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From Academic to Professional English: Investigating Learning Transfer Between EAP and ESP Courses

Feiya Wang, Yangyu Xiao*

School of Humanities and Social Science, The Chinese University of Hong Kong, Shenzhen, 2001 Longxiang Boulevard, Shenzhen, China
E-mail: shirleyxiao@cuhk.edu.cn

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Abstract: The current study explores the learning transfer between English for Academic Purposes (EAP) and English for Specific Purposes (ESP) courses at an international university in China. Drawing on qualitative data from semi-structured interviews with 11 science and engineering students, the research explores academic skills transferred from the EAP to ESP courses and factors that affect such transfer. The findings revealed five key categories of transferred skills: research skills (e.g., logical thinking and literature reading), speaking skills (e.g., public speaking and presentation skills), language skills (e.g., appropriate vocabulary use and writing as a process), confidence, and time management skills. Factors affecting the transfer were classified as task-related (e.g., task type and difficulty), personal factors (e.g., personal interest and learning methods), and course-related (e.g., similarities and differences between EAP and ESP courses, as well as cross-disciplinary differences). This study enhances the understanding of learning transfer in EAP and ESP contexts and provides strategies for improving English language instruction for academic and professional purposes. Our findings suggest that EAP course design should emphasize higher-order skills and facilitate the transfer of academic literacies across disciplinary contexts.

***Keywords*:** learning transfer, English for Academic Purposes, English for Specific Purposes

1. Introduction

The success of English for Academic Purposes (EAP) instruction lies in whether students can transfer what they have learned to academic tasks in a different context or courses in their own disciplines. Without transfer, the value of EAP courses is limited because the skills and knowledge acquired remain confined to the classroom (James, 2008; 2014; 2024). Learning transfer is defined as "when learning in one context or with one set of materials impacts on performance in another context or with other related materials" (Perkins & Salomon, 1992, p. 6452).

Previous studies on learning transfer have highlighted that English for Academic Purposes courses could equip students with both language skills and study skills beyond the language classroom, as students have immediate and concrete needs to use these skills in their academic studies (Hill et al., 2020; Hyland, 2002; James, 2010; Jeon, 2022). Those studies have affirmed that a broad range of skills obtained from EAP courses can be transferred to different learning contexts, such as multi-lingual writing courses (e.g., Wilson & Soblo, 2020), business communication courses (Jwa, 2019), and discipline-specific assignments such as engineering proposals (Hill et al., 2020). However, such

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transfer does not occur naturally after students have taken the EAP course (Jeon, 2022). Research evidence has revealed that there is a distance between what students have learned and how they apply such skills in a different context (Haskell, 2011; James, 2014). This complexity underscores the need for further studies to explore how transfer can be effectively facilitated in different contexts.

While existing studies have identified transferable skills, the factors affecting the transfer, and various degrees of transfer (e.g., Green, 2015; Wubalem, 2021; Wilson & Soblo, 2020), there is still a need for further research into the relationship between transfer and classroom instruction in various L2 education contexts (James, 2024). In particular, there remains a gap in understanding how transfer occurs between a research-oriented EAP courses that demand higher-order cognitive and rhetorical skills, and an ESP course. The current study seeks to address this gap by investigating the transfer process and its influencing factors through an exploration of students' experiences in an advanced, research-focused EAP course requiring abstract reasoning and sophisticated academic writing competencies. By examining the skills transferred among science and engineering students, the study contributes to the literature by providing a deeper understanding of how academic and professional English instruction can be better designed to enhance learning transfer and support students' success in both academic and workplace contexts. It will also generate pedagogical implications for EAP instructors to design pedagogical tasks that facilitate learning transfer and develop students' higher-order thinking skills.

2. Literature review

2.1 *Near, far and adaptive transfer*

Studies on learning transfer reveal that transfer can be categorized into **near transfer**, **far transfer**, and **adaptive transfer** (Perkins & Salomon, 1992; Wilson & Soblo, 2020). **Near transfer** refers to the application of skills to closely related contexts and tasks. For example, in a community college in USA, low-proficiency second language learners who learned how to ask for directions on a street map outperformed those who studied unrelated tasks (e.g., learning how to buy a television) or were in a control group, demonstrating transfer between tasks of similar complexity and topics (Benson, 2016). **Far transfer** involves applying skills to rather different contexts. For instance, university students in Thailand reported transferring skills learned in EAP courses, such as selecting sources and using reference conventions, to courses in history, management, and psychology, which shared similar written assignment requirements. However, they reported limited transfer in metacognitive and abstract skills, highlighting the challenges of far transfer in language learning (Green, 2015).

At the **adaptive transfer** level, students apply skills to unfamiliar situations, new linguistic contexts, and genres. For example, when writing secondary source papers, students at a research university in the southeastern United States recalled writing experiences from their first-semester writing course, such as planning and audience awareness. This awareness extended beyond writing courses to other university courses, demonstrating adaptive transfer of metacognitive strategies like rhetorical awareness and cross-genre adaptability (Wilson & Soblo, 2020). These examples illustrate that learning transfer in language courses occurs between tasks of similar complexity or topics, across distinct teaching contexts, or at an adaptive level, where students apply skills in novel and varied situations.

2.2 *Learning transfer in EAP and ESP courses*

There are various discussions regarding specific skills in English for Academic/Specific Purposes Courses that can be transferred, from foundational language abilities to advanced academic and professional competencies. These transferable skills can be broadly categorized into language-related skills, higher-and lower-order abilities, and discipline-specific skills, which contribute to students' ability to apply learning across contexts (Hyland, 2002; James, 2006; Zarei & Rahimi, 2014).

Language-related skills form the foundation of learning transfer in EAP and ESP courses. James (2006) concludes that the transfer could occur across all sorts of language skills, including listening, speaking, reading, and writing. Zarei and Rahimi (2014) further specify the language-related skills that can be transferred, such as vocabulary, syntax rules, resource use, coherence, organization, and topic development. Additionally, students often transfer skills like paraphrasing, guessing the meaning of unknown words, and engaging in clear oral communication (James, 2006). These

abilities are essential for both academic and professional communication and are frequently developed and applied across various contexts.

Beyond basic language skills, learning transfer extends to higher-order abilities, academic competencies, which are critical for students' academic success. These skills include (1) organization (e.g., overall structure of the text and sequence of ideas), (2) using resources (e.g., searching information, summarizing, paraphrazing, and using citations), (3) developing topics (e.g., using examples, making comparisons, and providing details), (4) establishing coherence and the use of cohesive device. (5) writing multiple drafts in a process (e.g., initial draft and revision), (6) writing efficiently and fluently, and (7) using appropriate vocabulary (James, 2010). These competencies enable students to navigate academic tasks and apply their learning across different courses and disciplines.

In ESP courses, learning transfer focuses on discipline-specific skills that are tailored to professional or academic fields. For example, Hill et al. (2020) tracked the potential for transfer by analyzing 25 undergraduate engineering students' technical proposals and lab reports. Their findings identified transfer skills such as using up-to-date information, avoiding common language errors, using credible sources, writing technical descriptions, and correcting citation conventions. Other discipline-specific skills include writing technical definitions, using qualifiers, and maintaining cohesion in technical documents**.** However, the extent and sustainability of learning transfer change over time, depending on the alignment between the ESP course, and discipline-specific tasks as well as the opportunities to use such skills.

Overall, learning transfer in EAP and ESP courses goes beyond basic language skills to include advanced academic and professional competencies. In general, there is a consensus that those skills are related to expected learning outcomes; however, the transfer of skills between EAP and ESP courses, despite their differing academic and professional objectives, remains a relatively unexplored area in the literature. Understanding how these skills transfer across different educational and professional settings can inform more effective curriculum design and teaching practices.

2.3 *Factors affecting transfer*

Researchers have discussed two key strategies for fostering learning transfer: "hugging", which involves designing learning experiences that closely resemble the target context, and "bridging", which encourages learners to understand the general principle behind particular skills, make abstract conceptualizations of their initial learning and generalize their learning to new situations (Green, 2015; Salomon & Perkins, 1988). The former approach involves pedagogical strategies such as modeling, role play, and simulation with contextual similarity, whereas the latter focuses more on metacognition and reasoning (Green, 2015). Thus, learning transfer depends to a certain degree on the instructional practices, for example, whether teachers create learning activities that resemble situations beyond the language classroom (e.g., role-play or simulation activities) or activities that require abstract thinking (e.g., identifying patterns in the text structure) (James, 2024).

Based on the instructional model developed by Fogarty et al. (1992), Green (2015) specifies hugging and bridging strategies that can be adopted by the EAP instructors. Key "hugging" strategies include: reminding students to use what they have learned in English class in their other courses (e.g., referencing), using course materials that are similar to those in other courses, and demonstrating real examples of how to use skills from English classes to other courses; "bridging" strategies, on the contrary, require students to make abstract conceptualizations and connections, such as encouraging students to think about ways to use skills learned in English class in other courses, principles and rules that could be applied in other courses, and to plan, monitor, and evaluate their own thinking. In particular, Green (2015) reports a strong positive relationship between students' perceptions of instructors' use of hugging-bridging strategies as a whole and their perceived learning transfer. The learning transfer, however, falls mainly on the low road transfer, where learning has been transferred to similar domains, with less high road transfer, which requires metacognitive thinking. Such findings further support the complexity of transfer and the need to investigate factors affecting the learning transfer.

Furthermore, Green (2015) emphasizes the role of disciplinary teachers in promoting such transfer by drawing the connection between disciplinary courses and EAP courses, indicating the need for collaboration between EAP and disciplinary teachers. Such an assumption has been confirmed in Haghighi et al.'s (2019) study, which examined 58 medical postgraduate students' experience in a collaborative ESP writing program. The findings reveal that the

collaboration between language and disciplinary instructors contributes to the positive transfer as the assistance from specialized instructors in introducing the original disciplinary issues helps them activate their knowledge about technical terms and writing in the discipline; additionally, the improved disciplinary writing competence also optimizes the transfer of academic writing skills, as students have developed their learner agency and learning security (Haghighi et al., 2019). Both "hugging" and "bridging" strategies are designed to equip students with the ability to apply their learning beyond the classroom through distinct pedagogical approaches.

Third, the transfer may depend on whether skills covered in the EAP course are required in the targeted course (e.g., reading textbooks that were text-heavy, as opposed to calculation-heavy) (James, 2006). For example, in a study of undergraduate students' writing experience in Hong Kong, Lu and Ha (2024) uncovered that whereas the language courses value English standardization and academic style conventions (e.g., structure, cohesive devices, writing formally and precise and concise language), subject courses prioritize argumentation in assignments (e.g., developing original ideas and supporting them with evidence). This discrepancy often leads to the instrumental approach to writing in the EAP course, where students focus on strategical writing for grades rather than transferring skills across contexts.

Besides, the transfers did not occur equally among all task types, and there appears to be more transfer from EAP courses to some disciplines (e.g., in humanities and social science) than others (e.g., natural science), and for some types of tasks (e.g., research projects and synthesizing different resources) than others (e.g., explanations of calculations) (James, 2010). The transfer could also be affected by contextual factors, such as the shortage of time or a heavy workload (James, 2006).

Finally, learning transfer could also be affected by students' motivation for transfer (James, 2023; Jeon, 2022). To tackle this challenge, a case study teacher in Jeon's (2022) study explicitly told students that the target course was a beginning course for them to build up what they have to do in junior and senior years, in order to let students see the long-term value of the course. Such findings also affirm that learning transfer can be enacted by teachers' intentional instructional practices in teaching for transfer.

Although prior studies have identified several factors influencing learning transfer, such as task design, motivation, and course alignment (e.g., Green, 2015; Jeon, 2022; Haghighi et al., 2019), it is uncertain whether and to what extent such factors affect the learning transfer from EAP courses to ESP courses. To address the gaps above, two research questions have been put forward below:

R.Q. 1 What skills do students transfer from English for Academic Purposes (EAP) courses to English for Specific Purposes (ESP) courses?

R.Q. 2 What factors influence the learning transfer between EAP and ESP courses?

3. Methods

To answer the above research questions, a qualitative approach was adopted to investigate the learning transfer between the EAP and ESP courses and the factors affecting such transfer.

3.1 *Context of the study*

The study was conducted at an international university located on the southern coast of China. The university adopts English as the medium of instruction. Students came from diverse linguistic backgrounds and displayed varying levels of English proficiency. On average, students' language proficiency aligns with the B2 level of the Common European Framework of Reference for Languages (CEFR), indicating an upper-intermediate ability to understand and produce complex texts. In addition, the English as a medium of instruction context also expects them to use English for a variety of purposes in different disciplines.

Students were required to take one EAP course and one ESP course during their sophomore year. Both the EAP and ESP courses utilized a lecture-based instructional approach, which was a 3-credit program. The students met the instructors for 3 hours per week face-to-face for 14-15 weeks per semester. The EAP course mainly focused on developing students' research and public speaking skills. Students completed an individual speech and a mini-research project, which included writing a research proposal, composing a research paper, and delivering a research presentation. The ESP course, which is followed by the EAP course, is a discipline-specific English course for science

and engineering-related majors. The course aims to develop students' oral and written communication skills in the professional and workplace contexts. Students are expected to complete a written technical proposal and a technical proposal presentation, followed by a professional portfolio, which contains a curriculum vitae and a cover letter, as well as a group interview. The course assessment components can be found in Table 1.

Table 1. Course assessment component for the EAP and ESP courses

Course assessment components	
EAP Course assessment components	ESP Course assessment components
1. Research proposal -An 800-word research proposal	1. Technical proposal presentation -A 5-minute presentation for the technical proposal, plus a 3-minute Q & A by the end
2. Research presentation -A 5-minute presentation for the research paper, plus a 3-minute Q & A	2. Written technical proposal -A 1,200-word technical proposal
3. Research paper -A 1,500-word research paper	3. Cover letter and curriculum vitae -One page for each document written for an internship position from a related disciplinary field
4. Public speaking speech -A 4-minute Ted talk-like individual speech	4. Job interview -A mock interview for an internship position from a related disciplinary field

3.2 *Participants*

The research team employed a convenience plus purposive sampling strategy (Babbie, 2010; Merriam, 2009) to select the participants for this study. The research team sent out an invitation email to English for Science and Engineering Students who have also taken the same EAP courses taught by the two authors, and written consent was obtained from 11 students. Those 11 sophomores–comprising nine females and two males–came from different majors, as shown in Table 2. All participants were from science-and engineering-related backgrounds and had completed the EAP course in the fall semester, followed by the ESP course in the spring semester within the same academic year.

Table 2. Interview participant's background information

No	Name	Gender	Year of study	Area of study
1	Ruby	Female	2	Data Science & Big Data Technology
2	Amy	Female	2	Biological Sciences
3	Lauren	Female	2	Financial Engineering
4	Peter	Male	2	Financial Engineering
5	Joseph	Male	2	Statistics
6	Emily	Female	2	Financial Engineering
7	Frances	Female	2	Data Science & Big Data Technology
8	Nancy	Female	2	Electrical and Computer Engineering
9	Catherine	Female	2	Statistics
10	Molly	Female	2	Data Science & Big Data Technology
11	Zelda	Female	2	Biomedical Science and Engineering

Sophomore students were specifically chosen because they had recently completed both the EAP and ESP courses, enabling them to recall their learning experiences with greater clarity and detail. This timing ensures that the data collected is both recent and relevant, providing a more accurate reflection of their transfer experiences. While the sample size of 11 students is relatively small, it is appropriate for an exploratory study, which is aimed at gaining in-depth insights into the students' learning experiences and transfer processes. Each student in this report is assigned a pseudonym, as shown in Table 2, to ensure confidentiality.

3.3 *Data collection*

Data were collected through semi-structured interviews. The interview protocol addressed students' overall attitudes toward the experiences in the EAP and ESP courses, the assessment tasks, and their learning transfers. Specifically, students were asked to (1) elaborate on their skills gained from the two courses respectively, (2) describe challenges they faced during the learning processes, (3) explain skills they learned in the EAP course that were used/adapted to the ESP course or other contexts, (4) share reflections in terms of learning behaviors during the two courses. The interviews were conducted face-to-face and were recorded through Tencent Meeting. Each interview lasted around 30-60 minutes, trained research assistants transcribed the interviews verbatim. Ethical approval was secured from the university's ethical committee, where the two authors are from.

3.4 *Data analysis*

The eleven transcripts were analyzed using abductive thematic analysis (Thompson, 2022) by employing James' (2010) framework on students' learning transfer. James's (2010) framework was selected for its relevance to identifying and categorizing transferrable skills, which aligns with the focus of our EAP and ESP courses. Initially, four categories of transferrable skills were identified: organizing ideas effectively, utilizing resources efficiently, implementing a structured writing process, and utilizing appropriate vocabulary. During the initial data analysis, two additional categories–logical thinking and speaking skills–emerged and were incorporated into the coding scheme. Both authors actively read the transcripts, and the first author coded two randomly selected transcripts using the framework while remaining open to emerging themes. This process generated a set of initial codes, such as "confidence in handling tasks", "time management skills", and "logical thinking ability". These codes were subsequently refined and combined into broader themes, resulting in a preliminary coding scheme. The authors then discussed and revised this scheme, creating a new codebook that merged codes into higher-level themes. For example, "learning outcomes" were merged into "skills transferred", and factors were grouped into three broader categories based on their shared characteristics. These categories were then refined through iterative discussions. Finally, the first author coded the remaining transcripts according to the final codebook using NVivo 14. While inter-coder reliability was not formally assessed, the collaborative development and refinement of the codebook ensured consistency and rigor in the analysis.

4. Findings

Our findings suggest that learning transfer took place across various aspects, shaped by specific course objectives and task types. We reported findings mainly from two aspects: the skills transferred and the factors influencing students' learning transfer.

4.1 *Skills transferred from EAP courses to ESP courses and other contexts*

Our data disclosed five categories of skills that could have been transferred from the EAP course to the ESP course and other contexts. Students addressed more than 10 transferrable learning outcomes, including research skills, language skills, speaking skills, confidence, and time management, as displayed in Table 3, with detailed responses presented in the section after the table.

Table 3. Transferrable learning outcomes from EAP to ESP

Skills	NoP*	NoR*
Research Skills		
Logical thinking	10	51
Organization	6	10
Searching literature	7	11
Reading literature	7	22
Speaking Skills		
Presentation skills	9	17
Public speaking	7	15
Language Skills		
Using appropriate vocabulary	7	11
Writing as a process	4	6
Confidence	10	24
Time management	9	15

NoP = Number of participants who mentioned the point
NoR = Number of times such a point has been referred to in the interview

4.1.1 *Research skills*

Research-related skills were most frequently reported during the interviews, as students completed an individual research project by the end of the EAP course. Among the nine research skills, six were reported to have been transferred to the ESP course, as reported below.

a. *Logical thinking ability*

The most frequently mentioned skill transferred was the ability to think logically when dealing with different tasks in both EAP and ESP courses, as reported by 10 out of 11 participants. Students reported that logical thinking abilities were essential to the completion of their research paper project, such as figuring out the logical connection between literature (e.g., Peter, Emily, and Nancy), understanding the research paper structure (e.g., Joseph, Emily, and Lauren), developing a clear logic that helps in expressions (e.g., Lauren), and identifying research focus (e.g., Peter and Joseph). The logical thinking ability developed from the EAP course became valuable for students studying the ESP course. For example, they were able to understand the logical sequence in writing the technical proposal, as shown in Peter's response:

> *The EAP course has cultivated my logical flow, which I believe is very important. For example, when we were writing the literature review, we could see how the entire logical chain worked, and we could apply that to our technical proposal.* (Peter)

Students also find applying logical appeals (ethos, pathos, and logos) useful in addressing reader benefits, as Joseph stated:

> *I remember in the EAP class, there was an example discussing ethos, pathos, and logos. For instance, how wearing glasses or an academic shirt can make you appear more professional and make the audience more willing to believe you.* (Joseph)

In particular, students explained that they realized the importance of logos. Such a mindset becomes vital for them in addressing reader benefits when writing the technical proposal through providing solid data (e.g., Joseph), specifying a clearer point of view (e.g., Lauren), and developing a clear logic (e.g., Emily).

b. *Organization ability*

Participants responded with several writing strategies related to the organization of different texts in both the EAP and ESP courses, including understanding the structure of the content of a research paper (e.g., Frances), understanding the framework of the ESP texts (e.g., Joseph), and drawing easier conclusions by understanding the structure of the research paper better (Molly).

Students reported that completing the technical proposal in the ESP course became more efficient as they benefited from the experience of understanding the organization of the research paper during the EAP course, as shown by Ruby's remark below:

> *The technical proposal expects us to include background, as well as the problem and method sections. The entire structure is quite similar to the research proposal. When we were writing the report for the ESP course, it felt relatively easy because we understood how the whole framework worked.* (Ruby)

Such responses indicate that students have transferred the ability to organise their writings from the EAP to the ESP course.

c. *Ability to search and read literature*

Seven students mentioned how the EAP course helped them attain strategies for searching literature efficiently. Students indicated that it was the first time for them to systematically learn how to use search engines like Google Scholar when writing their research paper (e.g., Peter, Ruby, and Catherine), from which they have learned different tips in searching for relevant literature, such as "playing with different keywords with similar meanings" and using the 'snowballing' strategy (e.g., Ruby and Zelda).

After completing the EAP course, students found the process of searching literature in the ESP course was smoother, and they were able to search literature efficiently (e.g., Zelda and Ruby), as stated by Ruby:

> *In the ESP course, finding literature was a bit easier; I didn't feel like I spent a lot of time searching. In contrast, in EAP, it took a long time to find sources. I felt that I was better at using keywords for searching, like on Google Scholar. Also, using APA format became smoother.* (Ruby)

Apart from literature-searching ability, seven out of 11 students reported an improvement in their ability to read literature. Many mentioned that reading literature was one of the biggest challenges at the beginning of their research project (e.g., Emily and Catherine). However, with the increased reading volume, students have improved their reading proficiency and conquered the fear of reading academic journal articles (e.g., Zelda, Molly, and Nancy), as Emily stated:

> *I felt that I had studied a new course about reading literature. At first, reading articles takes a lot of time, but it gets faster and faster. I have taken a lot of notes, and I paid attention to how different people review similar topics. I might spend a long time on the first article, but as I kept reading every week or whenever I had time, I could read faster.* (Emily)

Such ability has been transferred evidently to the ESP course. Emily mentioned that as her literature-reading ability improved, she could handle the reading load for the ESP course using the literature-reading habit developed in the EAP course:

> *When I read different types of articles in the ESP course, I applied the methods I learned in the EAP course. For instance, I created several documents for myself: one document specifically for background information, another for problems, and so on. I would place relevant parts into those documents so that when I write my own articles later, I can easily see where the information came from and find the references to summarize.* (Emily)

4.1.2 *Speaking skills*

Speaking skills ranked as the second most frequently mentioned skill transferred, as both EAP and ESP courses provided students with sufficient speaking training. The data analysis revealed that the transfer of speaking skills lay mainly in a) public speaking skills and b) presentation skills.

a. *Public speaking skills*

In the EAP course, students completed a TED-talk-like public speech where they delivered a 4-minute off-script talk to their classmates. Students stated that speech training provided considerable freedom in topic selection, enabling them to express themselves (e.g., Peter). They also understood the importance of audience benefits and how to address the audience's needs (e.g., Joseph, Peter). For example, Peter reported the development of delivery skills that attract the audience, such as pausing and effective body language. Additionally, students also became more familiar with the preparation needed for delivering an effective speech, as shown below:

> *Now I know how many hours I needed to get ready for a speech so that I could speak fluently without a script, and wouldn't get stuck on stage. I know that I have reached that preparation timeline, and I will definitely be able to perform like this.* (Emily)

Correspondingly, the public speaking skills developed in the EAP course, such as voicing personal views without restraint, were reported to have been transferred to the group interviews in the ESP course. Students reported becoming more capable of answering impromptu questions in job interviews, partly:

> *I used to be quite hesitant to speak so much in English in front of others, and I wasn't very good at communicating with others in English. This speaking practice has helped build my confidence, allowing me to not feel very nervous during the interview segment in the ESP course.* (Amy)

Such responses indicate that the skills developed in one speaking task could possibly be transferred to a different task in a different course.

b. *Presentation skills*

Nine students reported they have developed effective presentation skills after taking the two courses, such as designing effective visual aids (e.g., Nancy) and having clearer logic and organization in the delivery (e.g., Catherine).

In particular, students explained that due to the similar expectations between presentations in the EAP and ESP courses, they applied skills such as extracting information for the visual aids (e.g., Lauren) and using logical appeals to deliver a persuasive technical presentation (e.g., Peter); they also needed much shorter preparation time due to better proficiency (e.g., Nancy). Such exercise from the EAP course gave students the ability to perform at a higher level in academic presentations, as indicated by Nancy:

> *I felt that my ability to do presentations had improved compared to last semester, both in terms of conceptualizing and presenting ideas. This might be because I practiced quite a lot last semester, and I became more proficient.* (Nancy)

Students also gained more confidence in the Q & A session after their EAP course training, because they could apply the Q & A skills developed from the EAP course to a similar situation in the ESP course.

> *I got a lot of practice during the Q & A session after the English presentation. In my EAP course, after I finished the presentation, I took the questions on-site. I had chances to do that again in the ESP one. I experienced this for two semesters in a row.* (Molly)

4.1.3 *Language skills*

Compared with research and speaking skills, transfer of language skills was less frequently reported, with only two major language-related skills mentioned: (a) using appropriate vocabulary and syntactic patterns, and (b) writing as a process.

a. ***Using appropriate vocabulary and syntactic patterns***

Seven students reported gaining and transferring skills related to vocabulary and syntactic patterns. Students regarded the research paper as the most formal academic writing they had encountered so far, as Catherine responded:

> *Writing research papers is the most rigorous academic task among all subjects, whether it's the APA format, grammar, or word choice. It's the most challenging, and it will definitely help with writing in the future.* (Catherine)

Accordingly, students reported specific writing skills they have developed through writing a research paper, for example, writing with an objective and rigorous tone (e.g., Zelda and Catherine), using action verbs and appropriate prepositions (e.g., Peter and Ruby), and using vocabulary that fits in the contextual needs (e.g., Emily). Frances was quite firm that the learning transfer of vocabulary and syntactic patterns did happen.

> *The language skills, such as vocabulary and structure, I learned in the EAP course definitely transferred, especially if we wrote seriously without relying on tools like ChatGPT. When I wrote longer, structured papers, like technical proposals.* (Frances)

Ruby's response demonstrated how she transferred the language skills-using pronoun references correctly from the EAP to the ESP course:

> *I know how to express myself more clearly now because I've noticed that some of my classmates' reports have unclear references. For example, they keep using pronouns, which can make things confusing. It's hard to understand which step they're specifically referring to. The English class has actually helped with language expression, which is beneficial for writing reports in our major courses.* (Ruby)

b. ***Writing as a process***

Students reported how they transferred the skills needed for process-based writing (e.g., drafting-revising-finalizing) from writing a research paper to a technical proposal, as Joseph remarked:

> *When writing the proposal, it's important to clarify what needs to be done at each stage. I became clearer about the tasks involved in the different stages of writing and the corresponding skills required for each phase.* (Joseph)

Other students reported different strategies for revising their papers, such as making modifications after writing each section, which helps them reflect on the writing progress (e.g., Peter), raising questions, and reflecting on their projects while preparing for data collection (e.g., Zelda).

Students also claimed that teachers' involvement in the writing process helped them develop a better mindset in writing an effective research paper. Zelda recalled that the teachers provided a lot of facilitation in writing by dividing students into small groups and guiding each group to research a specific topic and write a simple proposal, which helped her develop an idea about an effective writing process, which she was able to follow in the ESP course.

4.1.4 *Confidence*

Ten out of 11 students brought up the issue of whether confidence has been transferred. Some believed that confidence could be increased by the accumulation of practices (e.g., Peter and Joseph), and it could also be transferred to diverse contexts (e.g., Lauren, Joseph, and Emily). Lauren elaborated on how her experience of doing presentations in the EAP course helped her boost her confidence in the ESP course:

> *The speaking requirement in the two courses was quite similar. It was also about finishing the paper and then creating a PowerPoint (PPT). At least in terms of the aesthetics of the PPT, information refinement, and speed, I made a significant improvement. Additionally, I got good results in the EAP course, and I felt that my*

presentation skills on stage at that time were also decent. I am more confident when doing presentations in the ESP course. (Lauren)

However, several students reported their lack of confidence in English speaking (e.g., Emily, Nancy, Ruby, and Zelda), and they believed that such a lack of confidence was hard to change in a short amount of time, as stated by Emily:

I currently have this situation where I feel my vocabulary has increased, and I know more sentence structures, but my spoken language seems to be less fluent than before. I feel very cautious and hesitant, as if there's an obstacle. I am still working on overcoming this. (Emily)

4.1.5 *Time management*

Nine students reported that they developed better time management skills by completing a research project within a three-month timeframe. Students reported skills they used to handle procrastination (e.g., Lauren, Ruby, and Molly), with Ruby's response as an example:

I overestimated myself, thinking I could accomplish one thing each week, but I failed to do so. I still hadn't completed the data analysis right before the research presentation. That was a lesson learned. I started the ESP course a bit earlier. I planned to do each step a bit earlier, avoiding procrastination. (Ruby)

In addition, students mentioned the importance of reserving time for tasks that they considered to be challenging, for example, brainstorming ideas (e.g., Lauren), data collection (e.g., Nancy), data analysis (e.g., Peter), writing the final paper (e.g., Catherine), and preparing for the research presentation (e.g., Peter and Molly). It seems that students developed time management skills by handling the task completion process strategically.

4.2 *Factors affecting the transfer of skills and learning outcomes*

Students' responses identified three main factors that affect the learning transfer from the EAP course to the ESP course, as shown in Table 4, with detailed responses presented in the section after the table.

Table 4. Factors affecting learning transfer

Factors	NoP*	NoR*
Task-Related		
Task(assessment) type	8	29
Task difficulty	9	18
Task practicality	7	16
Personal factors		
Personal interest	8	24
Personal learning method	6	10
Course-Related		
Differences between EAP and ESP	7	19
Course requirements cross-discipline	6	9
Similarities in EAP and ESP	3	4

NoP = Number of participants who mentioned the point
NoR = Number of times such a point has been referred to in the interview

4.2.1 *Task-related factors*

Students addressed three task-related factors that affect learning transfer, including (a) task type, (b) task difficulty, and (c) task practicality, among which task type was the most frequently mentioned one. Eight students attributed their learning transfer to the task types encountered. Ruby's comment below indicated it was due to the familiarity with the task types from the EAP course (e.g., reporting your research paper in a presentation) that helped her perform well in the ESP course (e.g., the technical presentation):

> *You need to report things you've researched yourself during the EAP course, and it's something you did from start to finish. This experience helped me make a good technical presentation in the ESP course.* (Ruby)

Whereas similar task types facilitated the learning transfer, learning transfer was unlikely to take place if students could not recognize the connection between different tasks. For instance, some students could not find resemblance between the writing tasks (e.g., research proposal and technical proposal) in the two courses (e.g., Peter), some reported difficult in incorporating technical aspects in their technical proposal writing (e.g., Zelda), indicating the necessity for course instructors to draw explicit connection between task types.

In terms of task difficulty, students found the technical proposal in the ESP course much easier to handle (e.g., Peter, Emily, and Ruby). Thus, they were able to apply what they had learned in the EAP course to ESP one (e.g., literature reading strategies). Emily illustrated that she was more willing to read and spent more time tackling readings as she felt less overwhelmed by the course requirements:

> *Yes, because, as I mentioned earlier, the textbook and that paper were the two most challenging things for me. In the EAP course, I overcame a mental barrier, so in the ESP course, when I didn't encounter a big boss like the textbook, I felt brave enough to tackle these readings.* (Emily)

Finally, task practicality was also a frequently mentioned factor. Seven students indicated they were putting more effort into tasks that lead to more practical usage in further contexts (e.g., Peter, Lauren, and Catherine). These tasks include the research paper writing strategies, which can be adapted to writing in their disciplinary learning, such as reading/synthesizing literature (e.g., Frances) and writing a curriculum vitae for job application (e.g., Peter). Such remarks affirmed that learning transfer is more likely to happen when students feel skills practiced in their academic English courses can be applied to a wider context.

4.2.2. *Personal factors*

Personal-related factors were the second most frequently mentioned, which include personal interest and personal learning methods. Eight students highlighted that personal interest facilitated the transfer. Students claimed that they would enjoy the process of preparing for the tasks and achieve better outcomes if they had a strong interest (e.g., Molly and Catherine). Similarly, some responded that they would grow negative feelings towards the course when they are not interested in the content or cannot relate the task to their own learning, as shown below:

> *I find the ESP course quite different from the EAP course. I tend to think it's troublesome finishing the tasks when I have to adapt to this new thinking logic of the ESP, which I'm not as interested in.* (Emily)

Students also believed that their learning methods facilitated the learning transfer. In particular, students brought up the concept of "practice makes perfect". They believed that how they prepared and practiced speaking skills helped them enhance their oral competence (e.g., Frances and Nancy), and they understood the time needed to prepare for different tasks better during the ESP course (e.g., Emily).

> *When writing the technical proposal and doing the presentation, I felt that my abilities had improved compared to last semester. I think it might be because I practiced quite a bit last semester, so when I approached it this semester, I was more skilled.* (Nancy)

Students also reported the effective study methods they have mastered from taking the EAP course, such as engaging in group discussions (e.g., Ruby), summarizing and synthesizing information (e.g., Nancy), or handling a challenging task such as data collection (e.g. Lauren).

4.2.3 *Course-related factors*

Our findings identified three course-related factors, including (a) similarities between the EAP and ESP courses, (b) differences between the EAP and ESP courses, and (c) course requirements cross-discipline.

Students found both similarities and differences between the two courses affect learning transfer. In terms of the similarities, students found that the similar thinking process (e.g., developing a new idea in a proposal) in the two courses made them feel more confident in completing the task in the ESP course (e.g., Lauren). They also found that both courses have similar expectations on the formality of language, as Ruby stated:

> *For example, in terms of language. I feel that the EAP course required us to refer to certain things clearly. For instance, the EAP course expected us to use clear pronouns, establish coherence between sentences, and state the whole ideas logically so that the reader will not be confused. The ESP course also has the same requirements.* (Ruby)

Seven students commented that the differences between the courses, such as different workloads (e.g., Amy, Zelda, and Lauren), different focuses (e.g., Joseph and Catherine), and different skills trained (e.g., Joseph), also facilitate or hinder the transfer. For example, Catherine responded that as the workload in the ESP course reduced, she felt more relaxed and had more time to apply the writing skills she obtained from the EAP course. Similarly, Ruby agreed that she also had more chances to practice time management skills due to the reduced workload.

Six students believed that the course requirements across disciplines affected the learning transfer. Amy elaborated from a medical student's perspective that many skills obtained from the course could be transferred to her major courses. She considered the EAP course to be highly relevant, as it facilitates the acquisition of professional vocabulary and the development of a research-oriented mindset. Students also indicated that students from certain majors developed specific speaking skills more than others since they received more speaking training from their major courses. For example, Zelda felt that compared with her roommate, who was studying marketing and management, she, as a biology student, had less chance to utilize the speaking skills developed from the EAP/ESP course; such a response indicated the necessity for ESP courses to address students' specific disciplinary needs.

5. Discussion and conclusion

Drawing on students' experiences in the research-oriented EAP course and an ESP course for science and engineering students, the current study enhances the understanding of learning transfer between the two courses, which provides potentially useful strategies for language teachers and learners to promote positive transfers between academic English and discipline-specific English courses.

5.1 *Learning transfers from EAP to ESP*

To answer the first research question, the skills transferred from the research-oriented English for the Academic Purposes (EAP) course to English for Specific Purposes (ESP) course can be categorized into five main areas: research skills, speaking skills, language skills, confidence, and time management, which are related to 10 transferable learning outcomes (see Table 3). Research-related skills emerged as the most prominent category, encompassing sub-skills such as logical thinking, organization, and literature reading and searching ability. Speaking skills, including speaking and presentation skills, ranked as the second most frequently mentioned. The third category was language skills; though less frequently mentioned, students' improvements in vocabulary and writing processes were recognized. Students' confidence was enhanced in both EAP and ESP contexts, although some continued to struggle with fluency and confident expression. Finally, time management abilities have transferred to ESP contexts based on their experiences in

planning during previous research projects.

These findings align with previous studies (Hyland, 2002) and exemplify that EAP courses act as a preparatory stage for the more specialized demands of ESP courses. Our findings contribute positively by supporting that various sub-language skills developed in the EAP course, such as using appropriate syntactic patterns and organizing ideas, have been transferred to the ESP course and courses across various disciplines (James, 2006; James, 2010; Zarei & Rahimi, 2014). What is different in our study is that our participants seemed to mention less on language aspects such as guessing the meaning of unknown words, establishing coherence and paraphrasing, but more on advanced writing skills, such as writing as a process, as well as higher-order skills such as logical thinking, literature searching, and reading for the EAP course. Such differences indicate that the skills transferred depend probably on course objectives and assessment requirements (James, 2024). As the completion of a research project was a major focus of the research-oriented EAP course, it is not surprising that our participants put less emphasis on the linguistic aspects and more on skills related to the overall academic literacies (such as developing logical thinking skills for constructing writing and writing as a process). In contrast to Hill et al.'s (2020) study, our participants perceived less transfer of discipline-specific skills, such as writing technical definitions and technical communication. This was probably due to our study focusing mainly on the skills transfer from EAP to ESP, instead of from the ESP course to their disciplinary writings. Further studies may further explore the extent to which skills from EAP or ESP courses can be applied to discipline-related writing.

Our findings further contribute to understanding the types of learning transfer in academic contexts. In terms of the types of transfer, our study confirms that learning transfer can take the form of near or far transfer (Perkins & Salomon, 1992), as well as adaptive transfer (Wilson & Soblo, 2020). The learning transfer in the current study lies more on the far and adaptive end. In terms of far transfer, our students specifically reported that their use of logical appeals in public speech was transferred to the technical presentation. As for adaptive transfer, the ability to read literature in the social science context has been transferred to reading literature in their own disciplinary studies. The factors contributing to such transfer can be attributed to two major aspects. First, the essence of the course was designed to develop students' writing abilities at a higher level, which enabled them to focus more on enhancing logical thinking skills. Second, the differing course objectives and writing contexts encouraged and urged students to reflect on effective writing practices in the ESP course.

5.2 *Factors influencing learning transfer*

Concerning the second research question, the findings reveal multiple factors influencing learning transfer from the research-based EAP course to the ESP course, including task-related, personal, and course-related factors. For task-related factors, task type was the most frequently mentioned. Students reported that performing an ESP task, which is similar to what they have done in an EAP course, can facilitate transfer (e.g., technical presentation vs. research presentation). As most students found the ESP tasks relatively easier compared to the EAP course, they expressed a greater willingness to engage with related materials when task difficulty was reduced. This aligns with Barnett and Ceci's (2002) findings that task familiarity and perceived difficulty significantly influence learners' ability and transfer skills to different contexts. Personal factors played a vital role. Interest and learning methods both further and consolidate learning transfer. This echoes the findings from Pugh and Bergin (2006), who stated that individual interest motivates students to utilize cognitive strategies and demonstrate persistence, both of which are linked to deep-level processing (Ainley et al., 2002; Schiefele, 1991). Such evidence reflects the existence of a deeper level of cognitive engagement rather than simple memorization from our participants' experiences. Finally, similarities in logical thinking and language requirements between courses related to increasing students' confidence, while differences in workload greatly influenced the transfer. Students also reported that the types of tasks they need to perform in their major (e.g., business presentation vs. solving mathematical problems) affect their learning transfer to a different degree, indicating that the practical implications could strengthen effective learning transfer.

The three categories of factors identified echo Green's (2015) interpretation of the positive relationship between students' perceptions of italicize and *bridging* strategies used by their instructors and their perceived learning transfer. Our participants highlighted the importance of both *hugging* strategies, such as simulated interview training, scaffolded resume writing exercises, and public speaking training on pause and body language, and *bridging* strategies, including training on critical literature review, academic presentation structures, audience awareness, topic development, and

logic and coherence, in supporting learning transfer. Per previous research (Green, 2015; Salomon & Perkins, 1988), those hugging and the bridging strategies appeared to affect learning transfer to different extents. More specifically, hugging strategies facilitated learning transfer towards the near end (e.g., using appropriate body language in both public speaking and technical presentations). On the contrary, bridging strategies tended to support learning transfer at the adaptive end (e.g., from developing clear logic in a research paper to logical technical proposals). Students with engineering backgrounds in our study constantly related tasks received in the ESP course to similar tasks from their discipline (e.g., adopting a similar logical structure when preparing for presentations for both courses, vocabulary, and research mindset), which supports that the learning transfer can go beyond the ESP course to their disciplinary learning. Such findings support Haghighi et al.'s (2019) notion that learners develop their learning agency through such a process, with the difference lying in that the language instructors in the current study did not collaborate with disciplinary instructors. Subsequently, our students admitted that learning transfer was sometimes hindered by their unfamiliarity with the ESP tasks and the challenges in incorporating technical knowledge into their writing, which indicates the need for collaboration between ESP teachers and disciplinary teachers.

Our study generated pedagogical implications for language instructors and curriculum designers to enhance learning transfer between EAP and ESP courses. First, the study points out the necessity for EAP/ESP course instructors to cultivate students' higher-order skills, such as logical thinking, and organizational coherence through classroom instruction. For instance, instructors could design reading tasks that require students to analyze, evaluate, and synthesize information from sample journal articles. To develop synthesis skills, students can integrate findings from various sources, including those with opposing viewpoints, to create cohesive literature reviews that demonstrate how to reconcile or critically evaluate differing perspectives. Moreover, tasks that involve problem-solving and decision-making could also elevate such learning transfer. Instructors can implement project-based learning in EAP to develop problem-solving and time-management skills, subsequently enabling students to apply these competencies in ESP courses. For instance, instructors could involve identifying real technical problems on campus-such as inefficient energy use in labs or outdated software in computer clusters–and tasking students with applying their technical knowledge to draft practical solutions, complete with cost-benefit analyses or implementation timelines. These projects could include clearly defined phases, such as problem identification, research and data collection, collaborative brainstorming, and the presentation of evidence-based recommendations. Third, it was identified as essential for students to apply skills adaptively to different contexts. To address adaptive transfer, language instructors could design tasks that encourage students to position themselves in different contexts within the same learning topic, for example, through tasks that ask students to address audiences with different backgrounds or expand relevant readings from different genres. Finally, it is also worthwhile to foster collaboration between ESP and disciplinary instructors through cross-disciplinary workshops to ensure learning objectives. By systematically integrating these strategies–targeted skill development, real-world problem-solving, adaptive application, and cross-disciplinary collaboration, educators can create a seamless bridge between EAP and ESP, empowering students to transfer their learning effectively across academic and professional contexts.

5.3 *Limitations and further studies*

The methodological limitation of this study lies in the fact that it only collected data from a relatively small number of students. Further research could include students from different disciplines, such as business, humanities, and social science. Second, the study depended only on interview data. Future studies could involve analysis of students' work, which could provide direct evidence for their learning transfer. Finally, our study still focuses on utilizing general writing skills (e.g., literature searching, reading, and process-based writing) in the ESP course. Further studies may address the extent to which general academic skills can be transferred to writing discipline-specific genres.

Conflict of interest

The authors declare that there is no conflict of interest.

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