

Designing an EMP Teacher Education Program: Modalities and Structure in the Limelight

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Abstract

Despite the ever-growing demand for English for Academic Purposes (EAP) provision within universities around the globe and the impressive growth EAP has experienced throughout the last decades, very little attention has been paid to EAP teacher education and professional development. The present study is part of a research project that examined the existing requirement for a teacher education program for English for Medical Purposes (EMP) within the Iranian higher education system and developed a program, titled Teaching English for Medical Purposes (TEMP), and its accompanying curriculum drawing on a systematic process through a four-round Delphi study using the collective opinion of a panel of 22 EAP and EMP experts. In so doing, it employed a written interview, three questionnaires, and a comprehensive data analysis approach, incorporating a combination of inductive thematic analysis based on Braun and Clarke's (2022) model, descriptive statistics, paired samples T-test, and Kendall's Coefficient of Concordance. The current paper focuses on the modalities and structure of the program developed. At the final round of the study, the panelists came to the consensus that a flexible pre-service Ph.D. program can be the best alternative for EMP teacher education. This program is modular and hybrid in nature and offers benefits such as flexibility, cost-

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effectiveness, access to resources, targeted education, in-depth knowledge, and practical experience. Short-term in-service instruction in the form of seminars or workshops was also recommended for ongoing professional development of the EMP teachers to stay updated with the latest research trends.

Keywords: EAP, EMP teacher education, Delphi study, modalities, structure

1. Introduction

Despite its long history and significant role as part of the university curriculum for all academic programs, the Iranian EAP system still faces a number of major challenges regarding planning, implementation, and evaluation (Atai, 2021). One such challenge concerns itself with the lack of systematic teacher education programs specifically geared to the unique nature of teaching EAP, especially English for Specific Academic Purposes (ESAP), which should satisfy the English language needs of learners in particular university disciplines (Atai & Fatahi-Majd, 2014). EAP courses, as discipline-specific courses, have traditionally been taught by general English teachers, especially those who may have just started their career, or content teachers, mostly with differing conceptualizations of EAP teaching practice and relatively limited knowledge of English.

Although teacher education and professional development have been given increasing attention over recent decades, EAP teacher education has been neglected in many educational contexts. While numerous studies conducted in the Iranian context have been devoted to the methodological principles and practices of English for Specific Purposes (ESP) in general and EAP in particular, there has been little serious concern to develop and administer EAP teacher education programs, whereas the EAP branch of EFL instruction has been steadily growing (Atai, 2021).

Further, the issue of collaborative teaching in EAP courses has been almost overlooked, and according to Atai (2006), there is little cooperation between the language teachers and content teachers, and this has led to great confusion in the administration of EAP programs. To exacerbate the situation, the two parties do not seem to agree on the objectives of the programs, the preferred methodology, and assessment procedures, among other factors. Overall, there appears to be no consistent policy regarding recruiting qualified teachers for EAP courses in Iran, and the current degree programs at universities do not seem to meet EAP teachers' specific requirements.

In the fast-changing world today, teacher education and teacher professional development are indispensable factors if EAP practitioners aspire to meet the increasing demands for high-quality education. Orgoványi-Gajdos (2016)

appropriately describes the EAP teaching career as a profession with multiple developmental stages and further maintains that the professional life cycle of EAP teachers changes due to personal, professional, and contextual factors. Teacher education undoubtedly plays a critical role in improving the quality of EAP practice and enhancing its efficiency in dealing with deficiencies.

Moreover, as one of the subfields of EAP, English for Medical Purposes (EMP), with its multiple subfields, is one of the most rapidly growing fields. In today's world, medical practitioners need to interact with colleagues and researchers from various linguistic backgrounds. They also need to publish research papers in international journals to disseminate knowledge. Further, EMP has some characteristics that set it apart from other EAP fields. Firstly, the language used in this field is very technical and specialized, requiring an understanding of medical terminology and discourse. Secondly, it poses challenges not usually found in other EAP fields, e.g. cultural differences and the high risk of communicating critical information.

Furthermore, EMP has been identified as an area where many Iranian EAP teachers lack sufficient preparation and expertise. Studies have shown that many EMP teachers lack the necessary knowledge and skills to teach EMP effectively (e.g., Soodmand Afshar & Ahmadi, 2020), leading to inadequate preparation of healthcare professionals for their language needs. These challenges are further compounded by broader structural issues within the tertiary landscape; recent scholarship underscores that Iranian EAP and ESP programs struggle with systemic curriculum incoherence, top-down detachment from classroom realities, and a narrow, exam-driven focus on content mastery rather than genuine disciplinary professionalization (Lotfi Gaskaree et al., 2025a).

Beyond these institutional hurdles, EMP teachers face intense cognitive and professional demands that heighten the need for structured preparation (Cao et al., 2022). Cao et al. further emphasize that because of the specialized nature of medical discourse, instructors must continually rebuild their knowledge repertoires and reconstruct their professional identities while often navigating limited institutional support, scarce authoritative materials, and restricted access to online resources and communication platforms. Moreover, the authors highlight that effective instruction

requires deep familiarity with medical culture, values, and workplace practices to adequately prepare learners for authentic professional communication.

These persistent structural gaps and specialized demands highlight the timely need for systematic frameworks to bridge policy intentions and instructional practice (Lotfi Gaskaree et al., 2025a). Developing a specialized EMP teacher education program would enhance the quality of instruction, reduce teacher challenges to manageable in-service proportions, and yield noticeable improvements in competence and efficiency. Consequently, this study aims to contribute to the field of EAP by taking foundational steps toward developing a teacher education program specifically tailored for EMP teachers. By examining the preferences of EAP and EMP experts regarding the modalities and structure of such a program, this research seeks to fill a significant gap in the literature and offer practical recommendations for professional development within the Iranian higher education system. In so doing, it attempts to answer the following question: *How can the EMP teacher education program be structured and delivered to optimize learning outcomes and meet the needs of the candidates?*

2. Literature Review

2.1. EAP Teacher Education in the Spotlight

Earlier EAP research has primarily focused on analyzing the specialized discourse and genre of academic sub-disciplines, as well as the learners' needs (Atai, 2021). However, more recent scholarship has begun to explore the evolving conceptualizations and practices of EAP education across diverse institutional settings. This shift, according to Atai, has highlighted the increased demands placed on EAP practitioners, who are now, according to Campion (2016), expected to take on multiple roles and responsibilities while continually forging new professional identities. The EAP enterprise in Iran has likewise attracted substantial attention, resulting in a considerable body of research delving into various aspects of EAP. In what follows, an overview of the studies focused on EAP or EMP with direct implications for teacher education in the Iranian context is presented.

2.2. Navigating the Landscape: Challenges in EAP Instruction in Iran

A number of studies have focused on the challenges faced by EAP instruction in Iran. Early work by Hayati (2008) referred to limited resources, a lack of specialized materials, inadequate teacher training, and the dominance of general English teaching methods as the main problems. He argued that teachers should receive specialized training in ESP pedagogy, content knowledge, and needs analysis to effectively meet the language requirements of students in various specialized fields. Furthermore, Hayati discussed the necessity of preparing ESP teachers capable of employing more learner-centered approaches and engaging students in authentic tasks.

Echoing these concerns, Soodmand Afshar and Movassagh (2016) identified inadequate teacher training, lack of appropriate teaching materials, an outdated curriculum, large class sizes, limited access to authentic resources, and insufficient integration of technology into EAP instruction as the challenges EAP education is faced with. The authors emphasized the imperative to develop and improve teacher training programs to enhance EAP teachers' pedagogical skills and knowledge of EAP principles.

Similarly, Atai and Nejadghanbar (2017) highlighted difficulties in understanding complex subject-specific terminology, adapting teaching materials to suit students from different disciplines, addressing their diverse language proficiency levels, and managing time constraints as the main issues EAP teachers are struggling with. Based on their findings, the authors argued that subject-related critical incidents play a significant role in shaping the teaching practices of teachers and that by identifying and reflecting on them, teachers can develop strategies to enhance their efficiency.

Expanding on these contextual factors, Tavakoli and Tavakol (2018) focused on the educational, political, and sociocultural factors that contribute to the problematic nature of EAP instruction. They highlighted the tensions between the demands of global academic standards and local cultural and linguistic practices. They claimed that the dominance of traditional teaching and assessment methods impedes students' language development and that there is a need for reforms promoting teacher autonomy, student-centered approaches, and a more balanced integration of national identity and English proficiency. The authors highlighted the need for policymakers

to allocate appropriate resources to support EAP teacher education.

Moreover, believing in the need for EAP teachers to base their practice on research, Bahrami et al. (2019) stated that EAP teachers have varying degrees of familiarity with relevant research and face several challenges in implementing research-informed practices, e.g., limited access to resources and lack of institutional support. Bahrami et al. recommended various strategies such as attending conferences and workshops, collaborating with colleagues, and conducting action research to enhance their knowledge and skills.

Adding to this complexity, Kaivanpanah et al. (2021) showed that Iranian EAP practitioners have a diverse range of educational backgrounds and teaching experiences as well as a strong theoretical knowledge base in areas such as language teaching methodology, linguistics, and academic writing. However, they face challenges such as limited resources, lack of professional development opportunities, and institutional constraints.

More recently, Atai et al. (2022) explored novice EAP teachers' identity construction and the challenges they face. Their study revealed the existence of tensions between the claimed and constructed EAP identities, indicating the challenges novice teachers face in aligning their personal understanding of EAP with the expectations and demands of the profession, and content-related emotional conflicts. The study also revealed that novice teachers consider themselves undervalued professionals. Atai et al. underscored the importance of understanding the role of sociocultural, disciplinary, and contextual factors in shaping EAP teachers' identities, agencies, emotions, and motivations through appropriate teacher education.

Synthesizing these structural concerns, recent empirical investigations into Iranian EAP programs reveal persistent systemic impediments, including misaligned stakeholder cognitions regarding EAP goals, incoherent curricula driven by the exclusion of instructors from design processes, and an overemphasis on passive content transmission rather than active professional socialization (Lotfi Gaskaree et al., 2025a; Lotfi Gaskaree, Heydarnejad, et al., 2025b). Furthermore, traditional, transmission-oriented training leaves both content-area and EFL instructors ill-equipped to foster genuine academic socialization (Lotfi Gaskaree et al., 2025b). Collectively, these

findings reinforce the critical need for inclusive, participatory curriculum models and specialized pre-service teacher preparation to bridge policy intentions and classroom realities (Lotfi Gaskaree et al., 2025a; Lotfi Gaskaree et al., 2025b).

Addressing the digital dimension of EAP instruction, Shahmohammadi and Soodmand Afshar (2026) investigated the integration of technology and artificial intelligence in Iranian higher education. Their findings reveal that while digital tools significantly enhance writing fluency and vocabulary acquisition, systemic obstacles—such as infrastructure limitations, restrictive filtering policies, and a lack of discipline-specific software—hinder effective implementation, particularly in specialized fields like Engineering and Medicine. Consequently, they recommend the application of blended learning models and tailored technological solutions supported by institutional reform.

2.3. Addressing the Need for EAP Teacher Education

To set the stage in a seminal work, Atai (2006) examined the status of the Iranian EAP instruction system, focusing on the development of an EAP teacher education model. The findings of his study indicated the existence of a vague understanding of the principles and practice of EAP methodology and the role of EAP teachers, and extensive methodological inconsistencies in their classroom practice. He also referred to an obvious gap between the dominant teaching method in Iranian EAP courses and the methodological requirements of these courses. Therefore, he invited EAP curriculum planners to rethink the methodology and to view teacher education as an essential phase of curriculum development and renewal.

Further, Atai (2006) highlighted the significance of in-service training for EAP teachers to help them reconsider their roles and broaden their repertoires of language teaching strategies and activities. He proposed five recommendations for the development and implementation of any EAP teacher education program, i.e., redefining the roles of language and content teachers, analyzing the target situation tasks and responsibilities, promoting cooperation between both camps in determining the syllabus and delivering EAP courses, and updating EAP courses.

Based on a critical overview of ESP instruction in Iranian universities, Alibakhshi, et al. (2011) also highlighted the lack of specific training for ESP instruction. They noted that successful ESP teachers should have knowledge of adult learning principles, contribute to the development of all components of the ESP program, and be familiar with the subject matter they are teaching. Alibakhshi et al. also argued that there is a need for innovation in the type of assessment used, with new approaches such as portfolio assessment replacing traditional tests.

Furthering this discussion, Atai and Khazaei (2014) explored EAP teachers' pedagogical content knowledge (PCK) and their perception of their professional identity. Their study revealed that Iranian EAP teachers possess a solid understanding of the content knowledge and a good grasp of the specific language skills and academic genres necessary for their students' success. However, they face challenges in effectively integrating pedagogical strategies and instructional techniques to facilitate students' language development. Atai and Khazaei emphasized the importance of ongoing professional development opportunities to enhance EAP teachers' pedagogical skills and strengthen their professional identity.

Expanding on this theme, Atai et al. (2017) investigated EAP teachers' teaching practices and beliefs. The study revealed that while the majority of EAP teachers have a good understanding of the subject matter, their PCK is relatively weak. Additionally, Atai et al. claimed that there was a discrepancy between what the teachers claimed to do in their classrooms and what the students perceived as their actual teaching practices.

2.4. Addressing the Need for EMP Teacher Education

Ahmadi and Sajjadi (2009) attempted to answer the controversial question of who should teach EMP. They explored the qualifications and characteristics of an ideal EMP teacher, arguing that they should have a solid foundation in both English language teaching methodologies and medical knowledge. They also discussed the challenges of teaching EMP, including the complexity of medical language, the dynamic nature of healthcare settings, and the diverse cultural backgrounds of students. Ahmadi and Sajjadi highlighted the significance of continuous professional

development for EMP teachers to keep up with advancements in both the medical and language fields.

Atai and Taherkhani (2018) explored Iranian EMP teacher's beliefs and practices focusing on the differences between language and content teachers. The results revealed inconsistencies between the two groups. The study emphasized the importance of collaboration between the camps to improve their teaching methods. Atai and Taherkhani also highlighted the urgent need for more comprehensive and systematic EMP teacher education programs.

Adding to this complexity, Soodmand Afshar and Ahmadi (2020) examined the alignment between EMP students' needs and teachers' preferences, focusing on the content, materials, and teaching methods. They revealed discrepancies between students' needs and teachers' preferences. Whilst Students expressed a preference for communicative and task-based approaches and practical language skills, teachers tended to prioritize grammatical accuracy and traditional methods. Soodmand Afshar and Ahmadi highlighted the importance of considering student needs and preferences in EMP teacher preparation.

In a related study, Khalili and Tahririan (2020) explored EMP students' needs and preferences and the effectiveness of EMP courses in meeting them. They emphasized the need for these courses to be specifically tailored to medical students' needs, such as medical terminology and academic writing skills, to be taken into consideration in EMP teacher preparation. Additionally, Khalili and Tahririan emphasized the need for continuous evaluation and improvement in teaching practices.

On a different note, Hessamy and Mohebi (2014) explored the perceptions of medical students and EMP teachers regarding their materials. They revealed that the two groups had mixed perceptions of their materials. The authors emphasized the importance of incorporating student feedback in the development and selection of materials to ensure their relevance and effectiveness. They also underscored the need for professional development opportunities for teachers to enhance their pedagogical skills and knowledge in teaching EMP.

Further highlighting these systemic shortcomings, a recent content analysis of Iranian EMP literature by Karami et al. (2024) revealed that local research is heavily

skewed toward English for Medical Academic Purposes (EMAP) while entirely omitting English for Medical Occupational Purposes (EMOP). Furthermore, Karami et al. observed that foundational areas like needs analysis, particularly concerning instructor needs, administrative expectations, and teacher variables, have been neglected.

All the studies reviewed here highlight the detrimental impact of inadequate EAP teacher education on EAP instruction. This deficiency has led to inconsistencies in administering EAP courses, resulting in dissatisfaction and confusion among the stakeholders. This structural deficit in both empirical research and teacher preparation highlights the necessity for a comprehensive and systematic framework to bridge these pedagogical and institutional gaps.

3. Methodology

3.1. Context of the Study

There are currently over 60 universities recognized as medical universities under the Ministry of Health and Medical Education (MoHME) in Iran, with more than 222,000 students enrolled in various majors (Pourhaji et al., 2023). In these universities, all disciplines include at least one 3-credit EMP course in addition to a general English course. However, there is an ongoing debate about who is more suitable to teach these EMP courses - ELT department teachers with a background in TEFL or subject specialists from discipline-specific departments with varying levels of English proficiency. Pourhaji et al. have shown that out of a total of 1,263 EMP course credits, 33.3% are taught by ELT department faculty members, 39.5% are taught by subject specialists, and the remaining 27.15% are taught by non-faculty guest language instructors.

Further illustrating this instructor profile imbalance, Karami et al. (2024) note that across 31 Iranian medical sciences universities, out of 485 total English language instructors, only 12.57% (61 faculty members) possess a specialized ELT background. In contrast, the vast majority (87.43%) comprise non-ELT specialists, including medical professionals teaching language courses and guest lecturers. This

widespread reliance on non-ELT instructors, who often lack formal training in language teaching methodology and research principles, highlights the critical need for a systematic, specialized teacher education framework like TEMP.

3.2. Panelists

According to the guidelines for the Delphi method as specified by Hasson et al. (2000), the participants are individuals who have intimate knowledge of the topic under investigation, also called a panel of experts. Due to the critical role of the panelists in a Delphi study, much care was exercised in selecting a panel of experts who not only had sufficient knowledge of the topic, but also had been concerned about the existing problems of the field.

The number and representativeness of the participants undoubtedly affect the potential for idea generation, which in turn influences data analysis (Hasson et al., 2000). According to Gunaydin (2006), the number of experts cannot be considered from a statistical standpoint, since the Delphi technique does not aim for a random sample. The minimum number of participants recommended by Hasson et al. (2000) for a Delphi Study is 15 experts. Skulmoski et al. (2007) added that with a homogeneous group, a group of 10-15 experts is sufficient.

The expert panel of the current study included 22 experts who were rigorously selected from the population of EAP/EMP experts using Purposive non-probability and snow-ball sampling, recommended by Daniel (2012) for studies collecting expert judgement. The initial selection was conducted based on a consultation with the heads of the departments of English language teaching (ELT) and medical sciences. Following this, the experts introduced the next panelists to be recruited. Initial semi-structured interviews were conducted with the potential participating experts to ascertain they met the following criteria:

- Holding a Ph.D. degree
- Having the teaching experience of over ten years
- Having conducted empirical research on EAP/ EMP

- Possessing experience of EMP instruction
- Having particular interest in EAP/EMP teacher education
- Self-identification as an expert
- Willingness to participate in the study

Because close cooperation between ELT and content departments, according to Atai (2006), is a crucial prerequisite phase of curriculum planning for any EAP teacher education program and in order to take into account the differing perceptions and cognitions of these two parties in different contexts, the experts were selected from EAP/ELT and medical sciences departments of different medical and nonmedical universities. The profile summary of the panelists is outlined in Table 1.

Table 1

Panelists' Profile Summary

Attribute	Breakdown
Gender	16 male, 6 female
Academic rank	12 Assistant Prof., 4 Associate Prof., 6 Professor
Discipline	17 TEFL/ESP, 5 health sciences (Nutrition, Physiotherapy, Orthotics, Speech Therapy, Medicine)
Affiliation	10 general universities, 12 medical sciences universities
Teaching experience	Range: 11–30 years (median $\approx$ 28)

3.3. Instruments

In the different rounds of the Delphi study, a set of researcher-developed instruments was employed. In the first round, the experts were requested to respond to a written semi-structured interview focusing on the modalities and structure of the program (see Appendix A). This written interview encouraged participants to express their thoughts freely. This approach, according to Boucaud and Sossah (2022), allows for a greater depth of insight and can uncover unexpected or novel ideas that might not have emerged otherwise, as it encourages participants to think critically and reflect on their responses, potentially leading to more thoughtful and well-rounded contributions. Moreover, the experts were provided with the option to audio-record their responses in Persian to ensure accuracy and capture any nuanced insights. This approach aimed to enhance the richness of the data collected and facilitate a comprehensive analysis of the expert opinions.

Following the analysis of responses from the initial round, a five-point Likert-scale questionnaire was developed to further explore the expert opinions (see Appendix B). The items included were carefully selected based on the themes identified in the first round, ensuring that the questionnaire effectively captured the diverse perspectives of the experts. The panelists were requested to assess the significance of each item, focusing on the modalities, modularity, certification, prerequisite field exposure, and duration of the program.

In Round Three, a modified version of the same questionnaire was sent to the panelists, including a report of the results of the previous round (see Appendix C). Panelists were informed that the items which did not meet the cut-off mean were going to be excluded, and they were asked to review the results, reconsider their importance rating of each item, and add their comments in the case of any changes made. Moreover, certain items in the questionnaire which were identified as requiring clarification based on the feedback from the experts in the previous round were revised to ensure a clear understanding of the concepts being addressed.

The questionnaire used in Round Four was designed using the items from Round Three which showed a trend towards consensus. This questionnaire employed the force-ranking approach whereby the panelists were asked to prioritize the items

retained from the previous round, giving the experts one last opportunity to reconsider any necessary modifications (see Appendix D).

In each round, the panelists were allowed 20 days to respond, and a total of 22 completed responses were received. Expert validation was a crucial step in the development of the interview and questionnaires. Consultation with four experts in the fields of EAP and EMP helped to refine and improve the instruments by ensuring that the questions were clear, relevant, and comprehensive in capturing the essential aspects of the research topic. This helped identify areas for improvement before distributing the instruments to the panel. Additionally, establishing a feedback loop with the expert panelists throughout the study process allowed for ongoing refinement of the questionnaires to ensure alignment with the study's objectives.

3.4. Design of the Study

The study adopted an exploratory sequential research design involving four rounds of a Delphi study, each round building upon the previous one, allowing for the progressive refinement and convergence of ideas and opinions, with the last round leading to the creation of the expert panel consensus statements that were employed to develop the program.

3.5. Data Collection and Analysis

During the initial round, the exploration round, the recorded answers to the semi-structured interview were transcribed and translated as soon as they were shared with the researcher. Following Stemler (2001) and Magnuson (2012)'s recommendations for Delphi studies, the responses were then analyzed through inductive thematic analysis and were sorted and categorized into clear-cut items, which were then grouped into similar areas, searching for and using common threads.

Braun and Clarke's (2022) six-step approach to thematic analysis, presented in Table 2, was utilized to achieve the research objectives. Performing thematic

analysis effectively, according to the authors, typically involves a recursive and reflexive procedure of progressing forward and backward through various stages, including becoming acquainted with the data, coding, developing themes, revising, naming, and documenting. This kind of data analysis is, according to them, an active process, involving the intersection of the researcher's theoretical assumptions, disciplinary knowledge, research skills, and the data itself.

Table 2

Braun and Clarke's (2022) Approach to Thematic Analysis

Phase	Examples of Procedure for Each Step
1. Familiarization	Transcribing data: reading and re-reading; noting down initial codes
2. Generating Initial Codes	Coding interesting features in the data in a systematic fashion across the data set, collating data relevant to each code
3. Searching for Themes	Collating codes into potential themes, gathering all data relevant to each theme
4. Involved Reviewing Themes	Checking if the themes work in relation to the coded extracts and the entire data-set; generate a thematic map
5. Defining and Naming Themes	Ongoing analysis to refine the specifics for each theme; generation of clear names for each theme
6. Producing the Report	Final opportunity for analysis selecting appropriate extracts; discussion of analysis; relate back to the research question or literature; produce report

In this process, a combination of *in vivo* (i.e., using participants' own words where English terms were used by the panelists) and *process* (i.e., relying on researcher-made codes in the form of gerunds and noun phrases) coding strategies were used to create first-level codes. It should be pointed out that *in vivo* coding was used to stay truer to the participants' own accounts, and *process* coding was used as an additional tactic to deepen the analysis (Saldaña, 2013) and also in cases where translation was conducted.

In order to minimize the potential for individual bias and therefore enhance the reliability and validity of the coding process, the consensual coding approach introduced by Kuckartz (2013) was applied. In this method of qualitative data analysis, two or more researchers work together to analyze the same set of data

independently and then compare their coding, discuss the disagreements, and reach a consensus on the final set of codes. In this regard, following the content analysis and data coding stages, a second coder who had a Ph.D. in ELT with a focus on qualitative research was also invited to comment on the coding procedure and the identified themes. The disagreements were resolved through discussion, and necessary modifications were made to boost the reliability of the data analysis procedure.

The second round started with organizing the codes into five distinct subject categories, which allowed for a more comprehensive analysis of the data. By grouping statements by subject matter, the researcher identified patterns and trends across categories, including the program's structure and modalities. The next step was developing a Likert-scale questionnaire using the emerging statements. However, for the sake of brevity, the statements were developed into questions followed by items in each subcategory.

The survey was conducted using a five-point Likert scale, where the participants were required to rate each item listed under the questions representing the main categories of the coded data as *very important*, *important*, *not decided*, *slightly important*, or *not important*. The panelists were also requested to share their feedback on the questionnaire to ensure that no items had been overlooked during the first round. The data collected were analyzed using measures of central tendency, i.e. means and standard deviations, as recommended by Hasson et al. (2000) and Hsu and Sandford (2007) as the most preferable statistical measures for Delphi studies, using the Statistical Package for the Social Sciences (SPSS) 26.

In Round Three, the results of the previous round were reported to the panelists and it was clarified to them which items were going to be excluded. They were asked to review the results and reconsider their importance rating of each item and add their comments in the case of any changes. The data collected were analyzed using measures of central tendency and the items not meeting the cut-off mean were dropped. To analyze the data further, comparisons of the means for each area between Rounds Two and Three were conducted using a paired-samples t-test to identify any significant differences in responses between the two rounds.

Afterwards, the items that showed a trend towards consensus were included in a rank-ordering questionnaire used in Round Four, where the experts were requested to review and reflect upon the program developed and to prioritize the items by assigning them a ranking number (1 indicating the highest priority, 2 representing the second highest priority, and so on). Data from Round Four were analyzed using measures of central tendency, specifically means and standard deviations to determine the frequency of the rankings received by each of the items listed in the survey form. Ultimately, an analysis employing Kendall's Coefficient of Concordance, also referred to as Kendall's W, recommended by Field (2005) as a measure of the level of agreement among multiple experts was performed.

4. Results

4.1. Round One Results

The experts' perspectives on the modalities and structure of the program collected using the open-ended questionnaire are reported in Table 3 below.

Table 3

Modalities and Structure of the Program

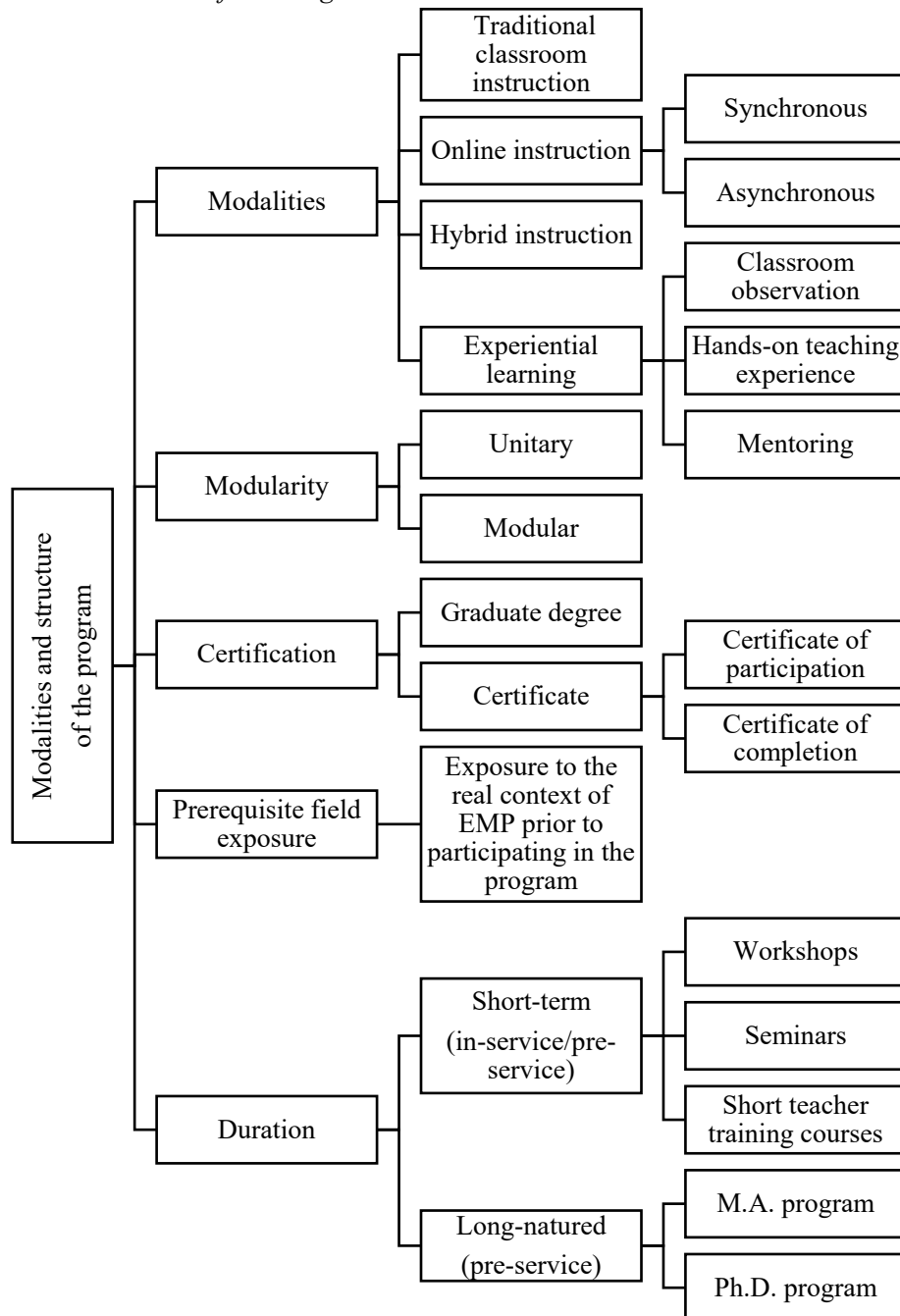
Themes	Frequency (N = 22)	Sample Participant Responses
Hybrid program (Combination of resident and distance education)	18	EX 4: I think a combination of face-to-face methods with computer-mediated activities is the best method of delivery of such a program considering the situation we are in [referring to the pandemic]. Budget issues may also require us to offer such courses through both the physical classes held at universities and distance education which may be conducted through individual faculties or through a centralized administrative unit. At least the very first cohort of candidate entering the program can benefit from the hybrid modality given the situation we are currently dealing with.
Flexible modular program	16	EX 9: The prospective teachers who are receiving training in the medical fields are already very busy with their specialized courses. So, there should definitely be some level of flexibility. Further, since the requirements of the prospective teachers taking part in the course vary, whether they have an ELT or medical academic background, I believe a modular program can work the best. This ensures the program matches professional

Themes	Frequency (N = 22)	Sample Participant Responses
Experiential learning (e.g., observations, mentoring, and hands-on training)	14	work commitment of the would-be doctors and their differing needs. EX 22: It goes without saying that future EMP teachers can greatly benefit from experiential learning, including observations and mentoring, since they allow them to apply theoretical knowledge gained in the classroom to real-life teaching situations. Through observations, they can witness effective teaching strategies in action and understand how to adapt them to their own teaching context in the future. Also, this provides them with opportunities to develop and refine their pedagogical skills. They can observe experienced teachers critically, receive feedback, and engage in reflective practice, which enhances their ability to plan and deliver effective EAP lessons. Teaching in real EMP classes and receiving constructive feedback can also build their confidence which is critical for their future career.
A graduate program in EMP (Pre-service)	14	EX 4: Considering the fact that EAP is a complex teaching field that requires a deep understanding of its theory and practical applications, it could be argued that an in-depth study, through an M.A. or Ph.D. program, that goes beyond the basics is highly required, especially for those entering the program with a medical education background, rather than a degree in ELT. A Ph.D. program may be preferred since some extra filtering can be applied in the acceptance of the candidates to ensure they have the array of qualifications I referred to before. However, such a program in EMP may not be practical for some other fields of EAP and, in my humble opinion, not all EAP subfields require their own specific Ph.D. programs.
Short-term instruction (e.g., pre-service or in-service seminars or workshops)	10	EX 3: I believe that given limitations in budget, only short-time workshops are enough, at least for the short run. In today's world, the focus is no longer on academic degrees and a certificate of completion or even participation in a short-term workshop would suffice. In my idea, 1-2 weeks of on-campus instruction would suffice to ensure the EAP teachers actively involved at universities have a clear understanding of EAP in general and EMP in particular and its best practices, rather than just translating texts in their classes. Such training can also help them to stay up-to-date with the latest trends in EMP and better equip them to deal with the challenges they may face in their careers. They can also benefit from the experiences shared by other instructors.
Traditional classroom instruction	9	EX9: Traditional classroom instruction is enough and necessary for such a program. The interaction with their peers occurring in such a context and learn from their perspectives and past experiences.

Themes	Frequency (N = 22)	Sample Participant Responses
On-line instruction (Synchronous and asynchronous)	6	EX 21: I believe such a program can be offered online; especially given the opportunities the pandemic provided us with. I assume synchronous learning in which instructors and students meet online and interact in real-time instruction, for example on Adobe Connect, can be combined with asynchronous learning in which students have the chance to access materials at their own pace and interact with each other over longer periods.
Prerequisite field exposure	3	EX 19: Since EMP is a unique teaching sub-field of EAP that requires a deep understanding of the context in which it is implemented, I strongly believe that EMP teachers need to experience some sort of teaching to medical students before their placement into the programs to ensure some level of understanding of the specific context. Without exposure to the real context of EMP, prospective teachers may struggle to understand the nuances of the field. Of course, those who have already acquired such experience are obviously not required to participate in such preparational courses.
Independent study (self-study)	1	EX 12: An EMP teacher education program may offer independent study as part of EMP teacher preparation because of the flexibility, self-directed learning, and a better opportunity for specialized knowledge acquisition and reflective practice. This, however, makes sense if the candidates already have prior EMP related education and teaching experience and should be project based to ensure the outcomes.

The obtained data on the modalities and structure of the program were categorized into five categories: the modalities, the modularity, the certification pathways, prerequisite field exposure, and issues related to the duration of the program, as presented in Figure 1.

Figure 1
Modalities and Structure of the Program



4.2. Round Two Results

The results of the quantitative analysis of the data from the responses to Round Two questionnaire are presented in Table 4.

Table 4
Results of Round Two Questionnaire

Item	Mean	SD	# of ratings	% of ratings
Hybrid program	4.04	1.25	17	77.3
Flexible modular program	4.00	1.27	16	72.8
A graduate program in EMP	3.95	1.43	16	72.8
Short-term instruction	3.36	1.39	14	63.7
Experiential learning	3.36	1.59	13	59.1
Traditional classroom instruction	2.86	1.58	9	40.9
Independent study	2.90	1.68	8	36.4
Prerequisite field exposure	2.90	1.63	8	36.4
Online instruction	2.72	1.48	7	31.9

As can be seen, over 70 percent of the respondents rated having a “hybrid program”, structured as “a flexible modular program”, and the requirement for “a graduate program in EMP” as being either very important or important. Sixty percent of the respondents also emphasized the importance of “short-term instruction” and “experiential learning” as components of the program. The four items at the bottom of the table did not meet the cut-off mean and were considered as potential candidates for removal if the ratings remained unchanged in Round Three.

4.3. Round Three Results

The results of the quantitative analysis of the data from the responses to the Round Three questionnaire are listed in Table 5. As can be seen, the quantitative analysis of the Round 3 responses re-emphasized the significance that respondents placed on flexibility in the structure of the program, with over 60 percent favoring a hybrid modular graduate program together with “short-term instruction” and “experiential learning”. None of the items with a mean score below the cut-off mean was saved by the panelists, and therefore the 4 items at the bottom of the table, namely “prerequisite

field exposure”, “traditional classroom instruction”, “online instruction”, and “independent study” were dropped at this stage.

Table 5*Results of Round Three Questionnaire*

Item	Mean	SD	# of ratings	% of ratings
Hybrid program	4.13	1.39	18	81.9
Flexible modular program	3.81	1.62	17	77.3
A graduate program in EMP	4.00	1.27	16	72.8
Short-term instruction	3.81	1.40	15	68.2
Experiential learning	3.63	1.43	14	63.7
Prerequisite field exposure	3.27	1.48	10	45.5
Traditional classroom instruction	2.86	1.58	9	40.9
Online instruction	2.90	1.57	8	36.4
Independent study	2.18	1.40	4	18.2

To further analyze the data, SPSS was employed to perform a paired samples t-test on the mean values of Rounds Two and Three, the results of which are reported in Table 6. As can be seen, there was no statistically significant difference between the two rounds regarding the modalities and structure of the program. Therefore, it can be concluded that the responses to the third question did not change significantly between Rounds Two and Three.

Table 6*Paired Samples T-test Results*

Paired Samples Test								
Paired Differences								
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2- tailed)
				Lower	Upper			
Round2 Round3	-.05	.35	.11	-.32	.21	-.47	8	.647

4.4. Round Four Results

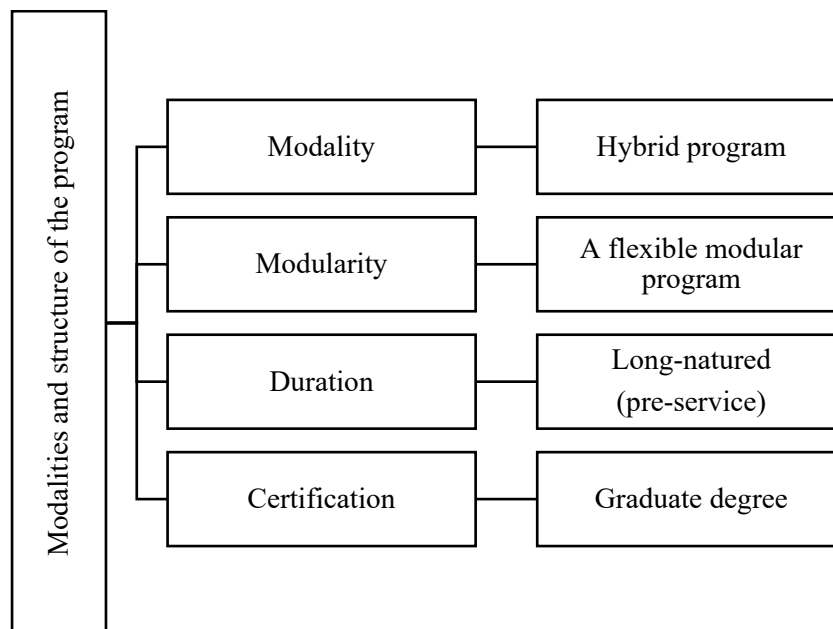
Table 7 below presents the quantitative analysis results from the responses in Round Four.

Table 7
Responses to Question Three in Round Four

Items	N	Mean	SD	Min.	Max.
1. Hybrid program	22	1.77	1.02	1.00	4.00
2. Flexible modular program	22	2.13	.71	1.00	3.00
3. A graduate program in EMP	22	2.50	.80	1.00	3.00
4. Short-term instruction	22	3.77	1.19	1.00	5.00
5. Experiential learning	22	4.81	.39	4.00	5.00

Note: Items are ranked in priority order, with a ranking of 1 indicating the highest priority.

As can be seen, the respondents ranked “hybrid program”, “flexible modular program”, and “a graduate program in EMP” as their top three priorities for the structure of the program. Additionally, “short-term instruction” was also considered a high priority. However, “experiential learning” was ranked as the lowest priority. It is important to note that while the panelists highly valued experiential learning as a core component during the earlier rounds, the forced-ranking procedure required them to weigh structural macro-modalities against practical implementation elements, resulting in a lower relative priority placement for experiential learning despite its recognized foundational value. The consensus regarding the modalities and structure of the program could be categorized into the main components shown in Figure 2.

Figure 2*Modalities and Structure of the Program*

As the next step, Kendall's Coefficient of Concordance analysis was conducted to assess the level of consensus among the panelists in the final round. The results of Kendall's Coefficient of Concordance are presented in Table 8, providing valuable insights into the level of agreement among the panelists.

Table 8*Kendall's Coefficient of Concordance Results*

Modalities and structure of the program	
N	22
Kendall's W ^a	.62
df	4
Asymp. Sig.	.000

a. Kendall's Coefficient of Concordance

The results of the Kendall's Coefficient of Concordance analysis revealed a statistically significant level of agreement among the panelists regarding the modalities and structure of the program based on Landis and Koch's (1977) scale of the agreement levels ($W = .62, p < .001$).

5. Discussion

Delving into the preferred modalities and structure of the program, the Delphi panelists agreed on a hybrid program combining traditional classes and online education as their top priorities. Such a program allows for flexibility in scheduling and location, while providing opportunities for interaction and collaboration. As they decided, the online component can, as they decided, include asynchronous activities— such as readings, videos, and discussion forums— as well as synchronous ones, including live webinars and virtual meetings. This setup allows candidates to engage with course materials at their own pace while interacting with their peers and professors. Additionally, it would enable non-traditional professional students to pursue their degrees while holding down their positions. Further, since a significant portion of the curriculum is based on the expertise of professional practitioners working in the fields of EMP, faculty would have more time for developing a vibrant program of guest speakers.

Furthermore, as decided by the panelists, a modular program would offer the best opportunity to meet the differing needs of individuals entering the program with diverse educational backgrounds. A modular program, offering prerequisite courses to candidates coming from the two camps, enables departments to select modules that align with the candidates' needs, prospective teaching contexts, or areas requiring improvement to ensure more targeted education, equipping them with in-depth knowledge and practical skills that can be applied to their future teaching practice. Feak and Reinhart (2002) support a modular program offering a range of options to meet the needs of different candidates as the optimal approach to EAP teacher education since such programs can benefit both novice and experienced teachers.

Regarding the duration of the program, the results demonstrated that although both pre-service and in-service program structures were offered, a long-term Ph.D. level program was ranked higher. This also aligns with the literature, where it is frequently

argued that, given the scope of EAP, long-term dedicated programs can better address the particularities of EAP education globally (Ding & Campion, 2016) and in Iran (Bahrami et al., 2019). McDonough (1984) declared that for an ESP teacher preparation program to be effective, it should have a sufficient duration to enable trainees to develop a variety of classroom skills and gain a comprehensive understanding of the process of language teaching.

Overall, the panelists agreed that a pre-service Ph.D. program in EMP would be the best alternative, as they believed that merely a comprehensive Ph.D. program featuring advanced coursework and research is necessary to equip the candidates with essential academic linguistic skills, a comprehensive pedagogical knowledge base, and a solid knowledge of medical terminology, thereby enabling them to design and deliver EMP lessons most effectively. Based on her examination of various pathways to enter the field of EAP, Alexander (2007) concluded that a specialized postgraduate degree equips aspiring teachers with the essential theoretical knowledge and practical preparation required to excel in their teaching practice.

The high ratings for both long-term and short-term programs can be explained by considering that the panelists attempted to cater to two distinct groups of candidates, i.e., novice teachers who require a comprehensive teacher education program and those who are already involved in EMP instruction and need a short-term training course to address gaps and update their skills.

Research on EAP teacher education has also emphasized the importance of ongoing professional development and support for EAP teachers after completing the program (e.g., Alexander, 2007; Morgan, 2009). This can include access to resources such as online communities, conferences, workshops, and mentoring programs. Short in-service instruction in the form of seminars or workshops was recommended by the panelists for the ongoing professional development of the individuals already involved in EMP instruction at universities. This can ensure that EMP teachers from various camps and with various backgrounds have the opportunity to share their experiences, challenges, and success stories for better practice. Furthermore, these short-term orientation programs can expose current EMP teachers to innovative approaches and best practices before a comprehensive Ph.D. program is officially introduced and implemented.

Moreover, the panelists emphasized the importance of incorporating practical experience and hands-on learning opportunities within the program to bridge the gap between theory and practice, since participating in real-life teaching fosters a deeper understanding of the subject matter, providing prospective teachers with practical skills and contextual awareness. Although experiential learning ranked lower in the final round's forced-choice priority hierarchy (Table 7), this ordinal ranking reflects its relative position compared to macro-structural components (such as hybrid design and modularity) rather than a diminished perception of its worth. Across earlier rounds, experts consistently affirmed its critical role; as Loughran (2006) emphasizes, programs should place a strong emphasis on giving prospective teachers the chance to participate in real-world teaching situations so they can gain a thorough understanding of the complexities of teaching and learning. According to him, this enables teacher education programs to move beyond theoretical knowledge and integrate real-world experiences that allow aspiring educators to put what they have learned into action, enabling them to make more informed decisions and adapt their teaching strategies to meet the students' varied needs.

Additionally, Loughran (2006) claims that this experiential learning, including observations, collaborative projects, case studies, and problem-based learning where candidates analyze their strengths and weaknesses, enables teachers to reflect on their experiences and critically evaluate their profession. He also emphasizes the value of reflection in experiential learning, as it allows teachers to critically analyze their experiences, identify areas for improvement, and refine their teaching practices. In a similar vein, Basturkmen (2014), Wilson et al. (2001), and Zeichner and Liston (2013) emphasize the importance of reflection in teacher education, as it allows teachers to critically examine their experiences, challenge their assumptions, and continuously improve their practices and professional growth. Further, Waters (1988) highlights the role of feedback and evaluation in the learning process. He believes that trainees should receive regular feedback on their progress and performance, helping them identify areas for improvement.

These experiences lead to growth and skill development, allowing teachers to gain the necessary expertise and confidence to thrive in their teaching careers. As noted by Hyland (2006), this increased confidence reduces the probability of EAP teachers being

downgraded to a subservient service role, which can impede their success. Exposing student teachers to a wide range of classroom scenarios empowers aspiring teachers and equips them with the resilience needed to thrive in their careers.

Recent empirical work in other EAP/EMP contexts reinforces these findings. Cao et al. (2022) demonstrate that EMP teachers face persistent cognitive and professional challenges that cannot be resolved through short-term or fragmented training. Their study shows that EMP teachers must continually rebuild their knowledge repertoire and reconstruct their professional identities due to the highly specialized nature of medical discourse. These insights highlight that EMP teacher education must be systematic, sustained, and supported by robust institutional structures, further validating the panelists' recommendation for a comprehensive and modular graduate program.

6. Conclusion

The present study set out to explore the modalities and structure of an EMP teacher education program within the Iranian higher education system. Through meticulous rounds of a Delphi study, a collective agreement was reached that a hybrid modular Ph.D. program incorporating both theoretical and experiential learning is required to prepare the next-generation teachers. In fact, the study made the case that novices who are interested in a career in EMP teaching may need a Ph.D. degree in TEMP, and the individuals currently involved in EMP instruction can participate in seminars and workshops to update their knowledge and familiarize themselves with best practices in the field.

This research is expected to assist higher education institutions in determining the most effective modes of instruction for EMP teacher education, ultimately addressing the challenges currently faced in the field. By developing a structured program like TEMP, educators can ensure that EMP teachers are equipped with the necessary knowledge and skills to effectively teach in their specific context. This highlights the requirement for ongoing research and development in teacher education to meet the evolving demands of the field. By offering a combination of pre-service graduate programs and short-term in-service instruction, universities can provide EMP teachers with opportunities for continuous professional development and growth.

However, it is important to consider the limitations of the study. Although the Delphi method enabled the researcher to collect commentary from a diverse group of participants, it did not lead to the collection of the same sort of interactions as a live discussion in a physical meeting from which a stronger consensus might possibly emerge. Additionally, while efforts were made to ensure diverse perspectives were included, there may still be biases present in the collective opinions gathered.

Future studies can evaluate the practicality of the modalities and structure recommended in the present study and explore additional modalities for ongoing professional development for EMP teachers beyond seminars and workshops. By continuing to investigate and refine EAP teacher education programs, we can work toward addressing the current challenges faced by EAP teachers and ultimately improve EAP provision within Iranian universities.

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Appendices

Appendix A: Round One Written Interview

It should be noted that only the section of the interview related to the focus of the paper, i.e., the modalities and structure of the TEMP Model, is presented here.

پنلیست گرامی،

با سلام و احترام

از مشارکت شما در این تحقیق، که بخشی از پایان نامه دکتری اینجانب با هدف توسعه و اجرای یک برنامه تربیت مدرس انگلیسی برای اهداف دانشگاهی (EAP) مختص دانشگاه های علوم پزشکی است، سپاسگزارم. بدین وسیله در دور اول با هدف جمع آوری و بررسی نقطه نظرات متخصصین در رابطه با چنین دوره ای، از جنابعالی تقاضا می شود با اختصاص بخشی از وقت گرانبهای خود و پاسخ به پرسش زیر، در انجام این پژوهش همکاری فرمایید. لازم به ذکر است اطلاعات گردآوری شده صرفاً برای مقاصد پژوهشی استفاده و کاملاً محرمانه تلقی خواهد شد.

- به نظر شما یک مدل عملیاتی برای تربیت مدرس زبان انگلیسی برای اهداف پزشکی چه ویژگی هایی باید داشته باشد تا کیفیت و اثربخشی آن تضمین شود (از نظر طول دوره، شکل برگزاری دوره، مازول های آموزشی، ابزار آموزشی، ارزیابی و غیره)؟
از همکاری شما بی نهایت سپاسگزارم.

Appendix B: Round Two Questionnaire

It should be noted that only the section of the questionnaire related to the focus of the paper, i.e., the modalities and structure of the TEMP Model, is presented here.

Dear panelists,

Please take a few moments to provide your comments on whether any changes need to be made before the next round of the study. Additionally, we welcome your suggestions for any missing items that should be included in future iterations of the questionnaire. Your comments and recommendations will help us refine the research process, ensuring its relevance and applicability.

Thank you for taking the time to assist us in this project.

Please indicate the level of importance of each item by selecting one option that best represents your opinion.

Which of the following items would be most desirable for the teacher education program for EMP regarding the modalities, modularity, duration, and certification?					
Items	Not Important	Slightly Important	Not Decided	Important	Very Important
Traditional classroom instruction	☐	☐	☐	☐	☐
Online instruction (Synchronous & asynchronous)	☐	☐	☐	☐	☐
Hybrid program (Combination of resident and distance education)	☐	☐	☐	☐	☐
Flexible modular program	☐	☐	☐	☐	☐

Experiential learning	☐	☐	☐	☐	☐
Short-term instruction/seminars/ workshops (in-service/pre-service)	☐	☐	☐	☐	☐
A graduate program in EMP (Pre-service)	☐	☐	☐	☐	☐
Independent study	☐	☐	☐	☐	☐
Prerequisite field exposure	☐	☐	☐	☐	☐

Thank you for your time and contribution to this study.

Appendix C: Round Three Questionnaire

It should be noted that only the section of the questionnaire related to the focus of the paper, i.e., the modalities and structure of the TEMP Model, is presented here.

Round Three Questionnaire

Dear panelists,

Please read each question below and, considering the results, indicate the level of importance of each item by selecting one option that best represents your opinion. In case you make any changes to your previous rankings, please inform the researcher about the motivation behind the modification.

Please take a few moments to provide your comments on whether any changes need to be made before the next round of the study. Additionally, we welcome your suggestions for any missing items that should be included in future iterations of the questionnaire. Your comments and recommendations will help us refine the research process, ensuring its relevance and applicability.

Please indicate the level of importance of each item by selecting one option that best represents your opinion.

- Which of the following items would be most desirable for the teacher education program for EMP regarding the modalities, modularity, duration, and certification?						
Items	Percentage	Not Important	Slightly Important	Not Decided	Important	Very Important
Hybrid program (Combination of resident and distance education)	77.3	☐	☐	☐	☐	☐
Flexible modular program (to match professional work commitment of the would-be doctors and the differing needs of the participants)	72.8	☐	☐	☐	☐	☐
A graduate program in EMP (Pre-service)	72.8	☐	☐	☐	☐	☐
Short-term instruction/ seminars/ workshops (in-service/pre-service)	63.7	☐	☐	☐	☐	☐
Experiential learning (e.g., observations & hands-on training)	59.1	☐	☐	☐	☐	☐
Traditional classroom instruction	40.1	☐	☐	☐	☐	☐
Independent study	36.4	☐	☐	☐	☐	☐
Prerequisite field exposure (Exposure to the real context of EMP prior to participating in the program)	36.4	☐	☐	☐	☐	☐
Online instruction (Synchronous & asynchronous)	31.9	☐	☐	☐	☐	☐

Thank you for your time and contribution.

Appendix D: Round Four Questionnaire

It should be noted that only the section of the questionnaire related to the focus of the paper, i.e. the modalities and structure of the TEMP Model, is presented here.

Round Four Questionnaire

Dear panelists,

Thank you for your continued support and valuable contributions in the development of the EMP teacher education program. Please provide us with your expert views by filling out the survey questions listed below by looking at the group's consensus for each of the categories and ranking them based on the level of priority you assume each item has in the spaces provided, listing them in order of highest to lowest priority using numbers (e.g., 1, 2, 3,). Please consider that a ranking of 1 shows the highest priority, 2 indicates the item with the next highest priority, and so on until all of the items in a listing are ranked.

- Which of the following items would be most desirable for the teacher education program for EMP regarding the modalities, modularity, duration, and certification? (Rank 1-5)

	Ranking
• Hybrid program	☐
• Experiential learning (e.g., observations and hands-on training)	☐
• A graduate program in EMP (Pre-service)	☐
• Short-term instruction/seminars/ workshops (in-service/pre-service)	☐
• Flexible modular program	☐

Thank you again for your invaluable contribution.

About the Authors

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