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# Exploring the evolution of pre-service teachers' beliefs about English for specific purposes (ESP) through case studies from a teacher education program

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Regardless of the increasing recognition of English for Specific Purposes (ESP) in the learning of languages, the conceptions of pre-service teachers with respect to ESP instruction remain unexplored, especially when compared to their perspectives about general English language teaching. This study examines the evolution of nine Chinese pre-service teachers' beliefs about ESP over six months, focusing on two critical phases of their teacher education program: the methods courses and the internship. Data were collected through informal conversations, stimulated recall discussions, classroom observations, and reflective diaries. The findings shed light on how future educators develop and transform their beliefs about ESP, illustrating the dynamic nature of teacher cognition during professional training. Through an in-depth analysis of nine cases, the study identifies six distinct belief dynamics, ranging from stability to substantial modification, and explores the contributing factors driving these transformations. The results contribute to the understanding of how pre-service teachers conceptualize ESP instruction and the extent to which teacher education programs influence their evolving perspectives. The study offers implications for both researchers investigating teacher cognition and teacher educators designing ESP-focused training programs.

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## Introduction

Teacher beliefs play a fundamental role in shaping instructional practices and decision-making in language education (Borg, 2003a). This study examines how pre-service teachers' beliefs about English for Specific Purposes (ESP) evolve during a teacher education program and identifies key factors influencing these changes. Research has consistently highlighted that pre-service teachers enter teacher education programs with pre-existing beliefs about teaching and learning, which subsequently influence how they interpret new pedagogical knowledge and experiences (Basturkmen, 2019). Understanding the evolution of these beliefs is particularly crucial in the context of ESP instruction, as teaching ESP requires specialized knowledge that blends linguistic competence with subject-specific expertise (Hyland and Jiang, 2021). While a lot of studies have explored teacher cognition in general English language teaching, limited attention has been given to how pre-service teachers conceptualize ESP instruction and how their beliefs shift during professional training (Cheng, 2025).

This study investigates the development of pre-service teachers' beliefs about ESP instruction in a teacher education program in China. ESP instruction presents unique challenges, as it necessitates an understanding of disciplinary discourse, professional communication needs, and pedagogical strategies that differ from those used in general English courses (V. Bhatia, 2014). Pre-service teachers often enter teacher training programs with varied assumptions about the role of ESP instructors, the objectives of ESP instruction, and the methodologies that best support learners in professional or academic settings. Given that ESP teaching requires adaptability, content awareness, and the ability to bridge linguistic and professional domains, examining how pre-service teachers' perspectives evolve throughout their training is essential for improving ESP teacher education (Borg and Sanchez, 2020).

The study adopts a qualitative case study approach to examine nine pre-service teachers enrolled in an ESP teacher training program. Through a longitudinal exploration of their beliefs over six months, it seeks to identify patterns of belief transformation and the factors influencing these changes. The research focuses on two pivotal stages in the teacher education process: the ESP teaching methodology courses and the internship experience. By analyzing reflective journals, classroom observations, stimulated recall discussions, and semi-structured interviews, the study captures the complexity of belief evolution in ESP teacher education (Cukurova et al. 2024). Findings from this research contribute to the broader discourse on teacher beliefs and professional development, offering insights into how future ESP educators construct their pedagogical identities (Goldbart et al. 2014). The study also informs teacher education programs by highlighting the areas where pre-service teachers may require additional support to refine their understanding of ESP instruction. The implications extend to curriculum designers and teacher educators seeking to enhance ESP teacher preparation, ensuring that pre-service teachers develop the necessary competencies to meet the demands of ESP classrooms (Basturkmen, 2025).

## Literature review

**ESP teaching.** English for Specific Purposes (ESP) is defined as an approach to language teaching where learners aim to use English within a particular professional or academic domain (Basturkmen, 2025). The primary goal of ESP instruction is to enable students and professionals to perform language-related tasks relevant to their fields of study or employment. Since ESP is closely tied to specific disciplinary contexts, needs analysis plays a crucial role in course design. For instance, medical professionals require specialized English to communicate with patients and

colleagues, while legal professionals need the linguistic competence to interpret and draft official documents (Korkoryi Jr, 2024). Given this domain-specific nature, ESP programs must actively involve not only students and instructors but also industry professionals and subject specialists to ensure the relevance of instructional content (Borg, 2003b).

The overarching aim of ESP instruction is to facilitate learners' academic and professional success by enhancing their ability to use English effectively in discipline-specific contexts (Borg, 2017). ESP courses are designed to develop learners' fluency in workplace or academic communication by integrating subject-specific language use, fostering linguistic proficiency through contextualized learning, and highlighting the discourse features unique to different disciplines. Although ESP instruction involves elements of subject knowledge, its primary focus remains on equipping learners with the necessary language skills rather than delivering in-depth content knowledge (Borg, 2019).

A long-standing debate within ESP research concerns the applicability of English for General Purposes (EGP) methodologies to ESP instruction. Some scholars argue that there is no distinct ESP teaching methodology and that the instructional techniques used in EGP courses can be equally effective in ESP contexts (Borg, 2015). However, many researchers maintain that ESP requires a specialized pedagogical approach tailored to learners' specific professional and academic needs. Unlike EGP instruction, ESP teaching demands that educators engage with disciplinary discourses, adapt language teaching strategies to domain-specific requirements, and employ diverse instructional techniques to address subject-specific content.

Despite the growing body of research on ESP, the complexity of ESP pedagogy remains insufficiently explored (T.V.A. Dang et al. 2024). Teaching ESP requires a multifaceted skill set, including expertise in the target discipline, an understanding of the linguistic conventions of professional and academic communication, and proficiency in both general language teaching methodologies and subject-specific instructional strategies. The question of whether ESP should be taught by language teachers or subject-matter experts continues to be debated. Some scholars argue that content specialists are better suited to teaching ESP due to their deep disciplinary knowledge (Clark-Goff and Eslami, 2016). Others contend that English language teachers are more capable of addressing students' linguistic needs, as they are trained in language pedagogy and second language acquisition (Buehl and Beck, 2014). Nevertheless, many ESP instructors, particularly those with a background in ESL teaching, may lack an awareness of the fundamental differences between ESP and EGP, which can influence the effectiveness of their teaching practices. Understanding the perspectives of pre-service ESP teachers is therefore essential for designing more effective teacher education programs and preparing instructors to meet the demands of ESP instruction.

## Pre-service teacher beliefs

*Defining pre-service teachers' beliefs.* Teacher beliefs play a critical role in shaping instructional practices, guiding decision-making, and influencing professional development. They encompass deeply held perceptions, attitudes, and understandings about teaching and learning. According to Buehl and Beck (2014), teacher beliefs reflect emotionally entrenched perceptions, conceptual frameworks, and cognitive understandings related to pedagogy. These beliefs may be categorized as either explicit or implicit. While explicit beliefs are those that teachers consciously recognize and articulate, implicit beliefs operate at a subconscious

level and influence teaching behaviors in ways that instructors may not always be aware of V.K. Bhatia (2014b).

Because teacher beliefs are complex and interconnected, they cannot be directly observed or measured. Instead, they must be inferred from teachers' verbal expressions, instructional choices, and classroom practices (V.K. Bhatia, 2014a). The present study primarily focuses on explicit beliefs, given that pre-service teachers are at the formative stage of their professional development and are likely to engage in conscious reflection about their teaching perspectives. However, it acknowledges that implicit beliefs also play a role in shaping pedagogical attitudes and decisions.

The impact of teacher beliefs extends beyond theoretical constructs; they influence career trajectories, instructional approaches, and engagement with professional learning (Berkenkotter and Huckin, 2016). Previous research has identified three key areas in which teacher beliefs exert a significant impact: the way educators perceive their teaching roles, the methods they adopt in instructional delivery, and the pedagogical decisions they make in response to classroom dynamics (Belcher, 2024). Given this substantial influence, the study of belief evolution—particularly the ways in which teacher beliefs change over time—has emerged as a crucial area of inquiry in teacher education. Understanding how pre-service teachers' beliefs develop throughout their training is essential for improving teacher preparation programs and fostering professional growth.

*Modifications in pre-service teachers' beliefs.* Pre-service teachers enter teacher education programs with preconceived notions about teaching and learning, shaped by their prior educational experiences and cultural backgrounds (Hollins, 2015). The extent to which these initial beliefs are modified during teacher training depends on their strength and rigidity. Some deeply ingrained beliefs are highly resistant to change, making them difficult to alter within the relatively short duration of a teacher education program. According to Ari and Vick (2008), pre-service teachers often struggle to assimilate new pedagogical knowledge when it challenges their prior experiences and assumptions. However, research has also shown that many pre-service teachers' beliefs undergo substantial transformations throughout their training, particularly when they are exposed to conflicting or alternative perspectives.

Teacher education programs are intentionally designed to shape and refine pre-service teachers' beliefs, encouraging them to develop more informed and adaptive perspectives on pedagogy. Studies indicate that experiential learning, particularly through teaching practicum and internship experiences, has a stronger influence on belief transformation than theoretical coursework alone (Miretzky, 2017). This suggests that direct engagement with classroom practice plays a pivotal role in challenging and reconstructing pre-service teachers' pedagogical assumptions.

Although studies on the development of teacher beliefs have been receiving more and more attention, especially in English language teaching, examinations that concentrate specifically on the trajectories of pre-service ESP teachers are still relatively underrepresented. A number of scholars have discussed ESP teacher cognition by way of example (Basturkmen, 2012). However, much of the available literature is more focused on looking at experienced practitioners rather than those still training. Considering that ESP instruction calls for a balance of time for language and topic-related demands, the process of evolving beliefs in the pre-service period should be understood.

This research provides a basis for this comparatively less explored field by analyzing how the assumptions of pre-service ESP teachers alter in response to formal teaching practice,

coursework, and critical reflection throughout a structured preparation program. This gap highlights the need for further investigation into the cognitive and experiential factors influencing ESP-specific teacher development.

Existing research studies propose several pathways that evolve the beliefs of pre-service teachers. In a few cases, perspectives remain the same when new information lines up with previous knowledge, strengthening pre-existing perspectives. These fluctuations highlight the context-dependent and dynamic nature of belief development in teacher education. In most other cases, the beliefs may be rejected or adapted according to new experiences and revelations (Farrell, 2018). Some pre-service teachers experience faith reorganization, which is the reorganization of their views because of exposure to disparate convictions, whereas others make a complete conversion, elimination of pre-existing beliefs and the adoption of newly acquired beliefs (Atai and Taherkhani, 2018). In addition, belief intensity can vary with the passage of time, with some viewpoints being entrenched more deeply while others become weak or sided as teachers accumulate more experience.

Despite the increasing recognition of belief modification as a key component of teacher learning, the specific mechanisms driving these shifts remain underexplored. Research has yet to examine how pre-service ESP teachers' beliefs evolve in response to specialized training in disciplinary language instruction. Given that ESP teaching requires a unique combination of linguistic expertise, pedagogical skills, and subject-specific knowledge, understanding how teacher beliefs develop in this context is critical for enhancing the effectiveness of ESP teacher education programs.

*Belief transformation and influencing factors.* Belief transformation is a complicated cognitive process, shaped by a great number of cognitive, social and environmental factors. According to research, beliefs develop based on their exposure to new information, socialization, and experiences (Bardi and Goodwin, 2011). The motivation and ability factors influence the manner in which individuals process persuasive information following the elaboration likelihood model. Belief adoption is greatly influenced by social identity because people tend to identify with the in-group and conform to the in-group norms in order to be a part of the group. According to Nyhan and Reifler (2019), confirmation bias turns out to be a significant barrier to belief change because people do not like information that challenges pre-existing beliefs. Emotional experiences are instrumental in belief transformation, and Trevors et al. (2016) prove the extent to which emotional reactions can either promote or arrest belief revision processes. Educational interventions using active learning strategies have indicated effectiveness regarding conceptual change and belief revision. Digital media environments are full of opportunities and challenges that enhance or undermine belief transformation because algorithmic filtering can support this or enhance this process by filtering out content that is disagreeable. The systematic process of meaning making can function as a catalyst for major belief recasting, as a trigger for profound belief restructuring, from trauma and meaningful life events. Recent signals of neuroscience attest that belief revision triggers certain neural networks, thereby implying biological underpinnings behind the accommodation of belief systems.

## Methods

**Research design.** The design for this study was a qualitative multiple case study, which examined the evolution of pre-service teachers' beliefs about English for Specific Purposes (ESP) instruction in a Chinese teacher education program. The

approach was longitudinal, six months long and centered around two key phases: the ESP teaching methods courses and the internship. This design is in accordance with the aims of the study to identify, articulate and analyze varied belief change patterns of nine pre-service teachers. A case study approach was selected because it enables an in-depth examination of complex cognitive and pedagogical transformations within a natural educational setting. By focusing on multiple cases, the study captures both individual variations and shared patterns in belief evolution, providing a nuanced understanding of how pre-service teachers conceptualize ESP instruction (Y. Dang et al. 2024). The study specifically explored how participants' beliefs about ESP goals, instructional methodology, and the role of language specialists changed over time. To examine these belief transformations, the research was guided by three key questions. The first sought to uncover the assumptions pre-service ESP teachers held when they initially engaged with ESP instruction. The second examined how participation in an ESP teaching methodology course influenced their pedagogical beliefs. The third investigated the ways in which their internship experience contributed to belief modification. A longitudinal qualitative approach was adopted, spanning six months and covering two critical phases of the teacher education program: the ESP methodology courses and the supervised teaching internship.

**Participants and context.** The study was carried out at the University of China, which offers a special ESP teacher preparation program. This program is intended to provide future ESP teachers with an intellectual, linguistic and expertise in subject-specific knowledge essential to teach in vocational training settings, technical colleges and higher education.

In this linguistic context, “teachers” refers to the pre-service participants registered in the program, while the “instructors” refer to the faculty members or mentors who oversee their training. In their practicum, the pre-service teachers taught mock lessons or peer-teaching to colleagues in the programs of education instead of real-life ESP learners as a scaffold learning experience. The program is targeted to enable the future ESP instructors (i.e., pre-service teachers) to acquire the linguistic, teaching, and subject matter knowledge that is essential for teaching in higher education, technical colleges, and vocational training.

The curriculum was structured to provide both theoretical instruction and practical teaching experience, allowing pre-service teachers to engage with ESP-specific pedagogy while developing their instructional competencies.

Nine final-year pre-service Chinese teachers enrolled in a dedicated ESP teacher preparation program from a university in China were involved in this study. They were selected through purposive sampling to ensure rich, relevant insights based on their completion of multiple ESP courses, their participation in the teaching practicum, and their demonstrated capacity to operate in critical self-reflection. They were selected for participating in the study based on their active engagement in the teaching practicum, willingness to reflect on their learning, and ability to articulate their beliefs about ESP instruction. Although inexperienced in the field of ESP instruction, the focal point of the career of these participants was that they had finished most of the coursework in their teacher education journey and were heading towards the field of ESP instruction.

Their perspectives of ESP education were initially influenced mostly by the coursework, which consisted of five ESP-oriented classes. According to Table 1, participants had to go through three ESP programs: English for Mechanical Engineering, English for Electricity and Electrical Engineering, English for Computer

Science. They also had to take two elective ESP courses. While their knowledge background was similar, the evolution of their beliefs concerning ESP teaching diverged sharply among the individuals.

Selection criteria included enrollment in the ESP teaching program, intent to pursue careers in ESP instruction, and the ability to articulate beliefs about language education. These participants had completed at least five ESP-specific courses and two ELT methodology courses prior to the study. Their participation was voluntary, and ethics approval was obtained from both the university's research ethics board and the faculty of education. The ESP teacher education program consisted of two key components. The first was the ESP teaching methodology course, which lasted six weeks and included theoretical instruction on ESP pedagogy, needs analysis, syllabus design, and micro-teaching sessions in which participants delivered ESP lessons to peers. The second component was an 8-week supervised internship, during which participants taught university ESP classes, observed classroom interactions, and reflected on their teaching practices. This internship provided an opportunity to apply theoretical knowledge in real-world teaching scenarios, allowing participants to refine their pedagogical skills.

**Data collection instruments.** The study employed multiple qualitative methods to capture the evolution of participants' beliefs and ensure the validity of findings. Semi-structured interviews were conducted at three points: before, during, and after the ESP teaching methodology course and internship. A semi-structured interview protocol and sample questions shown in Appendix A were used for conducting interviews. These interviews explored participants' beliefs about ESP instruction, teacher roles, and instructional strategies. Questions were designed based on existing literature on teacher cognition and belief modification, ensuring that the inquiry was grounded in theoretical frameworks. Semi-structured interviews (45 min, 10–12 questions) explored beliefs, observations focused on 60-min ESP lessons, stimulated recall sessions (30 min) analyzed teaching decisions, and weekly reflective journals (200–300 words) documented pedagogical reflections. A list of the core interview questions is provided in Appendix A.

In addition to interviews, classroom observations were conducted to document how participants' beliefs translated into instructional practices. Each participant was observed teaching a full ESP lesson during their internship, and field notes were taken to capture teaching behaviors, instructional decisions, and classroom interactions. Stimulated recall sessions followed these observations, where participants watched recordings of their teaching and reflected on key moments, explaining their decision-making processes and assessing whether their teaching aligned with their evolving beliefs. Reflective journals were maintained throughout the study, with participants documenting their self-reflections on teaching experiences, pedagogical challenges, and shifts in their beliefs. These journals provided additional insights into participants' cognitive and affective responses to their training and allowed for a more detailed exploration of belief transformation over time.

Data were obtained using four qualitative methods integrating the fluidity of beliefs.

- *Informal conversations:* Regularly implemented within the program to create rapport and to obtain spontaneous insights about participants' reflections.
- *Stimulated recall discussions:* Conducted after classroom lecture hours, in which participants watched recorded footage of their lessons and conferred on their instructional decision-making.



**Table 1 Teacher experiences and ESP programs.**

Individual	Teaching skills	Optional ESP programs
Participant A	Individual instruction in EGP	Eco-Friendly Language Instruction Nutritional Science and Food Technology: English
Chau	Professional teacher of English as a foreign language at a local center	Eco-Friendly Language Instruction Professional English
Tra	Individual instruction in EGP	Eco-Friendly Language Instruction Nutritional Science and Food Technology: English
Jin	Peer tutoring in university ESP modules	Environmental Science, Professional English
Mei	Practicum assistant for general English	Nutritional Science, English for Information Technology
Bo	Volunteer ESP curriculum designer	Professional English, Eco-Friendly Language Instruction
Lin	ESP content reviewer and editor	English for Tourism, Professional English
Xia	Intern at a technical college ESP program	Eco-Friendly Language Instruction, English for Business
Fei	General English peer mentor	Environmental Science, English for Information Technology

- *Classroom observations:* Each participant taught an ESP lesson during the internship, and detailed field notes recorded strategies in classroom instruction and interactions between teacher and learner.
- *Reflective diaries:* Regularly kept to enable participants to make notes of changes in their pedagogical thinking and challenges encountered in the course and internship.

**Procedures.** Data collection was conducted in two stages, aligned with the participants’ coursework and practicum experiences. The first stage took place during the ESP teaching methodology course, which ran from November to December. At the beginning of this stage, pre-course interviews were conducted to capture participants’ initial beliefs about ESP instruction. Throughout the course, participants maintained reflective journals in which they documented their weekly reflections on the course content and micro-teaching experiences. Upon completion of the course, post-course interviews were conducted to explore how exposure to ESP pedagogy influenced their beliefs. The second stage of data collection occurred during the teaching internship, spanning February to April. Prior to their teaching assignments, participants took part in pre-teaching interviews to discuss their expectations and beliefs about practical ESP instruction. Classroom observations were conducted during this phase, allowing researchers to document how participants applied their learning in real teaching scenarios. Following each observation, participants engaged in stimulated recall sessions to analyze critical moments in their lessons. At the conclusion of the internship, post-internship interviews were conducted to assess how the teaching experience contributed to belief modification. The longitudinal nature of this study ensured that changes in beliefs could be tracked across different stages of professional learning.

**Data analysis.** Thematic analysis was applied in identifying the patterns and the themes in participants’ belief trajectories. The analysis was inductive, initially with open coding of interview transcripts, observation notes, recall discussions to think with interviewees several days after the interview, and diary entries. These codes were then categorized into broader themes, resulting in the classification of six belief change patterns: stability, modification, fluctuation, explanation, reprioritization, and reversal. Cross-case analysis assisted in uncovering individual differences and co-factor influences in belief development. Cross-triangulation of various sources of data increased the credibility and depth of interpretation. Data analysis was conducted using an iterative and inductive approach, integrating thematic analysis with case study methodology. This strategy was selected on the basis of its suitability for investigating complex and context-

dependent circumstances and for grasping evolving beliefs of participants over time. The analysis began with an initial coding phase, in which interview transcripts, journal entries, and observation notes were examined to identify emerging themes. Codes were assigned based on participants’ stated beliefs about ESP teaching goals, instructional methodologies, and teacher competencies. This chronological approach allowed for the identification of patterns in belief evolution over time. Once initial codes were established, thematic analysis was conducted to categorize data into six distinct belief modification types: verification, modification, fluctuations, explanation, reprioritization, and reversal. These six types were based inductively on data after reading and repeatedly interpreting participants’ narratives and teaching reflections. They are reflective of patterns repeated in the analysis of more than one data source, but they also partially cohere with constructs in the existing teacher cognition literature. The different belief modification types were then linked to the three parts of the participant cases in the result part. For example, (Participant A): Patterns of verification and modification were conspicuous in this case. Most initial beliefs were confirmed and corrected to some extent by classroom practice. This participant retained a steady perspective of ESP instruction, corroborating initial assumptions with slight amendments elicited from reflective teaching efforts. Chau: This participant presented a dynamic development of beliefs in the modalities of pattern explanation, reprioritization and modification. Her development of perceptions in this regard changed and indicated an increasing level of understanding of ESP, and she was greatly informed by internship feedback and exposure to pedagogical theory. Tra: She had great oscillation and reversal in her beliefs, which this experience reflected. Initially, she felt comfortable with such rigid differences between ESP and EGP; her views changed dramatically during the internship as she uncovered internal conflicts and reevaluated past assumptions. Jin: Jin demonstrated a tendency toward gradual adjustment. He originally had relatively simplistic framings of ESP instruction, but subsequently verified and built on this by systematic reflection and interaction with course material and peer discussions. Mei: Mei has had a high degree of modification and reprioritization. At first, concentrated on the linguistic competence alone, her views expanded to include domain-specific communication and the needs of the learner, which developed as a result of different teaching situations. Bo demonstrated good reflective thinking that resulted in consistent amendment. The exposure to real-life ESP teaching cases prompted her to question and rethink earlier beliefs, leading to better nuanced pedagogies. The characteristics of Lin’s belief development are reflected in verification. With advanced ESP understanding from previous editing work, she affirmed her beliefs when validated during the teaching practicum and content engagement. Xia experienced

changing of belief during the internship. Her early emphasis on content mastery was replaced now with an understanding of communicative strategies and student involvement, for experiential learning and observation. Fei's experience revealed patterns in explanation and belief clarification. He augmented past misconceptions with a close ideological relation to classroom interaction and the discourses of pedagogy, thus producing a more balanced stance on ESP instruction.

These categories were accustomed inductively from the data in the course of the coding, which expressed patterns within the belief changes of participants. Nevertheless, they were also guided by past research on teacher belief transformation, which showed them a conceptual foundation through which to interpret such changes; thematic analysis was used, as it allows handling the patterns in qualitative data flexibly while identifying and analyzing them, and then reporting on these as well. Cross-case analysis was used to compare participants' experiences, highlighting both commonalities and divergences in belief transformation. This comparative approach lines up with the research principles of this case study, which highlights an in-depth, multifaceted exploration of complex issues.

To ensure reliability, findings from interviews were compared with observational and reflective journal data, while stimulated recall data were used to verify the accuracy of self-reported beliefs and instructional practices. The final stage of analysis involved interpretative synthesis, in which individual belief trajectories were mapped across the study period. This process allowed for the examination of how participants' beliefs shifted in response to different training experiences. Findings were then compared with existing models of teacher cognition and belief transformation, drawing on relevant literature to contextualize the results within the broader field of teacher education research. This multifaceted analytical approach enhances transferability, credibility and is consistent with excellent practices in qualitative educational research (Ahmed and Suhag, 2024). By employing this rigorous data analysis process, the study ensured a comprehensive and valid representation of pre-service ESP teachers' evolving beliefs.

**Ethical considerations.** Ethical approval was obtained from the participating universities Research Ethics Committee in China. Taking written informed consent from participants, all data were anonymized for confidentiality purpose. Participation was optional with the right to withdraw at any time without penalty.

## Results

This study draws on the findings from nine case studies to highlight the distinct perspectives held by each pre-service ESP teacher and the ways in which these beliefs evolved over time.

### Researcher (Participant A): beliefs established and reinforced.

Before taking the ESP teaching methodology course, Participant A held strong misconceptions about ESP instruction. Initially, she believed that subject teachers were better suited to teaching ESP, as she assumed that ESP primarily involved the mastery of discipline-specific terminology and grammatical structures. She also perceived no significant methodological difference between ESP and general English language teaching, reinforcing her assumption that ESP did not require a distinct pedagogical approach. However, after completing the ESP methodology course, she underwent a notable shift in perspective. The conceptual framework introduced in the course challenged her initial assumptions, leading her to reconsider the role of ESP teachers and their responsibilities. She acknowledged that ESP teachers should focus on helping students articulate subject-specific content in English rather than simply teaching discipline-related

terminology. Reflecting on this realization, she remarked that English teachers, rather than subject teachers, were more suited to ESP instruction, as they could better support students in developing communicative competence in professional and academic contexts.

Her belief transformation continued during her teaching internship. Through classroom observations, she analyzed the teaching practices of both English language instructors and subject teachers, noting key differences in their pedagogical approaches. She observed that English instructors, despite lacking deep content knowledge, were more effective in facilitating language development, whereas subject teachers primarily focused on content delivery with limited attention to language scaffolding and communicative strategies. This experience further reinforced her belief that ESP teachers should prioritize language-oriented instruction while collaborating with subject experts when necessary.

During her internship, Participant A also engaged in first-hand ESP teaching experiences, further solidifying her belief that ESP instruction should be language-driven rather than content-dominated. She taught a grammar-focused ESP lesson to Mechatronics students and found that the instructional techniques she had previously associated with general English teaching were equally applicable in the ESP context. Reflecting on this, she concluded that there was no fundamental distinction between ESP and EGP teaching strategies in terms of classroom procedures and methodology. This perspective remained consistent throughout her internship, reinforcing her belief that ESP instruction should center on helping learners apply English effectively within their specific professional and academic fields.

**Chau: beliefs evolved and deepened.** Chau entered the ESP teacher education program with a firm conviction that subject-matter experts should be responsible for teaching ESP. She believed that ESP students would achieve the highest level of comprehension when instructed by professionals with deep expertise in their respective fields. This assumption was shaped by her experience in ESP courses, where she perceived content knowledge to be the dominant instructional focus. Her belief in the superiority of subject specialists for ESP instruction was further reinforced during her ESP methodology class. In small-scale teaching sessions, she and her peers closely replicated the lessons they had previously encountered in their ESP courses. This reinforced her perception that ESP instruction was primarily about delivering disciplinary content rather than facilitating language learning.

During her teaching internship, Chau maintained her initial perspective, further solidifying her belief in the primacy of content knowledge in ESP instruction. In this teaching apprenticeship, she was allotted to conduct sessions for practice teaching with her peers, who were also pre-service ESP teachers but role-playing as students. Encouraged by her senior instructor to provide more detailed explanations of disciplinary concepts, she became even more convinced that ESP teachers should serve primarily as conveyors of technical knowledge. At this stage, she saw little distinction between ESP and subject-specific instruction, believing that the role of ESP teachers was to equip learners with deeper disciplinary understanding rather than to facilitate language acquisition.

However, Chau experienced a critical shift in perspective during her post-internship reflection. She understood that the students she had been teaching during her training were not actual ESP learners from professional or academic disciplines, but rather her fellow pre-service teachers who were imitating the role of ESP students for the purpose of training. This realization led

her to reevaluate the primary goals of ESP instruction. She recognized that ESP learners, particularly non-English majors, often already possess sufficient content knowledge in their fields but struggle to express that knowledge in English. Consequently, she revised her belief that ESP should be content-focused and began to acknowledge the need for ESP instruction to prioritize the teaching of discipline-specific language skills rather than subject matter itself.

This shift in her understanding led to a reassessment of ESP teacher competencies. While she had initially prioritized subject expertise as the defining qualification for ESP teachers, she now struggled to determine whether language instructors or subject specialists were more suitable for ESP teaching. She recognized that both linguistic proficiency and content knowledge were essential, but wavered in her stance on which should take precedence. This internal conflict reflected her attempt to reconcile her previous assumptions with her emerging awareness of ESP learners' actual needs. Although she had not yet fully resolved her views on the ideal profile of an ESP teacher, she acknowledged the necessity of a balanced approach that integrates both linguistic and disciplinary knowledge.

Chau's evolving perspective highlights the complexity of belief transformation in pre-service ESP teachers. Initially influenced by her prior learning experiences, she reinforced her early assumptions during her methodology course and internship. However, through direct engagement with ESP instruction and critical reflection, she recognized the limitations of a content-dominant approach and the importance of integrating language-focused instruction into ESP pedagogy. Despite her ongoing uncertainty regarding the ideal ESP instructor profile, her belief evolution underscores the dynamic and fluid nature of teacher cognition as pre-service teachers navigate the complexities of their professional development.

**Tra: confused and reinforced beliefs.** Tra experienced significant shifts in her beliefs about ESP instruction throughout her participation in the teacher education program. Initially, she held the firm conviction that ESP required an entirely distinct pedagogical approach from English for General Purposes (EGP). She believed that ESP instruction demanded specialized methodologies and instructional strategies that were not applicable in general English teaching. However, after completing the ESP teaching methodology course, this belief began to waver. She started to question whether ESP actually required unique teaching methods or whether it could, in some cases, align with the pedagogical principles of EGP. Her uncertainty was reflected in her realization that ESP and EGP were "more comparable than distinct," leading her to reconsider the necessity of specialized instructional techniques for ESP.

At the same time, Tra also revised her views on the role of ESP teachers. Initially, she underestimated the importance of domain knowledge for ESP teachers, assuming that linguistic and pedagogical competence alone would suffice. However, after exposure to ESP pedagogy, she came to believe that ESP teachers inevitably need to possess some level of subject knowledge in order to facilitate meaningful instruction. Despite this shift, she still ranked subject expertise as secondary to pedagogic ability, asserting that understanding students' specific learning needs was the most critical competency for ESP instructors.

Her perspectives continued to evolve during the teaching internship, where she engaged in direct classroom instruction and observed experienced ESP instructors in action. Unlike her earlier uncertainties about whether ESP required a specialized teaching approach, she seemed more assured in her convictions after gaining hands-on teaching experience. By actively participating in

academic activities during her internship, she observed a variety of instructional strategies used by ESP educators, including those who had both subject expertise and language teaching backgrounds. These experiences allowed her to refine her approach to ESP instruction and develop more practical teaching strategies.

During her internship, Tra took a learner-centered approach, focusing on ways to engage students, facilitate comprehension, and promote self-directed learning. She placed particular emphasis on enhancing learners' understanding of discipline-specific terminology, spending extensive time researching ESP vocabulary and gathering supplementary resources such as videos, images, and real-world examples to support her lesson planning. This approach proved effective in her classroom, as she encouraged her students to collaborate in small groups to investigate and define key terms, an activity she found to be more engaging and effective than traditional teacher-led explanations.

Through these experiences, Tra developed a preference for interactive and inductive teaching methods, which she believed were more adaptable to ESP than rigid, lecture-based instruction. She contrasted this with traditional deduction-based classes, where teachers served as "experience producers" and students remained "passive viewers." In her reflection, she argued that students retain information more effectively when they are actively involved in discovering and applying knowledge rather than merely receiving it.

By the end of the internship, Tra had solidified her belief in the importance of balancing subject expertise with strong pedagogical skills. While she acknowledged the necessity of some domain knowledge for ESP teachers, she ultimately prioritized instructional effectiveness and adaptability over content expertise. Her experience reinforced her belief that effective ESP instruction is not about simply delivering subject content but rather about equipping learners with the linguistic and strategic competence needed to communicate within their disciplines.

**Jin: beliefs gradually refined.** Jin came into the ESP teacher training program with a rudimentary idea of ESP as extrinsic to the regular English classes. He assumed that in the case of ESP, there was just a matter of introducing the domain-specific vocabularies into general lessons without the structural changes having to be made to pedagogy. His early beliefs revealed a superficial difference between EGP and ESP. Jin started to question these assumptions during the ESP methodology course. He came to know that the essence of teaching ESP was not just the teaching of terminologies. Students' professional contexts needed to be understood, and instruction had to be related to authentic communication needs. He became more aware of the communicative demands that characterized each discipline through microteaching tasks and peer work. His internship only increased awareness further. Students, according to Jin, had difficulty not with vocabulary but with the use of vocabulary in real life, such as writing technical papers or taking part in meetings. This occasioned him to adjust his instructional priority from vocabulary learning to the usage of contextual language. ESP after the internship was perceived by Jin as an area in which both linguistic sensitivity and functional deployment, relevant to the purposes of those who study it, were required.

**Mei: beliefs modified toward learner needs.** Initially, Mei perceived ESP instruction as a kind of advanced language instruction that emphasized grammar obviousness and vocabulary expansion. Her previous experience in general English had confirmed her impression of teaching as rule-based and teacher-dominated. However, in the process of a participation in an ESP methodology



course, she encountered new ideas concerning needs analysis and learner-centered instruction. These ideas undermined her prior beliefs in this area and led her to view ESP not as a more complicated form of general English, but as a different focus concentrating on relevance and context. While on the internship, Mei exercised these principles by preparing learner-centered activities of a given field—Information Technology. She used role play, case studies and workplace simulation exercises. Such approaches caused her to believe that responsiveness to learner needs was more important than textbook fidelity or grammar instruction. After reflection, Mei changed her teaching philosophy so that flexibility, authenticity, and learner engagement became core strands of her ESP value system, away from her earlier concentration on the teaching of structural language.

**Bo: beliefs transformed through reflective practice.** Bo approached the program convinced that ESP instruction ought to feature a university-like lecture format and that auditory-visual recitation should be avoided. She thought the ESP teacher's function was to impart knowledge assertively and that students would ingest and regurgitate material. This perspective started to drift after she was exposed to ESP theory when in school. She was a person who interacted closely with reflective journaling and peer feedback, leading her to reflect on her teacher-centered approach. Bo's transformation grew more (more pronounced) when she was involved in an internship. Assigned a project to a group of students studying Environmental Science, she noticed that the conventional lecture culture resulted in disinterest. This forced her to try participatory approaches, like debates and assignments that include project work. Bo's post-internship writings demonstrated apparent changes in favour of interactivity, collaboration and relevance. She learned to think of ESP as a practice domain that called for dynamic facilitation, not for static delivery.

**Lin: beliefs confirmed through experience.** Lin was a member of this program with experience as an ESP content editor and a strong foundational ideology that ESL instruction should be highly contextualized. She advocated for adapting instruction to the communicative tasks adopted by student's specific professions. Majorly, her coursework reflected her expectations. In peer teaching and collaborative work, Lin always stood for materials that modeled real-world scenarios. Both teachers and fellow students agreed with her approach. As a part of her internship with a group of Tourism and Hospitality students, Lin introduced a curriculum that involved mock interviews, itinerary writing and simulated customer service. These experiences reinforced her conviction that true guidelines of ESP instruction should include genuine workplace communication. Her confidence in her belief system improved after undergoing interning. Whereas others had a change, the line of Lin had verification and advancement of her previous beliefs.

**Xia: beliefs reversed toward functional competence.** Xia, previously, believed that knowledge in content was the one that would be taught in ESP, and would follow the style of lecture on subject matter. She considered technical accuracy in use and the command of content to be the greatest consequences of ESP instruction. However, with teaching simulations and peer discussion, Xia started to doubt the communicative usefulness of this approach. She found out that her peers, acting as students during role-play, were more receptive to tasks that required authentic language use than technical explanation. Her point of turning was when she was an intern in a vocational college. There, she noticed that students were more challenged in explaining what they

already knew rather than explaining content. This coerced her to reconsider her instructional goals. By the end of the internship, Xia had turned around her belief system. She turned her interest towards developing students' communicative competence, focusing, in particular, on professional contexts, and took a more student-centered, task-based approach.

**Fei: beliefs clarified and contextualized.** Fei entered the program with a fairly wide and somewhat vague definition of ESP as "teaching English in a job-related context". He was short of a clear picture of the difference between ESP and ordinary English, or what it required pedagogically. His ability to define clearer conceptual boundaries was attributed to the ESP teaching methodology course. Active Sheet of reading about frameworks like needs analysis, register variation, and discourse, Fei started to view ESP as a conscious audience-oriented method of instruction. Fei's internship was in designing lessons for IT students. He understood that his previous sweeping strategies did not serve him in providing students a position to handle such genre-specific exercises as, for example, writing software documentation or being a part of client meetings. After his internship, Fei expressed a more exacting version of ESP. He conceptualized it as a "language service" that allows learners to do specific communicative tasks. This clarity indicated a shift from a conceptual to an operational view of ESP instruction. These personal stories emphasise a subtle, growing process of belief development in pre-service ESP teachers and illustrate the range of learning pathways as shaped by reflection, experience, and context.

## Discussion

This study examined the evolution of pre-service ESP teachers' beliefs throughout their teacher education program, focusing on their concepts about ESP instruction, the duty of ESP teachers, and the methods suitable for ESP classrooms. The findings indicate that belief transformations varied significantly across participants, influenced by theoretical exposure in coursework, classroom observations, and hands-on teaching experiences. Some beliefs remained stable, others evolved incrementally, while certain deeply rooted assumptions were entirely reversed. Despite these individual variations, a common trajectory was observed in all participants: increased awareness of the balance between linguistic and content knowledge. These results provide insights into the cognitive and experiential factors shaping pre-service ESP teachers' pedagogical reasoning and contribute to discussions about ESP teacher identity formation as evaluated by Kaivanpanah et al. (2021). At the outset of the study, participants held strong preconceived notions about ESP instruction. All nine participants initially viewed ESP as a discipline primarily focused on specialized content knowledge rather than as an instructional approach grounded in communicative language teaching. This perception aligns with previous research conducted by Tajeddin and Mansouri (2024), indicating that novice ESP teachers, even those undergoing formal teacher training, often assume that ESP instruction requires deep disciplinary expertise rather than linguistic and pedagogical skills. Participant A's shift to language-driven instruction aligns with Basturkmen's (2014) emphasis on linguistic scaffolding, while Tra's oscillation reflects (Clark-Goff and Eslami, 2016) findings on belief challenges during training. However, it is essential to note that as the participants entered the program with these perceptions, they were registered in structured teacher education programs configured to challenge and gain their professional knowledge, such as pedagogical competencies specific to ESP teaching. Such perceptions, typically rooted in their prior learner experiences, may persist into early stages of professional development until challenged through targeted



instructional training. Participant A and Chau both entered the program believing that subject-matter specialists would be more effective ESP teachers than English language educators, while Tra assumed that ESP required an entirely distinct instructional methodology from EGP. Jin cognitively misruled that ESP was normal English with a plethora of technical jargon added. However, he came to understand that in the course of coursework and classroom observation, ESP involves purposeful context-specific language. This perception, enhanced by his internship, resulted in his transformation of belief forms from a superficial focus on language to functional task-based instruction.

Copywriting of Mei moved from a focus on grammar to learner-centered actions. Her initial perspective on ESP was as a structuralist, but slowly she was learning to incorporate needs analysis and authentic language use, especially after seeing how real-world communicative tasks engage the students in the class during her internship. With a belief in formal lecture-style ESP instruction to teach, Bo started the program. Her reflective journaling and experiential learning disputed this belief, which resulted in her embracing interactive student-centered approaches, which acted from the belief that communication is paramount to structure. Lin had the right beliefs about contextualized ESP instruction because she had worked as a content editor previously. These beliefs were substantiated and enriched on the job with rich 'real' classroom practice, confirming her focus on authentic tasks, learner relevance.

Xia stayed focused on content in an early ESP approach, thinking that domain knowledge was the heart of it. Her internship experiences manifested in a change in her perceptions in favor of prioritizing language scaffolding and interactions, especially when she saw struggling students learn to communicate. Fei started, more or less, with the rudiments of ESP, job-related English. The program assisted in shaping this into a perspective on ESP as a functional, learner-specific practise. By teaching IT-related subjects, he realized that targeted genre-based instruction proved to be more learner-oriented. These assumptions reflect common misconceptions about ESP instruction, as noted in prior research carried out by Yang et al. (2023). However, whereas some studies conducted by Helmida et al. (2024) suggested that such beliefs remain deeply entrenched, this study found that structured exposure to pedagogical theory, reflective engagement, and direct teaching experience can significantly alter pre-service teachers' conceptualizations of ESP instruction.

The ESP teaching methodology course played a crucial role in reshaping participants' beliefs, though the extent and nature of these transformations varied. Some beliefs were challenged immediately, while others changed more gradually as participants engaged with pedagogical theories, classroom observations, and teaching strategies. Tra, for instance, initially overestimated the methodological distinction between ESP and EGP, but after exposure to task-based and communicative approaches, she began to recognize key overlaps between the two. This shift aligns with research suggesting that ESP and EGP share fundamental pedagogical principles, particularly in learner-centered instruction and task-based learning, as explained by Wingate (2025). Similarly, Chau's content-oriented view of ESP was initially reinforced by her prior learning experiences, consistent with studies indicating that pre-service ESP teachers often retain content-driven perspectives unless challenged by new pedagogical insights by Clark-Goff and Eslami (2016). However, classroom observation and teaching practice ultimately encouraged her to reconsider this stance, supporting research that emphasizes the role of experiential learning in reshaping teacher cognition. Jin, Bo, and Mei also had their assumptions revisited strongly in the methodology course. Jin's point of view has changed from limited vocabulary to relevance. Bo's shift of orientation was triggered by

the structured reflection, and Mei started understanding the supremacy of learner needs and authenticity in the ESP instruction.

The internship experience emerged as the most significant catalyst for belief modification, reinforcing the notion that direct teaching experience is critical in consolidating and refining pedagogical perspectives. Participant A, for instance, underwent a profound shift in her perception of ESP instruction after observing and teaching ESP classes. Initially convinced that ESP teaching should be content-driven, she recognized that English teachers without specialized content knowledge could still effectively facilitate language learning by helping students navigate discipline-specific discourse. This realization supports findings that ESP teachers do not need to be content experts but must develop strategies for engaging with discipline-specific communication. Similarly, Chau, who had previously believed that ESP students needed extensive content instruction, later revised her assumption after realizing that most ESP learners already possess disciplinary expertise but struggle with domain-specific communication in English. These findings align with studies suggesting that ESP instruction should focus on linguistic scaffolding rather than content delivery. The transformative role of internship-based learning in bridging the gap between theoretical knowledge and practical application is further supported by prior research of Miretzky et al. (2016), which emphasizes the importance of real-world teaching experience in shaping teacher cognition.

The internship observations changed beliefs for Lin, Xia and Fei, too. Lin's correct theoretical assumptions were empirically confirmed and operationalized in the practice of teaching, Xia's content-based suppositions were inverted towards communicative competence, and Fei discovered a more explicit, contextualized sense of ESP as functional and task-based. While these findings largely align with existing research on ESP teacher education, this study also offers unique insights into how pre-service ESP teachers navigate tensions between linguistic and content-focused approaches. Previous studies carried out by Hewings and Hewings (2002) have often framed ESP instruction as a dichotomy between content specialists and language teachers, with pre-service teachers struggling to reconcile these competing roles. However, this study found that as participants gained more teaching experience, they moved beyond this binary view. Rather than seeing ESP as either content-focused or language-driven, participants increasingly recognized the need for a hybrid approach, integrating both linguistic competence and awareness of disciplinary discourse practices. This finding underscores the importance of ESP teacher education programs that emphasize integration rather than separation of these domains. The study also highlights the role of self-reflection in fostering belief transformation, with participants who engaged in deeper reflection being more likely to critically evaluate and modify their initial assumptions.

The findings of this study have several important implications for ESP teacher education programs, curriculum design, and professional development initiatives. Given that pre-service ESP teachers entered the program with content-focused conceptions of ESP instruction, the results highlight the need for teacher education programs to explicitly address and challenge these assumptions early in training. Many participants initially believed that ESP instruction required deep subject-matter expertise rather than pedagogical competence, reinforcing the necessity of integrating discussions on ESP teacher roles into coursework. Teacher educators should adopt structured reflection activities and guided observations to help trainees critically examine their initial beliefs and understand how ESP instruction fundamentally differs from subject instruction (Esteban-Millat et al. 2014). This study also underscores the importance of bridging theoretical knowledge

with practical teaching experiences, as belief modification occurred most significantly during the internship. Pre-service ESP teachers should be exposed to real ESP classroom contexts earlier in their training to prevent misconceptions about the discipline from persisting too long. The findings further suggest that internships should not merely focus on lesson delivery but should also provide structured opportunities for feedback and self-reflection, ensuring that trainees engage critically with their evolving beliefs rather than passively adjusting to the teaching context. Another implication concerns ESP teacher competency development, as participants gradually moved beyond a binary view of ESP instruction as either content-driven or language-focused, instead recognizing the need for a balanced, hybrid approach. This finding suggests that ESP teacher education should not only emphasize linguistic and methodological training but should also provide strategies for handling discipline-specific communication challenges. Teachers should incorporate practical training in collaborating with subject specialists, adapting materials, and scaffolding domain-specific discourse skills, so that pre-service ESP teachers feel confident in teaching ESP without feeling pressured to become experts in a given subject.

Additionally, since the participants who engaged in deeper self-reflection demonstrated more significant belief evolution, ESP teacher education programs should incorporate structured reflective practices to help trainees monitor and critically engage with their own pedagogical development. Finally, this study highlights the need for ongoing support beyond pre-service training, as belief modification is an extended and non-linear process. Institutions should consider follow-up mentorship programs, peer collaboration networks, and ongoing professional development workshops to help ESP teachers further refine their instructional approaches once they begin their careers. By ensuring that ESP teacher education is explicitly designed to challenge misconceptions, integrate theory and practice, and foster reflective engagement, institutions can better prepare ESP educators to navigate the complex demands of ESP instruction and develop effective, adaptable teaching practices. This study contributes by identifying six belief change patterns (verification, modification, fluctuation, explanation, reprioritization, reversal), offering a framework for understanding pre-service ESP teacher cognition.

## Conclusion

This study explored the evolution of pre-service ESP teachers' beliefs throughout their training, highlighting how theoretical exposure, classroom observations, and teaching experiences influenced their conceptualizations of ESP instruction. The findings indicate that while participants initially viewed ESP as primarily content-driven and assumed that subject-matter expertise was the most critical teaching qualification, their perspectives shifted as they engaged with pedagogical coursework and practical teaching experiences. The study demonstrated that belief transformation is a non-linear process, with some participants reinforcing their initial perspectives, others modifying their views gradually, and some undergoing significant conceptual shifts. This non-linear procedure was affected by factors including openness to new ideas, prior experiences and individual capacity for reflection. For instance, in the case of Chau, the strong propensity towards pedagogical theory allowed for deeper transformation, whereas Tra's restrictions towards pedagogy resulted in a more measured way of change and assured losses at times. On the contrary, Participant A demonstrated fluctuations between reinforcing and modifying beliefs because of inconsistent feedback and deficient mentoring. Transition of Jin from vocabulary-based teaching to contextual communication awareness shows structured training overcoming the superficial level of learning. Mei's

transformation from teaching that was grammar-oriented towards student-based communicative instruction is a case example of the effectiveness of authentic classroom observation. Bo's development was coined by reflective journaling instead of formalism to interaction-oriented approaches. Lin, who had been aware of contextualization prior to entering, had her beliefs endorsed through practical activity. The shift in Xia from a content-rich to a communicative scaffolded method is an example of how work experience can shift core assumptions. Fei began with ambiguous perceptions of ESP, and gradually figured out a crystallized picture of ESP as a functional, learner-centered and discipline-minded activity.

The internship experience emerged as the most influential factor in shaping participants' evolving perceptions, reinforcing the importance of bridging theory and practice in ESP teacher education. Participants experienced true-to-life situations, making them recognize the gap between the content-only approaches and the worth of a flexible, student-centred type of instruction. These real teaching contexts were talent-critical incidents that elicited critical evaluation and integration of pedagogical knowledge, especially when accompanied by feedback and mentorship. The participants benefited from the internship in applying the learned theoretical knowledge without delay in classrooms where they experienced cases of student engagement, motivation, and diverse learning needs. This practical experience went against their first assumptions, and they had to rethink the practicality and applicability of content-driven methods. Furthermore, the mentoring relationship provided the participants with a friendly environment for critical reflection, where participants were able to freely share their challenges, seek guidance and even try out new ideas on teaching strategies. Specifically, the participants mentioned that the feedback they received during the internship helped them refine their teaching strategies in terms of interaction with students as well as adapting the lessons. Consequently, the internship experience helped not only to incorporate the experience of pedagogical theory into practice but also aided in understanding the essence of effective ESP teaching.

Despite these endeavors, however, there are limitations in this study. The outcomes reported here are not generalizable due to the smaller number of participants, and replicating the belief trajectories here would be beneficial if future studies include a larger group of participants across different institutions. The dependence on self-reported data, which includes reflective journals and interviews, introduces the potential for error or selective recall; incorporating objective measures like peer evaluations, classroom recordings or longitudinal follow-up would provide a more thorough picture of belief evolution. Moreover, the conducted study did not take into account how these beliefs developed in the course of professional practice of teachers and, therefore, the research question still remains concerning such development. Future research should examine what impact the initial belief alterations have on in-service teachers' practices in the classroom and whether the continued professional development plays a role in fine-tuning the ESP teachers' practice in the classroom. In addition, this study was carried out in a single teacher education program; hence, future studies should focus on the effect of context on belief change in different institutional and cultural settings in order to better understand how context influences ESP teacher cognition. Finally, considering the different levels of self-reflection among participants and investigating the efficacy of structured reflective practice in speeding or deepening conceptual change in teacher belief evolution might be the next viable step toward the future.

Despite these limitations, this study contributes to the growing field of ESP teacher education by demonstrating that pre-service teacher beliefs are malleable and shaped by both instructional exposure and real-world teaching experiences. It reinforces the

importance of integrating pedagogical training, structured reflection, and early teaching practice into ESP teacher education programs to ensure that novice ESP instructors develop effective and informed teaching approaches.

Data availability

No datasets were generated or analysed during the current study.

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Appendix A: Sample interview questions

Interview stage	Sample questions
Pre-program	<ol style="list-style-type: none"><li>1. What is your concept about ESP?</li><li>2. What are your beliefs about how ESP should be taught?</li><li>3. What is your perception about the role of an ESP teacher?</li><li>4. What do you anticipate to learn from the methodology course of ESP?</li><li>5. How confident are you about teaching ESP in the future?</li><li>6. What previous experiences, if any, have molded your beliefs about ESP teaching?</li></ol>
During program	<ol style="list-style-type: none"><li>1. How has your consideration of ESP instruction altered since starting the course?</li><li>2. Which characteristics of the course have most affected your thinking?</li><li>3. Can you evaluate any moments that challenged your prior beliefs about teaching?</li><li>4. What is your strategy for lesson planning of ESP classes?</li><li>5. What issues have you observed while delivering lessons of micro-teaching?</li><li>6. Have you observed any differences between ESP teaching strategies and general ESL?</li></ol>
Post-internship	<ol style="list-style-type: none"><li>1. How would you clarify your present beliefs about effective ESP teaching?</li><li>2. How did your internship experiences affect your reviews of ESP instruction?</li><li>3. Were there any teaching moments that caused you to think again about your role as an ESP teacher?</li><li>4. How do you analyze your teaching performance during the internship?</li><li>5. What types of instructional approaches do you now believe are most effective in ESP contexts?</li><li>6. In what ways have your beliefs about language learners and their necessity to evolve?</li><li>7. What are your goals as an ESP teacher in the future, and how have they altered through this program?</li></ol>

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### Author contributions

YS: Conceptualization, methodology and writing. XS: Software, formal analysis, investigation, and resources. YC: Data curation, writing (review and editing). All authors reviewed the manuscript.

### Competing interests

The authors declare no competing interests.

### Ethical approval

All study procedures were approved by the ethics committee of Southwest University of Political Science and Law. Approval date: 15 August 2023, Approval Number:2023-SU254b. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

### Informed consent

Informed consent was obtained from all individual participants or their guardians in this study. As it was not an interventional study, oral consent was obtained. All participants were fully informed that their anonymity would be guaranteed, the reasons for conducting the study, how their data would be used, and whether there were any risks involved in their participation. Date: October 8, 2023.

### Additional information

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