

Teaching English for specific purposes in the age of automation within the Cambodian context

Kimyut Phin¹, Sovanna Huot¹

¹ Department of Political Science, University of Delhi, New Delhi, India

Article info

Article history

Received: March 2, 2026

Revised: April 19, 2026

Accepted: June 3, 2026

Keywords

Automation

Curriculum innovation

Digital competence

English for specific purpose (ESP)

English language education

Article type

Narrative review

Abstract

This paper scrutinizes the roles of English for Specific Purposes (ESP) in Cambodian higher education, which has become crucial in preparing learners for the global labor market in the age of automation, artificial intelligence, and Industry 4.0. Drawing on international and local literature, the author combines theories, histories, and current ESP practices in Southeast Asia to understand the unique complexities of Cambodia, including the misalignment of the ESP curriculum, the lack of pedagogical infrastructure, and the slow pace of curriculum and pedagogical change. The author also explores alternative solutions and practices, such as innovative, adaptable strategies like artificial intelligence and task-based instruction, to improve learners' educational and employability outcomes. This study highlights significant gaps in national education policy and industry practice, and the need to establish a culturally grounded, technology-rich ESP pedagogy. The author provides a national perspective in which ESP serves as a holistic, integrative framework for the seamless alignment of higher education and the workforce. This paper also extends a call for the regional and national ESP community to engage in a variety of research activities, such as longitudinal studies and cross-regional comparisons, to evaluate the impact and effectiveness of ESP. The insights from this study are invaluable for educators, curriculum planners, and policymakers as they seek to reconfigure English language teaching and learning to meet Cambodia's development needs in the digital age.

This is an open-access article under the [CC BY-SA](#) license.



Corresponding author

Kimyut Phin

Department of English, University of Delhi, New Delhi, India

Email: kphin.phd2023@english.du.ac.in

1. Introduction

Scholars across disciplines observe the rapid pace of technological change, often referred to as the Fourth Industrial Revolution or Industry 4.0. (Schwab, 2016). Automation, artificial intelligence (AI), robotics, and machine learning, in addition to transforming industrial production, are also profoundly reshaping the global labour market. According to McKinsey Global Institute (2020), by 2030, up to 375 million people worldwide will need to change the occupational categories in which they work due to automation. In this situation, language skills, particularly for specific purposes, will be vital for entry into new digital, cross-disciplinary work environments. Numerous authors note that, due to the dominance of English in international communication, science and technology, and business, English will increasingly

be integrated into the applied, communicative, and intercultural competencies required in today's professions (Hyland & Jiang, 2021; Iswati & Triastuti, 2021). In these circumstances, English for Specific Purposes (ESP) operates within crucial boundaries to equip learners with language skills targeted to specific disciplines, such as information technology (IT), medicine, engineering, tourism, and finance (Salmani-Nodoushan, 2020; Syakur et al., 2020). Tann and Scott (2021) document a growing need for English language teaching that is both structurally correct and relevant to the situation and purpose for which it is intended in the world of work.

The rapid integration of Cambodia into global economic and digital frameworks has escalated the country's need for English for Specific Purposes (ESP). According to the Asian Development Bank [ADB] (2023), Cambodia's economy has begun to digitise, with increased reliance on automation across the textile, agricultural, and tourism industries. However, the workforce lacks both technical and communication skills. Ngo (2023) noted that Cambodian HEIs are beginning to face the language skills gap, meaning that graduates are increasingly lacking the English proficiency skills that are demanded by employers in these new industries.

Cambodian universities face remarkable structural and pedagogical challenges, even as ESP becomes increasingly important in the age of automation. According to Ekayati et al. (2020) and Iswati and Triastuti (2021), a plethora of regional ESP programs are outdated, over-reliant on grammar-translation approaches, and fail to incorporate real-world communicative activities and industry-related content. For Huot and Hok (2025b), in the Cambodian context, curriculum design emphasises general English and academic reading and insufficiently addresses the other crucial components of automated and digital workplaces, such as technical writing, presentation, and professional interaction. Additionally, researchers such as Arini et al. (2022) and Bui (2022) mention the prevalence of undercut ESP classrooms devoid of technology, let alone automation. Regarding digital pedagogical applications, a disparity between policy and classroom practice persists in Cambodia. Educators are often not equipped to use AI tools such as speech-to-text and other interactive simulations that are considered vital for promoting learner autonomy and authentic workplace practice (Kakoulli-Constantinou & Papadima-Sophocleous, 2020; Vinothkumar & Karunamurthy, 2023).

The gap between supply and demand for English language teaching has led to issues with the employability of teaching graduates. Mostafavi et al. (2021) suggest that ESP programs must change and adapt to the linguistic and digital dimensions of the 4th Industrial Revolution, or else students will remain unprepared for the globalised, digital, and highly integrated labour market. This review will focus on how ESP has changed within the context of global automation, as well as the responses of higher education institutions in Cambodia to these changes. The paper draws on international best practices and recent empirical evidence to examine the necessary changes to ESP teaching to remain relevant in the context of intelligent automation.

The review addresses (1) the impact of automation on the skills that the workforce requires, particularly in terms of communicative and linguistic skills; (2) the emerging ESP landscape in Cambodia, including its advantages and disadvantages; and (3) the necessary pedagogical, technological, and policy changes needed to realign ESP to the global changes. In doing so, the review aims to analyse the challenges and opportunities in the ESP education landscape in Cambodia, and to develop context-specific recommendations for curriculum revision, teacher training, and education policy.

2. Understanding ESP: Concepts, history, and trends

The overarching definition of English for Specific Purposes (ESP) views it as an approach to teaching concerned with learners' present and future communication requirements in specific areas of knowledge or professional fields. Hutchinson and Waters (1987) argue in their pioneering writings that ESP should not be considered a product but rather a methodology, and that it should be customised to learners' specific contextual needs. Moreover, Hyland and Jiang (2021) explain that the distinguishing feature of ESP is the commitment to relevance, whereby the instructional materials, professional discourse communities, and activities are integrated.

ESP, General English, and English for Academic Purposes are frequently compared. General English helps learners develop communication skills for daily use, while the ESP develops skills in the use of language, the choice of words, and the use of interpersonal skills in the accurate and appropriate use of language in each profession or field (Anthony, 2018). ESP differs from EAP not only in the disciplines it covers but also in the genres it uses. While EAP covers essays, reports, and research papers, ESP may include activities such as writing lab reports, business emails, or making presentations (Iswati & Triastuti, 2021). ESP also includes English for Medical Purposes, English for Law, English for Tourism and Hospitality, and English for ICT, each with specific discourse communities and communication skills. The main aim of ESP is not only to teach English but also to teach learners the ability to use the English language in social and professional settings (Arnó-Macià et al., 2020). This is what makes it stand out as part of the education for the world of work. With the onset of automation and globalisation, the ability to speak and write in the technical and professional language of a specific field is becoming increasingly important. This is especially the case in a workplace that is diverse in terms of language and culture (Salmani-Nodoushan, 2020; Syakur et al., 2020).

The roots of English for Specific Purposes (ESP) date back to the post-World War II period. According to Hutchinson and Waters (1987), the 60s were instrumental in advancing ESP as English became a global language for business, diplomacy, and higher education. Educators began embracing the one-size-fits-all syllabus for language instruction and developed ESP as a nimble, focused system that catered to the specific needs of a profession or occupational group. Dressen-Hammouda (2025) emphasises that the first Economic ESP programs, developed as Western economies grew, targeted professionals in engineering, oil, and business management. ESP as a field of study developed and incorporated applied linguistics, discourse analysis, and corpus linguistics. According to Hyland (2014), ESP is now considered a field of language teaching that transcends the boundaries of the language being taught and the discipline of ESP, merging the concepts of language, discipline, and identity.

ESP has been used internationally in various fields, including academia. For instance, Gollin-Kies et al. (2015) describe how it has been used in the health sciences (e.g., patient interviews, medical case studies), law (e.g., courtroom discourse, legal drafting), ICT (e.g., document and software manuals), and hospitality and tourism (e.g., service encounters, intercultural negotiation). The changes in ESP have mirrored changes in the economy and technology; the emergence of new industries is accompanied by the emergence of new registers and new demands for teaching (Tann & Scott, 2021). ESP seems to have gained popularity in Southeast Asia as countries liberalise their economies and integrate into the global knowledge economy, thereby enhancing their human capital. For example, in Thailand, ESP has been adopted in vocational and tertiary education to enable students to undertake mobility towards the ASEAN and to secure employment in the services sector (Bolton & Jenks, 2022). In the business and science programs in Vietnam, curriculum realignment and needs assessment have been used to

implement ESP (Ngo, 2023). Similarly, in Indonesia, where there are also labour market problems, ESP has been incorporated into the curricula of polytechnic and teacher training institutions, in line with local need assessments and the national educational framework (Iswati & Triastuti, 2021).

Compared with other countries in the region, Cambodia's situation is both more complex and more varied. While English is becoming an important language of education, commerce, and cross-border and regional diplomacy, the integration of English for Specific Purposes (ESP) teaching in Cambodian universities is still in its infancy. Huot and Hok (2025b) show that Cambodian public and private universities still teach English using the same generic, non-context-specific syllabi. Students in finance, tourism, engineering, and other professions are taught the same generic courses regardless of the actual communication needs of their workplaces. The stagnation of ESP in Cambodia was the result of a lack of localised teaching materials, teacher training, and institutional support (Carrión-Martínez et al., 2020). While some private universities in Phnom Penh have begun implementing ESP for tourism and business, most regional (i.e., provincial) universities lack the facilities, expertise, or institutional support to do so. The situation has been made worse by the urban-rural digital divide (Syakur et al., 2020). On a more positive note, some progress is being made. As efforts to address the ESP needs of labour mobility within ASEAN begin, some Cambodian universities have started partnering with universities in other countries in the region. Although these initiatives are still in the early stages, they demonstrate a developing understanding of the importance of ESP in closing educational and employment gaps, particularly in automated workforce contexts, as shown in Figure 1.

Figure 1. Conceptual overview of English for specific purpose: Scope, origins, and regional trends



Source: Authors

3. Automation and the changing skills landscape

The rapid increase in automation, especially due to Artificial Intelligence (AI), is changing how people use language in both work-related and social interactions. For example, in addition to the traditional mechanical and manual functions, Benanav (2020) and Willcocks (2020) demonstrate that AI can now be employed in areas that involve high levels of interpersonal and communication activities, such as in customer service, healthcare, and digital marketing. The increased use of AI in these and similar professions poses challenges for the teaching of English in these fields, especially within English for Specific Purposes (ESP) frameworks. The development of communication technologies, especially AI-powered communication technologies, such as chatbots, automated email responders, and voice assistants, remains the most popular and significant innovation. According to Song et al. (2023), while technologies can simulate human-like conversations, for the learners of ESP, the technologies present both potential and problems. The innovations could remove the need for learners to participate in real-world language interactions and replace such interactions with artificial conversations; however, real communicators in the world, such as the audience of the learners, can understand and appreciate variables of culture, tone, context, and emotion in ways that these innovations cannot (Adamopoulou & Moussiades, 2020).

Taking machine translation as an example, there has been considerable advancement in the use of deep learning techniques and large volumes of data in systems such as Google Translate and DeepL Translate. However, the research community assumes less confidence in the use of these systems in specific fields (Wu & Dredze, 2020). In their work, they note that machine translation in law, medicine, and technical engineering lacks sufficient contextual and substantive accuracy in the use of proper terminology specific to the domain. In reply, Chamorro-Premuzic (2023) posits that users of such systems need to be trained to go beyond using them to include assessing and modifying the system-generated output, critiquing those outputs, and making edits as necessary, all of which require a complex integration of linguistic and digital skills. Automation has transformed the focus of English instruction, rather than eliminating the need for English teaching. The role of ESP instructors has been expanded to equip students to operate within hybrid communicative frameworks. He means that, in addition to having a working knowledge of English, students need to be able to use AI systems to collaborate with or work alongside them. The need to rework ESP frameworks to incorporate a greater emphasis on critical awareness of language, flexible pragmatics, and technology integration is pressing (Kim & Kim, 2024; Vinothkumar & Karunamurthy, 2023). As stated in Kolasani (2024), Industry 4.0 encompasses the cyber-physical systems, the Internet of Things (IoT), and cloud computing, which thrive in contemporary digital workplaces and require more than just functional language skills. Aksoy et al. (2022) and Schwab (2016) discuss the increasing integration of human labour and intelligent systems, with communicative activities partitioned among human-machine interfaces. In this case, English is not merely an interaction language but serves as a means of integration between technological systems and the human mind.

According to Kolasani (2024), workers of today's digital environments must possess more than just digital literacy; they must also be able to compose and analyse data-based reports, adhere to cybersecurity protocols, and navigate collaborative environments like Slack, Trello, or Zoom. As a result, ESP is digital communication ethics, asynchronous discourse management, and platform-specific registers, which must extend beyond the confines of grammar and vocabulary teaching. Such claims have also been made by Huot and Hok (2025a) regarding the Cambodian situation. There is little to no use of digital tools, whether real or simulated, in ESP

teaching, and this is a growing concern for low-resource provincial universities, where limited infrastructure hinders the implementation of blended or online ESP teaching models. Furthermore, as digital workplaces advance, organisations are increasingly susceptible to security breaches and the spread of false information. Because of this, cybersecurity training is necessary to complete a new type of professional training. Researchers like Fernando (2024) and Nickerson (2025) advocate for modifications to ESP (English for Specific Purposes) to include the teaching of the language of data protection, email security, and incident-reporting procedures, especially in the fields of banking, e-commerce, and public administration.

Consequently, the potential of ESP is to meet the new demands of Industry 4.0 language and to integrate 21st-century skills, including traditional skills, digital platform skills, and safe and ethical practices in digital environments. New fields are continually created by digital advancement and sustainable development agendas, and, as such, the breadth of ESP must also be expanded to include industry-specific language and discourse practices. In this regard, Dlamini et al. (2024) and Johnson et al. (2022) noted that emerging fields such as digital finance, data analytics, UX/UI design, and green technology are providing new employment opportunities and new forms of professional communication. In digital finance, ESP learners deal with algorithmic trading, cryptocurrencies, and real-time risk analysis. In the case of data analytics, they need to describe, visualise, and interpret data through dashboards, which is a synonym for multiple literacies (Chamorro-Premuzic, 2023; Monteiro & Leite, 2021). In contrast, UX/UI design requires the mastery of design critiques, user testing, and report documentation, which are cross-disciplinary and user-centred. Hassan (2023) and Tangredi and Galdorisi (2021) emphasise that the ESP for these new domains should be framed within a task-based learning paradigm, in which learners engage in simulations, role-play, and team-based activities that mirror the critical functions of actual jobs. Such an approach fosters retention and develops the use of flexible language in learning to cope with the demands of both stable and volatile innovation and adaptive systems.

In Cambodia, these trends are still incipient. Nevertheless, some universities have started to experiment with the introduction of ESP courses in environmental science, agribusiness, and digital marketing, which are directly aligned with the ADB (2023) reports on the integration of national and international development and pedagogical scholarships. Such efforts signal the start of a shift in pedagogy toward more contextually responsive ESP teaching for which there is still considerable need for scaling and a more professional approach.

Table 1. Automation and the changing skills landscape

Subsection	Key focus areas	Implications for ESP
The Impact of Automation on Language Use	Rise of AI tools, limits of machine translation, and hybrid linguistic-technical skill demand	ESP must train students in AI tool interaction and editing machine-generated output
Industry 4.0 and Digital Work Environments	Need for digital communicative competence, ESP integration with cybersecurity, and digital literacy.	ESP should prepare learners for digital discourse, cybersecurity language, and platform-specific skills

Subsection	Key focus areas	Implications for ESP
The Language of Emerging Fields	ESP applications in digital finance, data analytics, UX/UI, and sustainability sectors	ESP must evolve with industry trends, incorporating task-based learning and domain-specific vocabulary

4. Current state of ESP in Cambodian higher education

Cambodian higher education institutions have acknowledged the role English plays in determining global employment and academic competitiveness. Scholars such as Hok et al. (2026) and Ngo (2023) note that several public and privately owned universities have begun offering English for Specific Purposes (ESP) courses, albeit limited in scope and quality. The provision of such courses has been reported at the Royal University of Phnom Penh, Norton University, and the Paññāsāstra University of Cambodia, which offer ESP in disciplines other than English, such as business, finance, tourism, real estate, IT, and engineering.

However, the scope still appears to be limited. In certain urban institutions, specialised ESP modules, such as those in hospitality or computer science, are offered. In contrast, many universities offer the same English course to all non-English majors, irrespective of their field of study (Iswati & Triastuti, 2021). As noted by Syakur et al. (2020), this creates a gap between the content of English courses and the needs of the workplace. Legacy structures that are not suited to the 21st-century employment context still dominate the curricula of many Cambodian universities. Tann and Scott (2021) contend that the majority of ESP teaching still employs the Grammar Translation Method and focuses on reading comprehension and vocabulary memorisation, while communicative competence and task-based applications are ignored. This is consistent with Ekayati et al. (2020), as many ESP syllabuses in Southeast Asia fail to address the descriptions of the actual jobs and the labour market.

Employers in Cambodia, for instance, report that graduates fail to accomplish basic communicative tasks like report writing, meeting management, and client correspondence in English. This means graduates are unprepared for rapidly changing communicative tasks driven by automation and internationalisation. The ongoing professional development and preparation of ESP teachers also acts as an obstacle to inadequate ESP teaching in Cambodia. Carrión-Martínez et al. (2020) stress the importance of having both language and field-related knowledge for teaching ESP. However, most Cambodian teachers are trained in general English and applied linguistics and are unexposed to educational technologies and the relevant content areas.

According to Bui (2022), Project-Based Learning (PBL) and blended learning models are underused because of a lack of infrastructure, institutional support, and teacher training. Rural universities face a unique challenge: limited access to computers, internet speeds, and digital learning tools, ultimately deepening the access gap between urban and rural students. This gap underscores the need for greater investment in teacher training programs that align with Industry 4.0 and student-centred learning.

5. Innovative approaches in ESP teaching and learning

ESP education worldwide has adopted innovative and student-centred methods to address the gap between conventional teaching and the new vocational status. Anthony (2018) and Hyland

and Jiang (2021) advocate the use of Task-Based Learning (TBL) and Content and Language Integrated Learning (CLIL) as valid frameworks for integrating language teaching with the world of work. These approaches place learners in contexts involving problem-solving, simulations, and interdisciplinary collaboration to reflect workplace communication. Furthermore, gamification, storytelling, and project-based modules are being implemented to sustain learner motivation and aid language retention (Bahari, 2022). New technologies, such as chatbots, automatic speech recognition (ASR), adaptive learning systems, and virtual environments, have made AI-enhanced ESP instruction more accessible. According to the research of Vinothkumar and Karunamurthy (2023), these tools are shown to improve recipients' technological confidence, engagement, and proficiency in processing the target language.

In Cambodia, several universities and language centres, despite limited physical resources, are trying to implement context-sensitive ESP innovations. For instance, Norton University has created an English for IT course that teaches coding language, communication, tech support, and software documentation. The Royal University of Phnom Penh has also implemented the first ESP modules in the fields of tourism and hospitality, where participants learn customer service and intercultural communication through scenario-based learning (Huot & Hok, 2025b). In less-resourced, contextually challenging areas, there is also noticeable local innovation. In the provincial teacher-training centres, teachers have started to adapt open educational resources (OERs), translating them into bilingual formats and developing specific materials for use in agriculture, business, and nursing programs. These initiatives have been primarily donor-funded, but they are beginning to localise global ESP practices. Huot and Hok (2025a) suggest CoTSR-IL (Counterbalance Tempo-Spatial Reinforcement for Instructional Learning) as a model for modern ESP teaching that draws upon international theory and Cambodian realities. The model consists of four elements:

- 1) Cognitive engagement through professional story simulation.
- 2) Sensory integration and social collaboration through visual and group learning activities.
- 3) Real-world contextual gamification of vocabulary and grammar teaching.
- 4) ESP (English for Specific Purposes) digital scaffolded activities with structured autonomy.

This model aims to counterbalance the sequencing rigidity of traditional lessons by flexibly and dynamically reinforcing language use across time, space, and multiple modalities. This aligns with the adaptive learning philosophy, given the range of demographic and technological infrastructure diversity in the Cambodian learner population.

Table 2. ESP in Cambodian higher education and innovative practices

Section	Key insights
Institutional Landscape	ESP offered at select universities (e.g., RUPP, Norton); limited integration in non-English majors
Curriculum Limitations	Curricula misaligned with labour market needs; overreliance on grammar-translation methods

Section	Key insights
Teacher Preparation and Pedagogical Gaps	ESP teachers lack training in educational technologies and experiential teaching approaches
Global Best Practices	Adoption of TBL, CLIL, gamification, and AI tools improves learner engagement and real-world readiness.
Contextual Adaptations for Cambodia	Innovative ESP examples in tourism, IT, and agriculture; use of bilingual OER in rural institutions
Proposed Pedagogical Model	CoTSR-IL model promotes dynamic learning through storytelling, group work, and gamified tasks.

6. Challenges and barriers in Cambodia

One extremely relevant challenge for the modernisation of ESP instruction in Cambodia is the gap in technological infrastructure in both urban and rural areas. Alam and Asimiran (2021) and Bui (2022) mention that limited internet access, outdated computer labs, and a lack of specialised software severely impede the integration of technology into ESP learning. Although universities in Phnom Penh have begun to use digital learning tools and multimedia instruction, many of the provincial universities continue to operate without adequate hardware and software. This digital divide creates inequity and negatively impacts ESP learners by making it impossible for them to access Industry 4.0 tools such as virtual simulations, AI language-learning apps, and personalised adaptive learning systems.

Agboola and Tunay (2023) argue that such inequalities compromise the learning experience and exacerbate the gap between the availability of the required resources and a technology-savvy workforce that meets national aspirations. Concerning ESP, it is rural universities that are worst affected, leaving students to graduate without the experience of a digital-remote workplace (Huot & Hok, 2025b). Another key obstacle is the disjointed national language policy and its implementation in the labour market. The Ministry of Education, Youth and Sport (MoEYS) is trying to implement English across the curriculum, but there is still no focus on English for specific purposes (ESP) within the national educational framework. Iswati and Triastuti (2021), similarly, point out that the policy documents focus on General English or English for Academic Purposes (EAP), without a systematic focus on the profession-specific communicative competencies.

Huot et al. (2025) indicated that national curriculum development is often highly centralised and lacks systematic incorporation of employer and labour market feedback. This creates a disconnect between higher education curricula and the competencies required in the workplace. For example, tourism and information technology are priority sectors of Cambodia's economic development strategy, yet many higher education institutions lack or underprovide ESP in these fields (ADB, 2023). The marginalisation of ESP has multiple institutional origins. ESP is often treated as optional because there are no guidelines, no funding, no training, and therefore no institutional recognition as a necessary component of professional education. Such an oversight demonstrates a policy gap that impedes alignment between a country's human capital development and the requirements of a knowledge- and automation-based economy. Cultural and pedagogical factors also hinder the implementation of ESP in Cambodia. The hierarchical,

unilateral nature of curriculum development, in which major decisions are made by the central bureaucracy or the university administration, leads to a lack of teacher ownership and stifles creativity and innovation in the classroom. As Tann and Scott (2021) indicated, the absence of meaningful ESP teaching stems from educators not being empowered to adapt the content to students' learning goals due to the inflexibility of the syllabus and other central curriculum guidelines. Also, students' passive learning habits from years of rote learning and high-stakes testing are barriers to adopting learner-centred methods, such as task-based learning, project work, or communicative activities based on simulated real-world workplace situations. In many Southeast Asian classrooms, as noted by Bui (2022) and Dhillon and Murray (2021), students view teachers as the only source of knowledge and are hesitant to participate in exploratory or collaborative activities that require self-initiative and critical thinking.

In addition, Cambodian education's emphasis on testing, especially standardised tests, and memorisation leaves no space for ESP approaches that foster language use, intercultural communication, or problem-solving skills. This cultural resistance, on the one hand, discourages and stifles learners' creativity, while, on the other hand, it continues the cycle of producing graduates who are proficient in the language but lack the skills needed for the workplace, as depicted in Table 3.

Table 3. Challenges and barriers to ESP implementation in Cambodia

Challenge area	Key issues	Impact on ESP
Technological Infrastructure and Digital Divide	Poor internet connectivity, outdated computer labs, and limited access to educational software, especially in rural universities	Prevents effective use of digital tools in ESP; widens rural–urban learning gap; limits exposure to AI-enhanced instruction
Language Policy and National Education Goals	ESP not prioritised in MoEYS policy; misalignment between curricula and labour market needs; lack of formalised ESP frameworks	Limits development and funding for ESP courses; restricts innovation in curriculum design; fails to meet workplace communication needs
Cultural and Pedagogical Resistance	Top-down curriculum design restricts teacher agency; students show passive learning habits and a preference for rote learning.	Reduces classroom adaptability and learner engagement; hinders the adoption of task-based and project-based learning models

7. Conclusion and recommendations

While Cambodia is facing pressures from automation, digital transformation, and global economic integration, the reform of English for Specific Purposes (ESP) in higher education becomes a strategic necessity rather than a peripheral concern. This study shows a mismatch between conventional English teaching methods and the demands of the workplace, particularly in communication, technology, and culture. In the ESP field, post-automation contexts must be viewed as education, employability, and national development paradigms.

One of the core conclusions of this study is that successful ESP reform cannot be explained by new curriculum documents, additional technological innovations, or any single initiative.

Rather, it is a comprehensive and systemic reform that combines institutional capabilities, policy frameworks, teachers' discretionary power, and the relevance of the curriculum to the labour market. In this context, it is recommended that Cambodian universities develop holistic ESP frameworks to address the systemic fragmentation of ESP. Integrating ESP into the core content of professional and disciplinary fields (e.g., IT, business, healthcare, engineering, and tourism) enhances the authenticity of learning outcomes and aligns language instruction with workplace demands. ESP must be anchored in the needs of the economy and the skills sought by employers, and, as such, it must be responsive to the views of employers, alumni, and industry.

ESP and national education strategies need stronger alignment urgently from a policy perspective. Integrating ESP into higher education policy will reinforce its position from a supplementary subject to a fundamental component of employability education. Policy endorsement will also channel funds into teacher training, digital infrastructure, and curriculum development. A national ESP framework, including quality standards, accreditation, and adaptable benchmarks, would assist regional and urban universities and help reduce disparities across institutions.

Instructors of ESP and developers of the curriculum are, pedagogically, in a position to implement the policies and institutional vision in the classroom. This study values pedagogy that is digitally informed and aware of automation. Digitally enhanced pedagogy, including blended learning, task-based instruction, and the use of technologies such as simulations, collaborative tools, and AI language-learning apps, prepares students for the workforce. Technology, however, should be considered an adjunct to pedagogical reasoning, not the primary driver. The professional development of teachers, including the curriculum for digital training, should be co-designed, interdisciplinary, and digitally revitalised.

It is equally important to understand teacher agency. ESP reform will always be superficial if educators are seen only as executors of externally designed curricula. Educational institutions and organisations need to limit rigid protocols and develop teacher ESP pedagogy reform, empowering reflective practitioners to be curriculum problem solvers. This is especially important to address the rural–urban divide and inadequate digital resources.

The study points to several areas for future research and development. Longitudinal, empirical studies are needed to follow the ESP learner's journey from higher education to the workforce and to understand how ESP skills relate to job performance and career advancement. More work is needed on the effects of automation and artificial intelligence, and the subfield of Cambodia within the human–machine partnership on language work and the communicative tasks that accompany it. Within ASEAN, cross-regional research can inform Cambodia on various aspects of policy borrowing, curriculum reform, and partnerships within its unique socio-cultural and institutional context.

The ESC reforms in Cambodia must be seen as a long-term commitment to rebuilding its human capital and to its economic and educational self-determination. With a coherent national vision that combines policy with institutional action and teacher empowerment, ESP can be positioned as a fundamental pillar of higher education reform. By integrating linguistic proficiency with technological, ethical, and cultural competencies, Cambodia can equip its graduates with the flexibility and communication skills needed to navigate an automated world.

Thus, positioning ESP at the centre of the reform of higher education in Cambodia must be seen as an educational imperative and an essential pathway towards the country's inclusive and sustainable development.

Acknowledgments

The authors would like to express their deepest gratitude to the blind reviewers and the editorial team of CJESS for making this article available to the scholarly community. Without their contributions, this article would not have appeared in academic circles. Therefore, their contributions are considered irreplaceable and beneficial to society as a whole, especially to the scholarly research and publication community.

Conflict of interest

No potential conflict of interest was reported by the authors.

Funding

The authors received no financial support for the study, authorship, and/or publication of this article.

Declaration of AI usage

The authors used ChatGPT and QuillBot to polish the language in some parts of the article. However, they stated that the article's content is entirely theirs.

References

- Adamopoulou, E., & Moussiades, L. (2020). Chatbots: History, technology, and applications. *Machine Learning with Applications*, 2, 100006. <https://doi.org/10.1016/j.mlwa.2020.100006>
- Agboola, O. P., & Tunay, M. (2023). Urban resilience in the digital age: The influence of information and communication technology for sustainability. *Journal of Cleaner Production*, 428, Article 139304. <https://doi.org/10.1016/j.jclepro.2023.139304>
- Aksoy, C. G., Barrero, J. M., Bloom, N., Davis, S. J., Dolls, M., & Zarate, P. (2022). Working from home around the world. *Brookings Papers on Economic Activity*, 2022(2), 281–360. <https://doi.org/10.1353/eca.2022.a901274>
- Alam, G. M., & Asimiran, S. (2021). Online technology: Sustainable higher education or diploma disease for emerging society during emergency—Comparison between pre- and during COVID-19. *Technological Forecasting and Social Change*, 172, Article 121034. <https://doi.org/10.1016/j.techfore.2021.121034>
- Anthony, L. (2018). *Introducing English for specific purposes*. Routledge.
- Arini, D. N., Hidayat, F., Winarti, A., & Rosalina, E. (2022). Artificial intelligence (AI)-based mobile learning in ELT for EFL learners: The implementation and learners' attitudes. *International Journal of Educational Studies in Social Sciences*, 2(2), 88–95. <https://doi.org/10.53402/ijesss.v2i2.40>
- Arnó-Macià, E., Aguilar-Pérez, M., & Tatzl, D. (2020). Engineering students' perceptions of the role of ESP courses in internationalized universities. *English for Specific Purposes*, 58, 58–74. <https://doi.org/10.1016/j.esp.2019.12.001>
- Asian Development Bank. (2023). *Cambodia's education and skills sector assessment, strategy, and road map*. Asian Development Bank.

- Bahari, A. (2022). Game-based collaborative vocabulary learning in blended and distance L2 learning. *Open Learning: The Journal of Open, Distance and e-Learning*, 37(4), 348–369. <https://doi.org/10.1080/02680513.2020.1814229>
- Benanav, A. (2020). *Automation and the future of work*. Verso.
- Bolton, K., & Jenks, C. (2022). World Englishes and English for specific purposes (ESP). *World Englishes*, 41(4), 495–511. <https://doi.org/10.1111/weng.12604>
- Bui, T. H. (2022). English teachers' integration of digital technologies in the classroom. *International Journal of Educational Research Open*, 3, Article 100204. <https://doi.org/10.1016/j.ijedro.2022.100204>
- Carrión-Martínez, J. J., Luque-de la Rosa, A., Fernandez-Cerero, J., & Montenegro-Rueda, M. (2020). Information and communications technologies (ICTs) in education for sustainable development: A bibliographic review. *Sustainability*, 12(8), Article 3288. <https://doi.org/10.3390/su12083288>
- Chamorro-Premuzic, T. (2023). *I, human: AI, automation, and the quest to reclaim what makes us unique*. Harvard Business Review Press.
- Dhillon, S., & Murray, N. (2021). An investigation of EAP teachers' views and experiences of e-learning technology. *Education Sciences*, 11(2), Article 54. <https://doi.org/10.3390/educsci11020054>
- Dlamini, R., Louw, T. A., & Yu, K. (2024). Digital-centric higher education: An African perspective. In K. Yu & R. Dlamini (Eds.), *Higher education ICT integration in Africa* (pp. 5–24). Routledge. <https://doi.org/10.4324/9781003394877-2>
- Dressen-Hammouda, D. (2025). Ethnography in ESP. In S. Starfield & C. A. Hafner (Eds.), *The handbook of English for specific purposes* (pp. 599–617). Wiley Blackwell. <https://doi.org/10.1002/9781119985068.ch31>
- Ekayati, R., Manurung, I. D., & Yenni, E. (2020). Need an analysis of ESP for a non-English study program. *Language Literacy: Journal of Linguistics, Literature, and Language Teaching*, 4(2), 322–332. <https://doi.org/10.30743/ll.v4i2.3152>
- Fernando, R. (2024). Artificial intelligence capabilities and hyperselfish intelligence, the possible impacts, and why humans need Industry 5.0. In *Industry 4.0 to Industry 5.0: Explorations in the transition from a techno-economic to a socio-technical future* (pp. 113–149). Springer. https://doi.org/10.1007/978-981-99-9730-5_6
- Gollin-Kies, S., Hall, D. R., & Moore, S. H. (2015). *Language for specific purposes*. Palgrave Macmillan.
- Hassan, A. (2023). Developing an ESP-based language learning environment to help students improve critical thinking skills in written output. *Information Sciences Letters*, 12(4), 1131–1140. <https://doi.org/10.18576/isl/120431>
- Hok, C., Phin, K., Chea, S., So, S., Chheang, S., & Huot, S. (2026). Advancing ELT in Cambodia: Sustainability, digital inclusion, and culturally responsive pedagogy. *The Rubrics*, 8(1), 79–99. <https://doi.org/10.5281/zenodo.18149324>
- Huot, S., & Hok, C. (2025a). Enhancing English language teaching for multilingual learners: Leveraging heritage languages in the classroom. *Journal of Social and Educational Research*, 4(1), 87–95. <https://doi.org/10.5281/zenodo.15698964>
- Huot, S., & Hok, C. (2025b). Unpacking the struggle: Linguistic, pedagogical, and cognitive barriers in Cambodian students' English essay writing. *The Context*, 12(4), 149–168. <https://doi.org/10.5281/zenodo.15807401>
- Huot, S., Loch, S., Nget, R., & Em, S. (2025). Exploring multiliteracies in the digital era: A framework for 21st-century learning. *Cambodian Journal of Educational and Social Sciences*, 2(1), 7–27. <https://doi.org/10.69496/cjess.v2i1.50>
- Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centred approach*. Cambridge University Press.

- Hyland, K. (2014). English for academic purposes. In C. Leung & B. V. Street (Eds.), *The Routledge companion to English studies* (pp. 392–404). Routledge.
<https://doi.org/10.4324/9781315852515-29>
- Hyland, K., & Jiang, F. K. (2021). Delivering relevance: The emergence of ESP as a discipline. *English for Specific Purposes*, 64, 13–25.
<https://doi.org/10.1016/j.esp.2021.06.002>
- Iswati, L., & Triastuti, A. (2021). Voicing the challenges of ESP teaching: Lessons from ESP in non-English departments. *Studies in English Language and Education*, 8(1), 276–293. <https://doi.org/10.24815/siele.v8i1.17301>
- Johnson, M. W., Suvorova, E. A., & Karelina, A. A. (2022). Digitalization and uncertainty in the university: Coherence and collegiality through a metacurriculum. *Postdigital Science and Education*, 4(3), 772–792. <https://doi.org/10.1007/s42438-022-00324-1>
- Kakoulli-Constantinou, E., & Papadima-Sophocleous, S. (2020). The use of digital technology in ESP: Current practices and suggestions for ESP teacher education. *Journal of Teaching English for Specific and Academic Purposes*, 8(1), 17–29.
<https://doi.org/10.22190/JTESAP2001017K>
- Kim, J., & Kim, V. (2024). Unraveling the connections: English proficiency, motivational orientations, and online community engagement among ESP students. *English Teaching*, 79(1), 25–48. <https://doi.org/10.15858/engtea.79.1.202403.25>
- Kolasani, S. (2024). Optimizing with intelligence: Harnessing AI and ML algorithms for real-world solutions. In P. Whig, S. Sharma, S. Sharma, A. Jain, & N. Yathiraju (Eds.), *Practical applications of data processing, algorithms, and modeling* (pp. 190–204). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3693-2909-2.ch015>
- McKinsey Global Institute. (2020). *The future of Asia: Decoding the value and performance of corporate Asia*. McKinsey Global Institute.
- Monteiro, A., & Leite, C. (2021). Digital literacies in higher education: Skills, uses, opportunities, and obstacles to digital transformation. *RED: Revista de Educación a Distancia*, 21(65), 1–20. <https://doi.org/10.6018/red.438721>
- Mostafavi, S., Mohseni, A., & Abbasian, G.-R. (2021). The pedagogical efficacy of ESP courses for Iranian students of engineering from students' and instructors' perspectives. *Asian-Pacific Journal of Second and Foreign Language Education*, 6(1), Article 9. <https://doi.org/10.1186/s40862-021-00109-2>
- Ngo, N. H. H. (2023). Developing an English for specific purposes needs profile among library and information science students in Vietnam. *Vietnam Journal of Education*, 7(2), 125–135. <https://doi.org/10.52296/vje.2023.286>
- Nickerson, C. (2025). English for specific purposes and English as a lingua franca. In S. Starfield & C. A. Hafner (Eds.), *The handbook of English for specific purposes* (2nd ed., pp. 505–524). Wiley Blackwell. <https://doi.org/10.1002/9781119985068.ch26>
- Salmani-Nodoushan, M. A. (2020). English for specific purposes: Traditions, trends, directions. *Studies in English Language and Education*, 7(1), 247–268.
<https://doi.org/10.24815/siele.v7i1.16342>
- Schwab, K. (2016). *The Fourth Industrial Revolution*. World Economic Forum.
- Song, H., Kim, M., Park, D., Shin, Y., & Lee, J.-G. (2023). Learning from noisy labels with deep neural networks: A survey. *IEEE Transactions on Neural Networks and Learning Systems*, 34(11), 8135–8153. <https://doi.org/10.1109/TNNLS.2022.3212597>
- Syakur, A., Zainuddin, H., & Hasan, M. A. (2020). Needs analysis of English for specific purposes (ESP) for vocational pharmacy students. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, 3(2), 724–733.
<https://doi.org/10.33258/birle.v3i2.901>

- Tangredi, S. J., & Galdorisi, G. (2021). *AI at war: How big data, artificial intelligence, and machine learning are changing naval warfare*. Naval Institute Press.
- Tann, K., & Scott, A. (2021). Bridging disciplinary knowledge: The challenge of integrating EAP in business education. *Higher Education*, 81(3), 453–470.
<https://doi.org/10.1007/s10734-020-00551-0>
- Vinothkumar, J., & Karunamurthy, A. (2023). Recent advancements in artificial intelligence technology: Trends and implications. *Quing: International Journal of Multidisciplinary Scientific Research and Development*, 2(1), 1–11.
<https://doi.org/10.54368/qijmsrd.2.1.0003>
- Willcocks, L. (2020). Robo-apocalypse cancelled? Reframing the automation and future of work debate. *Journal of Information Technology*, 35(4), 286–302.
<https://doi.org/10.1177/0268396220925830>
- Wu, S., & Dredze, M. (2020). Are all languages created equal in multilingual BERT? In *Proceedings of the 5th Workshop on Representation Learning for NLP* (pp. 120–130). Association for Computational Linguistics.
<https://doi.org/10.18653/v1/2020.repl4nlp-1.16>