A Systematic Review on ESP Teachers: Current Focus, Collaboration, and Sustainability

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Article information	Abstract
	Since its emergence in the 1960s, English for Specific Purposes (ESP) has been a dominant subfield in language education and English language teaching. The mainstream ESP literature appears to be linguistic-oriented with less attention directed towards ESP teachers. Responding to the calls for more ESP teacher research, this systematic review aims to be a substantial starting point in scrutinising research on ESP teachers published from 2010 to 2022 in the Scopus-indexed journals to frame current research foci, explore existing pedagogical collaborations, and propose suggestions regarding the issue of sustainability. Thirty-seven empirical studies were initially short-listed, of which thirty-two were analysed. A synthesis of ESP teacher articles yields seven lines of research: teachers' perceptions and beliefs, teachers' identity development and agency, perceived challenges and needs, collaborative practices, teaching and innovation, teachers' knowledge, and technology in ESP. Two distinctive types of collaboration to effective instruction across contexts are illustrated. Drawn from the twelve years of research, the sustainability in ESP is presented to depict pedagogical, administrative, and policy implications. Last, future research directions are also proposed.

INTRODUCTION

English for Specific Purposes (ESP) has been considered as a rudimentarily significant approach in English language teaching (ELT). ESP emerged in the 1960s as a response to increasing globalisation and the arrival of English as a commercial lingua franca (Hutchinson & Waters, 1987). Unlike English for general purposes (EGP) that is commonly used for general communication, ESP focuses on the specificity of language use for communicative purposes in different fields of study or professional disciplines (Hyland, 2016). As such, ESP is aimed at specific cohorts of students with specific academic and professional needs. Initially, ESP instruction was based on written text-based accounts of grammatical features in various technical documents and instructors could simply explain those technical terms to connect the lexicogrammar and rhetorical purposes of authors (Hyland & Jiang, 2021). Language instructors were required to teach specialised lexical features or technical terms to students with different first language (L1) backgrounds, and at the same time, they were required to have discipline-specific discursive language abilities (Swales, 1988). In current ESP teaching and learning practices, students'

language use is focused on, which must correspond to their needs. Specifically, the specific needs of learners must inform the ESP practice and should also ensure that there is a link between theory and pedagogical practice (Anthony, 2018; Belcher, 2009; Johns, 2013). Therefore, ESP has become an approach that is used to identify specific linguistic features, discursive practices, and communicative skills that certain groups of learners may need, whilst recognizing the expertise of learners and their subject-matter needs (Hyland, 2006).

Science and technological advancement in the digital era has provoked critical concerns in ELT as to whether traditional teaching paradigms are still advantageous for language learners in different disciplines. The use of English for different occupational purposes has also experienced a considerable increase (Hyland, 2007). As such, extensive expectations have been directed towards ESP teachers who are expected to assist students in accomplishing future career-related communicative tasks through the use of English (Basturkmen, 2017, 2022; Belcher, 2013; Bruce, 2011; Papadima-Sophocleous et al., 2019). Currently, EFL/ESL teachers are expected to be ESP teachers, due to their ability to use English language in ESP pedagogy, placing less focus on the content. This generates many concerns on the instructional balance of "subject content" and "language." In transforming EGP to ESP, teachers report to have been exposed to some critical issues of professional identity construction and development, as how teachers perceive themselves can potentially reshape their praxis and students' performance. Knowledge necessary for ESP teachers and their professional development needs are also critical to effective teaching. Other contextual and administrative factors at an institution in which ESP is offered need to be substantially considered.

Despite the long establishment of ESP, there has been a call for more research on ESP teachers due to its significance to effective ESP instruction (e.g., Basturkmen, 2017; Blaj-Ward, 2014; Ding & Bruce, 2017). The mainstream ESP literature has been proliferated by the linguistic-related work (e.g., formulaic language, specialised vocabulary, specific academic discourse and genres), and needs analyses for ESP course and curriculum development across contexts (Liu & Hu, 2021). It is evident that other salient issues around ESP teachers have not received much attention as Basturkmen (2014) proposes that ESP teachers still know little about themselves. Thus, the current research foci in ESP teacher research need to be reviewed to illustrate the current picture of ESP teacher research, determine research trends, provide under-researched areas for future directions, discuss teaching collaborations, and propose some suggestions concerning sustainability in ESP teaching.

ESP teachers

ESP teachers are considered a key mechanism to establish a nexus between students' needs (both academic and professional) and course requirements aligned with the real-world professional needs. Given its origin, ESP was initially developed out of ELT (Basturkmen, 2021) with the endeavour to help language learners advance their communication skills for their specific employment-related communicative purposes (Basturkmen, 2010; Bruce, 2011; Harding, 2007). As such, ESP teachers are considered specialists who are "often needs analysts, first and foremost, then designers and implementers of specialised curricula" (Belcher, 2006, p. 135). Theoretically, ESP teachers are, thus, required to deliver ESP instruction to a certain cohort of

learners, which includes selecting the content to be taught, balancing the subject content and English language, and encouraging learners to engage themselves in a communicative use of language. In practice, ESP teachers in many contexts are EFL/ESL teachers, not specialists in a discipline (e.g., Ahmed, 2014; Bojovic, 2006), while ESP teachers in some other settings are disciplinary specialists (e.g., Bocanegra-Valle & Basturkmen, 2019; Cao et al., 2022; Górska-Poręcka, 2013; Mulyadi et al., 2020). This distinction has led to multiple instructional challenges that need further administrative and professional actions.

The knowledge required for ESP instruction appears to be excessive and complex. That is, apart from the knowledge of disciplinary knowledge and English language, ESP teachers require how-to knowledge of needs analysis, course design and development, and specialised teaching innovation implementation within their own context (Basturkmen, 2014; Bruce, 2011; Campion, 2016; Dudley-Evans, 1998; Ferguson, 1997; Hall, 2013; Master, 2005). The distinction between ESP teacher's knowledge of subject matter and that of content specialists is considered "potentially fuzzy and occasionally disputed" (Wu & Badger, 2009, p. 21). This can be seen in the case of ESP team-teaching where one language teacher teaches English, and the specialist teaches the content in a certain field. Ferguson (1997, p. 85) proposed that ESP teachers require three holistic areas of knowledge, comprising knowledge of disciplinary culture and values, knowledge of the epistemological basis of disciplines, and knowledge of genres and discourse. By contrast, Harding (2007, p. 7) proposes that a requirement of ESP teachers is "understanding the nature of the material of the ESP specialism." This presumably relates to what Ferguson terms the "knowledge of genres and discourse" with a focus on the conventionally structured texts in different professional domains. Notably, all proposed knowledge is interconnected, meaning the disciplinary cultures and values can (re)shape the way professionals in a certain domain think, practice, critique, and express themselves through writing and speaking, and that, in turn, is reflected through knowledge of genres and discourse (community of practice). Thus, it may be worth revisiting the knowledge necessary for ESP teaching today in which technology has advanced the teaching and learning scenario.

Teachers' collaborations in ESP teaching are evidenced to help strengthen ESP instruction in many contexts. First, intradisciplinary collaboration occurs within the same cohort of ESP teachers. That is, language teachers or content teachers cohesively collaborate in designing, planning, and even reflecting on their own ESP practices. From the language teachers' perspective, pedagogical knowledge may be improved through the exchange of ideas, and collaborative reflection in which the ineffective practice can be resolved by others with more ESP teaching experience as the knowledge-sharing and problem-solving platform (Basturkmen, 2019). Second, interdisciplinary collaboration includes collaborative acts from both language and content teachers. This type of collaboration allows the language teachers to provide language-related support for content teachers to use in their ESP teaching, while the content teachers can also be the content specialist for language teachers to gain more insights into students' disciplinary practice. Such collaboration may also help novice ESP teachers learn how to deal with academic and professional expectations from the ESP community (Chien, 2014; Körkkö et al., 2016). Such collaboration can also help ESP teachers to develop a self-efficacy as they are exposed to more concrete instructional and decision-making exemplars (Makina, 2018; Parsons & Stephenson, 2005; Stenberg et al., 2016). Other collaborations can also be performed.

Specifically, researchers could assist ESP teachers (both language and content teachers) to conduct an exploratory study or to integrate secondary research findings in similar professional domains (e.g., English for business, English for mass communication, English for medical purposes) into course objectives, design in-class authentic activities/tasks, select materials, and even inform their knowledge of assessment. ESP teachers can also be trained to explore possible changes in learners needs, wants, and necessities (Duddley-Evans & St John, 1998; Hutchison & Waters, 1987), the core elements in ESP, and implement these into classroom-based practices. Thus, a review to practices through ESP teacher research may paint a clearer picture on collaborative practices reported to be effective and practical for ESP instruction, yielding contribution to ESP teachers, teacher education, and policy makers.

Calls for ESP teachers research

The general trends of ESP research include needs analysis, discipline-specific genres, corpus studies, specialised language skills, and lexical configuration (Belcher, 2009; Belcher et al., 2011; Paltridge & Starfield, 2013). The Handbook of ESP further adds more relevant topics, namely disciplinary variation, intercultural rhetoric, English as a Lingua Franca, and critical perspectives (Hyland & Shaw, 2016; Paltridge & Starfield, 2013). Most ESP-related publications concern the linguistic descriptions (e.g., lexical usage, formulaic language, rhetorical moves, and discipline-specific discourse), while a few prior studies have covered the ESP teacher (Blaj-Ward, 2014; Ding & Bruce, 2017; Ding & Campion, 2016). Specifically, prior studies on ESP teachers have been restricted to the transition of teachers' practice from EGP to ESP and the challenges they encountered during the process of such transition (e.g., Alexander, 2012; Campion, 2016), and the strategies these teachers employ to compensate for gaps in their subject content knowledge (Wu & Badger, 2009). Thus, other ESP teachers-related issues are in urgent need.

The call for more ESP teacher studies is also reflected through the co-citation analysis by Liu and Hu (2021). Their research synthesis illustrates that the mainstream discussion in the ESP literature appears to be linguistic-related and needs analysis dominant. It seems to neglect another fundamentally significant component in ESP education, "ESP teachers", who can bridge the gaps between mandatory policy and classroom practices, and between the students' expectations and real-world professional and linguistic needs. This co-citation analysis further yields several under-researched domains or what the authors termed, "New ESP territories", including (1) local grammar (e.g., Parkinson & Musgrave, 2014), (2) intradisciplinary variation (e.g., Hu & Gao, 2015), (3) multimodal discourse, academic speech and under-researched genres (e.g., Hu & Liu, 2018; O'Halloran et al., 2016; Zou & Hyland, 2020), (4) ESP teacher development (e.g., Margić & Vodopija-Krstanović, 2018), (5) improvement on research methodologies (e.g., Simpson-Vlach & Ellis, 2010), (6) contextualised research methodologies (e.g., Paltridge et al., 2016), and (7) reception studies of ESP research (e.g., Swale & Leeder, 2012).

Another recent review on ESP research directions conducted by Basturkmen (2021) suggests two lines of inquiries. The first line of ESP research concerns the linguistic inquiries conducted to explore linguistic needs for learners, namely (1) move structures in occasional speeches

(Kithulgoda & Mendis, 2020), (2) word phrases in secondary school textbooks (Green & Lambert, 2019), (3) lexical features for medical students (Nguyen Le & Miller, 2020), and (4) target lexical features for undergraduate computer science students (Bi, 2020). The second line of research concerns curriculum development and ESP pedagogy (Gollin-Kies et al., 2015). The emerging themes include (1) course development to enhance listening decoding skills for Psychology-majored students (Henderson & Cauldwell, 2020), and Legal English course development (Stojković, 2020). Basturkmen (2021) also proposes that despite the proliferation of the needs analysis studies in ESP over the years, the studies have been advanced, integrating more rigorous research methodology as seen in many recent studies, e.g., vocabulary needs (Atai & Hejazi, 2019) and academic English needs (Malmström et al., 2018).

Despite the significance of ESP teachers, ESP teacher research is still in its infancy. Highlighting existing research gaps and long-lasting calls for ESP literature, this systematic review aims to respond to the calls by systematically analysing ESP teacher studies published in the *Scopus*-indexed journals from 2010 – 2022 to highlight the existing research foci believed to be an initial step for both experienced and novice researchers to scrutinise this substantial line of research. The following research question was generated: What are the research foci in the ESP teacher research from 2010 to 2022 published in the Scopus-indexed journals?

METHODOLOGY

The current study employs the principles of a systematic review to analyse the selected empirical studies (see Appendix). Unlike a traditional narrative review, a systematic review refers to the "scientific methods" (Petticrew & Roberts, 2006) and is conducted to reduce systematic bias via identifying, evaluating, and synthesising all construct-related studies (Ellis, 2015; Plonsky, 2017; Plonsky & Ziegler, 2016). Macaro (2020) proposes that a traditional review may be influenced by biases due to the absence of systematicity in the selection of the published relevant articles, how such articles are (in-depth) reviewed, and how the articles are analysed and critiqued. Systematic reviews need to allow for systematicity, transparency, and replicability (Grant & Booth, 2009). The current study also follows Macaro's (2020) suggestion on bias elimination, stating that during the data analysing process, a co-coder is required to strengthen the quality of the analysis. As such, one assistant professor of English language teaching with a PhD in TESOL, who has published scholarly work on ESP teachers, was invited to co-analyse the selected studies. This effort helped to maintain the trustworthiness of the whole research process (Phakiti & Paltridge, 2015).

Article selection

Studies published in Scopus-indexed journals from 2010 to 2022 were selected for analysis. The article selection was conducted using the keyword search on Scopus. These keywords included: "ESP Teacher" OR "ESP Practitioner" OR "ESP Instructor" AND "ESP Teaching" AND "ESP Education." The researcher also applied an advanced search by setting the timespan (2010-2022), limiting the document coverage to articles, and selecting only articles written in English. Over three hundred and fifty articles were discovered in the initial searching stage. In

an abstract screening stage, thirty-seven research articles were found to be relevant to the aims of the review. The selected articles were then proceeded to the second round of abstract screening conducted by the researcher and an invited co-analyst. Only thirty-two empirical studies were eventually included in the systematic review. These studies were also all sourced from double-blind peer review journals to ensure their legitimacy as they have gone through the necessarily rigorous reviewing process with steep academic criteria that, in turn, has generated a high impact to the field (Duman et al., 2015).

Inclusion and exclusion criteria

The inclusion criteria included: (1) articles published during the determined period (2010 – 2022), (2) articles must consist of empirical research with a double-blind peer review process, and (3) articles with the following constructs - "ESP teachers", "ESP practitioners", or "ESP Instructors." For the exclusion criteria, research articles with no research methods, academic papers on ESP teachers, and reports on ESP practices with no research processes were excluded from the review. Another significant aspect concerned the constraints of the systematic review. That is, some forms of scholarly work such as, book reviews, unindexed articles in journals, and theses, were excluded. The exclusion criteria were established according to the objectives of the systematic review, placing different foci onto different domains of ESP teacher literature. Thus, a few papers or projects were inevitably missed. To deal with this inevitable constraint, Rose et al. (2018) suggest that "a positive result of following these stringent criteria is the limitation of bias, thereby increasing the trustworthiness, and arguably the value, of the results and recommendations of the study" (p. 153).
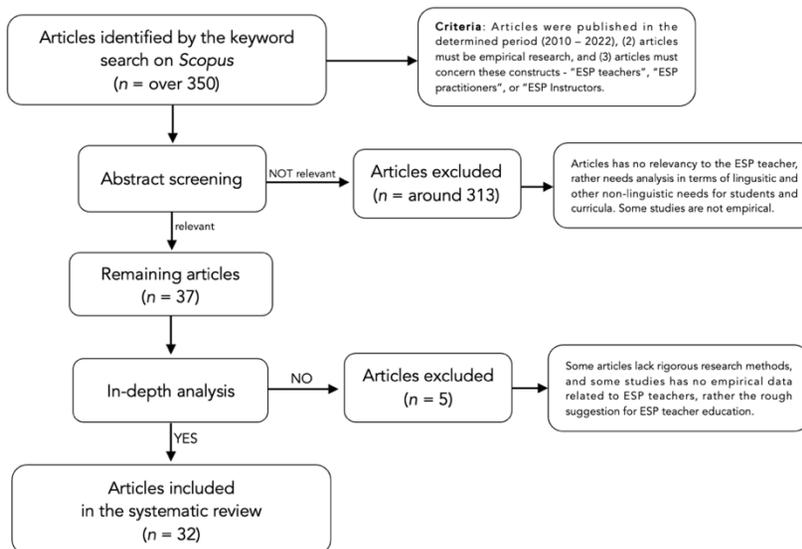

Figure 1 Procedural diagram of the article selection

Data analysis

After the initial abstract screening, a total of thirty-two research articles on ESP teachers were proceeded to in-depth analysis. All relevant articles were downloaded onto the researcher's PC and shared through Google Drive for a co-coding purpose. The obtained articles were analysed using an inductive coding approach (Phakiti & Paltridge, 2015). That is, all articles were grouped into different shared themes according to the research constructs, including teachers' perceptions and beliefs, teachers' identity development and agency, perceived challenges and needs, collaborative practices, teaching and innovation, teachers' knowledge, and technology in ESP instruction. The study demographics (contribution) concerning research foci, contexts, study types, participants, data sources, and key findings were also analysed. Some studies on EFL teachers and their pedagogical practices were excluded despite having suggestions for ESP teachers as those studies were not purposively conducted to contribute to the empirical literature of ESP teachers, but rather to offer rough suggestions for ESP education. Two analysts independently analysed the articles in the first round, and, in the second round of data analysis, the researcher and the co-coder collaboratively analysed the articles, identifying contrastive interpretations. The disagreements were resolved to form a conclusion. In this process, the appropriateness of the articles in terms of research methodology, objective-relevant nature, and reliability and trustworthiness of their analysis, were also considered to maintain the reliability of the systematic review results (Gough et al., 2017; Macaro, 2020).

RESULTS

Research foci in ESP teacher

The synthesis of the ESP teacher-related research from 2010 to 2022 on the Scopus database yielded that the research foci in the ESP teacher literature appear to have an association with seven interrelated aspects. As illustrated in Table 1, those research foci include (1) ESP teachers' perceptions and beliefs towards the implementation of ESP instruction and implementation in their localised contexts, (2) ESP teachers' identity development and agency, (3) perceived challenges and needs, (4) collaborative practices, (5) teaching and innovation, (6) teachers' knowledge, and (7) technology in ESP instruction.

Table 1
Current ESP-teacher research foci in Scopus-indexed journals during 2010 – 2022

Theme	Construct	Author	Year
Teachers' Perceptions and Beliefs	ESP teachers' perception of resilience	Estaji and Rahimi	2014
	Lecturers' beliefs about active learning in ESP class	Nguyen	2020
	Quality and relevance of ESP in higher education	Kamberi et al.	2020
	Teachers' attitudes towards online EAP instruction implementation	Dashtestani	2020
	ESP teachers' attitudes toward online instruction	Gavranović and Prodanović	2021

Theme	Construct	Author	Year
Teachers' Perceptions and Beliefs	Influence of culture and context on teacher beliefs and behaviour	Yang and Wyatt	2021
	English for medical purposes (EMP) teacher cognition	Cao et al.	2022
	Students' and teachers' perceptions of effective ESP teaching	Bui	2022
Challenges & Needs	Challenges and needs for English curriculum innovation	Jiang et al.	2018
	Teacher education needs of experienced ESP teachers	Bocanegra-Valle and Basturkmen	2019
	ESP teachers' needs of professional development	Bayram and Canaran	2020
	Instructional challenges of English for aviation teachers	Demirdöken	2021
	Perceived challenges of ESP teaching	Iswati and Triastuti	2021
	Challenges in ESP teaching	Meristo and López Arias	2021
	ESP teachers' sociocultural challenges in online formative assessment	Rachmawati et al.	2022
Teachers' Identity & Agency	Teacher's identity development	Chang	2017
	ESP teachers' identity constructions	Tao and Gao	2018
	Professional teacher identity	Ayar	2021
	Teacher agency in ESP instructional policy implementation	Deng	2021
	ESP teacher identity model	Rebenko	2020
Collaborative Practice	ESP Teachers as CLIL tutors	Woźniak	2017
	Reflective practice to ESP-teacher agency development	Tung	2018
	Relationship between collaborative climate and knowledge sharing	Farahian and Parhamnia	2021
	Collaboration between ESP teaching and domain expert in CLIL	Jitpaiboon and Sripicharn	2022
Teaching & Innovation	Relationship between teaching styles and self-efficacy in ESP teachers	Baleghizadeh and Shakouri	2017
	Pedagogical shift in ESP from lecture-based to active learning	Nguyen et al.	2019
	EAP teachers' localized ESP genre-based pedagogy	Li et al.	2020
	Teacher emotion and pedagogical decision-making in ESP teaching	Zhao et al.	2022
Teacher's Knowledge Technology in ESP	Roles of teacher knowledge in ESP course design	Górska-Poręcka	2013
	ESP teachers' TPACK	Mulyadi et. al.	2020
	Digital technology in ESP	Kakoulli Constantinou and Papadima-Sophocleous	2020
	WEBQUEST as technology of differentiated ESP instruction	Synekop	2020

1. ESP teachers' perceptions and beliefs

The systematic review suggests that this line of research appears to be a dominant area. Specifically, there were only five empirical studies that investigated ESP teachers' perceptions towards ESP instruction implementation, online instruction (Dashtestani, 2020; Gavranović & Prodanović, 2021), and perceived effectiveness of ESP instruction (Bui, 2022) across the pedagogical contexts. Only two studies made an attempt to explore the concepts of teachers' resilience (Estaji & Rahimi, 2014), and quality and relevance of ESP education (Kamberi et al., 2020). The other three articles merely concern teachers' beliefs (Cao et al., 2022; Nguyen, 2020) and factors influencing such beliefs (Yang & Wyatt, 2021).

Estaji and Rahimi (2014) explored ESP teachers' perceptions of resilience in relation to their professional development. With an underlying theoretical assumption, resilience is believed to help teachers persist in difficult encounters, as evidenced in the studies of teachers' stress and burnout. This study aimed to answer the question of whether teachers' genders and experiences had an influence on their resilience, and teachers' perceptions of resilience and their roles in dealing with resilience in classroom. Forty ESP teachers from various public universities in Iran were invited to complete a five-point *Likert*-scale questionnaire. The statistical analysis of *Chi*-square revealed that there was a significant difference between resilience and teaching experience, and genders and resilience. Qualitative data also supported the quantitative results that resilience was reflected through pedagogic tasks forming different patterns of behaviours that were considered a salient factor for teachers' professional development. In the same vein, Kamberi, Urlica and Ameti (2020) conducted a study to explore ESP teachers' perceptions towards the quality and relevance of ESP instruction in tertiary education in Romania. Framed in the qualitative case study design, ten university teachers were contacted to respond to the online open-ended questionnaire. The findings suggested that the quality and relevance of ESP instruction appeared to be largely related to the university management in terms of organisation and course deliveries, and to establish a united perspective on English as a lingua franca in all fields of study.

Responding to the scarcity of online instruction research, Dashtestani (2020) explored teachers' perceptions towards the online EAP course implementation in Iran. The mixed methods design with the use of a questionnaire and semi-structured interview indicated that most of the participants (n = 91) expressed positive attitudes towards the online EAP instruction despite the ongoing challenges and constraints encountered by the teachers. Moreover, emerging constraints included the absence of training, online learning and teaching facilities, low digital literacy of both instructors and students, and infrastructures necessary for online instruction. The participants further opined practical measures in achieving the better EAP/ESP course implementation to those involved in the policy making process and course design. Similarly, Gavranović and Prodanović (2021) conducted a more recent study to investigate ESP teachers' perceptions towards their online course during the COVID-19 pandemic. The quantitative study involved sixteen ESP teachers across disciplines (e.g., business, information technology, tourism, sport management and, environmental science). The results from the five-point *Likert*-scale questionnaire revealed that the teachers perceived themselves as "digital immigrants" in transferring their synchronous class into an asynchronous environment. Despite the difficulties in teaching language skills, teachers' self-efficacy was evidenced. In a non-online classroom environment, Bui (2021) also conducted a large-scaled study to explore teachers' and students' perspectives towards an effective ESP instruction. Two hundred and forty-eight participants from five Vietnamese universities were involved (216 students and 32 teachers). The *Likert*-scale questionnaire and interview were utilised. The findings illustrated that all categories for the effective ESP course, that teachers and students' responses, involved (1) task-based language teaching, (2) corrective feedback and assessment, (3) discipline specifications, (4) culture integration, (5) language use, (6) application of technologies, and (7) grammar teaching. Moreover, the teachers and students held different perceptions in the first four categories, while there was an alignment in their perceptions in the last three categories.

The ESP teachers' beliefs that were elicited from teachers' perceptions on the concept of active learning (AL) in ESP classes were evidenced in Nguyen's (2020) work. This classroom-based action research aimed at exploring the five science teachers' beliefs about active learning as reported to be implemented in their ESP classes over a three-semester period. Several instruments (e.g., semi-structured interviews, classroom observations and planning meetings) were used. The findings disclosed that after having used an AL approach, the positive beliefs about AL were evident, contributing to the rise in teachers' awareness of their professional role shift from a traditional lecturer to a learning facilitator. Another key point was that teachers' self-efficacy and agency (roles) were considered a key mechanism to fuel change. Such change appeared to be dynamic and collaborative in nature that occurred in the cyclical procedures - developing, implementing, reflecting, and planning for future actions. Another study by Cao et al. (2022) explored teachers' beliefs in English for Medical Purposes (EMP) courses in China. This large-scale mixed methods research (MMR) study included 254 ESP EMP teachers who responded to a questionnaire developed on previous studies on teachers' cognition. The study revealed that teachers' beliefs were constituted and influenced by their own perceptions, beliefs, prior learning, supports, professional roles, and pedagogical practices. These categories were not discrete, but to some extent, interrelated, meaning that teachers' beliefs were (re) shaped by these factors in a non-linear direction. Similarly, Yang and Wyatt (2021) explored the concept of ESP teachers' beliefs about their practice and students' motivation. Using stimulated-recall interviews and classroom observation, their qualitative case study of three Chinese teachers asserted that there were discrepancies between teachers' beliefs about students' motivation and their observed roles and practices. Such discrepancies were believed to impact the self-determination of the teachers. The sources of discrepancies resulted from the limited professional development (PD) exposure, dated knowledge of motivation, deep cultural value of Confucianism, and assessment culture. Moreover, the researchers raised that support provision may help Chinese ESP teachers deal with the culture-related and context-related issues.

2. ESP teachers' identity and agency

Another cohort of empirical studies on ESP teachers concerns how teachers develop their identity as an ESP teacher in teaching an ESP course in which linguistic and professional knowledge need to be focused. In this line of research, teacher identity construction and development appear to be the most dominant issues (Ayar, 2021; Chang, 2017; Deng, 2021; Tao & Gao, 2018) while only one issue of an ESP teacher identity model (Rebenko, 2020) was documented. Notably, this line of ESP teacher research appears to be more or less associated with long-established debates on an ESP teacher, resulting in the challenges and dilemmas in constructing their identities that correspond to students in specific disciplines and students' future employment.

The teachers' identity development was first documented in Chang's (2017) work. The fundamental focus of this work was placed on how one EAP teacher developed an identity after his/her exposure to the ESP classroom in Taiwan. This longitudinal qualitative case study used multiple instruments to capture such identity development over time, including reflections, learning journals, teaching journals, and semi-structured interviews. The findings indicated

that from EAP to ESP instruction, teachers needed to encounter extensive learning, participate in interdisciplinary collaboration, solve pedagogical and contextual problems, meet stakeholders' expectations, and practice various pedagogical tasks. As such, the ESP teacher was perceived to be a learner, communicator, collaborator, multi-tasker, presenter, problem-solver, evaluator, and manager. Chang further proposed that, of those roles, four (e.g., a learner, collaborator, multi-tasker, and problem-solver) appear to be the major differences from EAP instruction that fundamentally contributed to greater teaching experience. Early-career ESP teachers and ESP educators should foster these identities for potential challenges in the changing and localised ESP instruction.

The concept of ESP teachers' identity construction was studied by Tao and Gao (2018). This qualitative study was conducted to encapsulate the complex identity construction of eight Chinese ESP teachers, using the model of TESOL teacher identity (Pennington, 2014). This important study provided many theory-driven and evidence-based conclusions that becoming an ESP teacher was a complex process in transforming professional practices and constructing identities. Although teachers' identity was found to be influenced by their intrinsic fulfilment in assisting students to acquire ESP-related skills necessary for their socio-economic status escalation, it was undermined due to the marginalised status imposed by the university. The researchers further suggested that ESP teachers may fail to sustain their professional identity development unless the sufficient institutional support (e.g., incentives, extrinsic rewards, authentic material provision, and engagement with experts in many business fields) was facilitated. Another sub-aspect of teachers' identity was the professional identity. Ayar (2021) explored teachers' professional identity in an ESP course with three teachers in Turkey, using autobiographies, informal dialogues, classroom observation, field notes, and interviews. The results indicated that professional competence was considered the most significant mediator to develop an awareness of teachers' professional identity. Moreover, that self-efficacy played an important role in teachers' complex identity construction.

Rebenko (2020) conducted a study to explore ESP teachers' identity that was later used to establish a model of ESP teacher identity. Using an MMR approach, a total of thirty-six participants in Ukrainian universities (fifteen senior ESP students, fifteen language teachers, and six content teachers) were invited to complete open-ended and closed-ended questionnaires. All groups of participants agreed that the model of ESP teacher identity should include multiple categories – "methods of teaching", "professional knowledge", "individual features", "foreign language competence", and "work experience." The researcher further stressed that "professional knowledge" appeared to be as significant as "work experience." Rebenko's study shaded the light on the ESP teachers' Identity by adding new findings and a reduction of the ambiguity in ESP teacher identity as addressed in previous literature by using a combination of methodological procedures.

For teachers' agency in implementing an ESP instruction, Deng (2021) explored how ESP teachers implemented the ESP-related language policy in Chinese tertiary education. This qualitative study with five university teachers suggested that ESP teachers showed their resistance towards the mandated ESP policy by "adjusting" the requirements, rather than "implementing" them. Such resistance was caused by teachers' academic background, their

understanding of language learning and acquisition, profound distrust of ESP instruction, and students' performance in their ESP courses. The in-depth analysis of teachers' voices further yielded that teachers' agency can be transformed into a defending mechanism of their unwillingness to change that could not benefit students' language and professional performance.

3. ESP teachers' perceived challenges and needs

One of the dominant domains of ESP teacher research appears to be teachers' perceived challenges and needs in their localised ESP instruction, curriculum, professional development (PD), and assessment. A total of seven empirical studies were included in this line of research, representing the current research trends in this sub-area of ESP. Specifically, three studies were conducted to explore the challenges in ESP teaching across contexts (Demirdöken, 2021; Meristo & López Arias, 2021; Iswati & Triastuti, 2021), two on PD needs (Bocanegra-Valle & Basturkmen, 2019; Bayram & Canaran, 2020), one study on both challenges and needs for English curriculum design and innovation (Jiang et al., 2018), and one study on challenges in an online formative assessment (Rachmawati et al., 2022). The following sections provide a more in-depth analysis of the mentioned studies.

ESP instruction is catered for a specific cohort of students in a specific discipline and, as such, the localised ESP instruction often faces the challenges. For instructional challenges, Demirdöken's (2021) employed the constructivist approach to conduct a qualitative study to explore the challenges teachers encountered in aviation English in Turkey, using observation, observation notes, checklists, and semi-structured interviews. The analysis indicated that self-efficacy beliefs concerning how a pilot could naturally behave in multiple real-life target situations appeared to be the main challenge. Another challenge concerned the insufficient aviation-related knowledge, resulting from the absence of professional training and teachers' hand-on experiences also emerged. In a similar study, Meristo and López Arias (2021) investigated the challenges in ESP teaching in an Estonian context with thirteen English teachers in public universities, using a semi-structured interview. This qualitative study yielded three salient challenges – dealing with changes in professionalism resulting from insufficient content knowledge and no professional training, lack of collaboration, instability of ESP instruction implementation. This set of challenges was aligned with that of Iswati and Triastuti's (2021) study with five ESP teachers with no TESOL-related background in Indonesia. The findings, drawn from the interview data, revealed five profound areas of challenge – low content knowledge, inadequate ESP-teaching training programmes, practical needs analysis training, large classroom size, and mixed ability students. Thus, the main challenges of ESP instruction revolved around the specific content knowledge, lack of ESP training, interdisciplinary collaboration, and contextual and managerial issues. Surprisingly, the issue of English language proficiency of ESP teachers was not perceived to be a challenge in ESP instruction. That may be because EFL/ESL teachers in those universities, except Iswati and Triastuti's (2021) work, are also an ESP teacher, placing the perceived challenges to be non-English-related. This finding is indeed significant to ESP educators in considering the possible challenges that different groups of ESP teachers would encounter. That is, ESP teachers who are EFL/ESL teachers may have a different set of challenges that are different from that of the content teachers.

Another sub-aspect of research concerns ESP teachers' needs. Two studies were conducted to investigate the needs in terms of PD and teacher education needs. That is, Bocanegra-Valle and Basturkmen (2019) explored the teacher education needs of nineteen in-service university teachers in Spain. The qualitative study with semi-structured interviews suggested that these experienced teachers had their needs in five areas – course development, content knowledge, language use necessary for a target discipline, peer collaboration, opportunities for PD. The findings further indicated that the ESP teachers had "a plurality of interrelated necessities, concerns, expectations, lacks and wants" (Bocanegra-Valle & Basturkmen, 2019, p. 144). In a similar study, Bayram and Canaran (2020) conducted an MMR study to investigate twelve novice ESP teachers' PD needs in Turkey, using the Competency Framework for Teachers of English for Academic Purposes questionnaire and one-on-one interview. The findings illustrated five main needs, including a teacher-and-faculty collaboration, higher-order thinking skill promotion, appropriate textbooks and teaching materials, and knowledge of ESP-pedagogy. Moreover, ESP teachers had an insecure feeling, resulting in low self-efficacy, when individually performing pedagogical tasks, placing such a need of collaborative practice.

In terms of English curriculum innovation, both challenges and needs were reported in Jiang et al.'s (2018) work. This explanatory sequential MMR study invited two-hundred and eight novice teachers in China to complete the questionnaire and six to take part in semi-structured interviews. The exploratory factor analysis generated four main challenges and needs that included (1) "developing new subject matter knowledge", (2) "knowing needs and students", (3) developing new pedagogical content knowledge", and (4) mapping existing communication skills in new curriculum context." The researchers also noted that institutional support in terms of finance and policy were important to effective ESP course provision.

Recently, only one study in this line of research explored the sociocultural challenges faced by the ESP teachers in conducting an online formative assessment (FA). Rachmawati et al. (2022) conducted a large-scale study with five hundred and sixteen participants (118 ESP teachers, 367 students, and 14 program coordinators) from twenty-five different universities in Indonesia. The challenges were classified into four main areas – strategic, resource, social, and technical challenges. To the strategic challenges, no FA integration into the curriculum, no concrete guidelines, established standards, and no impact on students' grading policy emerged. The resource challenges were the lack of administration in terms of time, classroom size and assessment materials, while the social challenges involved distance between teachers, students, and faculty's support personnel, indicating low collaboration among stakeholders. Last, teachers reported that they encountered the technical challenges of FA-informed pedagogy, nexus between the lessons and FA contents, and no FA standards to follow.

4. Collaborative practices to ESP instruction

The systematic review revealed that only two types of collaboration emerged in this line of research. The first collaboration was between language teachers and content teachers as implemented in CLIL settings (Woźniak, 2017), while the second collaboration was between the ESP teachers and domain experts in students' discipline (Jitpaiboon & Sripicharn, 2022). Moreover, the reflective practices among ESP teachers were perceived to be a knowledge-

sharing platform to reflect on (in)effective instructional decisions and practices (Farahian & Parhamnia, 2021) and essential for teachers' agency development (Tung, 2018). This line of ESP teacher research still requires more localised work to contribute to the ongoing debate of who can be ESP teachers and how an ESP class can be effectively delivered.

The collaboration between language teachers and content teachers was reported in the work of Woźniak (2017). This longitudinal study aimed to gain insights into how ESP teachers navigated their changing roles in Spain. The ESP teachers in this study were those with backgrounds in ELT and appointed to be CLIL tutors who helped the content teachers integrate English language into CLIL. Two open-ended questionnaires and interviews were used. The result indicated three main aspects of work vis-à-vis contribution to the CLIL programmes. The first aspect was that ESP teachers were identified as a "content-language support" who were responsible for conducting a needs analysis, utilising appropriate instruments and frameworks to design a course for language skills improvement. The second aspect was named "ESP teachers in CLIL" and this was where the collaboration occurred. In this part, ESP teachers helped the content teachers practically integrate English language into their areas of studies. This included the help in pedagogical strategies, contents to be delivered through English, material selection and design, target linguistic identification, assessment, and occasional team-teaching. The last aspect regarded a "disciplinary communication within the subjects." To this, ESP teachers needed to communicate with other administrators in a certain discipline to introduce disciplinary practices into an ESP course. In a similar study in the context of CLIL, the collaboration between the ESP teachers and specific domain experts was evidenced. Jitpaiboon and Sripicharn (2022) conducted an MMR study with twenty participants (including students, professionals, and ESP teachers) in Thailand to explore such collaboration, using both questionnaire and semi-structured interview. The findings yielded that the collaboration between ESP teachers and domain experts appeared to be effective and beneficial to the knowledge of subject content, specialised linguistic features, and awareness towards professional culture. In addition, students exhibited more learning motivation and task engagement with the domain experts, and this helped students see the nexus between the course and their future employment.

Teacher collaboration was perceived to be a knowledge-sharing platform to reflect on their pedagogical decisions and instructional practices among different cohorts of ESP teachers. Farahian and Parhamnia (2021) explored the relationship between the collaborative climate and knowledge sharing in a large group of Iranian ESP teachers (n = 328), using a questionnaire and interview. The findings illustrated the four sub-categories of collaboration, including (1) institutional culture, (2) department head, (3) teachers' perceptions, and (4) group support. The multiple regression also showed that these four sub-categories were the predictors of teachers' perceptions towards knowledge sharing. The integration of reflective practice through collaboration or group support in ESP teachers' agency development was documented in Tung's (2018) work. Tung's qualitative case study with five ESP teachers in Vietnam was developed with the underlying assumption that collaborative reflective practice was believed to be a key in escalating teachers' awareness necessary for PD. Through the interviews, the findings suggested that the reflective practice substantially contributed to the development of teacher agency. ESP teachers demonstrated their contentment and commitment to improve their current teaching practices. Reflection, thus, appeared to stimulate their PD for professional tasks on a regular basis.

5. ESP teaching and innovation

The emerging issues concerning ESP teaching and innovation that ESP teachers developed for their localised ESP instruction vary. That includes (1) localised ESP genre-based pedagogy (Li et al., 2020), (2) pedagogical decision-making (Zhao et al., 2022), (3) pedagogical shift from lecturer-based to active learning (Nguyen et al., 2019), and (4) teachers' teaching styles and self-efficacy (Baleghizadeh & Shakouri, 2017). Considering the number of existing studies, it clearly reflects that an extensive body of research concerning localised ESP teaching is needed so that other ESP teachers can access or at least generate some debates on effective teaching and innovations. The following section provides an in-depth analysis of the existing studies.

Li et al. (2020) reported on what they termed as "a localised genre-based pedagogy" (p. 1). Such pedagogy was evidenced through the recordings of classroom instruction, document analysis, and interviews. This qualitative case study involved two Chinese EAP teachers. Apart from the localised pedagogy, the findings further suggested steps for teachers to follow. Specifically, the instruction involved, first, setting "inductive and discovery-based genre analysis", developing pedagogical tasks from the available local resources, and integrating a linguistic approach into a genre approach. The study also suggested that genre-based written papers in students' disciplines contributed to the establishment of common ground for ESP learning, teaching, and sharing.

How ESP teachers made their pedagogical decisions was also explored in this line of research. Zhao et al.'s (2022) qualitative study with nine experienced ESP teachers in China was conducted to gain more insights into teachers' emotion and decision-making. The participants took part in two rounds of semi-structured interviews, and all associated documents were also analysed. The study suggested that ESP teachers' pedagogical decisions were significantly influenced by the emotional labour, resulting from the students' engagement. The ESP teachers reported to have experienced a mixture of emotions pertaining to expectations, disappointment, empathy, and anger. Moreover, they also placed a distance between their position and that of the institution due to the strict regulations, objective assessment based on students' performance, and students' punishments for those with low class engagement.

The pedagogical shift from a traditional teacher-centred approach to a student-centred one is observed in Nguyen et al.'s (2019) work. The qualitative study with eight Vietnamese ESP teachers aimed to encapsulate such a pedagogical shift, using a semi-structured interview and classroom observation. The findings portrayed that all ESP teachers perceived active learning as a student-centred approach, and they were aware that their roles had changed while implementing active learning. The classroom observation also indicated that the teachers practised active and interactive learning activities, placing more focus on teacher-student interaction. To achieve the meaningful use of the target language for professional communication, this type of interaction needed to be promoted as it perhaps helped increase teachers' self-efficacy to teach a subject content that was not their area of specialisation. This could, in turn, reduce the tension occurring from the discrepancies between teachers' pedagogical competence and students' expectations based on what they need for their future professional practices.

The last issue on ESP teaching and innovation concerns the relationship between teachers' teaching styles and self-efficacy. Baleghizadeh and Shakouri (2017) developed a quantitative study to explore the relationship between the two constructs of teaching styles and self-efficacy. A total of eighty-seven ESP teachers from different universities in Iran voluntarily participated in the project by completing the questionnaire. Findings suggested that there was a significant relationship between ESP teachers' teaching styles and self-efficacy, meaning that the confidence in teaching resulting from the accumulation of teaching experiences, content and language knowledge, and classroom management skills, appears to be the key to the selection of appropriate teaching styles for a certain group of students in an ESP class.

6. ESP teachers' knowledge

The systematic review indicated that only two empirical studies explored the constructs related to teachers' knowledge in teaching ESP courses and the roles of knowledge necessary for ESP course development. Specifically, Mulyadi et al. (2020) conducted a quantitative study to explore teachers' TPACK (Technological Pedagogical and Content Knowledge) in blended learning in Indonesia. The results, drawn from the questionnaire with seven ESP teachers, showed that the ESP teachers in the study mastered three sub-domains of TPACK (1) Technological Content Knowledge, (2) Technological Pedagogical Knowledge, and (3) Technological Pedagogical and Content Knowledge), and they needed to further improve their Pedagogical Content Knowledge to achieve effective ESP instruction in a blended learning environment. In addition, Górska-Poręcka (2013) investigated the roles of ESP teachers' knowledge in course development. Considering the extension of teachers' beliefs in language education, this quantitative study aimed to encapsulate the internal structure of ESP teacher beliefs and identify the knowledge bases and their functions. Thirteen teachers of legal English and business English were involved to complete a five-point Likert-scale questionnaire. The findings demonstrated that there was a distinction between EGP and ESP instruction, specifically ESP teachers' professional knowledge. The major difference relates to the subject content where the ESP practitioners need to align their pedagogical practices with students' specific disciplines. Another salient aspect concerned teachers' complex and cognitively demanding roles in ESP instruction. These required additional abilities, concerning needs analysis, course design, and material selection and development.

7. Technology in ESP instruction

This line of ESP teachers' research has received little attention as for over a decade, there have only been two empirical studies that documented the integration of technology in ESP instruction. In the first of which, Kakoulli Constantinou and Papadima-Sophocleous (2020) explored teachers' digital technology use in ESP instruction where sixty-seven ESP teachers in Greece and Cyprus were invited to complete a Likert-scale questionnaire on their technological employment. The analysis indicated that the use of technology could facilitate ESP teachers' tasks concerning course design and development, teaching, material selection and development, course evaluation, and research. With the realised importance of technological utilisation, ESP practitioners still need further technological improvement along with collaboration with domain experts, productive skill development for students, activity and task design, subject knowledge development, and teaching methodology. In the same year, another study by Synekop (2020)

was conducted to reflect on teachers' use of WebQuest as the "technology of differentiated ESP instruction". Thirty-one Ukrainian teachers from the department of English for Engineering voluntarily participated in the project to have their classroom observed and the questionnaires completed. The results demonstrated that ESP teachers employed the WebQuest learning as an approach in their differentiated teaching. Such technological utilisation could help diversify ESP learning offered by a technical university and improve students' skills in their professional communication. From the teachers' knowledge of TPACK and the use of technology to teach ESP, it is evident that technology literacy needs to be added to the existing knowledge bank of ESP teachers.

DISCUSSION

Collaborations to teach ESP

Although the issue of team-teaching in ESP courses has been highlighted by Dudley-Evans and St John (1998) since the early emergence of ESP, the current systematic review illustrates that there are two types of pedagogical collaboration. The first type is the collaboration between the language and content teachers. In this collaboration type, as evidenced in Woźniak's (2017) work, the content teachers initially provide the topics to be covered as the references for language teachers to introduce the future employment-like linguistic features (e.g., grammar, sentence and text structures, and lexical features) to learners. Alternatively, the language teachers can prepare ESP learners with a sufficient language foundation to perform academic and professional tasks derived from the needs analysis. Concerning the administrative cost and lack of trained ESP teachers, this type of pedagogical collaboration can be achieved through occasional team-teaching. This finding from the review is also in line with Dudley-Evans and St John's (1998) suggestions on progressive stages, meaning that some pedagogical tasks, namely teaching approaches, classroom activities, tasks, linguistic features and specialised genre identification, material selection, and assessment format selection (Basturkmen, 2010; Paltridge & Starfield, 2013) may be conducted in the pre-teaching stage. During the course, both language and content teachers can also take turns teaching an ESP course depending upon the lesson core focus. Alternatively, language teachers may have the responsibility of an ESP tutor argued in Woźniak's (2017) work, meaning that the content teachers should be trained with the necessary language skills for ESP pedagogy or integrating English language into their ESP instruction. As such, an occasional team-teaching may be unnecessary, rather an intensive one-on-one conference with institutional support.

The systematic review further yields another type of collaboration that is between the ESP course (mostly language teachers) and domain experts. Such a collaboration is believed to promote students' engagement, facilitate students' learning, and raise students' awareness towards the use of English language in their future employment. As raised in Jitpaiboon and Sripicharn's (2022) study, the domain experts can be invited to conduct a short workshop and give lectures during the ESP course and this practice contributes to an increase in students' awareness towards the demands of future employment in their specific discipline, facilitating students' learning through classroom engagement. In addition, this practice may function as

the key mechanism in assisting the teachers to draw the nexus between the ESP course in which the content and language are pre-determined for the professional demands and students' academic needs. Despite its similarity to the content-language teacher collaboration, the dated knowledge and on-the-job skills in a certain professional domain appear to be the focus of this collaboration type as other papers suggest that students cannot see the link between classroom-based ESP instruction and future work-based real-life practice. This type of collaboration is believed to reduce the administrative expenditures as the institution does not need to spend an excessive financial amount to employ two teachers to conduct a team teaching. This ESP instruction may, thus, be effectively and economically enhanced.

Technology literacy as ESP teachers' knowledge

Technology literacy is another pivotal part of ESP teachers' knowledge. This new and meaningful finding can reconceptualise the knowledge necessary for ESP teachers to conduct their teaching. Given the seminal conceptualisation of teachers' knowledge by Ferguson (1997) and Harding (2007), the ability to teach has an association with three significant sets of knowledge, including knowledge of disciplinary culture and values, knowledge of the epistemological basis of disciplines, and knowledge of genres and discourse. In a more holistic and up-to-date account, ESP teachers' knowledge needs to include technology literacy so that the ESP instruction can be more personalised and specific to a certain cohort of students as found in Kakoulli Constantinou and Papadima-Sophocleous' (2020) and Synekop's (2020) studies. This knowledge of technology may eventually link what is mandated by the ESP policy in a controlled learning environment to more authentic career-like instruction. To illustrate, ESP legal English teachers can utilise an online authentic reading text as a teaching material to familiarise them with discipline-based writing conventions. This may also raise students' awareness towards their future professional exposure, responding to the aim of ESP that is to assist students in using English to accomplish their future employment tasks.

Sustainability in ESP instruction

Many empirical studies in this systematic review reported on the profound challenges that need institutional support so that ESP instruction can be sustained (Bayram & Canaran, 2020; Bocanegra-Valle & Basturkmen, 2019; Demirdöken, 2021; Iswati & Triastuti, 2021). As summarised in Figure 2, ESP teachers encounter numerous issues when teaching the subject with a dual focus on language and disciplinary content. In the EGP-to-ESP transformation, language teachers were reported to have faced profound changes in professional roles that influence their behaviours and new identity construction. Moreover, ESP teachers require up-to-date knowledge of the language, subject content, pedagogy, and technology to be effective ESP instructors. ESP teachers are also influenced by stakeholders' expectations towards the use of language, together with discipline-related knowledge to accomplish real-world professional tasks. In doing so, ESP teachers in most studies expressed their need for ESP-related training with the ultimate hope that it would overcome the multifaceted challenges they face and help students acquire the necessary skills of communication for their future career advancement after the completion of their programme. All in all, institutional support in terms of continuous professional development (CPD) is believed by ESP teachers to be able to mitigate those profound challenges at least.
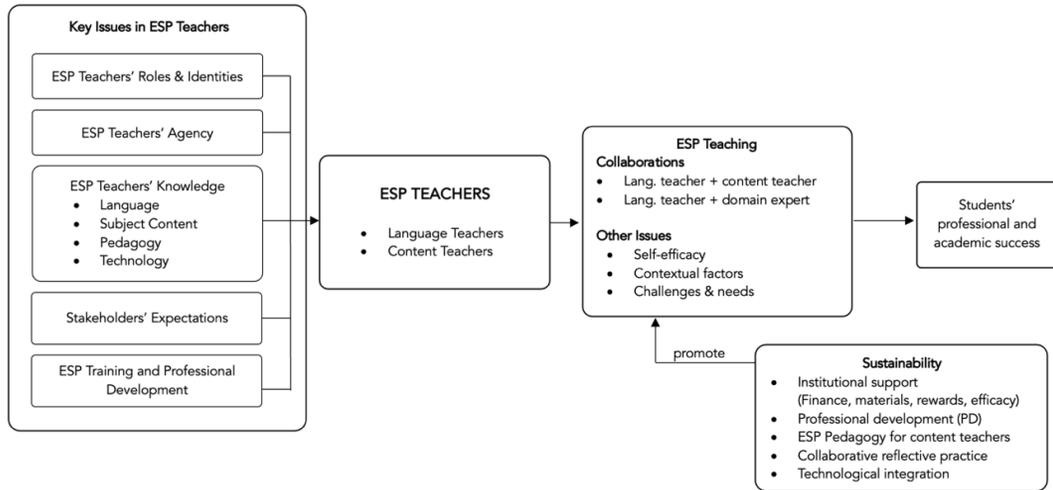
Figure 2 A holistic picture of teachers, teaching, and sustainability in ESP

CPD can be promoted at a departmental level using a collaborative reflective practice. Specifically, Woźniak (2017) illustrated that when the department provides a one-on-one conference for language teachers to assist content teachers in integrating English into their ESP teaching as a medium of instruction, it results in an increase in content teachers' self-efficacy that in turn promotes students' academic and professional outcomes. Farahian and Parhamnia (2021) also asserted that the promotion of collaborative practices among ESP teachers supported by their institution had a positive impact on teachers' knowledge sharing in which the challenges can be understood and resolved with the help of other ESP teachers in the same institution. Such practice also generates opportunities for the teachers to together adjust their pedagogical directions. The institution can also take advantage of such collaborative practice to identify future directions of PD based on teachers' profound lacks, needs, wants and necessities as practiced in Tung's (2018) work. Some other studies in teachers' PD have also illustrated that there are also issues of political conflict within the department (e.g., Supunya, 2022) and such issues may be deemed, if not resolved, with institutional support as holding the authoritative power to bridge the gaps of ESP-related arguments on practice.

Collaborative pedagogical reflection is believed to ensure the long-term effectiveness of ESP teaching. ESP teachers can engage in peer-to-peer reflective learning, including sharing their difficulties, successful practices, and how contextual factors (e.g., internal political conflicts and classroom management-related issues) can improve their ESP teaching. Through such practice, ESP teachers can gain more self-efficacy which appears to be one of the most important elements in teachers' identity construction and agency development, teaching, and awareness towards long-term professional development (Ayar, 2021; Demirdöken, 2021; Nguyen, 2020). Problems related to materials in a certain professional domain can also be reduced when engaged in ESP peer support (Basturkmen, 2019) as all teachers are able to scrutinise the relevancy and appropriateness of materials to be devised. Those with administrative power need to recognise the possible benefits and facilitate this teacher-to-teacher learning platform for the exchange of their knowledge and experiences. Moreover, this pedagogical reflection

among ESP teachers may also help to visualise the gap between the content and language knowledge of ESP teachers and, thus, sustain effective ESP instruction.

Another key mechanism to sustain ESP instruction concerns the integration of technology into ESP teaching and CPD. In a classroom-based practice, the use of digital technology appears to help ESP teachers diversify learning tasks for students with mixed academic and professional interests. For example, WebQuest is devised by the ESP teachers in Synekop's (2020) study to improve students' professional communication skills in many work-related situations. ESP teachers can also personalise their teaching based on students' needs. For CPD, technology is reported in Kakoulli Constantinou and Papadima-Sophocleous' (2020) study to help ESP teachers engage themselves in a knowledge-sharing platform with domain experts, research accessibility, pedagogical reflection among peers, and content knowledge development. Despite the research scarcity in technology-enhanced learning in ESP instruction, technology can be used as a personalised learning approach for both in-class learning and out-of-class autonomous learning for students. As such, the ESP instruction can be sustained.

FUTURE RESEARCH DIRECTIONS

The demographics of ESP teacher studies reflects future research directions. Table 2 illustrates that only thirty-two empirical studies were documented in the surveyed international peer-review *Scopus*-indexed journals. Only fourteen countries are reported to have conducted research on ESP teachers, highlighting the need for more systematic investigations into this line of research. Most of the work comes from China (21.87%), followed by Vietnam (12.50%), Iran (12.50%), Indonesia (9.37%), Turkey (9.37%), Spain (6.25%), and Ukraine (6.25%), respectively, while other countries, namely Estonia, Greece, Poland, Romania, Serbia, Taiwan, and Thailand only produced one study (3.12%). From the contribution, the current systematic review is in line with others (e.g., Basturkmen, 2022; Liu & Hu, 2021) in calling for more empirical studies from both the same and new countries. For the methodological approaches, half of the existing research in the current research synthesis follows a qualitative research design (50%) (see Appendix). Another dominant portion of research in this review follows an MMR (31.25%) with the aim of establishing the generalisability to other similar contexts. The least-used approach appears to be quantitative (21.87%) with *Likert*-scale questionnaires. Only one study used advanced statistical measures (e.g., correlation and multiple regression) to capture the research construct. To assess the methodology in ESP research, the issues of methodological rigour need to be advanced. That is, some studies explicitly report that the researchers employed a quantitative approach with a small group of participants which can be questionable in terms of a statistical analysis.

The future research directions can also be derived from the results of the research synthesis. Apart from the foci in the current review, how ESP teachers use and develop their teachers' talk in the environment where students' discipline is more advanced or specific (e.g., medical engineering, biomedicine, and advanced statistics) is an important area to explore. Similarly, how the content teachers develop their language skills to justify content-related concepts as the ways to deliver an ESP course also needs to be explored. These areas appear to be the key

in responding to the urgent calls of ESP training with practicality. This can, perhaps, reduce teachers' workload by not participating in interdisciplinary collaboration if equipped with concrete pedagogical guidelines and examples. In many teaching environments as yielded by Sukying et al. (2023), an ESP course is designed and offered to one large faculty cluster and the "S" in ESP can be questionable. To illustrate, English for Sciences is developed for students in four majors (e.g., biology, chemistry, and physics) and it may not be specific enough to each discipline. Hence, the specificity requires further attention.

Table 2
The demographic distribution of ESP teacher articles from 2010 – 2022 in Scopus-indexed journals

Study Description	Frequency	Percentage
Country		
China	7	21.87
Vietnam	4	12.50
Iran	4	12.50
Indonesia	3	09.37
Turkey	3	09.37
Spain	2	06.25
Ukraine	2	06.25
Estonia	1	03.12
Greece	1	03.12
Poland	1	03.12
Romania	1	03.12
Serbia	1	03.12
Taiwan	1	03.12
Thailand	1	03.12
Study Type		
Qualitative	16	50.00
Mixed-Methods	10	31.25
Quantitative	7	21.87

CONCLUSION AND LIMITATIONS

Despite the proliferation of ESP studies since the 1960s, the research on ESP teachers remains elusive. Over the last decade, the debate has centred around the qualities and practices of ESP teachers, whether they should focus on language and/or content, as well as whether team teaching is more effective than a one-teacher-teaching format. As such, this systematic review aimed to analyse the empirical studies on ESP teachers to reconcile ongoing debates by identifying the existing research foci. The emerging research foci included ESP teachers' perceptions and beliefs, teachers' identity development and agency, perceived challenges and needs, collaborative practices, teaching and innovation, teachers' knowledge, and technology integration. The systematic review also further discussed the emerging findings on collaborative practice with prior studies. The two types of collaborations in ESP teaching are collaboration between language and content teachers, and those between language teachers and domain experts. The former type of collaboration appears to be a new finding in the ESP literature. This review also proposes a sustainability model for ESP, which is the result of an in-depth

synthesis of ESP research over a decade. It is believed that this will be advantageous to ESP teachers, enabling them to be aware of what may occur in their ESP course; to administrators, allowing them to better position themselves in ESP course implementation; to course designers, offering them an awareness of the contextual constraints; and to policy makers, enabling them to take these evidence-informed suggestions to establish clear-cut guidelines for future ESP practitioners. Thus, the sustainability of ESP can be achieved in dyads, triads, teams, interdisciplinary, and intradisciplinary settings.

The current systematic review also contains an inevitable limitation concerning the exclusion of empirical studies. The researcher is aware that there is an edited book by Papadima-Sophocleous et al. (2019) that compiles some studies on ESP teaching and teacher education across pedagogical contexts. This work, among others, was not included in the systematic review since they were not published in *Scopus*-indexed journals. Also, despite their relevance, articles published in 2023 (e.g., Suking et al., 2023) were not included in this review because it is outside the timespan of the review. These exclusions might be considered for future work to draw a comprehensive picture of the ESP practices and ESP education by exploring those unindexed sources that the current review cannot do so.

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APPENDIX 1

Studies included in the systematic review.

No	Study	Country	Foci	Participants	Study Type	Data Sources	Key Findings
1	Ayar (2021)	Turkey	Professional teacher identity through ESP courses	3 EFL teachers	QUAL	- Autobiographies - Informal dialogues - Classroom observations - Opening interviews - Post-observation interviews - Field notes	Professional competence came to the fore being the best mediator to gain awareness of professional teacher identity. However, self-efficacy did not subserve as a predictor in exploring the complexity of teacher identity due to discordance with perceptions and realities of identity issues.
2	Baleghizadeh and Shakouri (2017)	Iran	Relationship between teaching styles and self-efficacy in ESP teachers	87 ESP instructors from different universities	QUAN	- Questionnaire	The findings yielded that a significant relationship between ESP teachers' teaching styles and self-efficacy was evidenced.
3	Bayram and Canaran (2020)	Turkey	ESP Teachers' perceived professional development needs	12 novice ESP teachers	MMR	- 5-Likert scale questionnaire - One-on-one Interview	The ESP teachers have no how-to knowledge on programme implementation and higher-order thinking promotion in their ESP classes. The feeling of insecurity has been verbally expressed, calling for more collaboration with other ESP teachers and faculty members.
4	Bocanegra-Valle and Basturkmen (2019)	Spain	Teacher Education Needs of Experienced ESP Teachers	19 experienced in-service ESP teachers with no TESOL-related background from two Spanish universities	QUAL	- Semi-structured interviews	ESP teachers' needs have been classified into five areas: (1) course development, (2) knowledge of the target discipline, (3) knowledge of language use in the target discipline, (4) peer collaboration, and (5) professional development opportunities
5	Bui (2022)	Vietnam	Students' and teachers' perceptions of effective ESP teaching	216 students and 32 teachers from 5 universities	MMR	- Likert-scale questionnaire - Interviews	Significant differences between students and teachers' perceptions were evident in four categories: (1) task-based language teaching, (2) corrective feedback and assessment, (3) discipline specifications, and (4) culture integration. The remaining three categories – (1) language use, (2) technological use, and (3) grammar instruction – were aligned
6	Cao, Zhang, Liu and Pu (2022)	China	English for medical purposes (EMP) teacher cognition – Teacher belief factors	254 English for Medical Purposes Teachers	QUAN	- EMP TC questionnaire	Teacher cognition is influenced and constituted by (1) teacher attitude, (2) teacher belief, (3) teacher learning, (4) teacher support, (5) role identification, and (6) teacher practice.
7	Chang (2017)	Taiwan	Teacher's Identity Development	1 ESP teacher during the process of becoming an ESP instructor	QUAL	- Reflections - Learning journals - Teaching journals - Face-to-face meeting - Semi-structured Interviews	New ESP teachers need to encounter extensive learning, engagement in interdisciplinary collaboration, expectations towards discipline-specific problem-solving, and multitasking ability. From EAP to ESP instruction, a teacher encounters constant changes in instructional approaches, decisions, and activities. Four teacher's identities emerged, including (1) a learner, (2) collaborator, (3) multi-tasker, and (4) problem-solver.
8	Dashtestani (2020)	Iran	Online EAP Teacher Elements	19 Iranian EAP teachers	MMR	- Semi-structured interviews - Questionnaire	Teachers' attitudes towards online EAP instruction implementation appear to be positive despite the recognised challenges and obstacles in their pedagogical context. Several constraints yielded by the study include (1) online learning facility shortage, (2) teachers' and students' low digital literacy, and (3) online teaching infrastructure shortage. The practical measures are also suggested for a further collaboration from policymakers and course developers.

No.	Author (Year)	Country	Focus	Participants	Method	Instruments	Findings
9	Demirdöken (2021)	Turkey	Instructional challenges of English for aviation teachers	5 ESP EA teachers	QUAL	- Observation - Observational notes & checklists - Semi-structured interviews	The results indicate the aspects of self-efficacy beliefs pertaining to their behavioural encounters in a real-life aviation. ESP EA teachers appear to have a prominent challenge of low contextual knowledge, resulted from the insufficient PD and ESP EA teaching experience.
10	Deng (2021)	China	Teacher agency in ESP instructional policy implementation	5 Chinese teachers from different ESP classes	QUAL	- Classroom observations - Semi-structured interviews	ESP teachers "adjusted" the curriculum policy to allow for their own classroom discourse, rather than "implemented" the policy. That is because of (1) teachers' academic background, (2) understanding of language acquisition, (3) profound distrust of ESP course effectiveness, and (4) learners' performance. The analysis of implicit discourse given by the students yields that such teachers' agency appears to be the unwillingness to make instructional changes that, in turn, can be detrimental to learners' academic performance.
11	Estaji and Rahimi (2014)	Iran	ESP teachers' perception of resilience	40 ESP teachers from different universities	MMR	- 5-Likert scale questionnaire - Semi-structured interview	Resilience was found in all ESP teachers' practices with various types of behavioural patterns, and this appears to be a factor influencing professional development.
12	Farahian and Parhamnia (2021)	Iran	The relationship between collaborative climate and knowledge sharing among ESP teachers	328 Iranian ESP teachers	MMR	- Questionnaire - Interview	A positive correlation for four measures (institutional culture, department head, instructors' attitude, and group support) and collaborative climate was identified. The interview suggests that the knowledge sharing is contributed by four sources of collaborative climate – (1) supportive atmosphere, (2) department head's encouragement, (3) reward, and (4) group support.
13	Gavranović and Prodanović (2021)	Serbia	ESP teachers' attitudes toward online instruction	16 ESP teachers from private universities	QUAN	- 5-Likert scale questionnaire with 14 questions	The results show that all participants asserted that they could manage ESP classes in an online environment with satisfaction but with different difficulty levels in language skills (i.e, receptive and productive skills) deliveries. That is, speaking, writing and listening appear to be the most challenging skills to conduct an online lesson.
14	Górska-Poręcka (2013)	Poland	The role of teacher knowledge in ESP course design	13 teachers of legal English (8) and business English (5)	QUAN	- 5-Likert scale questionnaire	There is the distinction between the EGP and ESP instruction, specifically ESP practitioners' professional knowledge. The major difference relates to the subject content that the ESP practitioners need to align their pedagogical practices with a specific discipline. Another salient aspect concerns teachers' complex and cognitively demanding roles in their instruction. These require additional abilities, concerning needs analysis, course design, and material selection and development.
15	Iswati and Triastuti (2021)	Indonesia	Perceived challenges of ESP teaching	5 ESP teachers in non-English departments	QUAL	- Interview	The challenges faced by ESP teachers include (1) the lack of students' disciplinary, (2) insufficient ESP training, (3) large class size, and (4) mixed proficiency students. To minimise the reported problems, collaboration from the policymakers (stakeholders) and ESP praxis are required.
16	Jiang, Zhang, May and Qin (2018)	China	Novice teachers' perceived challenges and needs for English curriculum innovation	208 novice ESP teachers	MMR	- Questionnaire - Semi-structured interview	The EFA illustrates four key challenges faced by the novice Chinese ESP teachers that include (1) developing new subject matter knowledge, (2) knowing needs and students, (3) developing new pedagogical content knowledge, and (4) mapping existing communication skills in new curriculum context. The results further suggest that both policy and financial support from the institution are required to achieve the effective ESP provision.
17	Jitpaiboon and Sripicharn (2022)	Thailand	Collaboration between ESP teaching and domain expert in PR in a CLIL context	20 mixed background participants (students, PR)	MMR	- Questionnaire - Semi-structured interview	It is found that the collaboration between the ESP teachers and domain expert in students' discipline appears to be effective to help establish content knowledge, understand specialised language, and establish professional cultural awareness. Such a collaboration also promotes

students' engagement and help students realise the course usefulness despite its uncertain link to the future careers.

No	Authors	Country	Topic	Sample	Type	Methods	Findings
18	Kakoulli Constantinou and Papadima-Sophocleous (2020)	Greece	Digital technology in ESP	professionals, and ESP teachers) 67 ESP practitioners	QUAN	- Questionnaire	The use of technology could facilitate ESP teachers' tasks concerning course design and development, teaching, material selection and development, course evaluation, and research. With the realised importance of technological utilisation, ESP practitioners still need further technological improvement along with collaboration with domain experts, productive skill development for students, activity and task design, subject knowledge development, and teaching methodology.
19	Kamberi, Urlica and Ameti (2020)	Romania	On the Quality and Relevance of English for Specific Purposes in Higher Education	10 teachers	QUAL	- Open-ended questionnaire - Free interview	The teachers and the management fostered by the university are considerably responsible for ESP instruction and deliveries in tertiary education. This is to prepare students for the future professional expectations and demands from the global market with the emphasis of English used as a "lingua franca" in all fields of study.
20	Li, Ma, Zhao and Hu (2020)	China	EAP teachers' localized ESP genre-based pedagogy	2 Chinese EAP teachers	QUAL	- Audio recordings - Classroom instruction - Document analysis - Interview	The "localised ESP genre-based pedagogy" has been illustrated by the study. That is, such instruction involves, first, setting "inductive and discovery-based genre analysis", developing pedagogical tasks from the available local resources, and integrating a linguistic approach into a genre approach. The study further suggests that genre-based written papers in students' disciplines contributes to the establishment of common ground for ESP learning, teaching, and sharing.
21	Meristo and López Arias (2021)	Estonia	Challenges in ESP teaching	13 English teachers from four public higher education institutes	QUAL	- Semi-structured interviews	The study suggests three potential challenges influencing the ESP instruction in the context of Estonian universities, including (1) professionalism, (2) insufficient collaboration, and (3) instability in ESP course implementation. The first challenge has been resulted from the lack of subject content knowledge and professional training. The second challenge has been influenced by the lack of domain expert and stakeholder involvement. The complexity of the ESP is accounted for the last challenge since to comprehensively design the course materials for a cohort of ESP students to achieve the same goal seems to be of difficulty.
22	Mulyadi, Wijayatingsih, Budiastuti, Ifadah and Aimah (2020)	Indonesia	ESP teachers' TPACK	70 ESP teachers of nursing from 35 universities	QUAN	- TPACK questionnaire	The ESP teachers in the study have mastered three subdomains of TPACK (Technological Content Knowledge, and Technological Pedagogical Knowledge, Technological Pedagogical and Content Knowledge) and they need to improve their Pedagogical Content Knowledge.
23	Nguyen, Haworth and Hansen (2019)	Vietnam	Pedagogical shift in ESP from lecture-based to active learning	8 Vietnamese ESP teachers	QUAL	- Semi-structured interview - Observation	All ESP teachers perceived active learning as a student-centred approach, and they were aware of their roles changed as implementing active learning. The classroom observation also indicated that the teachers practiced active and interactive learning activities, placing more focus on a teacher-student interaction.
24	Nguyen (2020)	Vietnam	Lecturers' Beliefs and Agency about Active Learning in ESP class	5 Vietnamese ESP teachers	QUAL	- Semi-structured interviews - Classroom observations	The participants hold positive beliefs toward the change and the awareness of role changes. Teachers' roles shifted from a traditional lecturer to be a facilitator. Teacher change appears to be dynamic and collaborative in the stage of developing, enacting, reflecting, and planning future actions in a cyclical manner.
25	Rachmawati, Purwati and Anam (2022)	Indonesia	ESP Teachers' Sociocultural Challenges in Online Formative Assessment	118 ESP teachers 367 students 14 programme coordinators from 25 universities	MMR	- Questionnaire - Semi-structured interview	ESP teachers opined that they had important challenges in integrating the sociocultural approaches into their online assessment. The teachers reported to have high challenges in implementing an online formative assessment, specifically the strategic challenges, and data triangulation accounted that this was because they had no institutional support to integrate a formative assessment into the ESP curriculum. Another point concerns the contextual barricade of the class size and teaching schedule.

No	Author (Year)	Country	Topic	Sample	Methodology	Data collection	Findings
26	Rebenko (2021)	Ukraine	ESP teacher identity model	15 senior ESP students 15 language teachers 6 content teachers	MMR	- Opened-ended Questionnaire - Closed-ended questionnaire	The study illustrates the ESP teacher identity model, comprising of (1) "methods of teaching", (2) "professional knowledge", (3) "individual features", (4) "foreign language competence" and "work experience".
27	Synekop (2020)	Ukraine	WEBQUEST as technology of differentiated ESP instruction	31 Ukrainian teachers from the department of English for Engineering	MMR	- Classroom observation - Multiple-choice questionnaire	ESP teachers employed the WebQuest learning as an approach in their differentiated teaching. Such a technological utilisation can help diversify the learning of ESP offered by a technical university and improve students' skills of their professional communication.
28	Tao and Gao (2018)	China	ESP teachers' identity constructions	8 Chinese ESP teachers	QUAL	- Life history interview	Becoming an ESP teacher appears to be a complex process in transforming instructional and professional practices and in constructing their own identities. There is a mixture of the intrinsic fulfilment feeling and identity construction related to the marginalised status of ESP undermined by the institution. The ESP teachers may face difficulty to sustain their identity development with on supporting system provided by the administrators.
29	Tung (2018)	Vietnam	Reflective practice to ESP-teacher agency development	5 English teachers of professional purpose	QUAL	- Interview	Reflective practice substantially contributes the development of teacher agency. ESP teachers demonstrated their contentment and commitment to improve their current teaching practices. Notably, reflection appears to stimulate their PD for their regular-basis professional tasks.
30	Wozniak (2017)	Spain	Perceptions of ESP Teachers as CLIL tutors	6 ESP teachers in 4 academic years	QUAL	- Two open-ended questionnaires - Interviews	The findings suggest three major ESP teachers' contribution to the degree programmes, including (1) "content-language support", (2) "ESP teachers in CLIL", and (3) "disciplinary communication within the subjects". The first contribution roughly concerns ESP teachers' responsibilities in analysing students' needs, selecting frameworks and designing a course for language teaching, while, in the second type, ESP teachers also plays a role of a CLIL tutor to provide support to content teachers in integrating English into their instruction. The last contribution concerns a collaborative activity through teaching innovation and research in specific disciplines.
31	Yang and Wyatt (2021)	China	The influence of culture and context on teacher beliefs and behaviour	3 ESP teachers	QUAL	- Pre-observation interview - Classroom observation - Stimulated recall interviews	there were the discrepancies between teachers' beliefs about students' motivation and their observed roles, and practices. Such discrepancies were believed to impact self-determination of the teachers. The sources of discrepancies resulted from the limited PD exposure, dated knowledge of motivation, deep cultural value of Confucian, and assessment culture.
32	Zhao, Li and Zhong (2022)	China	Teacher emotion and pedagogical decision-making in ESP teaching in a Chinese university	9 experienced ESP teachers	QUAL	- 2 rounds of semi-structured interviews - Policy document analysis - Teaching materials analysis	The study suggested that ESP teachers' pedagogical decisions significantly influenced by the emotional labour, resulted from the engagement of students. The ESP teachers reported to experience a mixture of emotions pertaining to expectations, disappointment, empathy and anger. Moreover, they also placed a distance between their position and that of the institution due to the strict regulations, objective assessment based on students' performance, and students' punishments who had low class engagement.