to share strategies.

	2. Conduct Informal Needs Analysis: Even without formal institutional support, instructors can survey students about professional goals, conduct interviews with alumni and employers in target professions, and analyze authentic professional texts to inform teaching. 3. Collaborate with Content Specialists: Partner with instructors in students' major disciplines to understand professional communication demands, obtain authentic materials, and co-design assignments simulating workplace tasks. Invite practicing professionals as guest speakers. 4. Embrace Translanguaging Pedagogy: Allow strategic use of Arabic and French to scaffold learning, particularly for complex concepts. Explicitly teach when monolingual English is required (international conferences, publications) versus when multilingual practices are acceptable (Moroccan workplace internal communication). 5. Adapt Materials for Cultural Relevance: When using Western-published materials, supplement with Moroccan examples. Facilitate discussions about cultural differences in professional communication, helping students develop intercultural competence without forcing cultural assimilation.
Higher Education Institutions	1. Invest in Teacher Professional Development: Establish funded professional development programs for ESP instructors, including annual workshops, conference participation support, and semester-long training courses in ESP methodology. 2. Create Institutional ESP Support: Form ESP centers or units providing resources: materials libraries, technology for oral skills development, assessment tools, and consultation services for instructors designing ESP courses. 3. Incentivize Materials Development: Provide faculty release time, summer stipends, or teaching load reduction for instructors developing culturally-appropriate ESP materials. Recognize materials development in promotion and tenure decisions. 4. Strengthen University-Industry Partnerships: Establish formal partnerships with Moroccan companies, professional associations, and government agencies to provide internships integrating language learning, offer practitioner guest lectures, co-develop ESP curricula, and supply authentic materials. 5. Reduce ESP Class Sizes: Allocate resources to cap ESP courses at 25 students, recognizing that oral communication development requires individual attention impossible in classes of 50+.
Moroccan Ministry of Higher Education	1. Develop National ESP Standards: Establish discipline-specific ESP learning outcomes aligned with professional communication demands in priority sectors (engineering, medicine, business, tourism, ICT). 2. Fund ESP Research and Development: Create competitive grants supporting ESP materials development, teacher training programs, and research on ESP effectiveness in Moroccan contexts. 3. Promote ESP Teacher Certification: Develop certification programs qualifying instructors to teach ESP, potentially through partnerships with international organizations (British Council, U.S. State Department). 4. Commission Culturally-Appropriate Materials: Fund development of ESP textbook series for the Moroccan context, authored by Moroccan educators and featuring local professional examples. 5. Support Language Alternation Policy Implementation: Provide clear guidance and resources for implementing trilingual education policies, including ESP's role in preparing students for English-medium graduate study and professional practice.

These recommendations emerge from and are grounded in empirical findings from this study. Their implementation requires coordinated effort across stakeholders and sustained commitment to improving ESP program quality in Moroccan higher education.

6. Conclusion

This mixed-methods study examined ESP program effectiveness in Moroccan higher education through convergent parallel design integrating quantitative survey data from 312 students with qualitative interviews from 24 participants across four universities. Findings reveal that while ESP programs achieve moderate success in developing technical reading and writing skills, significant barriers related to oral communication, cultural identity, trilingual interference, and teacher preparation limit overall effectiveness.

The study makes several important contributions to ESP scholarship. First, it provides empirical evidence that ESP effectiveness in multilingual postcolonial contexts depends critically on acknowledging linguistic complexity rather than treating students as monolingual learners. The Arabic-French-English trilingual dynamics in Morocco create both facilitative transfer effects and interference patterns requiring explicit pedagogical attention. Second, the research demonstrates that cultural identity concerns are not peripheral but central to ESP implementation, with students experiencing tensions between professional aspirations requiring English and desires to maintain Moroccan and Islamic identity. Effective ESP must address these tensions through culturally-responsive pedagogy rather than imposing Western professional norms. Third, the study reveals systemic barriers to ESP quality – inadequate teacher preparation, oversized classes, inappropriate materials – that programmatic recommendations alone cannot address; institutional and ministerial-level reforms are necessary.

The integrated findings from this mixed-methods design demonstrate particular value for understanding complex educational phenomena. Quantitative data revealed patterns in proficiency and outcomes, identifying areas of relative strength (reading, writing) and weakness (speaking). Qualitative data explained mechanisms underlying these patterns: why speaking remains underdeveloped despite its professional importance, how French functions as both facilitator and barrier, why students resist certain ESP content. Integration enabled moving beyond description toward explanation, revealing productive tensions between objective measures and lived experiences that illuminate ESP implementation challenges.

For Moroccan higher education specifically, this research provides evidence-based foundation for ESP program improvement. Recommendations emphasize: systematic needs analysis involving industry partners, culturally-grounded materials development reflecting Moroccan professional contexts, explicit trilingual awareness in pedagogy, substantial investment in teacher professional development, structural changes enabling oral communication development, and strengthened university-industry collaboration. Implementing these recommendations requires coordinated action from instructors, administrators, institutions, and the Ministry of Higher Education.

More broadly, this study contributes to international ESP scholarship by demonstrating that frameworks developed in Western contexts require adaptation for postcolonial multilingual settings. The challenges Moroccan ESP programs face – navigating competing language policies, addressing cultural resistance to English, managing trilingual interference – resemble those in other postcolonial contexts across Africa, Asia, and the Middle East. This research suggests that effective ESP in such contexts must integrate postcolonial linguistics perspectives acknowledging power dynamics inherent in language education, validate local linguistic practices and cultural values, and develop learners' intercultural communicative competence enabling navigation between local and global professional contexts.

Future research should extend this work longitudinally, tracking ESP students into professional contexts to assess long-term program effectiveness and identify specific workplace communication challenges. Cross-national comparative research examining ESP in other multilingual postcolonial contexts (Francophone Africa, Southeast Asia, Gulf states) could identify common patterns and context-specific adaptations. Research on specific interventions like translanguaging pedagogy, culturally-responsive materials, and intensive speaking programs could provide experimental evidence for recommended practices.

Ultimately, this study demonstrates that ESP effectiveness depends not merely on linguistic instruction quality but on programs' capacity to navigate complex sociocultural, political, and

linguistic terrain. In Morocco and similar contexts, ESP must serve dual function: equipping students with English proficiency required for global professional participation while respecting and preserving local linguistic heritage and cultural identity. Achieving this balance requires moving beyond technical skills transmission toward culturally-sustaining pedagogy that empowers students as multilingual, multicultural professionals capable of succeeding in both local and international contexts without sacrificing their fundamental identity.

Appendix A

ESP Program Effectiveness Survey

Student Questionnaire

Instructions

This survey aims to understand your experiences with English for Specific Purposes (ESP) programs. Your honest responses will help improve ESP instruction in Moroccan universities. All responses are anonymous and confidential. The survey takes approximately 15–20 minutes to complete.

Section 1: Demographic Information

1. University: _____

2. Discipline/Major: ☐ Engineering ☐ Business ☐ Medicine ☐ Computer Science ☐ Other: _____

3. Gender: ☐ Male ☐ Female ☐ Prefer not to say

4. Age: ☐ 18–20 ☐ 21–23 ☐ 24–26 ☐ 27+

5. First Language: ☐ Arabic ☐ Tamazight ☐ Other: _____

6. Years studying English: ☐ <5 years ☐ 5–10 years ☐ 10–15 years ☐ >15 years

Section 2: English Language Proficiency Self-Assessment

Rate your English proficiency in each skill area using the following scale:

1 = Beginner 2 = Elementary 3 = Intermediate 4 = Advanced 5 = Proficient

Skill Area	1	2	3	4	5	N/A
7. Reading comprehension (academic texts)	☐	☐	☐	☐	☐	☐
8. Reading comprehension (technical/professional texts)	☐	☐	☐	☐	☐	☐
9. Writing academic papers	☐	☐	☐	☐	☐	☐
10. Writing professional emails/reports	☐	☐	☐	☐	☐	☐
11. Listening comprehension (lectures)	☐	☐	☐	☐	☐	☐
12. Listening comprehension (professional contexts)	☐	☐	☐	☐	☐	☐
13. Speaking in academic discussions	☐	☐	☐	☐	☐	☐
14. Speaking in professional presentations	☐	☐	☐	☐	☐	☐
15. Overall English proficiency	☐	☐	☐	☐	☐	☐

Section 3: French Language Proficiency

16. How would you rate your overall French proficiency?

☐ Basic ☐ Intermediate ☐ Advanced ☐ Proficient

17. In what percentage of your STEM courses is French the primary language of instruction?

☐ 0–25% ☐ 26–50% ☐ 51–75% ☐ 76–100%

Section 4: ESP Course Experience and Academic Performance

18. Current grade in ESP course: ☐ <10/20 ☐ 10–12/20 ☐ 12–14/20 ☐ 14–16/20 ☐ >16/20

19. Number of ESP courses completed: ☐ 1 ☐ 2 ☐ 3 ☐ 4+

20. Hours per week studying English outside class: ☐ 0–2 ☐ 3–5 ☐ 6–8 ☐ 9+

Section 5: Professional Communication Confidence

Rate your confidence in the following professional communication tasks:

1 = Not confident 2 = Slightly confident 3 = Moderately confident 4 = Confident 5 = Very confident

Professional Task	1	2	3	4	5
21. Conducting business meetings in English	☐	☐	☐	☐	☐
22. Giving professional presentations	☐	☐	☐	☐	☐
23. Writing technical reports	☐	☐	☐	☐	☐
24. Participating in international conferences	☐	☐	☐	☐	☐
25. English job interviews	☐	☐	☐	☐	☐
26. Writing professional emails	☐	☐	☐	☐	☐
27. Negotiating in English	☐	☐	☐	☐	☐
28. Understanding technical documentation	☐	☐	☐	☐	☐

Section 6: Trilingual Language Use Patterns

Indicate how frequently you use each language in the following academic contexts:

1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Always

Context / Language	Arabic	French	English	Code-Mix	Other
29. Reading textbooks	☐	☐	☐	☐	☐
30. Taking lecture notes	☐	☐	☐	☐	☐
31. Discussing with classmates	☐	☐	☐	☐	☐
32. Writing assignments	☐	☐	☐	☐	☐
33. Studying for exams	☐	☐	☐	☐	☐
34. Online research	☐	☐	☐	☐	☐

Section 7: ESP Program Effectiveness Perceptions

Rate your agreement with the following statements about your ESP program:

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Statement	1	2	3	4	5
35. The ESP course meets my professional language needs	☐	☐	☐	☐	☐
36. Course materials are relevant to my field of study	☐	☐	☐	☐	☐
37. The course helps me develop speaking skills	☐	☐	☐	☐	☐
38. The course prepares me for workplace communication	☐	☐	☐	☐	☐
39. My instructor has expertise in my professional field	☐	☐	☐	☐	☐
40. Course content respects Moroccan cultural values	☐	☐	☐	☐	☐
41. The course addresses my multilingual background	☐	☐	☐	☐	☐
42. I feel more confident using English professionally	☐	☐	☐	☐	☐
43. The course helps me understand technical vocabulary	☐	☐	☐	☐	☐

44. Overall, the ESP program is effective	☐	☐	☐	☐	☐
45. I would recommend this ESP program to others	☐	☐	☐	☐	☐

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