Article

Mapping Discipline-Specific English Language Needs in Egyptian Medical EMI University Programs

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ABSTRACT

The rapid adoption of English-Medium Instruction (EMI) in medical education aims to enhance global workforce readiness; however, its alignment with the communicative demands of healthcare practice remains insufficiently examined. This study provides a comprehensive, discipline-specific analysis of English language needs across EMI medical university programs. Using a convergent parallel mixed-methods design, the study surveyed 220 undergraduate students and 58 faculty members from Medicine, Dentistry, Pharmacy, Physical Therapy, and Public Health. It complemented these data with interviews with 18 healthcare employers and 15 recent graduates. Quantitative results revealed significant disciplinary variations, with clinical documentation and patient communication as the most challenging domains. Qualitative findings emphasized three critical themes: clinical communication efficacy, mastery of specialized genres, and pragmatic professional competence. Integrated analysis exposes a systemic misalignment between academic language training and workplace expectations. The study advocates for ESP-informed, clinically integrated curricula to bridge this gap and advance healthcare communication competence.

Keywords: Curriculum Design, Discipline-Specific Language Needs, English for Specific Purposes (ESP), English-Medium Instruction (EMI), Healthcare Communication, Medical Education, Needs Analysis

The relentless global demand for a workforce proficient in English has positioned English-Medium Instruction (EMI) as a cornerstone of higher education internationalization. From

engineering to business programs, universities are adopting EMI to enhance their global competitiveness and graduate employability. However, beneath this rapid expansion lies a critical, and often unaddressed, question: Does the English language training embedded within EMI programs genuinely equip students with the communication skills demanded by the modern workplace? A growing body of evidence suggests a troubling disconnect, where graduates' academic English proficiency fails to translate into effective professional communication (Narzoles & Palermo, 2021; Yasmin et al., 2016).

This misalignment points to a fundamental challenge in EMI implementation: the frequent neglect of comprehensive, stakeholder-informed Needs Analysis (NA). While NA is a well-established pillar of English for Specific Purposes (ESP), its application in EMI contexts often remains confined to academic settings, focusing on skills like lecture comprehension and academic writing (Gadomska & Krajka, 2017). The perspective of industry, the ultimate end-user of graduate skills, is conspicuously absent from many curriculum design processes, despite consistent employer reports of graduates' deficiencies in key areas like professional correspondence and technical presentation (Caciora & Sturza, 2025; Ngah et al., 2011). This omission risks creating a pedagogical gap, where EMI programs produce graduates who are prepared for academic discourse but underprepared for the communicative realities of their professions.

Egyptian higher education has invested heavily in EMI to promote global competitiveness, particularly in medicine, public health, engineering, and business. However, research integrating the perspectives of students, faculty, and industry remains limited. Without such evidence, EMI risks operating in an informational vacuum, undermining its goal of career readiness. This study addresses this gap by examining the alignment between language needs in EMI programs and workplace competencies. By mapping viewpoints from students, faculty, and employers, it identifies areas of convergence and divergence, providing an empirical foundation for ESP-informed curricula that bridge academic preparation and professional practice.

LITERATURE REVIEW

This review synthesizes existing research relevant to understanding English language needs in EMI contexts, structured around three core themes: the theoretical and practical foundations of Needs Analysis (NA), the specific language demands within academic settings, and the critical English competencies required for professional employability:

The Foundation of Needs Analysis in Language Education

Needs Analysis (NA) is the cornerstone of effective and responsive language curriculum design, providing a systematic process for identifying the disparities between current competencies and target goals (Christison & Murray, 2021). The principle of tailoring instruction to specific learner requirements is fundamental. Early work in ESP emphasized the importance of defining specific language use contexts and the communicative events learners would encounter (Béjoint, 1981). This involves moving beyond general proficiency to analyze the precise linguistic features, genres, and skills required in the target situation. Methodologically, effective NA leverages multiple tools, including surveys, interviews, and document analysis, to gather comprehensive data from

various stakeholders (Gadomska & Krajka, 2017; Poorbehzadi & Songhori, 2016). This multi-faceted approach ensures that curriculum design is grounded in empirical evidence rather than assumption.

A robust NA must account for the diversity of the learner population. This includes differentiating instruction for learners with varying proficiency levels and specific learning challenges (Hoover & Patton, 2005). Furthermore, as Carlo et al. (2004) argue, closing the achievement gap for language learners requires directly addressing their distinct vocabulary needs, which are often not met by mainstream or bilingual classrooms alone. The context in which language is used and assessed is also critical; Solano-Flores & Trumbull (2003) advocate for new paradigms that examine language in context, recognizing that language demands are not uniform across situations. In community college settings, for instance, NA underscores the need for co-requisite courses tailored to support English language learners in credit-bearing classes (Avni & Finn, 2021).

English Language Needs in Academic and EMI Settings

The application of NA within higher education reveals a complex landscape of linguistic demands, particularly in environments where English is the medium of instruction. Research consistently identifies specific academic language skills as major challenges for students in EMI and tertiary education. These challenges often center on mastering the specialized vocabulary and discourse genres of their disciplines (Carlo et al., 2004). Studies focusing on specific student populations highlight the need for tailored NA to address their unique, non-native context (Poorbehzadi & Songhori, 2016). The needs extend beyond students to include educators; effective EMI implementation is contingent upon the professional development needs of faculty members, who require training to integrate language and content instruction effectively (Kabilan & Veratharaju, 2013). For adolescent learners, targeting content-area literacy instruction is essential to meet their developmental and linguistic needs (Watkins & Lindahl, 2010).

Addressing these academic needs often involves leveraging digital tools and adapting teaching materials. Gadomska & Krajka (2017) demonstrate the importance of using digital coursebooks to meet the academic purposes of students in tertiary education, highlighting how technology can be harnessed to support learning. This aligns with the broader imperative to adapt English language course contents to align with the specific linguistic needs of learners, such as beginner engineers, ensuring relevance and applicability (Caciora & Sturza, 2025).

English for Employability: Bridging to the Workplace

A critical function of NA is to align educational outcomes with the demands of the labor market, ensuring that graduates are work-ready. Studies across various sectors reveal a consistent employer demand for strong English communication skills. In the engineering field in India, NA is crucial for identifying the specific English language training needs that enhance employability (Clement & Murugavel, 2015). Similarly, research in the Pakistani hotel industry used NA to evaluate and critique existing teaching materials, finding them misaligned with the practical language needs of the sector (Yasmin et al., 2016). Highly specialized fields like aviation also depend on precise NA to develop

effective, safety-critical training, such as Aviation English for student pilots (Dewi & Kurnianingsih, 2025).

A prominent theme in literature is the persistent gap between the English competencies developed in academic settings and those required in the workplace. Narzoles & Palermo (2021) explicitly link workplace English language needs to their pedagogical implications in ESP, arguing for a direct connection between NA and curriculum design. This gap is observed globally; in Malaysia, graduates' English competency was found to be lacking when assessed against the needs of employers, underscoring a systemic misalignment (Sarudin et al., 2013). The core issue, as identified by Ngah et al. (2011), is the need for competent work-ready English language learners, a goal that can only be achieved by incorporating real-life workplace communication into vocational English modules (Choi, 2014). Beyond specific skills, the concept of need satisfaction itself can be applied to the workplace, with frameworks existing to capture factors like autonomy and competence in professional settings (Tiffin et al., 2024).

Accordingly, the existing literature firmly establishes the centrality of Needs Analysis in designing effective language instruction for both academic (EMI) and professional contexts. However, a critical gap remains. While numerous studies focus either on the internal challenges of academic settings (Avni & Finn, 2021; Poorbehzadi & Songhori, 2016) or on the external demands of specific industries (Caciora & Sturza, 2025; Dewi & Kurnianingsih, 2025), few studies deliberately and concurrently map these two domains to identify points of alignment and divergence within a single, defined context. The current study addresses this gap by conducting an integrated NA in the Egyptian EMI context, simultaneously capturing the perspectives of undergraduate students, faculty, and industry employers to provide a holistic view of the English-language needs landscape and to inform targeted, bridge-building curriculum interventions.
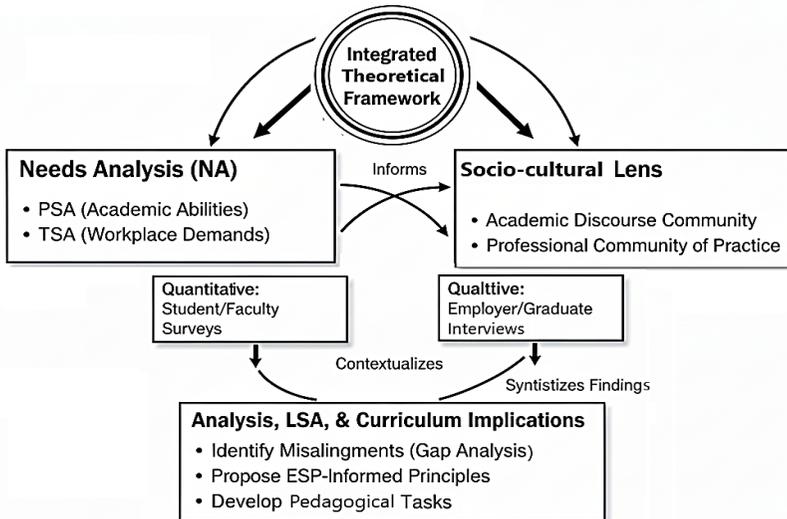
THEORETICAL FRAMEWORK

This study is grounded in an integrated theoretical framework that combines the foundational principles of English for Specific Purposes (ESP) with a sociocultural perspective on language learning. The primary theoretical anchor is the robust tradition of Needs Analysis (NA) within ESP, which shifts the focus from general English proficiency to addressing specific communicative requirements (Christison & Murray, 2021). This study operationalizes this through a triangulated NA model investigating three needs types: Present Situation Analysis (PSA), assessing current academic abilities via student and faculty surveys (Carlo et al., 2004; Poorbehzadi & Songhori, 2016); Target Situation Analysis (TSA), expanded beyond academia to professional workplace demands through employer and graduate interviews (Béjoint, 1981; Choi, 2014; Narzoles & Palermo, 2021); and Learning Situation Analysis (LSA), where findings directly inform pedagogical interventions (Caciora & Sturza, 2025; Gadomska & Krajka, 2017). This combined theoretical lens analyzes language needs not as isolated deficits but as situated within specific contexts, justifying the methodological triangulation of multiple stakeholders to bridge academic and professional domains.

The study also employs a sociocultural lens to contextualize language learning, emphasizing that language acquisition and use are fundamentally embedded within social and cultural practices (Solano-Flores & Trumbull, 2003). This perspective moves beyond

viewing language as discrete skills to understanding it as a tool for social interaction and meaning-making within specific discourse communities. The academic environment of an EMI faculty and the professional setting of an Egyptian corporation represent distinct communities with unique communicative norms and practices. Consequently, the challenges students face extend beyond linguistic competence to include sociocultural adaptation and identity negotiation as they navigate different communicative contexts (Watkins & Lindahl, 2010). The transition between these communities represents a central concern, where work-ready competence (Ngah et al., 2011) entails not merely skill acquisition but successful socialization into new professional practices. This theoretical framework justifies the direct investigation of workplace communication, as graduates' perceived deficiencies often stem from unfamiliarity with workplace-specific genres, registers, and pragmatic conventions rather than purely linguistic shortcomings (Sarudin et al., 2013).

Accordingly, the integrated framework guiding this research posits that by systematically analyzing both the present academic situation and the target professional situation through their respective sociocultural contexts, this study shall generate a nuanced and actionable understanding of English language needs in Egyptian EMI. This approach, illustrated in the Figure bellow, synthesizes ESP's structured Needs Analysis with the sociocultural view of language as social practice. The ultimate objective is to leverage this understanding to propose curriculum interventions that transcend merely teaching English and instead focus on socializing students into the communicative practices of their future professional worlds, thereby fulfilling the core promise of EMI to enhance genuine graduate employability.

Figure 1: Theoretical Framework of the study

METHODOLOGY

This study employed a convergent parallel mixed-methods design to comprehensively analyze English-language needs across medical EMI programs in Egyptian higher education. This approach enabled the collection of complementary quantitative and qualitative data, providing both statistical trends and deep contextual insights into communication challenges in medical education and practice.

Research Design

The convergent parallel design allowed for simultaneous collection and analysis of quantitative and qualitative data strands. The quantitative phase documented the frequency and severity of language challenges within academic medical programs, while the qualitative phase explored the nuanced communication demands of healthcare workplaces. These strands were analyzed separately then merged to identify convergence and divergence patterns.

Research Context and Participants

The study was conducted across four national Egyptian universities offering EMI medical programs. Purposive sampling ensured representation from key medical disciplines and professional contexts.

Table 1: Participant Distribution across Medical Disciplines and Universities

Participant Group	Total Sample	Medicine	Dentistry	Pharmacy	Physical Therapy	Public Health
Undergraduate Students	220 100%)	45 (20.5%)	52 (23.6%)	48 (21.8%)	42 (19.1%)	33 (15.0%)
Faculty Members	58 (100%)	12 (20.7%)	14 (24.1%)	11 (19.0%)	11 (19.0%)	10 (17.2%)
Healthcare Employers	18 (100%)	5 (27.8%)	4 (22.2%)	4 (22.2%)	3 (16.7%)	2 (11.1%)
Recent Graduates	15 (100%)	3 (20.0%)	3 (20.0%)	3 (20.0%)	3 (20.0%)	3 (20.0%)
Total	311	65 (20.9%)	73 (23.5%)	66 (21.2%)	59 (19.0%)	48 (15.4%)

As illustrated in the above table, the participant distribution demonstrates a balanced representation across medical disciplines, with Dentistry (23.5%), Pharmacy (21.2%), and Medicine (20.9%) comprising the largest proportions. The sample maintains consistent ratios between student and faculty distributions, while employer representation reflects the healthcare sector's emphasis on clinical specializations. This strategic allocation ensures comprehensive coverage of medical communication needs while maintaining statistical reliability for discipline-specific analysis.

Data Collection Instruments and Procedures

Data was collected using two primary instruments, aligned with the quantitative and qualitative strands of the research.

Students and Faculty Members Surveys

Two separate online surveys were developed using outlook Forms. The constructs measured and sample items for each survey are detailed below.

Table 2: Medical EMI Survey Constructs and Measurement

Survey Instrument	Key Constructs	Measurement Scale	Discipline-Specific Adaptations
Student Survey	- Medical terminology comprehension - Patient history documentation - Clinical case presentation - Medical literature synthesis - Interprofessional Communication	5-point Likert Scale (1=Very Easy to 5=Very Difficult)	Specialty-specific clinical scenarios Discipline-specific documentation tasks
Faculty Survey	- Observed clinical communication gaps - Patient interaction challenges - Research writing deficiencies - Academic presentation skills - Impact on clinical competency	5-point Likert Scale (1=Never to 5=Always)	Clinical supervision contexts Research supervision experiences

Semi-Structured Interviews

Semi-structured interviews were conducted with healthcare employers and recent graduates. The key themes explored in each protocol are summarized below.

Table 3: Healthcare Communication Interview Focus Areas

Stakeholder Group	Core Investigation Areas	Contextual Elements
Healthcare Employers	- Patient communication competence - Medical team coordination - Clinical documentation accuracy - Research communication skills - Professional development needs	- Hospital protocols - International collaboration - Medical technology systems
Recent Graduates	- Academic-to-clinical transition - Specialized communication challenges - Workplace adaptation strategies - Curriculum adequacy assessment	- Clinical rotation experiences - Specialization requirements - Cross-cultural patient care

Data Analysis

The quantitative and qualitative data were analyzed separately and then integrated.
- *Quantitative Analysis:* SPSS Version 28 was used for descriptive statistics, ANOVA to compare disciplines, and multiple regression to identify predictor variables.
- *Qualitative Analysis:* Thematic analysis followed Braun & Clarke (2006) framework, with NVivo software facilitating coding and theme development.
- *Integration:* Joint displays mapped quantitative frequencies against qualitative themes, particularly examining discipline-specific variations in communication needs.

Ethical Considerations

Ethical approval was obtained from the university's Institutional Review Board. All participants provided digital informed consent. Anonymity and confidentiality were guaranteed, with all identifiers removed from the final data set and publications.

RESULTS

This section presents comprehensive findings from the convergent parallel mixed-methods analysis, which examines English-language needs across medical EMI programs at Egyptian universities. Quantitative and qualitative data strands were analyzed separately and integrated to provide a holistic understanding of communication challenges in medical education and practice.

Quantitative Analysis of Academic Challenges in Medical EMI

The student survey (N=220) revealed significant variations in language challenges across different medical specialties, with clinical communication emerging as the most demanding area.

Table 4: The ANOVA Results for Student-Perceived Language Challenges

Language Skill Domain	Medicine (n=45)		Dentistry (n=52)		Pharmacy (n=48)		Physical Therapy (n=42)		Public Health (n=33)		F-value	η²
	M	SD	M	SD	M	SD	M	SD	M	SD		
Clinical Documentation	4.72	0.48	4.65	0.52	4.23	0.61	4.81	0.39	3.89	0.72	$F_{(4,215)}$ =18.34***	0.254
Patient Communication	4.68	0.51	4.59	0.55	3.92	0.68	4.75	0.42	3.45	0.81	$F_{(4,215)}$ =22.17***	0.292
Medical Terminology	4.15	0.63	4.28	0.58	4.35	0.54	3.89	0.71	3.72	0.69	$F_{(4,215)}$ =7.89***	0.128
Research Writing	4.25	0.59	3.89	0.67	4.12	0.62	3.45	0.78	4.52	0.48	$F_{(4,215)}$ =15.62***	0.225
Case Presentations	4.55	0.50	4.42	0.53	3.78	0.70	4.38	0.56	3.95	0.65	$F_{(4,215)}$ =12.45***	0.188

***$p < .001$

The ANOVA results demonstrate statistically significant differences across medical disciplines in all language domains ($p < .001$). Large effect sizes ($η² > 0.14$) were observed for clinical documentation and patient communication, indicating that discipline-specific requirements substantially influence perceived difficulty. Medicine and Physical Therapy students reported the highest challenges in clinical communication, while Pharmacy and Public Health students struggled more with research writing, reflecting their distinct professional demands.

Table 5: Faculty Ratings of Student Language Competencies by Medical Discipline

Assessment Area	Medicine (n=12)	Dentistry (n=14)	Pharmacy (n=11)	Physical Therapy (n=11)	Public Health (n=10)	χ² (4)
Patient History Accuracy	91.7%	85.7%	72.7%	90.9%	70.0%	18.23**
Clinical Note Completeness	83.3%	78.6%	63.6%	81.8%	60.0%	15.78**
Drug Information Communication	75.0%	71.4%	90.9%	63.6%	80.0%	12.45*
Research Protocol Understanding	66.7%	57.1%	81.8%	54.5%	90.0%	20.34***
Interprofessional Communication	58.3%	64.3%	72.7%	81.8%	70.0%	14.67*

*$p < .05$, **$p < .01$, ***$p < .001$

Faculty evaluations (N=58) revealed consistent patterns of language deficiencies affecting clinical training and academic performance.

Chi-square analysis revealed significant disciplinary variations in faculty-identified deficiencies (p < .05). Medicine faculty reported the highest concerns regarding patient history accuracy (91.7%), while Pharmacy faculty expressed the most concern about drug information communication (90.9%). Public Health faculty identified the most significant gaps in research protocol understanding (90.0%), reflecting their strong research orientation. These findings highlight the discipline-specific nature of language competency requirements in medical education.

Multiple regression analysis identified key predictors of language proficiency challenges across medical disciplines.

Table 6: Multiple Regression Analysis of Language Challenge Predictors

Predictor Variable	Clinical Communication β	Academic Writing β	Medical Terminology β	R²
Clinical Exposure Hours	-.42***	-.18*	-.25**	.38
English Medium Instruction Years	-.35***	-.28**	-.31***	.42
International Journal Reading	-.19*	-.45***	-.38***	.51
Simulation Training Participation	-.38***	-.22**	-.29**	.44
Peer Feedback Frequency	-.31***	-.35***	-.27**	.47

*$p < .05$, **$p < .01$, ***$p < .001$*

The regression model explained 38-51% of variance in language challenges ($R^2 = .38$-.51). Clinical exposure hours emerged as the strongest negative predictor of clinical communication difficulties ($\beta = -.42$, $p < .001$), while international journal reading frequency was the strongest predictor of academic writing competence ($\beta = -.45$, $p < .001$). These results suggest that experiential learning and academic engagement significantly mitigate language proficiency challenges in medical EMI contexts.

Accordingly, the quantitative findings systematically delineate a landscape of significant and discipline-specific English language challenges within Egyptian medical EMI programs. The consistent statistical significance and substantial effect sizes across all domains, particularly in clinical documentation and patient communication, underscore that these are not peripheral issues but central barriers to both academic and clinical training. These results provide a crucial macro-level understanding of what the predominant challenges are and where they are most acute across the medical disciplines. To fully interpret these statistical patterns and understand the underlying reasons and real-world implications of these challenges, the study now turns to the qualitative perspectives of those navigating the transition from the academic to the professional healthcare environment.

Qualitative Analysis of Healthcare Communication Demands

Thematic analysis of interviews with healthcare employers (n=18) and recent graduates (n=15) revealed three critical themes characterizing workplace communication demands.

Clinical Communication Efficacy

The analysis identified clinical communication as the paramount competency area, encompassing patient interaction, interdisciplinary collaboration, and medical documentation. Employers emphasized that effective patient communication requires not only linguistic accuracy but also cultural sensitivity and empathy. Graduates reported that the transition from academic medical English to clinical communication presented unexpected challenges, particularly in managing emotional patient interactions and delivering difficult news. This theme underscores the complex interplay between language proficiency and clinical rapport building in healthcare settings.

Specialized Genre Mastery

Workplace success depended heavily on mastery of specialized medical genres, including clinical notes, referral letters, and research protocols. Employers noted significant variations in genre competence across medical disciplines, with pharmacy graduates demonstrating strong drug information documentation but weaker patient education materials. Graduates described struggling with the concise, standardized formats required in clinical documentation, contrasting with the more expansive academic writing styles practiced during their education. This theme highlights the genre-specific nature of medical communication and its critical role in healthcare delivery.

Pragmatic Professional Communication

The analysis revealed that pragmatic competence, understanding implicit professional norms and appropriate communication strategies, determined workplace integration success. Employers identified deficiencies in interprofessional communication, particularly in team meetings and collaborative decision-making contexts. Graduates emphasized the challenge of adapting communication styles to different healthcare professionals and institutional hierarchies. This theme illustrates that beyond technical medical language, successful healthcare communication requires sophisticated understanding of professional contexts and relational dynamics.

Accordingly, the thematic analysis of employer and graduate interviews provides a rich, nuanced explanation for the quantitative data, moving from what the challenges are to why they exist and how they manifest in practice. The emergent themes, clinical communication efficacy, specialized genre mastery, and pragmatic professional communication, collectively reveal that the core of the problem extends beyond linguistic accuracy to a deficit in communicative adaptability. The workplace demands a sophisticated, context-dependent form of communication that integrates technical knowledge with interpersonal skills and an understanding of professional norms. These qualitative insights confirm that the deficiencies observed statistically in academic settings translate into tangible impediments to workplace integration, patient safety, and professional efficacy.

Merging quantitative and qualitative datasets revealed systematic patterns in how academic language preparation aligns with workplace demands across medical disciplines.

Table 7: Cross-Dataset Analysis of Medical Communication Competency Alignment

Competency Area	Quantitative Prevalence	Qualitative Emphasis	Alignment Status
Clinical Documentation	High challenge (M=4.54) across clinical disciplines	Critical for patient safety and legal compliance	Partial Alignment
Patient Communication	Highest difficulty in Medicine (M=4.68)	Most valued skill by employers	Significant Gap
Interprofessional Communication	Moderate difficulty (M=3.85)	Essential for collaborative care	Major Divergence
Research Communication	High variation by discipline (F=15.62)	Important for evidence-based practice	Context-Dependent
Medical Terminology	Consistent challenge (M=4.08)	Foundation for all medical communication	Strong Alignment

The integrated analysis demonstrates that while technical medical terminology shows strong alignment between education and practice, significant gaps exist in clinical and interprofessional communication competencies. The highest misalignments occur in areas requiring pragmatic competence and adaptive communication skills, particularly patient interaction and interdisciplinary collaboration. These findings suggest that medical EMI programs effectively teach disciplinary language but underprepare students for the relational and contextual dimensions of healthcare communication.

Accordingly, the final integration of quantitative and qualitative datasets offers a powerful, holistic diagnosis of the misalignment between EMI medical education and healthcare practice in Egypt. The convergence of data confirms a fundamental disconnect while EMI programs effectively build foundational disciplinary knowledge and terminology, they underprepare students for the dynamic, relational, and genre-specific communication demands of the clinical workplace. The most critical gaps lie not in what is taught, but in what is not—specifically, the pragmatic and adaptive competencies required for patient-centered care and interprofessional collaboration. This conclusive synthesis demonstrates that enhancing the effectiveness of medical EMI requires a paradigm shift in language support, moving from a focus on academic literacy towards a curriculum that explicitly fosters the full spectrum of communication skills essential for clinical competence and professional success.

DISCUSSION

This study provides compelling evidence of substantial disciplinary variation in English-language needs across medical EMI programs at Egyptian universities. The convergent mixed-methods approach reveals that, although all medical disciplines face substantial communication challenges, the nature and intensity of these challenges vary systematically across professional specializations and clinical demands. The most striking finding of this research is the pronounced disciplinary variation in language challenges, particularly in clinical documentation and patient communication. The large effect sizes ($\eta^2 = 0.254\text{-}0.292$) for these domains indicate that approximately one-quarter to nearly one-third of the variance in perceived difficulty can be attributed to disciplinary differences. Physical Therapy students reported the greatest challenges with clinical documentation (M=4.81), reflecting the extensive requirements for detailed progress notes and treatment records, whereas Medicine students struggled most with patient communication (M=4.68),

consistent with their central role in patient history-taking and communication of diagnoses. These findings extend the ESP principle of Needs Analysis (Christison & Murray, 2021) by demonstrating that even within the medical field, target situation analyses must be discipline-specific rather than assuming homogeneous needs across healthcare professions. The results suggest that the "one-size-fits-all" approach to English language support in medical education is inadequate and potentially inefficient.

The qualitative findings reveal a critical gap between the technical language skills emphasized in academic settings and the pragmatic communication competencies required in healthcare workplaces. While students across all disciplines demonstrated strong alignment in medical terminology mastery, a traditionally emphasized academic skill, they showed significant deficiencies in interprofessional communication and patient interaction. This divergence echoes the sociocultural perspective that language learning involves socialization into specific discourse communities (Solano-Flores & Trumbull, 2003). The transition from academic medical English to clinical communication represents a shift between discourse communities with distinct norms, genres, and interaction patterns. Employers' emphasis on communication efficacy over linguistic perfection aligns with findings in healthcare communication literature (Narzoles & Palermo, 2021), suggesting that successful medical practice requires pragmatic competence that enables healthcare professionals to build rapports, demonstrate empathy, and collaborate effectively across disciplinary boundaries.

The regression analysis identifies experiential learning factors, particularly clinical exposure hours ($\beta = -.42$) and simulation training participation ($\beta = -.38$), as the strongest predictors of clinical communication competence. These findings support the ESP approach of integrating language learning with disciplinary content and practice (Caciora & Sturza, 2025). The negative coefficients indicate that increased practical engagement mitigates communication challenges, suggesting that language development in medical contexts occurs most effectively through authentic clinical experiences rather than isolated language instruction. Similarly, international journal reading frequency emerges as the strongest predictor of academic writing competence ($\beta = -.45$), highlighting the importance of engagement with disciplinary discourses through literature. These findings challenge the conventional separation between language instruction and clinical training in medical education, advocating instead for integrated approaches that embed communication skill development within clinical learning contexts.

The integrated results necessitate a fundamental rethinking of English language support in medical EMI programs. First, curriculum design must adopt a discipline-specific approach that recognizes the distinct communication needs of different medical specialties. Pharmacy and Public Health programs, for instance, require greater emphasis on research communication and public health messaging, while Medicine and Physical Therapy need focused training on clinical documentation and patient interaction. Second, medical EMI programs must bridge the clinical-pragmatic divide by incorporating authentic clinical scenarios, standardized patient interactions, and interprofessional education activities into language curriculum. This approach aligns with the sociocultural view of learning as participation in community practices (Watkins & Lindahl, 2010), enabling students to develop not only linguistic competence but also the pragmatic skills essential for healthcare communication. Third, the strong predictive relationship between clinical exposure and communication competence suggests the need for earlier and more extensive clinical

immersion in medical education. Language support should be integrated into clinical rotations rather than confined to preclinical years, allowing students to develop communication skills in context and receive timely feedback on their clinical language use.

This study is limited by its focus on Egyptian universities, though the disciplinary patterns identified may have relevance for other contexts. Future research could employ longitudinal designs to track the development of communication competence throughout medical training and into professional practice. Additionally, intervention studies examining the effectiveness of discipline-specific communication training would provide valuable evidence for curriculum development. Research exploring the communication challenges of specialized medical fields beyond those included in this study would further enrich our understanding of medical English needs.

CONCLUSION

This study has systematically investigated the English language needs and communication challenges within Egyptian EMI medical programs, revealing a complex landscape of discipline-specific requirements that demand targeted educational responses. Through its convergent mixed-methods approach, the research has demonstrated that communication challenges in medical education are not uniform but vary significantly across specialties, with clinical documentation, patient communication, and interprofessional collaboration emerging as particularly demanding domains. The findings underscore that effective language support must move beyond generic English instruction to address the distinct communicative practices of each medical discipline.

The implications of these findings are substantial for curriculum design and pedagogical practice in medical EMI contexts. First, the identified disciplinary variations necessitate a specialized approach to ESP curriculum development, where language instruction is precisely aligned with the specific communicative demands of medicine, dentistry, pharmacy, physical therapy, and public health. Second, the strong relationship between clinical exposure and communication competence highlights the critical need for integrating language learning with clinical training through simulation exercises, authentic clinical scenarios, and early patient interaction opportunities. Third, the gap between academic language instruction and workplace communication demands calls for greater emphasis on pragmatic competence development, including interprofessional communication skills and genre mastery specific to healthcare contexts.

For Egyptian higher education institutions specifically, this research provides an evidence-based foundation for transforming English language support in medical programs. By adopting discipline-sensitive curriculum design, enhancing clinical-language integration, and strengthening pragmatic communication training, universities can significantly improve graduates' readiness for healthcare practice. Future research should explore the longitudinal development of medical communication competence and investigate effective interventions for addressing the identified discipline-specific challenges. Ultimately, this refined approach to EMI in medical education will not only enhance educational outcomes but also contribute to improved healthcare delivery through better-prepared medical professionals who can communicate effectively across diverse clinical contexts.

Acknowledgment

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APPENDICES

(are available as online supplemental materials)

1. Student Survey Questionnaire
2. Faculty Survey Questionnaire
3. Semi-Structured Interview Protocol for Healthcare Employers/HR Managers
4. Semi-Structured Interview Protocol for Recent Graduates