

3rd CYCLE OF STUDIES IN LANGUAGE SCIENCE

DIDCATICS OF LANGUAGES

## **Collaborative teaching in higher education**

**A case study examining the decision-making process of English for specific purposes and content teachers involved in collaborative teaching**

Isabele Maria Nunes Lavado

**D**

2025



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Tese realizada no âmbito do Doutoramento em Ciências das Línguas, orientada pela Professora Doutora Maria Ellison e pela Professora Doutora Maria Fernanda Martins

Faculdade de Letras da Universidade do Porto

2025



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*To my sons, Manuel, Tomás and Simão.*

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I further declare that I have not used generative artificial intelligence tools (chatbots based on large language models) to carry out part(s) of this thesis, and that all interactions (prompts and responses) have been transcribed in the annex.

Porto, Portugal, janeiro de 2025

Isabele Maria Nunes lavado

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## **Abstract**

This PhD thesis explores the receptiveness of professors, participating students, and faculty directors towards interdisciplinary collaboration with an English for Specific Purposes (ESP) teacher at the Castelo Branco Polytechnic University, focusing on the implementation and outcomes of collaborative teaching involving ESP and content teachers from various disciplines. Conducted in three stages and using a mixed-method approach, the research first assesses collaboration receptiveness through questionnaires. Stage Two focuses on implementation involving content selection, lesson planning, and assessments and finally captures feedback, reflections, and reactions from teachers and students. The study reveals the positive impact of interdisciplinary collaboration on content and language learning, with academic staff and school directors showing a strong commitment to integrating language instruction with disciplinary content. Drawing from Social Cognitive Theory (SCT) and Expectancy-Value Theory (EVT), the findings demonstrated that self-efficacy and task value influenced participants' motivation and engagement with teachers, showing greater receptiveness when they had higher self-efficacy and positive outcome expectations. At the same time, students were more engaged when they recognised the value of interdisciplinary learning for their academic and professional goals. Although collaboration was generally welcomed, some teachers and students needed additional linguistic support and incentives to increase their confidence in engaging with such initiatives. Reflections on the collaboration highlight its success and the need for continuous improvement, stressing the importance of a supportive institutional culture, stakeholder collaboration, and interdisciplinary approaches for enhancing educational outcomes.

**Keywords:** Interdisciplinary Collaboration, English for Specific Purposes, Integrated Content and Language, Social Cognitive Theory, Expectancy-Value Theory

## Resumo

Esta tese de doutoramento explora a recetividade de professores, estudantes e diretores de unidades orgânicas em relação à colaboração interdisciplinar com o professor de Inglês para Fins Específicos (IFE) no Instituto Politécnico de Castelo Branco. O estudo centra-se na implementação e nos resultados do ensino colaborativo, envolvendo professores de IFE e docentes de diferentes unidades curriculares. Desenvolvida em três etapas e recorrendo a uma abordagem metodológica de carácter misto, a investigação começa por avaliar a recetividade à colaboração através de questionários. A segunda etapa centra-se na implementação, abordando a seleção de conteúdos, o planeamento de aulas e a avaliação, culminando com a recolha de feedback, reflexões e reações de professores e estudantes. Os resultados do estudo evidenciam o impacto positivo da colaboração interdisciplinar na aprendizagem de conteúdos e de língua. Os docentes e os diretores demonstraram um forte compromisso no sentido da integração do ensino das línguas com os conteúdos curriculares. Com base na Teoria Social Cognitiva (TSC) e na Teoria da Expectativa-Valor (TEV), os dados indicam que a autoeficácia e o valor atribuído às tarefas influenciam a motivação e o envolvimento dos participantes. Verificou-se uma maior recetividade por parte dos professores quando apresentavam níveis mais elevados de autoeficácia e expectativas positivas em relação aos resultados. Simultaneamente, os estudantes demonstraram maior envolvimento quando reconheciam a relevância da aprendizagem interdisciplinar para os seus objetivos académicos e profissionais. Embora a colaboração tenha sido, em geral, bem acolhida, alguns professores e estudantes necessitaram de apoio linguístico adicional e de incentivos para reforçar a sua confiança em participar nestas iniciativas. As reflexões sobre a colaboração sublinham o seu sucesso e evidenciam a necessidade de melhoria contínua. Destacam, ainda, a importância de uma cultura institucional de apoio, da colaboração entre as partes interessadas e de abordagens interdisciplinares para a melhoria dos resultados académicos.

**Palavras-chave:** Colaboração Interdisciplinar, Inglês para Fins Específicos, Integração de Conteúdo e Língua, Teoria Social Cognitiva, Teoria da Expectativa-Valor



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## List of acronyms and abbreviations

BICS .....	BASIC INTERPERSONAL COMMUNICATION SKILLS
CALP .....	COGNITIVE ACADEMIC LANGUAGE PROFICIENCY
CEFR .....	COMMON EUROPEAN FRAMEWORK OF REFERENCE FOR LANGUAGES
CTESP .....	CURSOS TÉCNICOS SUPERIORES PROFISSIONAIS
CLIL .....	CONTENT AND LANGUAGE INTEGRATED LEARNING
DGEEC .....	DIRECTORATE-GENERAL OF STATISTICS OF EDUCATION AND SCIENCE
EAP .....	ENGLISH FOR ACADEMIC PURPOSES
ECTS.....	EUROPEAN CREDIT TRANSFER SYSTEM
EFL .....	ENGLISH AS A FOREIGN LANGUAGE
ELF .....	ENGLISH AS A LINGUA FRANCA
ELFA .....	ENGLISH AS A LINGUA FRANCA IN ACADEMIC SETTINGS
EMI .....	ENGLISH-MEDIUM INSTRUCTION
ESP .....	ENGLISH FOR SPECIFIC PURPOSES
EVT .....	EXPECTANCY-VALUE THEORY
FCT .....	FUNDAÇÃO PARA A CIÊNCIA E TECNOLOGIA
FTD .....	FASHION AND TEXTILE DESIGN
HE .....	HIGHER EDUCATION
HEI .....	HIGHER EDUCATION INSTITUTION
ICL .....	INTEGRATED CONTENT AND LANGUAGE
ICLHE .....	INTEGRATING CONTENT AND LANGUAGE IN HIGHER EDUCATION

INE ..... NATIONAL INSTITUTE OF STATISTICS

IPCB .....CASTELO BRANCO POLYTECHNIC UNIVERSITY

ISO .....INTERNATIONAL STANDARDS ORGANISATION

MADR ..... DEPUTY MINISTER FOR REGIONAL DEVELOPMENT

MEC ..... MINISTRY OF EDUCATION AND SCIENCE

OECD ..... ORGANISATION FOR ECONOMIC CO-OPERATION AND  
DEVELOPMENT

SCT ..... SOCIAL COGNITIVE THEORY

## Introduction

Internationalisation has emerged as a defining feature of higher education institutions. The prevailing consensus on internationalisation posits that institutions must prepare their students for a globalised world by exposing them to diverse perspectives, cultures, and experiences (Ament, 2021; Marinoni, 2019). This requires a commitment to internationalisation across all institutional levels (first, second, and third cycle studies), encompassing curriculum development, faculty and staff training, student support services, and research collaborations. Internationalisation is no longer an option; it is an imperative in higher education in the 21st century. Institutions prioritising it are better positioned to equip their students for success in an increasingly interconnected world (Ament, 2021; Bowles & Murphy, 2020).

Internationalisation is frequently accomplished within this landscape through English-medium instruction (EMI) (Chien & Valcke, 2020; Doiz et al., 2013; Kim et al., 2018). Indeed, "the English language is playing a significant role in the internationalisation of global higher education," making EMI a "strategic response to globalisation" of higher education institutions (HEIs) (Jenkins, 2014, p. 5). In other words, HEIs must provide English-taught courses to compete in the higher education market.

Higher education in Portugal is becoming increasingly internationalised, with courses designed to prepare students for the global job market. In some cases, English is now positioned as the primary language of instruction, with students required to attain high levels of fluency for academic success. Even in institutions where the primary language of instruction is not English, the language remains indispensable in higher education, serving as a conduit for global communication, access to information and career opportunities, and equipping students with the essential tools and skills for a rapidly globalising world.

The author of this PhD thesis, also referred to as the "researcher", actively participated in a project known as the "CLIL-ReCLes.pt project." This project aimed to prepare subject teachers to instruct in English by supporting the selection of materials and class preparation. Reflecting on the project results, it became evident that teachers required far

more support than initially envisioned. This included enhancing their language proficiency, developing teaching materials, and supporting students with language difficulties, among other needs. The researcher, an English language teacher at a higher education institution, brings eight years of experience collaborating with content teachers. During this period, they developed strategies to assist in creating course materials and conducting collaborative classes.

Informed by a commitment to interdisciplinary collaboration, the present study explores the intersections between ESP, EMI, and the innovative paradigm of Integrating Content and Language in Higher Education (ICLHE). This investigation acquires heightened relevance through a strategic partnership with an ESP teacher and content teachers in a Higher Education Institution, aiming to discern the pedagogical underpinnings that guide instructional decisions. The selection of ESP within this interdisciplinary context becomes paramount, influenced by the dynamic landscape of HEI instruction and the imperatives of fostering effective communication and knowledge transfer. This inquiry contributes to the broader discourse on educational methodologies by scrutinising and contrasting these instructional models. It elucidates the rationale behind the integration of ESP in collaborative cross-disciplinary settings.

The case study presented in this thesis examines the collaborative efforts of teachers within the higher education institution. Specifically, collaboration was established between an ESP teacher and three content teachers to implement Content and Language Integrated Learning (CLIL). The lessons were delivered during the content teachers' regular classes with their students, and the teaching plans were developed collaboratively. In some instances, only the ESP teacher conducted the lesson in English; in others, both the ESP and content teacher co-taught in English. This study takes a comprehensive approach to its research aims, ensuring that all aspects—from institutional dynamics and strategic planning to the integration of language and content instruction, as well as reflective practices—are holistically addressed. The first aim of this study is to assess the receptiveness of the Higher Education Institution (HEI) to interdisciplinary collaboration involving English for Specific Purposes (ESP) and content teachers. To evaluate this

receptiveness, all teachers and faculty directors at the HEI were invited to complete a questionnaire assessing their views on interdisciplinary collaboration and their willingness to participate in this teaching strategy. Understanding the receptiveness of students, ESP, and content teachers is a critical aspect of this study. Social Cognitive Theory (SCT) and Expectancy-Value Theory (EVT) are applied to systematically evaluate their openness and readiness to engage in interdisciplinary collaboration.

The second aim focuses on developing a targeted intervention plan to support collaborative teaching. This plan is designed to address the unique challenges faced by the HEI. Exploring the development of the intervention plan provides valuable insights into the decision-making processes and strategic considerations underpinning collaborative teaching efforts. This aim includes a detailed analysis of the step-by-step process of crafting an interdisciplinary collaborative teaching plan, with a key emphasis on integrating language and content instruction within the CLIL framework.

The third aim focuses on reflecting on teaching practices and exploring the benefits and challenges experienced by teachers in interdisciplinary collaboration. This objective examines how these factors affect their teaching practices and curricular decisions, focusing on the integration of language and content instruction within the CLIL framework.

The final aim is to evaluate the impact of interdisciplinary collaboration on student learning outcomes, specifically regarding the acquisition of technical language relevant to their content area. This evaluation incorporates teacher reflections, student feedback, and assessment data to provide an understanding of the effectiveness of interdisciplinary collaboration in enhancing technical language proficiency.

To address these aims, the study poses the following research questions:

1. How receptive is the higher education institution to implementing interdisciplinary collaboration between ESP teachers and teachers from other subject areas?
2. What key elements should be included in the intervention plan for interdisciplinary collaboration?

3. What are the benefits and challenges experienced by teachers in interdisciplinary collaboration, and how do these influence their teaching practices and curricular choices?
4. To what extent does the interdisciplinary collaboration enhance students' learning of the specific technical language of their content area?

Data were collected to analyse the teachers' decision-making processes, including choices regarding curriculum, materials, class organisation, and assessment methods. The collaboration was between an ESP and three content teachers from diverse courses: fashion and textile design, technological and graphic design, and communication and audio-visual design at the School of Applied Arts at the Castelo Branco Polytechnic University. The data were gathered through questionnaires distributed to the teachers during and after their decision-making processes, complemented by audio-recorded meetings. Additionally, students who participated in these collaborative classes were surveyed to gauge their opinions on interdisciplinary collaboration before and after the classes. Soliciting the perspectives of all participants was essential to presenting a comprehensive view of the case study, and these opinions significantly inform the study's findings and conclusions.

The analysis scrutinises the decision-making of content teachers. It also examines how the ESP teacher selects content and materials and how the content teachers determine the content to be taught in the foreign language. An analysis of the ESP teacher's decisions within each situation (the ESP teacher decided on three different courses) is conducted to identify similarities and differences. Lastly, the study explored how these individual decisions were integrated into the collaborative teaching environment. This case study aims to provide valuable insights into the decision-making process and the structuring of collaborative teaching practices. As part of this case study, an intervention plan was designed to facilitate and guide the collaborative teaching between ESP and content teachers. A potential outcome of this study is that it can serve as a starting point for higher

education teachers embarking on collaborative teaching initiatives and developing materials and assessments focusing on content and language integration.

This thesis is divided into two parts. Part I establishes the theoretical framework underpinning the exploration of the study into collaborative teaching in higher education, particularly within the context of evolving language policies. Chapter 1 examines the shifting landscape of language policies within higher education institutions (HEIs). It begins by highlighting the increasing internationalisation of HEIs, where English is often positioned as the primary language of instruction. The discussion also explores the concepts of language awareness and academic literacy, emphasising the continuous research efforts in this field. These concepts are essential for effectively integrating language and content instruction. Language awareness and academic literacy are widely regarded as essential factors that can support more effective collaboration between ESP and content teachers, which may contribute to improved student outcomes. This focus highlights the ongoing need to develop and refine strategies that support interdisciplinary teaching practices, ensuring that students gain the necessary language skills to succeed in their specific content areas. Moreover, it explores the role of English as a Lingua Franca (ELF) in higher education and the development of university language policies. Particular attention is given to Portuguese HEIs' language policies, highlighting their impact and implications.

Chapter 2 explores various language instruction approaches within higher education. It examines ESP, where language instruction is tailored to the specialised needs of learners. There is a discussion on the growing prevalence of EMI and its implications for higher education. The chapter also explores ICLHE. It compares EMI, ESP, and ICLHE approaches, considering factors such as language proficiency, historical context, recent trends, and collaborative external evaluation and research networks. The situation in Portugal is highlighted, along with an overview of research in ESP and ICLHE, including insights into language instruction challenges and the roles of language specialists.

Chapter 3 provides a foundational understanding of the concepts vital to this study. It begins with definitions of collaborative teaching and discusses the benefits and challenges inherent in interdisciplinary collaboration. The chapter further contextualises collaboration within the framework of ICLHE, detailing the roles and responsibilities of teachers, approaches to lesson planning, and methods for assessing student learning. By addressing these elements, Chapter 3 sets the stage for understanding how interdisciplinary collaboration can be effectively implemented within the HEI context.

Chapter 4 focuses on receptiveness, referring to the willingness and ability of teachers, faculty directors, and students to engage with and adapt to collaborative practices and innovative teaching methodologies. This chapter explores the theoretical underpinnings of receptiveness through Social Cognitive Theory (SCT) and Expectancy-Value Theory (EVT), providing insights into how beliefs, motivations, and perceived value influence participants' readiness to embrace collaborative approaches. Additionally, SCT, developed by Albert Bandura (1986), emphasises the role of observational learning, imitation, and modelling in the learning process, positing that individuals learn not only through direct experience but also by observing the behaviours of others and the outcomes of those behaviours. This theoretical framework is vital for understanding receptiveness and its impact on the collaborative teaching processes investigated in this study.

Part II of the study explores the methodology and design underpinning this research. Chapter 5 outlines the purpose, aims, research questions, and research design, which employs both quantitative and qualitative methods. It presents a case study approach detailing the sample population, which includes Castelo Branco Polytechnic University (IPCB), school directors, academic staff, and student participants. This chapter also describes the data collection methods, including teacher meeting recordings, questionnaires, and informal data collection strategies.

In Chapter 6, the findings and discussions are presented. This chapter is structured around the stages of the study: Stage 1 focuses on receptiveness among school directors, teaching staff, and students; Stage 2 examines the intervention based on ICLHE principles;

and Stage 3 reflects on post-collaboration insights from teacher and student feedback. Finally, Chapter 7 concludes the study by answering the research questions, discussing the implications of the findings, and addressing limitations and future research avenues.

**Part I Theoretical framework**

# 1. Language policies in higher education

## Introduction

In today's rapidly evolving global job market, higher education institutions (HEIs) face continuous pressure to prepare students for success worldwide. The demand for multidisciplinary capabilities, technological readiness, and innovation necessitates equipping students with lifelong learning skills. With increasing interconnectivity and globalisation, HEIs are faced with the challenges and opportunities presented by diverse linguistic backgrounds among students and faculty.

Language policies at institutional and national levels profoundly influence language practices and requirements for students and faculty. Faculty perspectives on language policies offer valuable insights into experiences, challenges, and perceptions of the changing language landscape. Language awareness in higher education is vital, encompassing proficiency in first languages and English as mediums of academic communication, directly impacting academic literacy—the ability to engage effectively with scholarly texts and disciplinary-specific conventions. Developing linguistic skills enables students and faculty to excel in their fields and fosters inclusive knowledge exchange. Consequently, academic literacy relies on language proficiency, crucial for navigating and engaging with academic discourse. The following discussions explore the evolving nature of academic literacy and its relationship to language policies, emphasising the importance of equipping students with the necessary linguistic tools.

English has become a dominant language in academia as a *lingua franca*, facilitating communication among scholars from different linguistic backgrounds. Examining the relationship between English proficiency and academic literacy reveals the challenges and implications of English as a Medium of Instruction (EMI) in higher education. The use of English as a *lingua franca* (ELF) has gained momentum, impacting language policies.

This chapter sheds light on the transformative nature of language policies in higher education and emphasises the importance of lifelong language learning skills. By promoting language awareness and academic literacy, institutions can create inclusive learning environments that empower students and faculty to excel in their respective fields and thrive in a rapidly evolving world. Through a comprehensive exploration of these topics, this chapter advocates for adapting language policies to embrace diversity and encourage interdisciplinary teaching, ultimately enhancing the overall quality and effectiveness of higher education.

### **1.1. Internationalisation of HEIs**

Higher education has experienced substantial changes since the Bologna process (2010). One of the main changes has been the increased use of EMI to attract international students. Galloway et al. (2017) expressed that “Offering EMI is a way to access cutting-edge knowledge and contribute to a ‘brain gain’. It can help attract international students and faculty, thus raising an institution's international – and research – profile” (p. 5). As higher education institutions increasingly prioritise global learning as a critical aspect of their internationalisation plans, it becomes evident that a new paradigm for academic work must emerge to support this strategic objective effectively. According to Kahn and Agnew (2017), an increasing number of universities specifically pursue global learning as a component of their internationalisation plans. They argue that a new way of doing academic work must evolve if global learning is a strategic priority for higher education institutions. Additionally, Marinoni (2019, p.6) highlights the widespread adoption of internationalisation in higher education institutions, citing a survey that collected responses from 907 HEIs from 126 countries. The survey found that most institutions (more than 90 %) mention internationalisation in their mission/strategic plan, indicating the widespread integration of internationalisation efforts in HEIs worldwide.

Regardless of the perspective from which these priorities are viewed, internationalisation is a reality in the landscape of higher education today. It is frequently realised through implementing EMI (Polyakova et al., 2022). As stated by Jenkins, “the

English language is playing a major role in the internationalisation of global HE,” making EMI a “strategic response to globalisation” of HEIs (Jenkins, 2014, p.5). HEIs must offer English-taught courses to compete in the higher education market. Thus, EMI has become a part of the management strategies of HEIs (Airey, 2020a, 2020b; Ament, 2021; Borsetto & Schug, 2016; Bowles & Murphy, 2020). English-medium education has emerged as an integral component of management strategies in various ways. Firstly, many universities have adopted English as the primary language of instruction to attract international students and foster a multicultural learning environment. By offering courses and programmes in English, these institutions aim to enhance their global appeal and compete internationally. As pointed out by Shimauchi (2018), the reasons for implementing EMI can be for language reasons since the language of instruction at a particular higher education institution may be complex for some foreign students, which is the case of Japan, and as such, not attract international students (Shimauchi, 2018, p. 79). Certainly this can be an essential factor for other languages and not just Japanese. Shimauchi further includes “the huge demand of industry for developing a global workforce” and explains that “the demographic crisis” in the country has meant fewer students enter higher education. As such, higher education institutions need to internationalise to attract international students (2018, p. 80).

The study in this thesis acknowledges the significant role of EMI in the internationalisation strategies of HEIs. However, it also seeks to provide an alternative approach by promoting the use of ESP and interdisciplinary collaboration within the ICLHE framework. This alternative aims to enhance English language teaching in HEIs while fostering internationalisation through more context-driven, collaborative, and integrated educational practices.

### **1.1.1. Internationalisation of Portuguese higher education institutions**

The importance of language is recognised in the Portuguese context in the document produced by the Ministry of Education and Science and the Deputy Minister For Regional Development in 2014 entitled 'A strategy for the internationalisation of Portuguese higher education' (MADR & MEC, 2014):

Proficiency in foreign languages, especially English, also facilitates the mobility of students, teachers and researchers and, in a second phase, could lead to an increase in the number of courses offered in English at Portuguese higher education institutions. (2014, p. 94)

In 2014, Portugal achieved a significant milestone in pursuing internationalisation within higher education by issuing Decree No. 36/2014. This decree delineated the status and regulations governing international students, introducing a comprehensive framework for their inclusion in various educational institutions. A strategy for enhancing the internationalisation of higher education was collaboratively introduced by the Ministry of Education and Science and the Deputy Minister for Regional Development in 2014 (MADR) and Education and Science (MEC) (MADR & MEC, 2014). This initiative effectively addressed a previously unmet need for comprehensive national guidance concerning institutional policies and endeavours in this domain. These regulations were swiftly implemented across several schools, marking a transformative shift towards bolstering the internationalisation policy and enhancing the country's capacity to effectively attract and integrate a more diverse cohort of international students. Aligned with this trajectory, the Portuguese Language Higher Education International Cooperation Strategy emerged, supported by governmental initiatives. Building upon the foundation outlined in 2014, a subsequent resolution by the Portuguese Ministerial Conference in 2016 solidified the principles and extended the theoretical framework. This encompassed prioritising public policies fostering knowledge and skill development, delineating the stakeholders participating in internationalisation, and regularly evaluating action and policy every four years. Rooted in this framework, Portugal's internationalisation policy has burgeoned,

inviting research centres, businesses, and cultural associations as active collaborators. The pivotal role of higher education institutions and research centres has been recognised, propelling their participation in the international network while catalysing innovation and socio-cultural and economic advancement. This collective effort has infused a renewed impetus into the internationalisation narrative of Portuguese higher education institutions.

Underpinning the trajectory of internationalisation in Portugal's higher education is the influential role played by the 21st Portuguese government. The Portuguese Internationalisation Strategy Research Group introduced a comprehensive national strategy centred on four pivotal areas: institutional cooperation, mobility, strategic institutional partnerships, and the development of digital educational resources. Institutional cooperation extends beyond mere consortia and programme collaboration, encompassing the confluence of researchers, joint projects, and innovative collaborations among higher education entities (Arau Ribeiro et al., 2015; Zhang et al., 2023). The expansive notion of mobility encompasses students, teachers, and researchers, manifesting in formulating an international student statute and enhanced welcoming procedures.

Notably, the aspiration to double the influx of international students by 2020 underscored the nation's commitment to this transformative journey. Concurrently, strategic institutional partnerships interweave with developing digital education resources, with the potential inclusion of Massive Open Online Courses (MOOCs) for language acquisition and Portuguese-language distance learning courses (Arau Ribeiro et al., 2015). These MOOCs are a type of online educational programme designed to provide open access to a large number of participants. They are typically offered by universities, colleges, or other educational institutions and are accessible to anyone with an internet connection. MOOCs provide a wide range of courses on diverse subjects, and they often incorporate various multimedia elements such as video lectures, interactive quizzes, discussion forums, and assignments. This multifaceted strategy places Portuguese higher education at the precipice of evolution, adeptly adapting to the requisites of the Bologna

Process and cultivating an environment conducive to the admission and success of international students (Coelho & Arau Ribeiro, 2018). The government's unwavering stance to foster attractive conditions for international educational activities is its dedication to charting a course towards comprehensive internationalisation.

Recently compiled data from the Directorate-General for Higher Education (DGES, 2020) reveals that the International Student Status facilitated an enrolment surge in higher education. As highlighted in the OECD report on higher education in Portugal (OECD, 2022), enrolment rates in institutions—especially polytechnics—located in interior regions and on islands have been experiencing a consistent decline. Despite endeavours to bolster enrolment through initiatives targeting adult populations, vocational secondary graduates, and international students, this downward trend is expected to persist in the coming decades. The most current available data from Portugal's Directorate-General of Statistics of Education and Science (DGEEC) (INE, 2023) for the academic year 2022/23 indicates a foreign student enrolment of 78,113, a 12% increase from the previous academic year with 69,965 foreign students. This figure underscores the success of HEIs in attracting international students. However, according to DGES, most of these students hail from Communities of Portuguese-speaking Countries: Brazil, Cape Verde, Guinea-Bissau, Angola, and São Tomé and Príncipe.

The statistics available may lead to an interpretation that internationalisation of HEIs in Portugal has been, for the most part, to attract international students into Portuguese HEIs and not necessarily internationalising the HEIs themselves. This is to say, despite the increased flux of international students into Portuguese HEIs, the courses offered only attract a few international students other than those from Portuguese-speaking countries. This is not necessarily a negative point. The Portuguese HEIs need to attract students into their courses to compensate for the declining enrolment of domestic students. Endeavours are necessary to synchronise higher education offerings with the anticipated student demand across Portugal's geographical expanse. The OECD report further points this out:

The critical question is whether there is alignment between the programmes international students seek and the established offerings in public institutions that face enrolment decline. Leaving aside the question of whether programmes should be offered in English to attract a more diverse set of international students, the attractiveness of programmes for international students is likely to be determined by the same fundamental factors as for domestic students – the quality of the offering and the reputation of the institution in teaching, research and relevant innovation activities. Here again, institutional solid profiles come into play. (2022, p. 113)

The internationalisation of HEIs in Portugal reflects a multifaceted landscape. The government's collaborative initiatives, as exemplified by the joint efforts of the Ministries of Regional Development and Education and Science, have laid the groundwork for enhanced internationalisation strategies. While the surge in enrollment among international students underscores HEIs' success in attracting international talent, challenges remain, particularly concerning enrollment trends in certain regions. As these institutions work to align offerings with future student demand and diversify their international student base, it is clear that a nuanced approach, encompassing both policy innovations and strategic partnerships, will be pivotal in shaping Portugal's higher education landscape on the global stage. In this context, one critical area that demands attention is the language policies of Portuguese HEIs, which play a central role in supporting and furthering their internationalisation efforts.

### **1.1.2. Portuguese HEIs language policies**

To build upon the foundational insights discussed above, this section examines the specific language policies that shape and support these internationalisation efforts. It focuses on the practical implementation of these strategies through tailored language policies. By examining how individual institutions foster multilingualism, enhance English proficiency, and maintain the prominence of Portuguese, this section offers a view of the linguistic dimensions critical to the internationalisation process. It addresses the diverse

approaches and unique contexts of HEIs in Portugal, providing a nuanced understanding of how language policies are designed to meet both global academic trends and local cultural identities.

Many HEIs have adopted approaches that revolve around the principles of internationalisation and effective multilingualism in higher education. Acknowledging the global nature of modern education, most of these institutions offer targeted language courses designed to enhance students' English proficiency. As part of their commitment to creating a conducive multilingual academic environment, many HEIs in Portugal establish dedicated language centres. These centres provide comprehensive language instruction, encompassing English and Portuguese as a foreign language. Through these initiatives, institutions aim to equip students with the linguistic competence required to engage confidently in academic and professional discourse across linguistic boundaries.

Language policies in Portuguese higher education reflect the CEL/ELC Working Group 'Langues et sciences', which states: "The CEL/ELC firmly believes that each university should have its specific language policy, reflecting the institution's mission and context". Within higher education, language policies have evolved to reflect historical legacies and modern demands. Notably, these policies are not uniform across institutions; each higher education institute crafts its language policy, which serves as a testament to the diversity of missions and contexts that define Portuguese academia. A recent study (Pinto & Araújo e Sá, 2020) explored language use in scientific research and policy creation among Portuguese public universities. Tensions between "English-first" research language policies and a desire for multilingual scientific environments were uncovered. These tensions reflect the increasing pressure on researchers to publish in English for global visibility and academic recognition while highlighting concerns about the marginalisation of Portuguese and other languages in academic discourse. The study underscores the complexity of balancing internationalisation with linguistic diversity as institutions grapple with the dual goals of advancing global knowledge exchange and fostering local language and cultural identity in academic contexts.

Language policies in higher education reflect Portugal's commitment to nurturing multilingualism and embracing cultural diversity (Moreira, 2020). While Portuguese remains a common thread, institutions develop policies accommodating various languages, celebrating diverse linguistic backgrounds. Portuguese HEIs are increasingly adopting English as an instructional language, reflecting a strategic approach to align language offerings with global trends while maintaining unique identities. These decisions, rooted in each institute's policies, reflect institutions' strategic direction to align their language offerings with global academic trends while staying true to their unique identities.

In Portugal, the Resolution 78/2016 internationalisation framework for higher education necessitates identifying diverse stakeholders. The policy's scope has expanded, demanding active engagement from entities beyond HEIs. Research centres, businesses, and cultural associations are now integral partners. Associations like the Association of Language Centres in Higher Education in Portugal (ReCLES.pt) and the European Language Council (CEL/ELC) play significant roles. Efforts to consolidate language centres began in 2005, leading to the formation of ReCLES.pt in 2009 with 16 members. Conducted by polytechnic institutes, ReCLES.pt is part of the Coordinating Council of CercleS, collaborating with 350+ HEIs to advance language learning and intercultural understanding (Del Carmen Arau Ribeiro & Coelho, 2019, pp. 77–78).

Resolution No 78/2016 does not explicitly prescribe specific language policies. Instead, it broadly emphasises international mobility, scholarships, networks, and scientific diplomacy. It underscores the dissemination of domestic higher education offerings in English and Portuguese and the promotion of Portuguese institutions through initiatives like the 'Study in Portugal' campaign. It also encourages participation in international scientific organisations. However, the responsibility for shaping language policies within HEIs remains largely decentralised, allowing institutions to respond to the global academic landscape in ways that align with their specific missions and contexts. This individualised approach to language policies echoes the diverse nature of Portuguese academia and the multifaceted strategies that contribute to its internationalisation.

Portuguese participation in the CEL/ELC and a SIG focused on Developing Different Models for Language Policies in Higher Education showcased the importance of diverse stakeholders. The outcomes highlighted various roles of language and the significance of individualised language policies. Within the SIG, 18 European HEIs participated, revealing explicit language policies related to internationalisation, cooperation, multilingual and multicultural competence. Arau Ribeiro et al. (2019) referred to issues raised in the SIG since these policies were limited to specific faculties, departments, and dispersed documents complementing internationalisation policies. Concerns were raised about knowledge transfer, technology adoption, and strategies for global challenges. The SIG outcomes highlighted language's role in instruction, research, influencing, and persuading and its function as a transversal skill and tool for internationalisation and social inclusion. Multilingualism was recognised as maintaining an individual's first language (L1) and promoting plurilingualism, aiding flexible and rapid communication in various contexts.

Despite efforts, standardised language policies remain primarily decentralised, with institutions independently addressing concerns such as language proficiency, equity, and multilingual research. This decentralised approach allows for flexibility and responsiveness to local needs and cultural contexts. However, as higher education institutions aim to balance cultural heritage with global demands, there is growing recognition of the need for a certain degree of alignment in language usage across the sector. Such coordination could enhance the effectiveness of internationalisation efforts, as outlined in the strategies for internationalisation in 2014 and the Resolution of the Council of Ministers No 78/2016, without sacrificing institutional autonomy or promoting linguistic diversity.

While Portuguese language policies in higher education have made significant strides, challenges remain. Balancing the preservation of cultural heritage with the demands of an interconnected world requires continuous adaptation. Addressing language proficiency among domestic and international students, ensuring equitable access to education, and promoting research in various languages are among the ongoing concerns that different institutions address in their distinctive ways through their language policies.

By nurturing language competence and promoting academic literacy in the language of instruction, HEIs can empower students to thrive in multicultural academic environments, effectively engage with course materials, and actively contribute to scholarly discourse on a global scale. The following section highlights the critical aspects of language awareness and academic literacy, demonstrating their transformative impact on higher education. As the discussion unfolds, the chapter will explore the vital connection between English proficiency and the internationalisation of HEIs, emphasising its role in fostering inclusive and interconnected academic communities. Together, these interconnected themes provide a comprehensive view of how language policies and linguistic competence are essential in shaping the future of HEIs.

## **1.2. Language awareness**

Academics have shown interest in fostering language awareness and disciplinary discourse among teaching staff, students, and language policymakers in higher education institutions across various subjects (Airey & Linder, 2009; Kuteeva et al., 2014). Carter (2003) refers to language awareness “as learners having an enhanced consciousness of and sensitivity to the forms and functions of language” (p. 64). It also refers to explicit knowledge about language, conscious perception, and sensitivity in language learning, teaching, and language use (Svalberg, 2016). Language awareness blends i) content about language, ii) language skill, iii) attitudinal education, and iv) metacognitive opportunities, which allow the student to reflect on the process of language acquisition, learning, and language use (Bilash & Tulasiewicz, 1993, p. 49).

‘Content about language’ involves providing learners with knowledge about a particular language's structures, rules, and features. It includes teaching grammar, vocabulary, phonetics, and other linguistic elements. When ‘language skill’ is associated with language awareness, it also focuses on developing practical language skills such as reading, writing, speaking, and listening (Dagenais et al., 2009). It involves enabling learners to use the language effectively and confidently in various contexts. ‘Attitudinal’ education fosters positive attitudes and perceptions towards language learning (Carter, 2003). It involves

creating an environment that encourages curiosity, motivation, and an appreciation for different languages and cultures. The 'metacognitive opportunities' aim to develop learners' metacognitive abilities, which involve understanding and regulating their thinking processes. Learners are encouraged to reflect on their language learning strategies, monitor their progress, and adjust to improve learning outcomes. Consequently, by blending these four components, language awareness seeks to enhance learners' overall understanding, proficiency, and metacognitive skills related to language (van den Broek et al., 2019). It promotes a holistic approach to language education, empowering learners to become more conscious, skilled, and reflective language users.

The document created by the Council of Europe, *The language dimension in all subjects: A handbook for curriculum development and teacher training* (Beacco et al., 2016), designed for schools (primary-secondary), is relevant to all educational levels. The handbook points out the importance of the language dimension in subjects for students and teachers. This perspective emphasises the necessity of incorporating language awareness as a fundamental element in curriculum development tailored to meet the requirements of higher education qualifications. The significance of this document lies in its relevance to practitioners involved in teaching content through a second language, as it underscores the crucial role of language in teaching subject-specific content.

The handbook examines the correlation between language and cognition, shedding light on its impact on curriculum development and implementation. The relationship between language and cognition is intricate and interconnected. As a communication system, language allows individuals to express and convey their thoughts, ideas, and knowledge. It serves as a tool for cognitive processes such as perception, memory, attention, and problem-solving. Language enables individuals to organise, categorise, and structure their thoughts, facilitating higher-level cognitive functions. At the same time, cognition, which encompasses mental processes such as perception, memory, attention, and reasoning, plays a fundamental role in language comprehension and production. Cognition enables individuals to understand and interpret linguistic input, process information, and generate meaningful and coherent language output.

In higher education, acquiring academic language is paramount for students' success in navigating complex disciplinary content and engaging in scholarly discourse. However, the attention given to language awareness by teachers may vary, potentially impacting students' preparedness for academic pursuits at the tertiary level. Despite its focus on practical aspects of acquiring academic language, the *Handbook for curriculum development and teacher training* (Beacco et al., 2016) does not explicitly address the importance of language awareness in higher education, even though the development of academic language skills is vital for students transitioning from everyday language usage to knowledge-related expressions. With English often being the predominant language of instruction in internationalised HEIs, language awareness and academic literacy in English have become indispensable. By nurturing language competence and promoting academic literacy in the language of instruction, HEIs can empower students to thrive in multicultural academic environments, effectively engage with course materials, and actively contribute to scholarly discourse on a global scale. Building on the importance of language awareness in fostering global academic communities, the following section examines academic literacy, a key competency for effectively navigating and contributing to these interconnected educational environments.

### **1.3. Academic literacy**

Academic literacy encompasses the ability to comprehend and engage with complex academic texts, as well as to communicate effectively in both writing and speaking within academic contexts (Lillis & Scott, 2015). For students learning in their first language, acquiring academic literacy may seem more intuitive due to their familiarity with the language. However, as previously mentioned, exposure to a language does not guarantee exposure to its academic form. Research has highlighted concerns about the perceived inadequacy of higher education students' knowledge, particularly in their reading and writing skills (Pineiro et al., 2016). Teachers on HEIs often express concern about the unpreparedness of incoming HEI students for the instructional demands they will face (Wollscheid et al., 2021). Many factors contribute to the complexity of understanding in

higher education, highlighting students' multifaceted challenges in comprehending and engaging with academic content. Many studies and research have been done on students' academic success, and these have examined their skills in the first language and a second language with varying conclusions. A set of different challenges are identified from these studies referring to using a language of instruction that differs from the student's native language (Chien & Valcke, 2020; Milcu, 2012; Pinheiro et al., 2016; Swales, 1971; Tulasiewicz, 1997; Wingate, 2012; Wollscheid et al., 2021).

1. Technical language: Using specialised terminology and jargon can challenge students to comprehend academic texts.
2. Sentence construction: Complex sentence structures, including syntactical patterns and sentence organisation, can make it difficult for students to understand the intended meaning of academic writing.
3. Cognitive discourse functions: Students may find it challenging to grasp the specific ways language conveys logical relationships, such as cause and effect or comparison.
4. Density and depth of concepts: Academic texts often contain dense and intricate ideas, requiring students to navigate complex concepts and delve into deeper levels of understanding.
5. Cultural and linguistic diversity: Differences in cultural backgrounds and languages students speak can impact their ability to understand academic texts.
6. Disciplinary-specific conventions: Each academic discipline has its own conventions and language usage, which can make understanding and interpreting texts difficult for students.
7. Information overload: Processing large amounts of information from multiple sources can overwhelm students and hinder their comprehension of complex ideas.

8. Lack of prior knowledge: Students need more background knowledge on a particular subject to improve their understanding of academic texts and ability to connect with existing knowledge.
9. Critical thinking demands: Higher education requires students to think critically and analyse information, which can be challenging without proper guidance and practice.
10. Limited academic support: Inadequate access to resources, insufficient guidance from teachers, or a lack of writing assistance can lead to difficulties in understanding academic texts.
11. Time constraints: The demanding nature of higher education, including tight schedules and numerous assignments, can limit students' ability to engage deeply with academic content.
12. Assessment formats: Different assessment formats, such as exams or essays, may require specific skills and strategies that students must develop to demonstrate their understanding effectively.

By considering these twelve factors, teachers and HEIs may better address students' multifaceted challenges in understanding academic content and provide the necessary support to enhance their comprehension skills. As researchers identify continuous challenges that students face in developing academic literacy skills, including language barriers, limited prior knowledge of academic conventions, and difficulty with critical thinking and analysis (French, 2020; Irannezhad et al., 2022; McKenna, 2004; Wollscheid et al., 2021; Xulu-Gama & Hadebe, 2022) the importance of addressing these issues becomes paramount to academic success.

Attaining academic literacy in a native or second language can be challenging. The barrier to understanding in higher education extends beyond the technical language utilised in academic reading and writing to encompass nuanced aspects such as disciplinary conventions, critical thinking skills, and cultural contexts. As such, HEIs often support students in developing their academic literacy skills. The support HEIs may provide

students includes language classes, writing workshops, and one-on-one tutoring sessions to help them succeed academically. As Pinheiro et al. (2016, p. 1959) point out, it is essential to begin by comprehending students' perspectives on the characteristics of academic literacies and the specific barriers they encounter when attempting to write and interpret various types of texts, such as scientific articles or technical reports.

Building on the discussion of changing language policies and the impact of internationalisation within higher education outlined in Chapter 1, the following chapter looks into specific approaches to language instruction that address these evolving demands. The focus shifts from the broader institutional trends to the pedagogical strategies employed within higher education to enhance language proficiency and subject mastery. This transition explores how ESP, EMI, and ICLHE can support both the academic goals of institutions and the linguistic needs of students. By examining these approaches, Chapter 2 highlights the intersection of language acquisition and content delivery, providing an analysis of their strengths, challenges, and implications for interdisciplinary collaboration in higher education.

## **2. Language instruction approaches in higher education**

### **Introduction**

Within the dynamic landscape of higher education, the cultivation of language proficiency has transcended conventional boundaries, assuming a pivotal role in promoting global competencies among students. This section examines four key language instruction paradigms - EMI, ESP, CLIL and ICLHE.

In higher education, the intricate interplay between language instruction and academic content has garnered substantial attention, driven by the need to prepare students for a globalised world. The convergence of language acquisition and disciplinary knowledge has manifested through diverse approaches, four of which merit focused investigation: ESP, EMI, CLIL and ICLHE. ESP tailors linguistic instruction to precise contextual needs, while EMI, CLIL and ICLHE utilise English as a vehicle for academic knowledge dissemination.

The following sections traverse the trajectories of ESP, EMI, CLIL and ICLHE, systematically uncovering their pedagogical foundations, merits, and implications within higher education. Employing an analytical framework, the intersecting and divergent components of these methodologies become discernible.

#### **2.1. English for Specific Purposes**

ESP is a specialised approach to language education tailored to meet the unique linguistic and communicative needs of individuals pursuing various professional or academic fields. It is an educational methodology that goes beyond the traditional boundaries of general language learning, focusing on the precise linguistic skills and terminology required in specific contexts (González Ramírez, 2015). At its core, ESP aims to equip learners with the language skills essential for navigating specialised domains such as science, technology, economics, and academia. Unlike general English language instruction, which covers various topics and communication scenarios, ESP focuses on developing proficiency in the language needed for particular endeavours. This includes cultivating both linguistic competence and communicative dexterity, ensuring that

learners can fluently and accurately convey their thoughts within the context of their chosen field.

The roots of ESP can be traced back to the mid-20th century when teachers and linguists began to realise the inadequacies of generalised language instruction in catering to learners with specific vocational or academic objectives. As industries and academic fields advanced, it became evident that conventional language courses needed to have equipped professionals and students with the language skills required for effective communication within their chosen domains. Hutchinson and Waters (1987, pp. 6–7) attribute the emergence of ESP to the transformative trajectory of the global economy, characterised by technological advancements, the economic ascendancy of oil-rich nations, and a growing influx of international students into English-speaking countries. Additionally, the significance of English acquisition extends beyond knowledge dissemination and communication as it plays a crucial role in fostering critical thinking, facilitating cultural exchange, and enabling students to engage with global academic and professional communities. This broader impact highlights how English proficiency not only supports information sharing but also empowers individuals to participate more fully in international discourse and opportunities. This knowledge dissemination refers to spreading and sharing knowledge, research findings, and academic information across different audiences, often on a global scale. As a dominant language in academia and research, English plays a crucial role in this process. It allows scholars, researchers, and students from various parts of the world to access, contribute to, and exchange knowledge within the international academic community. Johns and Dudley-Evans (1991) underscore the significance of English acquisition as a neutral medium for international interaction, a role widely acknowledged by the international community. This realisation prompted a shift in focus towards designing language curricula aligned with learners' practical needs and goals.

Over the years, ESP has gone through five stages, which, according to Hutchinson & Waters, (1987) take shape in five approaches or theories:

1. Register analysis: The analysis aimed to distinguish between specialised languages and common languages, creating an interest in identifying the grammatical and lexical features of these registers and designing the teaching materials. The primary purpose of register analyses was the pedagogic objective of making the ESP course more relevant to learners' needs. The most representative authors of this stage were: Ewer & Latorre, 1969; Halliday et al., 1964; Swales, 1971.
2. Rhetorical or discourse analysis: In line with the perspective put forth by Allen & Widdowson (1974), the central premise highlights the students' limited familiarity with English usage. This intricacy cannot be adequately addressed by focusing on sentence construction practice. Instead, the solution lies in a comprehensive approach that fosters an understanding of how sentences function within various communicative contexts within a specific area.
3. Target situation analysis: This approach aimed to relate language analysis more closely to the learner's reasons for learning; therefore, the ESP course was designed to identify the students' motivations to learn the language and the situations in which they would use it. From this information, the course would be elaborated, allowing students to achieve the goal that had been raised. Its leading representative was Chambers (1980).
4. Skills and strategies: This approach, which centres its efforts on reading and listening strategies, aims to equip students with the essential tools necessary to deduce the meaning of both spoken and written texts.
5. A learning-centred approach: Embodied within the suggested framework by Hutchinson & Waters (1987), this approach emphasises the significance of addressing questions related to effective teaching and learning methods. In this view, acquiring knowledge takes precedence over the language, its applications, and its contents.

In 1998 Dudley-Evans set out to clarify the meaning of ESP, giving an extended definition of it in terms of 'absolute' and 'variable' characteristics (Dudley-Evans & St. John, 1998)

### Absolute Characteristics

1. ESP is defined as meeting the specific needs of the learners;
2. ESP makes use of the underlying methodology and activities of the discipline it serves;
3. ESP is centred on the language appropriate to these activities regarding grammar, lexis, register, study skills, discourse and genre.

### Variable Characteristics

1. ESP may be related to or designed for specific disciplines;
2. ESP may use, in specific teaching situations, a different methodology from that of General English;
3. ESP will likely be designed for adult learners at a tertiary-level institution or in a professional work situation. It could, however, be for learners at the secondary school level;
4. ESP is generally designed for intermediate or advanced students;
5. Most ESP courses assume some basic knowledge of the language systems.

The efficacy of ESP in fulfilling learners' specific language needs led to its rapid growth and expansion across diverse sectors. As institutions recognised the benefits of ESP, more specialised courses and materials were developed. This is done most frequently through needs analysis. A needs analysis pinpoints the communicative requirements of an individual learner or a collective cohort, along with their distinctive learning inclinations and preferences. This process aids teachers in discerning the learners' forthcoming target undertakings. When warranted, it also prompts potential modifications to the syllabus, tailoring it to precisely accommodate learners' unique requirements (Graves, 2001). This calibration hinges upon recognising the learners' existing knowledge and pinpointing the areas that necessitate further development, thus effectively catering to their imperative learning objectives. Learners' needs and interests significantly influence their motivation

and learning effectiveness. Courses should be relevant to these needs, using texts from their specialist areas. This approach improves motivation and makes learning faster and more effective (Hutchinson & Waters, 1987, p. 8). ESP literature provides a diverse range of definitions to define what needs represent. Hutchinson and Waters (1987, pp. 54–63) view needs as ‘the ability to comprehend or to produce the linguistic features of the Target situation’. The proposal identifies two types of needs: 'target needs' and 'learning needs'. Target needs are defined as “what the learner needs to do in the target situation” (Hutchinson & Waters, 1987, p. 54), while learning needs emphasise “what ‘learners need to do in order to learn’”.

ESP serves as a critical link within the broader landscape of educational trends, impacting HEIs' internationalisation efforts. There is an intricate interplay between ESP and key areas such as internationalisation, language awareness, academic literacy, and language policies. Having laid a foundation of understanding regarding ESP, the subsequent section will explore the evolving landscape of EMI. It represents a distinct facet of the role of language in education, particularly within internationalisation and the intricacies of diverse learning environments.

## **2.2. English Medium of Instruction**

The pressure on HEIs to internationalise has increased the number of HEIs offering their students English-taught programmes. The number of English-taught programmes (ETPs) in non-English speaking countries is rising globally. Researchers have suggested that the main reasons for offering ETPs have been to attract international students, enhance the quality of education, and prepare graduates for the global job market (Ament, 2021; Bowles & Murphy, 2020; Shimauchi, 2018). EMI has been described by researchers as essential in higher education due to the increasing globalisation of the world, the need for access to knowledge, employability, mobility, and the internationalisation of universities (Airey, 2020; Bowles & Murphy, 2020; Doiz et al., 2013; Murata, 2019).

EMI in HEIs is an instructional approach where academic courses, programmes, or components are conducted in English, often transcending students' and teachers' first

languages (Doiz et al., 2013). This strategy creates an immersive academic environment, utilising English as the primary medium for communication, interaction, and knowledge dissemination. Proficient in subject matter and English, local teachers typically deliver these courses. Some cases involve native English-speaking teachers recruited to work in non-English-speaking countries. The instructional implementation of EMI varies according to contextual factors, which influence the selection of teachers.

However, despite the benefits outlined, several drawbacks associated with using EMI in higher education have been highlighted by various authors (Airey, 2020a; Chien & Valcke, 2020; Polyakova et al., 2022). These drawbacks can impact different stakeholders within the educational context. These challenges encompass both instructional intricacies and broader educational dynamics, shedding light on the complexities of implementing EMI effectively.

EMI can pose significant challenges for students whose first language is not English. A significant number of HEIs require that students demonstrate a certain level of English language proficiency to ensure effective participation in English-medium courses (Dafouz & Camacho-Miñano, 2016; Kim et al., 2018; Murata, 2019; Tang, 2020). This requirement often entails achieving a B2 level on the Common European Framework of Reference for Languages (CEFR). To evaluate students' language competence at this level, institutions frequently turn to internationally recognised language proficiency examinations such as ESOL TOEFL, Cambridge exams, or IELTS Academic. These standardised assessments serve as a means of gauging students' readiness to engage with the academic content presented in English, thereby maintaining the quality of education and fostering a conducive learning environment. The language barrier can hinder students' comprehension of subject matter, making it difficult to grasp intricate concepts, follow lectures, and actively participate in discussions (Airey, 2011; Fiedler, 2022; Qiu & Fang, 2022).

Teachers play a pivotal role in an EMI environment, but they, too, face difficulties. Adequate language proficiency is crucial for effective instruction (McKinley & Rose, 2022), and teachers might require additional support with vocabulary, grammar, pronunciation,

and other linguistic aspects, which can limit their communication effectiveness (Lasagabaster & Doiz, 2021). In EMI settings, teachers might also need help accessing English-language resources, potentially compromising the quality of their instruction. Presenting course material in a language different from the students' first languages can demand extra effort to ensure engagement, as students might experience waning interest and motivation and reduced participation in class activities without appropriate support. Teaching a subject in a foreign language often requires more time than teaching it in a first language, involving more extensive lesson preparation, assignment grading, and communication to facilitate student comprehension.

The literature on EMI highlights that the inclusion of English for Academic Purposes (EAP) and ESP is critical in these programmes (Bocanegra-Valle, 2008; Räisänen & Fortanet-Gómez, 2008). Yet, the post-Bologna restructuring of degrees has often led to a reduction in contact hours, causing ESP and EAP courses to be deprioritised (Wilkinson, 2008). Additionally, explicit language teaching is often undervalued in English-medium programmes, leaving students to struggle with the complex disciplinary codes that are not always made explicit by content teachers (Airey, 2011). Content teachers, while experts in their fields, may lack the inclination or expertise to teach disciplinary literacy skills (Hyland, 2006), and the limited time available further hinders explicit language instruction (Lyster, 2017). Despite this, students are still expected to emerge from these programmes as fully integrated members of their disciplines (Wilkinson, 2008), underscoring the need for ESP and EAP courses in English-medium curricula.

In the scholarly exploration of language and education, an inquiry into the specialised domain of ESP and the broader pedagogical landscape defined by EMI reveals multifaceted dimensions. ESP addresses the precise linguistic needs within distinct contexts, while EMI focuses on teaching academic subjects such as science, mathematics, history, and others in English, regardless of the students' or teachers' native languages. Its primary goal is to enhance students' content knowledge and has the potential to improve students' English language proficiency. However, this outcome is not guaranteed and depends on various supportive factors and the implementation of effective educational practices.

Extending this investigation, the present study advances into ICLHE. The ensuing trajectory introduces an innovative paradigm for consideration and lays the groundwork for a comparison of ESP, EMI, and ICLHE.

### **2.3. Integrating Content and Language in Higher Education (ICLHE)**

Having laid the groundwork by exploring the fundamental aspects of ESP and EMI, this section now turns its attention to ICLHE. The terms ICLHE and CLIL are related concepts in education but are typically applied in different educational contexts.

#### **1. ICLHE**

- **Context:** ICLHE primarily relates to higher education, such as universities and colleges. It refers to the practice of integrating language instruction with the teaching of academic content in higher education courses.
- **Objective:** In ICLHE, the aim is to help students, often non-native speakers of the language of instruction, acquire proficiency in both the language and the subject matter simultaneously. It recognises that language is a tool for learning academic content.
- **Example:** In an ICLHE context, a university might offer courses in a specific language (such as English, Spanish, or French), designed for non-native speakers. For instance, subjects like economics or engineering could be taught in the target language to promote both language proficiency and mastery of the content.

#### **2. CLIL**

- **Context:** CLIL is commonly applied in primary and secondary education settings but can also be used in higher education, as outlined above. It focuses on teaching various subjects (e.g., science, history) in a language other than the student's native tongue.

- **Objective:** CLIL aims to develop students' language skills while they learn subject-specific content. It is often used to promote language proficiency from an early age.
- **Example:** In a CLIL programme in a non-English-speaking country, students may study science or history in English, even though it is not their first language. This approach enhances both their language abilities and subject knowledge.

In short, ICLHE and CLIL are related concepts, with ICLHE being more commonly associated with higher education and the integration of language and content instruction at the university level. At the core of ICLHE lies CLIL, a deliberate and methodical approach that interlaces language instruction with teaching subject matter content (Coyle et al., 2010). This pedagogical model materialises through subjects such as mathematics, arts, and science taught through a foreign language.

Strotmann et al. (2014) illuminate subtle differentiations between EMI and CLIL. EMI primarily serves as a conduit for content transmission, with English proficiency implicitly assumed. In contrast, CLIL constitutes a more holistic process, as students are explicitly guided in their language acquisition, with courses bearing both content and language objectives. The amalgamation of content and language epitomises an innovative approach consonant with contemporary research on second language learning and teaching (Van de Craen et al., 2007). Language teaching experts such as Sierra (2011) and proponents of novel pedagogical methodologies like Dalton-Puffer (2007) and Coyle, Hood, and Marsh (2010a) recognise that language acquisition is expedited through integrating diverse academic content. This pedagogical rationale underpins the philosophy of CLIL, characterised as "...any dual-focused educational context in which an additional language, thus not usually the first foreign language of the learners involved, is used as a medium in the teaching and learning of non-language content ..." (Coyle, 2008, p. 97).

The term CLIL, coined by David Marsh in 1994, encapsulates a transformative approach to education encompassing various instructional modes. This includes scenarios where only the subject teacher, often called "the content teacher," imparts instruction.

Additionally, there can be collaboration with "the language teacher," who provides expertise in grammar, language, and vocabulary. Alternately, "the content teacher" and "the language teacher" can collaborate in a "co-teaching" model. Marsh's assertion (2002) that European programmes, educational initiatives, and legislative actions have progressively solidified CLIL's status underscores the evolution of the approach. The primary objectives of CLIL encompass not only academic performance in CLIL subjects but also the enhancement of proficiency in both the native and target languages, coupled with the nurturing of intercultural understanding, social skills, and critical thinking (Coyle et al., 2010a).

Incorporating a historical perspective, it is noteworthy to recognise that CLIL was conceived within the framework of primary education. Originating as a methodology designed for nurturing language acquisition and content comprehension at the foundational levels of schooling (Gabillon, 2020), CLIL has progressively traversed the educational continuum, making its way into higher education. This trajectory, marked by its initial utilisation in primary and secondary education, underscores its effectiveness in fostering linguistic competencies alongside subject matter comprehension.

This journey of CLIL's ascent from primary to higher education illuminates its adaptability and pedagogical efficacy. Rooted in the fundamental idea of learning content through a foreign language, CLIL's foundational principles have proven to be equally applicable in higher education contexts (Morgado et al., 2015; Taillefer, 2013). This transference has been driven by its success in the lower educational tiers and by the recognition of its capacity to enhance both language skills and academic knowledge holistically.

The empirical validation of CLIL's benefits is palpable, resonating with Lorenzo et al.'s (2011) belief in its efficacy for first and second-language development. The approach aligns learners for a globalised world while elevating their motivation for foreign language acquisition. Over the past decade, the prevalence of CLIL methodology has burgeoned within higher education, culminating in its integration across numerous European

countries (Lasagabaster & López, 2015). ICLHE's influence on linguistic competencies is documented in specialised literature (Bamond et al., 2014; Gil & Dueñas, 2023), extending into university graduate and postgraduate bilingual training programmes. Simultaneously, a robust discourse on processes and outcomes within higher education continues (D'Alessio & Hardie, 2019a; Gabillon, 2020; McDougald, 2015; Vilkancienė & Rozgienė, 2017). ICLHE manifests diversely, from teaching science to language immersion programmes and coordinated courses that synergise language skills and academic content. This approach represents a transformative paradigm in education, aligning with contemporary research on second language acquisition.

While the benefits of CLIL and ICLHE are widely acknowledged, their successful implementation within higher education is not without its challenges. Despite their growing adoption and alignment with global educational trends, both approaches require careful consideration of the practical hurdles teachers and students face. These challenges include the cognitive demands placed on learners and the need for effective collaboration between language and content teachers.

Students are required to grasp complex subject matter while simultaneously developing their language proficiency, which can overwhelm them, especially if their language skills are not sufficiently advanced (Coleman, 2006; Räsänen, 2011). In the context of CLIL, some teachers have criticised the need for language simplification at lower proficiency levels (A2 and B1 CEFR), as it might limit the depth of the subject matter (Merino & Lasagabaster, 2018). However, such simplification is often necessary to make content accessible without diminishing academic rigor. Teachers also face difficulty balancing the demands of teaching subject content with the need to ensure language acquisition. This requires them to have a high level of proficiency in the target language (often English) and to employ effective language teaching strategies, which can be challenging without sufficient training (Weinberg & Symon, 2017).

Research by Morgado and Coelho (2013) emphasises the importance of developing interdisciplinary cooperation to support language learning, especially in higher education.

This lack of coordination can result in the duplication of efforts or, conversely, gaps in the integration of language and content. Addressing this challenge, studies recommend structured professional development programs focused on fostering collaboration and refining teaching methods to meet both content and language objectives (Räsänen, 2011; Strotmann et al., 2014; Valcke & Wilkinson, 2017). This suggestion of training is present in further research, adding that successful CLIL programmes in higher education require an investment in teachers training in the methodology (Strotmann et al., 2014) as well as language support for content teachers from English language specialists (Graham et al., 2018; Vilkancienė & Rozgienė, 2017; Zayas & Romero, 2017). As expressed by numerous studies in CLIL implementation across educational levels, from primary to higher education, there is a continuous concern for teacher training and support in CLIL methodology and language proficiency (Ellison et al., 2017, 2022; Kletzenbauer et al., 2022; Vega & Moscoso, 2019). Gonçalves et al. (2022, pp. 246–247), when recommending CLIL in HEIs, suggest a continuous provision of assistance from a foreign language teacher specialising in CLIL is essential. They add that this support aids content teachers in various aspects, including session planning, material selection, choosing suitable student tasks and activities, and selecting appropriate assessment methods aligned with students' language proficiency.

Pérez-Cañado (2013) pointed out the existence of 'barriers' for content teachers and difficulties that must be addressed, including insufficient mastery of the target language, the shortage of teacher training programmes, and the fact that they must be content specialists. Other difficulties stem from the fact that they have not received training in second language pedagogy, such as evaluating how content and language can be assessed simultaneously and using what methods. There is an increased workload and the need to collaborate and liaise with other content and language colleagues (Perez-Cañado, 2013, p. 19). This issue is echoed by Ellison et al. (2017), whose study at the University of Porto identified significant concerns about linguistic proficiency among content teachers, underscoring the need for ongoing support to enhance teaching efficacy.

Institutional support plays a critical role in the success of both CLIL and ICLHE. Research indicates that many universities lack a coherent strategy for integrating language and content instruction, leading to inconsistent practices across departments (Coleman, 2006; Valcke & Wilkinson, 2017). Furthermore, scholars like Gonçalves et al. (2022) highlight the necessity of ongoing assistance from language specialists to help content teachers with curriculum design, material selection, and appropriate assessment methods. Without clear institutional guidelines or a supportive framework, ICLHE programs may struggle to meet their intended learning outcomes. This can be particularly problematic for students, who may be unsure of the language proficiency standards expected of them and how these standards align with their academic performance.

Finally, quality assurance in ICLHE and CLIL programs remains an ongoing concern. While the use of English as a medium of instruction has become widespread, studies emphasise the need for regular assessments of both teaching practices and student outcomes to ensure the effectiveness of these programs (Weinberg & Symon, 2017). Research findings, such as those from Graham et al. (2018), highlight that inconsistent evaluation criteria and varying implementation methods can result in differing outcomes across similar CLIL and ICLHE contexts. This highlights the need for comprehensive assessment frameworks that can accurately measure both language acquisition and content understanding (Vega & Moscoso, 2019).

While CLIL and ICLHE represent promising approaches to language and content integration in higher education, their successful implementation requires addressing a range of challenges. Overcoming these challenges will be essential for maximising the benefits of CLIL and ICLHE for students and improving the quality of higher education. While the benefits, challenges and frameworks of ICLHE have been well established, understanding its unique role requires a broader examination alongside other prominent instructional approaches like ESP and EMI.

## **2.4. Comparing ESP, EMI and ICLHE**

In higher education, ESP, EMI, and ICLHE offer distinct approaches to integrating language and content instruction, each with unique strengths and challenges. Examining them comparatively provides insight into their effectiveness and implications for interdisciplinary education.

The emphasis of each approach impacts educational outcomes. ESP focuses narrowly on the language needs of specific academic or professional domains, aligning with industry requirements and practical skills (Hutchinson & Waters, 1987). However, this specialisation can limit interdisciplinary engagement (González Ramírez, 2015). EMI, which uses English as the primary medium, facilitates content delivery in a global language but may overlook explicit language instruction, leading to gaps in disciplinary literacy (Doiz et al., 2013; Schmidt-Unterberger, 2018). ICLHE combines content and language learning goals, aiming to foster deep understanding and language proficiency simultaneously, which is effective but complex to implement (Coyle et al., 2010; Räsänen, 2011).

Teacher involvement differs across the methodologies. ESP courses are led by teachers skilled in teaching domain-specific language, ensuring targeted language acquisition (Dudley-Evans & St. John, 1998). In EMI, content teachers, who often lack language training, face challenges in supporting students' linguistic needs, which may require integrating ESP principles to fill the gaps (Lasagabaster & Doiz, 2021). In ICLHE, successful implementation relies on interdisciplinary collaboration between content and language teachers, an aspect emphasised in research on effective CLIL programs (Graham et al., 2018; Kletzenbauer et al., 2022; Strotmann et al., 2014).

Each method has specific challenges. ESP demands constant adaptation to evolving academic and professional requirements through needs analysis (Graves, 2001). EMI can cause cognitive overload for students who must learn complex content in a second language (Airey, 2011; Murata, 2019). ICLHE struggles with designing cohesive curricula that effectively blend language and content objectives, highlighting the need for teacher training and institutional support (Dalton-Puffer, 2007; Valcke & Wilkinson, 2017).

Outcomes vary depending on context. ESP's targeted approach efficiently meets professional language needs but may not foster broader academic competencies (Dudley-Evans & St. John, 1998). EMI supports internationalisation, offering students access to global academic resources, but without explicit language goals, it may not achieve comprehensive language development (Ament, 2021). ICLHE, when effectively integrated, enhances critical thinking and content comprehension by connecting disciplinary content with language objectives, though it requires sustained support and collaboration (Bocanegra-Valle, 2008; Morgado, Arau Ribeiro, et al., 2015).

Implementing these approaches highlights the need for institutional backing. Successful ESP programs depend on aligning courses with specific industry demands, necessitating continual curriculum updates (Graham et al., 2018). EMI requires a minimum English proficiency standard for both students and teachers, which can be a barrier in diverse educational contexts (Bowles & Murphy, 2020). ICLHE benefits from an institutional culture that encourages teacher collaboration and interdisciplinary methods, which can be challenging to establish but results in more integrated learning environments (Bartik et al., 2009; Coyle et al., 2010a).

ESP, EMI, and ICLHE each contribute uniquely to interdisciplinary education, with their effectiveness heavily reliant on institutional context and support. Tailoring the choice of method to an institution's goals—whether to prioritise targeted professional skills, global academic integration, or a balanced development of content and language—remains essential for successful implementation in higher education.

Schmidt-Unterberger (2018) addresses the growing use of EMI in higher education and highlights the conceptual ambiguities surrounding different pedagogical approaches. She introduces the *English-medium Paradigm*, a framework that clarifies the instructional types in English-taught programmes at universities in non-Anglophone countries. The study emphasises the importance of distinguishing between different educational approaches, such as ESP, EAP, CLIL, and EMI itself. Schmidt-Unterberger also highlights the pedagogical and curriculum design implications of each approach, offering a much-needed

framework for understanding English-medium education in higher education. Schmidt-Unterberger (2018) emphasises the need for programme designers to adopt a more language-conscious approach when implementing English-medium education in higher education. She advocates for the integration of ESP and EAP teaching within these programmes, promoting greater awareness of the linguistic demands placed on students.

Notably, collaborative initiatives are gaining increasing prominence within the ICLHE context. This heightened emphasis on collaboration underscores the recognition of the profound impact of interdisciplinary cooperation, firmly established as a cornerstone in developing successful educational programmes. This commitment to collaborative efforts resonates within the context of academic discourse and across the broader academic landscape. It is appropriate to detail the theme of the role of English language teachers within ICLHE further. In this study, the teaching methodology follows the ICLHE approach, emphasising the simultaneous development of academic content knowledge and language proficiency within a higher education context. The following section will involve a deeper exploration of its multifaceted dimensions, challenges, and transformative potential.

Collaboration between content and language teachers remains limited, despite the inclusion of ESP and EAP courses in English-medium programs (Unterberger, 2014). To foster this collaboration, university administration must encourage team teaching and collaborative curriculum planning through financial incentives or reduced teaching loads. Business schools, in particular, should see the integration of language courses as a valuable opportunity for faculty development and a competitive advantage in the crowded market of international English-taught degree programs (Knight, 2008; Unterberger, 2014).

This growing interest reflects how institutions are adapting ESP to meet global demands by leveraging content-focused language learning approaches, offering students language development opportunities while studying their core subjects. This approach also aligns with internationalisation strategies, addressing both language proficiency and content mastery in diverse educational settings.

The discussion will shift the focus to the national context of Portugal, examining the practical implementations and challenges within Portuguese higher education. This transition explores how the ICLHE language instructional approach intersects with Portugal's educational objectives, institutional strategies, and the diverse needs of its student population.

## **2.5. ICLHE in Portuguese HEIs**

The internationalisation of HEIs has emerged as a paramount pursuit within Portugal's higher education landscape. As elucidated in preceding sections of this thesis, English has undeniably assumed a central role. The directives of the European Union, in conjunction with the strategic initiatives of the Portuguese government, have laid a firm foundation for HEIs' internationalisation policies (Coelho & Arau Ribeiro, 2018).

The implementation and efficacy of ICLHE in Portugal are examined here, particularly in the context of interdisciplinary collaboration, as it is the chosen methodology for the case study undertaken in this thesis. As part of the broader internationalisation effort, ICLHE plays a critical role in integrating content and language learning, ensuring that students simultaneously develop subject-specific knowledge and language proficiency. This approach is vital in equipping students and teachers to navigate the globalised academic sphere, adapting content delivery, managing linguistic diversity, and facilitating multidisciplinary education. This section explores the national situation in Portugal, highlighting how ICLHE supports the educational objectives of internationalisation and enhances the collaborative and interdisciplinary capabilities of HEIs.

The higher education landscape in Portugal has experienced some changes in recent years, characterised by a modest interest in ICLHE. This interest is primarily driven by projects, research and initiatives within individual HEIs, particularly those led by English language teachers. While ICLHE is gaining attention within Portuguese HEIs, it is gradually influencing emerging trends and practices that shape the design, delivery, and reception of courses and programs.

In Portugal, ICLHE has gained significant interest from both language teachers and content teachers (Morgado, et al., 2015). A notable initiative in this regard is the CLIL-ReCLes.pt project, funded by the Fundação para a Ciência e Tecnologia (FCT). This project brought together language specialists, researchers, and educators from the institutions of the Association of Language Centres in Higher Education in Portugal (ReCLes.pt), creating a "learning community" to support content teachers in higher education. The project advanced with TERMINOCLIL, a terminology-based approach to CLIL that bridges "the key dimensions of language (discourse on knowledge) and knowledge/competencies (concepts and expertise) to organise, structure, and classify discourse and knowledge" (Morgado, et al., 2015, p. 71). TERMINOCLIL provided a structured framework for teachers to effectively bridge language and disciplinary content. A teacher's guide was also developed, offering practical support to subject teachers and facilitating collaboration with language specialists when available (Ribeiro et al., 2016). The impact of this initiative was significant. Teachers expressed strong interest in adopting and further developing this approach, and students responded positively to its implementation, highlighting its role in improving learning outcomes. Faculties involved in the project recognised the importance of regular CLIL training programs, reinforcing their commitment to sustain this methodology in higher education (Arau Ribeiro et al., 2016)

As part of the project, a guide was developed to assist teachers in designing their courses, encouraging collaboration with language specialists to ensure effective content-language integration. The success of this initiative led to further engagement, as many content teachers expressed interest in continuing to develop this approach in their teaching. Following this demand, the researcher continued collaborating with these teachers, many of whom felt that while they received support from ESP language specialists, they did not feel fully prepared to adopt the ICLHE methodology. This gap led to the suggestion of adopting a more collaborative model for ICLHE, with ESP teachers also involved in the delivery of undergraduate and master's courses within the institution.

The positive response from both teachers and students to the CLIL approach, as seen in the ongoing interest from faculties and the improved learning outcomes for students, underscores the value of integrated teacher training in enhancing both teaching effectiveness and student success in higher education (Morgado, Arau Ribeiro, et al., 2015). This research proposal, which emerged from the CLIL-ReCLes.pt project, further aims to explore and expand the application of ICLHE in collaboration with subject-specific educators.

Participation in this project provided valuable insights into the specific needs of content teachers and the challenges students face (Morgado, Coelho, et al., 2015). Subsequent studies have reinforced the need for increased support for content teachers, particularly in Portuguese HEIs (Ellison et al., 2017). Notably, teachers have expressed a strong desire to improve their English language skills to facilitate communication with international students better, engage with global academic communities, and ensure the successful transmission of subject-specific knowledge (Moreira, 2020; Morgado & Coelho, 2013).

In addition, recent research at the Polytechnic Institute of Portalegre sheds light on the widespread need for professional development among higher education lecturers, particularly in bilingual education. In this study, lecturers reported significant gaps in their understanding of how to apply bilingual education methodologies, especially in areas such as designing materials and resources for bilingual teaching and implementing student-centred methodologies. As Coelho (2022) notes, "There is an across-the-board demand for increased training, with lecturers' self-perception that they need considerable training in all the areas" (p. 257), particularly regarding professional development. These findings are highly relevant to the current study, as they align with the need to evaluate how decision-making processes—such as lesson planning and assessments—reflect the professional readiness of both ESP and content teachers. Furthermore, this study stresses the importance of institutional support for teacher training, which is critical when assessing an institution's readiness to foster interdisciplinary teaching (Coelho, 2022).

Coelho's thesis also touches on how the internationalisation of higher education intersects with CLIL/ICLHE practices. At the Polytechnic Institute of Portalegre, there was a strong appeal for more robust internationalisation policies, particularly regarding the development of language policies and support structures that facilitate bilingual education. Coelho points out that implementing CLIL/ICLHE could contribute to the "reinforcement of a strong internationalisation policy" (Coelho, 2022, p. 262) and offers pathways for improving quality standards within the institution. This is a crucial consideration for this study, as it may investigate how institutional internationalisation goals, such as offering courses in English, influence the support for interdisciplinary collaboration between ESP and content teachers (Coelho, 2022).

Moreover, Coelho (2022) highlights the challenges the Polytechnic Institute of Portalegre lecturers face in adopting a CLIL/ICLHE approach, which mirrors the possible obstacles this study explores. There is a generally low self-perception of knowledge among lecturers concerning bilingual education policies, theories, and methodologies, despite their confidence in their linguistic skills. This gap between linguistic competence and a deeper understanding of bilingual education practices is paralleled in the examination of institutional receptiveness to interdisciplinary collaboration.

A leading issue is that ICLHE can be a considerable alternative to EMI. A key argument for positioning ICLHE as an alternative to EMI arises from the perception that the internationalisation of universities is heavily focused on creating English-taught courses. This focus stems from the global importance of English, particularly its dominance in academic literature and its role as a lingua franca in international communication and research. However, the emphasis on English should not constrain HEIs that are unable to implement full EMI programs. Using ESP teachers within an ICLHE framework can provide a valuable solution in such contexts. This approach enables students to develop English proficiency while learning subject-specific content in their native language. ICLHE allows institutions to maintain the academic importance of English while also offering flexibility in course delivery. It serves as a means of equipping students with critical language skills

for participation in the global academic and professional community without requiring a full transition to EMI.

As this chapter has explored, language instruction in higher education, particularly through ESP and EMI, plays a crucial role in aligning linguistic training with academic content, enhancing both communication skills and discipline-specific knowledge. ICLHE presents challenges and opportunities, as discussed through various approaches implemented in Portuguese and international contexts. These approaches underline the necessity of interdisciplinary collaboration between language specialists and content experts to foster deeper learning outcomes and enrich student engagement.

Building on the discussions of how language instruction intersects with academic content, the next chapter will focus on interdisciplinary collaboration. While ICLHE addresses the gap between language and content instruction, interdisciplinary collaboration broadens this approach by fostering partnerships across various academic fields. Such collaboration enables universities to address complex global challenges, foster innovative research and teaching, and enrich the learning experience for students and faculty alike. The exploration of ICLHE in Portuguese higher education highlights its potential to foster internationalisation and enhance teaching and learning outcomes. However, the successful implementation of ICLHE relies on collaboration between ESP teachers, subject specialists, and institutional support structures. This underscores the broader importance of interdisciplinary collaboration as a key mechanism for addressing challenges in higher education, particularly in multilingual and multicultural contexts.

### **3. Interdisciplinary collaboration**

#### **Introduction**

Interdisciplinary collaboration in higher education institutions is an approach that allows different disciplines to collaborate to tackle complex problems and advance research and education. It is essential for addressing the challenges of the 21st century and creating innovative solutions that benefit society (Christensen et al., 2021; Moirano et al., 2020).

In recent years, collaborative teaching practices have gained prominence within many universities. The essence of co-teaching lies in its emphasis on collaborative instruction, a pedagogical approach aimed at enhancing the learning experience for diverse student groups. Cook and Friend (1995, p. 2) define collaborative teaching as "two or more professionals delivering substantive instruction to a diverse or blended group of students in a single physical space." Initially conceived as a means for specialist and general teachers to work together in mainstream classrooms, co-teaching has found application in various university courses, incorporating a range of participants. This collaborative approach goes beyond disciplinary boundaries, involving diverse experts, including medical professionals, engineers, architects, and faculty members from various academic domains. Integrating these varied perspectives and teaching styles enriches the instructional process, offering students a multifaceted and learning experience.

The following section will explore collaborative teaching within higher education, including its diverse modes, benefits, and challenges.

#### **3.1. Definitions of collaborative teaching**

The conceptualisation of collaborative teaching, as outlined by Perry and Stewart (2005), places it within a spectrum of collaboration. The variations depend on the extent of coordination and the sharing of responsibilities. At the lowest level of collaboration, courses are designed collectively by a faculty group but are subsequently taught and assessed individually by each member. Conversely, at the highest level of collaboration,

courses are co-designed, co-taught, and co-evaluated by a pair or a team of teachers. Within this study, collaborative teaching involves two teachers collaborating in the course planning process, discussing instructional delivery methods, creating teaching materials, and developing assessment tools for the same group of students.

Various terms, such as co-teaching, collaborative teaching, team teaching, and shared teaching (Suárez-Díaz, 2016), encompass different approaches and methodologies for their implementation. To provide a synthesis of these approaches, reference is made to co-teaching models proposed by Friend and Cook (2009) and Hughes and Murawski (2001), as interpreted by Castro Zubizarreta et al. (2017). This synthesis takes the form of a typology that categorises these approaches based on the level of interaction between participating teachers and students (see Table 1). Castro Zubizarreta et al. (2017) synthesised the collaborative teaching models proposed by Friend and Cook(2009) and Hughes and Murawski (2001) by identifying the similarities and differences between them. Both models emphasise the importance of collaboration and teamwork between teachers and identify station, parallel, and team teaching as effective approaches to collaborative teaching. However, Hughes and Murawski's model places a greater emphasis on clearly defining the roles and responsibilities of each teacher. In contrast, Friend and Cook's model emphasises the importance of observing and supporting individual students when required, which suggests that teachers observe difficulties, intervene, or that students themselves ask for support.

**Table 1 Co-teaching models (source: Castro Zubizarreta et al., 2017)**

*Co-teaching models (source: Castro Zubizarreta et al., 2017)*

<b>CO-TEACHING MODELS</b>	
<b>TPOLOGY</b>	<b>DESCRIPTION</b>
One teaches, the other observes or Observation Co-teaching.	While one teaches, the other collects information of interest. It requires coordination in the information to be collected and the subsequent analysis of the information.
One teaches, the other circulates, or Co-teaching support.	While one is primarily responsible for teaching, the other teacher circulates, offering occasional help to students who require it.
Co-teaching in concurrent groups or Parallel teaching	Teachers teach and share the same teaching materials but divide the class in two and assist students simultaneously.
Co-teaching in rotation with/without teaching stations.	Teachers divide the content, and the class in two, each teacher teaches the content that corresponded to his or her group, then the same content to the other. In addition, a third group "station" can be set up for students to work independently.
Complementary co-teaching	Consists of one teacher in the team performing actions to enhance or complement the teaching provided by the other teacher (e.g., paraphrasing, teaching in a different style, pre-teaching the social skills required for cooperative learning).

Alternative or differentiated education	The class is divided into two groups based on various criteria such as skill level, learning style, or specific needs. One teacher is responsible for the larger group, the other for the smaller group.
Teaching team	Teachers provide the same instruction simultaneously, in an invisible flow of action that makes it impossible to distinguish a leader. Both teachers actively teach, ask questions, and facilitate discussions. For instance, one might present new content while the other demonstrates examples or provides additional explanations. This is the most complex approach and most in keeping with the idea of co-teaching

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Zubizarreta’s synthesis of these two models provides a comprehensive framework for understanding the critical features of effective collaborative teaching partnerships. It can be used as a guide for teachers and administrators looking to implement co-teaching in their schools.

Interdisciplinary collaboration can take many forms, including research teams, academic programmes, workshops, and conferences. By utilising the unique expertise and capabilities in different fields of study or disciplines, we can draw upon the diverse knowledge, skills, and perspectives that scholars and experts from various academic areas bring.

### 3.2. Benefits and challenges of interdisciplinary collaboration

Researchers (Axelrod, 2014; Hargreaves, 2019; Jortveit & Kovač, 2022; Marouli et al., 2017) have highlighted the benefits of interdisciplinary collaboration in higher education, including:

- **Innovation:** Interdisciplinary collaboration brings diverse perspectives and knowledge from various fields to generate new ideas and innovative solutions to complex problems.
- **Enhanced learning:** Students participating in interdisciplinary collaborations can develop a more comprehensive understanding of a topic, learning from experts in multiple disciplines and gaining exposure to diverse viewpoints.
- **Broader research questions:** Interdisciplinary research explores broader questions that transcend traditional disciplinary boundaries.
- **Increased funding opportunities:** Interdisciplinary research projects may have an advantage in securing funding from organisations that require collaboration across multiple disciplines.
- **Professional development:** Collaborative efforts offer opportunities for researchers and teachers to acquire new skills, learn from peers, and expand their professional networks.
- **Improved communication skills:** Collaborating across disciplinary boundaries requires strong communication skills, helping students and researchers develop valuable abilities applicable to various aspects of life.
- **Real-world impact:** Interdisciplinary collaborations can lead to research and solutions with a significant societal impact, addressing complex problems and improving the lives of individuals and communities.

However, despite its numerous advantages, interdisciplinary collaboration in higher education presents several challenges and drawbacks, as acknowledged by the researchers. These challenges include:

- **Difficulty in coordinating:** Interdisciplinary collaboration can be challenging, as it requires individuals from different fields to work together, leading to disagreements and communication breakdowns.
- **Unequal participation:** There may be unequal participation in interdisciplinary collaborations, with some individuals contributing more than others due to differences in expertise, experience, or workload.
- **Time-consuming:** Interdisciplinary collaboration can be time-consuming, as it often requires additional planning and coordination to ensure that all participants are on the same page.
- **Resistance to change:** There may be resistance to change within disciplines. Some individuals may be reluctant to engage in interdisciplinary collaborations or view them as threatening traditional disciplinary boundaries.

With careful planning and communication, these challenges can be overcome (Chaovanapricha & Chaturongakul, 2020), and the benefits of interdisciplinary collaboration can be realised. In a case study by Marouli et al. (2017), teachers were asked to identify strategies they deemed essential for the success of collaborative teaching.

These strategies were rated on a scale from 1 (highest importance) to 5 (lowest importance), and the top-rated responses included:

1. Emphasising the need to establish strong rapport and relationships among the teachers.
2. Prioritising the development of a mutually agreed-upon action plan for teaching and class management at the outset of the collaboration.

3. Highlighting the importance of maintaining flexibility and demonstrating respect between teachers.

According to the teachers, these strategies are crucial for the success of collaborative teaching. A carefully devised action plan, including well-defined activities and learning objectives from the outset, seems crucial for a collaborative teaching endeavour (Marouli et al., 2017).

### **3.3. Collaboration in ICLHE**

Collaborative teaching in ICLHE involves close collaboration between content and language teachers, allowing both to contribute their expertise to enhance student learning. Castro Zubizarreta et al. (2017) synthesised collaborative teaching models and outlined several co-teaching models (see Table 1, p.64). These models provide flexibility but need to be adapted for ICLHE, where language and content are integrated into each lesson. The ultimate goal is to ensure that students simultaneously develop linguistic proficiency and master academic content.

Effective partnership between content teachers and language specialists plays a pivotal role in the success of ICLHE programmes, as suggested in the challenges outlined in the previous section. This theme closely aligns with the overarching focus of this thesis, which centres on interdisciplinary collaboration. Research conducted by Evans et al. (2009) at Macquarie University in Australia showcased the benefits of interdisciplinary collaboration. Their study revealed that when discipline-specific lecturers teamed up with language specialists to provide support, students experienced improvements in their professional skills (Evans et al., 2009). While the study by Evans et al. (2009) does not specifically focus on foreign language instruction, its approach is highly relevant to the ICLHE concept. The study highlights the importance of interdisciplinary collaboration between discipline-specific lecturers and language specialists, particularly in enhancing professional communication skills alongside discipline content. This aligns with the principles of ICLHE, which emphasises the integration of language support with academic

content. In this case, language specialists focus on professional communication skills, while content lecturers provide disciplinary expertise, creating a collaborative framework that enhances student learning outcomes. By moving away from 'content download' (2009, p. 609) and fostering collaborative relationships, the study contributes to the growing body of literature on integrating essential skills and competencies—such as professional communication— into diverse academic programs. This is one of the key goals of ICLHE, even when the language instruction is not explicitly foreign.

Similarly, a study conducted in Spain by Ruiz de Zarobe and Cenoz (2015) explored the experiences of university-level teachers collaborating with language teachers in an ICLHE program. The findings highlighted the valuable role of collaboration in improving teaching quality and meeting students' language learning needs, leading to increased student engagement and motivation. Studies (Niemelä & Jauni, 2014; Wilkinson, 2018) have underscored the significance of collaborative planning in effectively integrating language learning into content instruction. This approach ensures that students acquire subject matter knowledge and develop language proficiency simultaneously.

Furthermore, research has emphasised the need for ongoing teacher training and support. Aguilar and Rodríguez's study (2012) highlighted additional training was necessary to implement courses effectively, particularly in CLIL contexts. Nix (2021) echoed this sentiment, emphasising the importance of professional development to address challenges and enhance collaborative teaching practices. Pavón and Ellison (2013) discuss teacher training within the CLIL context, which is relevant to interdisciplinary collaboration in ICLHE. They emphasise that CLIL requires teachers to develop multiple types of expertise, not only in their subject area but also in the language of instruction. This creates a demand for specialised teacher training programs focusing on effectively integrating content and language. The authors highlight the importance of training teachers in content delivery and language awareness, ensuring they can adapt their methodologies for integrated learning environments. They also note that this training must include a focus on collaboration between content and language teachers, as well as the development of language competencies that go beyond basic linguistic skills to support content learning.

This reflects a broader need for professional development in interdisciplinary settings like ICLHE, where teachers are expected to balance language instruction with discipline-specific content, making teacher training essential for success.

As expressed above, while language specialists in ICLHE courses may collaborate with content experts, the effectiveness of these collaborations can vary based on institutional resources and student needs, institutional policies, programme specifics, and language-related guidelines. Nonetheless, in most instances, language specialists or teachers actively participate in implementing ICLHE to address students' language learning requirements (Fürstenberg et al., 2022, p. 309; Lyster, 2017). Studies show that integrating ESP with ICLHE methodologies helps develop professional and communicative skills by combining subject-specific content with language learning. In her book, Kovacikova (2020) explores the intersection of CLIL and ESP in the context of higher education. The book offers an in-depth examination of how integrating ICLHE methodologies into ESP courses can enhance students' language autonomy.

Kovacikova argues that by embedding ICLHE strategies within ESP classes, educators can create a more dynamic learning environment that mirrors real-world contexts. This integration facilitates the development of linguistic skills and subject-specific knowledge, effectively bridging the gap between academic study and professional practice. The emphasis on language autonomy encourages students to take ownership of their learning, equipping them with the skills to navigate complex professional scenarios requiring content knowledge and communicative competence.

Moreover, the book highlights how the ICLHE approach in ESP supports a more seamless transition from education to employment by aligning language learning with the specific needs of various industries. Kovacikova (2020) presents compelling case studies demonstrating the success of CLIL and ESP methodologies in both secondary and higher education. In higher education, Suzhou University in China reported increased motivation and autonomy from project-based CLIL, while Turkish and Spanish universities highlighted improvements in critical thinking and communication skills among their students (pp. 34–

36). Also, Dutch institutions provide exemplary models of CLIL integration. At CAH Dronten University and Wageningen University, interdisciplinary projects successfully blended content knowledge with English language learning, inspiring similar efforts at the Slovak University of Agriculture in Nitra to incorporate real-world problem-solving into CLIL programs (pp. 37–39).

These studies underscore the potential of CLIL to enhance both academic and linguistic outcomes. Students and educators consistently report positive attitudes toward these methodologies, particularly in fostering communication and professional readiness, despite challenges such as resource adaptation and teacher training (pp. 34–39).

By using ICLHE methodologies within ESP contexts, Kovacikova's work advocates for a shift in teaching practices that prioritises interdisciplinary collaboration and reflects the interconnectedness of language and content knowledge in professional domains. This approach addresses the challenge of producing graduates who are both linguistically proficient and capable of applying their knowledge in practical, industry-relevant ways.

Moreover, other studies explore ESP in combination with other approaches like EMI and how these are being utilised across various disciplines in countries like Turkey and Latvia, further emphasising the interdisciplinary benefits of these methods (Raitskaya, 2018). These studies collectively demonstrate the increasing relevance of combining ESP and CLIL or EMI, particularly in the context of higher education's internationalisation efforts.

Nix's (2021) study, conducted in Taiwan, offers valuable insights into the perceptions of collaborative teaching among English as a Foreign Language (EFL) teachers. The study involved three EFL teachers working collaboratively to teach an English course to non-native English-speaking students. Nix found that the EFL teachers had positive perceptions of collaborative teaching, believing it enhanced the learning experience for both the students and themselves. They perceived collaborative teaching as an opportunity to share expertise, learn from each other, and reduce workload and stress. Despite challenges such as differences in teaching styles and communication barriers, the study emphasises the

importance of understanding teachers' perceptions to promote effective collaboration and improve the quality of English language teaching. Furthermore, it underscores the need for ongoing professional development and training to support collaborative teaching practices in EFL contexts.

In the context of interdisciplinary collaboration between an ESP teacher and a content teacher within an ICLHE, Pavón and Ellison (2013) emphasise the importance of collaboration between language and content teachers in CLIL settings, which shares similarities with ICLHE. They argue that successful implementation of CLIL (and by extension, ICLHE) requires both content and language teachers to adapt their teaching methodologies and collaborate closely to ensure students achieve both linguistic and academic competence. As they explain, "The success of programmes involving the teaching of content through another language does not rest solely on whether the teachers responsible have a high level of linguistic and subject competence, but also on the collaboration between those teaching content subjects and languages. For example, foreign language teachers can provide invaluable linguistic support to students in their language lessons" (Pavón & Ellison, 2013, p. 70). This aligns well with the ICLHE approach, where interdisciplinary collaboration enhances learning by leveraging the expertise of both ESP and content teachers. As Pavón and Ellison (2013) note, this partnership ensures that language skills are embedded within content learning, which is critical for students in multilingual and multicultural environments. This reflection on teacher roles and competencies directly contributes to the ongoing discourse on interdisciplinary collaboration in higher education, providing a concrete example of how content and language integration can be practically achieved through cooperative teaching efforts.

Despite the potential for enriching student learning, co-teaching in ICLHE presents several challenges. As Gustafsson (2013) noted, besides practical challenges such as heavy workloads and a shortage of ICLHE-trained language teachers, other limiting factors include the prevailing belief that certain disciplines are more prestigious than others. This hierarchical view of disciplines, coupled with a perception that some fields are more insular and less open to interdisciplinary collaboration, makes ICLHE work more challenging.

Another significant barrier is the perceived incompatibility of research methodologies across disciplines, which hinders many collaborative efforts in ICLHE (Gustafsson et al., 2011). Moreover, the managerial culture in higher education, which often prioritises cost-efficiency over innovative educational designs, may see ICLHE as an expensive intervention compared to traditional teaching methods. This perspective further limits the adoption of ICLHE approaches in universities.

Various factors shape teachers' views on collaborating with language teachers, including the perceived value of collaboration, its nature, and the role of language in the teaching-learning process. Addressing these factors enables institutions to foster effective collaboration, benefiting teachers and students. Despite challenges, the benefits, such as enhanced student performance and innovative teaching approaches, justify collaborative efforts, contributing to a more engaging learning environment and a positive work atmosphere.

A PhD dissertation conducted at the same institution as this present study (Régio, 2024) emphasises the impact of teacher autonomy and collegiality on fostering collaboration in ICLHE. It found that while faculty possess autonomy, which can promote innovative approaches, they do not frequently engage in teaching collaborations through collegial interactions. The lecturers felt confident in their English skills but did not view language support as their responsibility, indicating a need for further training. Additionally, students' inadequate English proficiency was seen as an obstacle to successful ICLHE implementation, highlighting the need for interdisciplinary collaboration to improve bilingual education practices in similar contexts.

Effective interdisciplinary collaboration in ICLHE settings is rooted in understanding the complementary roles of content and language teachers. Successful collaboration involves aligning teaching strategies, integrating content and language objectives, and sharing responsibility for student learning outcomes. The next focus is on the roles and responsibilities of ESP teachers and content teachers within the ICLHE framework. Examining these roles is essential for understanding how decisions are made in lesson

planning, student assessments, and intervention strategies. The collaborative nature of ICLHE requires that both content and language objectives be seamlessly integrated, ensuring students achieve both content mastery and language development.

### **3.3.1. Roles and responsibilities of teachers in ICLHE**

Examining the roles and responsibilities of ESP teachers and content teachers in an ICLHE context is crucial for understanding how decisions are made in developing lesson plans, student assessments, and intervention plans, which are essential for ensuring that both language and content objectives are effectively addressed and that students receive the necessary support to achieve academic and linguistic success. The collaborative nature of ICLHE settings means that content and language objectives must be carefully integrated into teaching. Understanding how these teachers work together provides valuable insights into the interdisciplinary nature of teaching in these contexts, ensuring that educational outcomes reflect content mastery and language development (Pavón & Ellison, 2013).

ESP teachers play a critical role in ensuring students develop the necessary language skills to engage with academic content. This is particularly important in technical and academic settings where students must master specialised vocabulary and discourse strategies. Pavón and Ellison (2013) emphasise that language specialists provide the linguistic support students need to access content knowledge effectively. This reflects the findings of Cummins (2008, 2000), who argued that for students to engage with complex academic content in a second language effectively, they must develop Cognitive Academic Language Proficiency (CALP). While Basic Interpersonal Communication Skills (BICS)—the language skills used in everyday, informal communication—can be acquired relatively quickly, CALP is more complex and takes significantly longer to develop. According to Cummins, CALP is essential for understanding and producing academic language in subjects like mathematics, science, and the humanities. In an ICLHE context, simply acquiring conversational language skills is not enough; students must also be supported in developing the academic language necessary to engage with the content effectively. Integrating CALP into the curriculum, alongside content instruction, ensures that students

are equipped to communicate in a second language and master academic content, making it a crucial component of successful language and content integration in higher education.

In addition to language support, ESP teachers can collaborate closely with content teachers to develop curricula that balance content and language learning objectives. As Coyle suggests, lesson planning in CLIL contexts should be guided by a framework that integrates Content, Communication, Cognition, and Culture. Pavón and Ellison (2013) highlight that this collaboration often leads to tailored tasks and assessments, ensuring that students face disciplinary challenges and linguistic demands simultaneously. This co-planning approach ensures that language support is embedded in content instruction without compromising the academic rigour of the subject matter.

Content teachers can contribute their expertise in subject-specific knowledge while adapting their teaching practices to become more language-aware. According to Dafouz & Smit (2016), content teachers in ICLHE settings are increasingly expected to integrate language support into their disciplinary instruction. This involves an awareness of how linguistic features affect students' comprehension of complex subject matter. Pavón and Ellison (2013) argue that content teachers must develop a "language consciousness," where they not only convey disciplinary content but also consider how the language used in class can support or hinder student understanding.

In line with Frigols (2011), and Marsh et al. (2010) content teachers must balance maintaining the intellectual rigour of their subject and adapting their language use to facilitate student understanding. This might involve simplifying instructions, using visual aids, or breaking complex concepts into smaller, more manageable parts (Pavón & Ellison, 2013). Additionally, content teachers are responsible for assessing students' subject knowledge while working with ESP teachers to evaluate their language proficiency in using discipline-specific terminology and discourse.

Collaboration between ESP and content teachers is central to ensuring that content and language objectives are met in ICLHE settings. Pavón and Ellison (2013) stress that co-teaching or joint planning sessions are crucial in developing lessons, tasks, and

assessments that balance language and content goals. For example, Dalton-Puffer (2007) points out that classroom discourse in CLIL settings is a critical vehicle for scaffolding content and language learning, making teacher collaboration vital for aligning instructional goals. As a result, both teachers contribute to designing assessments that accurately reflect both language competence and content understanding.

Pavón and Ellison (2013) emphasise that this joint decision-making process involves negotiating which content areas should be prioritised and how language support should be incorporated. Coyle et al. (2010) further argue that such collaboration ensures that the curriculum reflects an integrated approach to teaching, where students receive adequate support in both areas. By analysing these collaborative decisions, teachers can identify areas where students may need additional help, allowing them to implement targeted interventions.

In ICLHE settings, where content mastery and language proficiency must be assessed, assessment decision-making is particularly complex. Pavón and Ellison (2013) argue that content teachers must collaborate with ESP specialists to develop assessments reflecting disciplinary knowledge and language use. Airey (2012) supports this by emphasising the importance of language-aware assessment practices, where content teachers assess subject knowledge and students' ability to express that knowledge in the target language.

Furthermore, intervention plans to support students struggling with content or language require input from both teachers. As Pavón and Ellison (2013) note, language teachers are often responsible for designing interventions that address language-related challenges, while content teachers focus on supporting students' understanding of subject matter. Snow et al. (1989) highlight the importance of collaboration in identifying the root causes of student difficulties, ensuring that interventions address content and language needs.

The roles and responsibilities of language and content teachers in ICLHE contexts are intertwined and require a collaborative approach to ensure both content and language objectives are met. Pavón and Ellison (2013), alongside other scholars such as Coyle (2007)

and Cummins (2000), underscore the importance of integrating language and content learning objectives through co-planning, co-teaching, and collaborative assessment.

In ICLHE contexts, the roles of ESP and content teachers are distinct yet interconnected. ESP teachers are typically tasked with fostering students' academic language proficiency (CALP), which is essential for engaging with complex academic content. This includes embedding linguistic support into curricula and assessments, particularly in technical and academic settings where specialised vocabulary and discourse strategies are crucial.

Content teachers, meanwhile, often leverage their subject expertise while developing language-conscious teaching practices to ensure disciplinary content is accessible to all students. This may involve simplifying instructions, using visual aids, or scaffolding complex concepts, particularly in settings where students face challenges engaging with subject matter in a second language. Ideally, content teachers balance maintaining intellectual rigour with adapting their instructional approaches to meet linguistic and cognitive demands.

Effective collaboration between ESP and content teachers frequently involves co-planning, co-teaching, and designing assessments that align content and language objectives. In well-integrated ICLHE settings, joint efforts ensure that assessments reflect students' mastery of disciplinary knowledge and ability to use discipline-specific terminology and discourse effectively. While the extent of collaboration may vary, these practices are crucial for addressing the dual challenges of linguistic and academic demands in ICLHE environments.

Ultimately, this shared responsibility supports students by providing comprehensive academic and linguistic development, laying the foundation for successful lesson planning and interdisciplinary collaboration in higher education.

### **3.3.2. Lesson planning in ICLHE**

The development of materials for ICLHE is a collaborative process in which content and language teachers play a critical role in designing and assessing student learning. Coyle, Hood, and Marsh (2010) introduced the 4Cs framework—Content, Communication,

Cognition, and Culture—which serves as the foundation for designing and delivering integrated learning experiences within the CLIL approach. These interrelated components help to create a balanced approach that addresses both the subject matter and the language learning needs of students.

1. Content refers to the subject-specific knowledge, skills and content concepts taught in the classroom. In a CLIL context, content learning is central but is integrated with language objectives, meaning students not only acquire core concepts of the subject but also the academic language necessary to understand and communicate these ideas effectively.
2. Communication emphasises the role of language as both a tool for and an outcome of learning. Students use language to acquire new content knowledge, while their ability to communicate in the target language improves as they engage with the subject matter.
3. Cognition refers to the development of thinking skills fundamental to deep learning. In CLIL, students engage in higher-order thinking—such as analysing, evaluating, and synthesising information—while using an additional language. This challenges students to operate at a high cognitive level, fostering critical reflection and enhancing their learning experience.
4. Culture highlights the intercultural understanding fostered in CLIL environments. Beyond learning content and language, students explore cultural contexts and perspectives related to the subject matter. It also expands into intercultural understanding fostered in CLIL environments, where culture is viewed as a community of learning, and encouraging students to learn with and from one another.

The 4Cs framework, proposed by Coyle, Hood, and Marsh (2010a), provides a structured approach to lesson planning by integrating content mastery, language development, cognitive engagement, and cultural awareness. It is designed to address the complexities of teaching and learning in contexts where both content and language objectives must be

achieved simultaneously. Grounded in educational research and influenced by frameworks that emphasise meaningful, interdisciplinary learning, the 4Cs promote a comprehensive approach to teaching that fosters subject knowledge, critical thinking, effective communication, and intercultural understanding.

This framework is particularly valuable in CLIL and ICLHE settings, where integrating disciplinary content with language learning is essential. Coyle (2006) underscores the importance of creating lessons that develop these interconnected skills through contextually rich, interactive methods. By embedding the 4Cs into their teaching, ESP and content teachers can collaborate to design lessons supporting students' academic and linguistic success, creating dynamic environments that encourage intellectual growth and global awareness.

Mehisto's (2012) article is a practical guide for developing effective learning materials, particularly valuable for lesson planning in ICLHE settings. It provides general principles for designing high-quality educational resources, addressing language and content objectives and criteria tailored to CLIL contexts. These practical examples and rationales are adaptable to interdisciplinary teaching environments, making the framework versatile and applicable to diverse educational settings.

Among the ten essential criteria Mehisto identifies, key elements include fostering transparency in learning intentions and processes, systematically developing academic language proficiency, and encouraging learner autonomy. The framework also emphasises incorporating formative assessments like peer and self-assessment within a safe and cooperative environment. Authentic language use, critical thinking, and scaffolding strategies further enrich the learning experience, enabling students to advance in both content knowledge and language skills. Finally, the creation of meaningful learning experiences ensures that materials resonate with students, promoting engagement and effective learning outcomes. Incorporating Mehisto's criteria is fundamental in developing effective CLIL lesson plans. These criteria align closely with lesson plans previously used in CLIL experiences and studies that outline best practices and criteria for materials

development and incorporating CLIL in classrooms (CETAPS, n.d.; Margarida Morgado et al., 2015). By integrating these criteria into lesson planning, educators can create structured and engaging learning environments that balance content and language objectives effectively.

Effective learning materials are crucial in lesson planning for ICLHE, as they facilitate the integration of content and language objectives, a central tenet of the 4Cs framework (Coyle, Hood, & Marsh, 2010). These materials provide a structured approach to delivering content and supporting academic language development, ensuring that students engage with both the subject matter and the associated language skills. Drawing on Mehisto's (2012) principles for designing high-quality educational resources, effective materials help scaffold complex concepts, address diverse student needs, and foster independent learning. These materials can promote the simultaneous development of content knowledge and language proficiency, encouraging students to think critically and engage in higher-order cognitive tasks. Additionally, these materials align with Cummins' (2000, 2008) emphasis on Cognitive Academic Language Proficiency (CALP), as they challenge students to engage with disciplinary content while developing the academic language necessary for academic success. By adhering to these research-based guidelines, learning materials ensure that lesson plans are inclusive, interactive, and designed to achieve content mastery and linguistic fluency, ultimately leading to effective, measurable student outcomes.

The inclusion of scaffolding techniques in lesson planning is fundamental to the success of the CLIL approach, ensuring that students can navigate both content and language learning effectively. Thoughtfully planned scaffolding strategies allow educators to design lessons that address the diverse needs of learners, enabling gradual mastery of subject-specific content and academic language. This intentional incorporation of scaffolding in lesson planning creates a structured yet flexible framework that supports students as they progress toward greater independence.

Scaffolding is a cornerstone of the CLIL approach, providing structured support that enables students to engage with complex content while simultaneously developing language proficiency. According to Coyle, Hood, and Marsh (2010), scaffolding is essential for managing the dual cognitive demands of CLIL, as it helps bridge the gap between students' current abilities and the target learning objectives. Through strategies such as pre-teaching vocabulary, visual aids, graphic organisers, and guided instruction, scaffolding allows learners to process content more effectively while acquiring the academic language necessary for success.

The importance of scaffolding in CLIL is well-documented. Meyer (2010) highlights its role in reducing cognitive overload, emphasising that scaffolded instruction allows students to focus on critical thinking and application without being hindered by linguistic barriers. Furthermore, effective scaffolding fosters student autonomy by gradually transferring responsibility for learning from the teacher to the student (Gibbons, 2015). This process aligns with Gibbons' description of the Teaching and Learning Cycle (2015, p. 110), which emphasises stages such as building the field, modelling the genre, joint construction, and independent writing to support learners in mastering both content and language. This gradual release model ensures students can eventually operate independently within the content and linguistic domains.

In interdisciplinary collaboration, particularly within the ICLHE framework, scaffolding becomes a shared responsibility between ESP and content teachers. As identified by Dafouz and Smit (2016), best practices include collaboratively designing scaffolded materials that integrate subject-specific language with technical content. For instance, ESP teachers can scaffold language instruction by creating glossaries of key terms and guiding students through academic writing tasks. In contrast, content teachers can scaffold conceptual understanding through case studies and real-world applications.

Research underscores the value of scaffolding in fostering deeper student engagement and improving learning outcomes in interdisciplinary settings. Lasagabaster and Doiz (2016) argue that scaffolding facilitates the integration of content and language and

strengthens the collaborative relationship between ESP and content teachers. By co-developing scaffolding strategies, teachers can address both the linguistic and disciplinary challenges students face, creating a more cohesive and supportive learning environment.

Building on the foundation of well-designed lesson plans, the next crucial component in ICLHE settings is student assessment. Understanding how to evaluate student's progress in content knowledge and language proficiency is essential for achieving the dual objectives of integrated learning environments. The following section explores strategies for designing assessments that reflect the interdisciplinary goals of ICLHE, ensuring alignment with lesson objectives and addressing students' diverse needs.

### **3.3.3. Student assessments in ICLHE**

Creating assessments in ICLHE settings presents a unique set of challenges. One significant difficulty is balancing content and language assessment. Teachers must design assessments that accurately evaluate students' understanding of subject-specific content while assessing their ability to communicate that understanding in a second language. This challenge requires careful consideration of both the academic demands of the content and the language proficiency needed to engage with it. Coyle, Hood, and Marsh (2010) emphasise the need for a collaborative approach to assessment in CLIL and ICLHE, ensuring that both content and language objectives are integrated in the assessment design process. This integrated approach helps ensure that students are assessed holistically, reflecting both their grasp of the subject matter and their linguistic ability.

Another challenge is ensuring that the assessments are valid and fair. As content and language are intricately linked in ICLHE, it can be difficult to design assessments that fairly evaluate both areas without one overshadowing the other. For example, language proficiency may sometimes influence the assessment of content knowledge, particularly if students struggle to express their understanding in the target language. Airey (2012) discusses how language awareness in assessment design can help ensure fairness by addressing this issue, while Dalton-Puffer (2011) argues that collaborative assessment

practices allow teachers to work together to create more balanced assessments, ensuring that both content knowledge and language proficiency are appropriately evaluated.

The diversity in students' language proficiency levels also complicates assessment design. With students coming from varied linguistic backgrounds, assessments must be accessible to all, yet challenging for those with higher proficiency. Pérez-Cañado (2012) discusses the importance of accounting for these differences to ensure fair evaluation for all students..

Creating authentic tasks that reflect real-world applications of both content and language is another critical challenge. Meyer (2013) argues that authentic language tasks allow students to demonstrate their skills in real-world situations. These tasks must be designed to assess both the cognitive and linguistic aspects requiring collaboration among teachers from different disciplines.

The distinction between formative and summative assessments can be difficult to navigate in ICLHE settings. While summative assessments are often used to evaluate overall content knowledge and language proficiency, formative assessments provide ongoing feedback. Coyle (2006) advocates for the systematic use of formative assessments to track both language development and content understanding, allowing teachers to provide timely feedback and make adjustments to instruction as needed. This ongoing assessment is crucial for supporting students' language and content learning in an integrated way.

Collaboration among teachers is essential for effective assessment design. By working together, teachers can create assessments that reflect the interdisciplinary nature of ICLHE and are aligned with both content and language learning goals. Dalton-Puffer (2011) and Meyer (2013) highlight that joint assessment practices foster shared responsibility for student outcomes, ensuring assessments are rigorous and inclusive.

By bringing their expertise in subject matter and language instruction, content teachers and language experts can ensure that assessments effectively measure students' understanding of content knowledge and language proficiency. These assessments reflect

the integration of disciplinary knowledge and language use, providing a comprehensive measure of students' ability to communicate ideas effectively (Kim et al., 2018; Mestre-Segarra & Ruiz-Garrido, 2022a; Ronfeldt et al., 2015).

Collaboration is key to designing assessments that address content and language objectives, ensuring students are assessed holistically. Lim Falk (2015) and Marsh (2002) underscore that collaborative assessment practices enhance the quality of assessments and promote critical thinking, problem-solving, and real-world application. The collaborative efforts between language and content teachers in lesson planning and assessment development are central to the success of ICLHE and CLIL frameworks, fostering critical thinking, communication, and creativity in students.

#### **3.3.4. Teacher meetings**

Teacher meetings are a cornerstone of best practices in ICLHE, providing a structured platform for fostering collaboration between ESP teachers and content teachers. These meetings enable educators to co-design, deliver, and assess instruction, addressing the dual demands of content delivery and language acquisition. Castro Zubizarreta et al. (2017) emphasise the shared responsibility of teachers in such contexts, highlighting the importance of collaboration to ensure a balance between linguistic and disciplinary objectives.

The role of teacher meetings extends beyond practical planning, as they serve as vital spaces for fostering professional collaboration and trust among colleagues. Insights from Kolley et al. (2021) demonstrate the critical role of trust in collaborative teaching settings, such as team teaching. While team teaching refers to contexts where multiple teachers share responsibilities within the same classroom, the findings on trust and shared goals are directly applicable to co-teaching in ICLHE. In interdisciplinary collaborations between ESP and content teachers, trust enhances professional relationships, supports equitable participation, and strengthens the alignment of teaching strategies.

Collaboration between ESP and content teachers in ICLHE settings requires structured and regular meetings to align their efforts and overcome the inherent complexities of

interdisciplinary teaching. Such collaboration is particularly significant in contexts where both linguistic and content objectives must be integrated effectively. Teacher meetings facilitate essential processes, such as:

- Co-designing curricula and assessments to meet the dual objectives of content mastery and language acquisition.
- Sharing expertise and pedagogical strategies to address diverse student needs, particularly in multilingual and multicultural environments.
- Developing trust-based professional networks, which, as noted by Kolleck et al. (2021, p. 102), enhance the effectiveness of collaborative teaching through reciprocal relationships and shared professional goals.

These meetings align closely with the best practices described in CLIL (Content and Language Integrated Learning), particularly the 4Cs framework proposed by Coyle, Hood, and Marsh (2010). By integrating content, communication, cognition, and culture, teachers ensure that disciplinary knowledge and language skills are developed simultaneously. Regular teacher meetings are the backbone of this integration, enabling ESP and content teachers to navigate the challenges of role negotiation, pedagogical alignment, and institutional priorities.

The efficiency of teacher meetings can be further enhanced by minimising redundancy. Referring to prior decisions during subsequent meetings ensures that discussions remain focused, streamlining the planning process and reducing repetitive conversations. Vangrieken et al. (2015) emphasise that effective collaboration not only saves time but also improves outcomes, particularly when it aligns content and language instruction efficiently.

As Kolleck et al. (2021, p. 94) emphasise, the importance of collaboration and trust in teacher meetings are not merely an outcome of professional collaboration but a prerequisite for effective interdisciplinary teaching. Structured teacher meetings provide

a forum for building and sustaining trust, enabling teachers to navigate the complexities of co-teaching while fostering innovation and professional growth.

Moreover, teacher meetings are essential for facilitating the integration of linguistic and pedagogical expertise, a critical requirement in ICLHE. Lasagabaster and Doiz (2016) argue that collaborative planning in CLIL contexts ensures curricular coherence and fosters mutual understanding among educators. These discussions allow teachers to adapt materials, develop consistent language policies, and share strategies to overcome challenges associated with multilingual education. Dafouz and Smit's (2016) work on language-aware teaching highlights the importance of integrating language support into content instruction within ICLHE. Teacher meetings enable ESP and content teachers to evaluate how effectively they balance content and language objectives, aiming to ensure that language learning is not overshadowed by content delivery. These meetings can provide valuable opportunities to assess and adjust collaborative practices.

Regular interaction and communication between teachers improve instructional coherence and ensure that content and language goals are met, which is fundamental in interdisciplinary collaboration (Pavón & Ellison, 2013). Therefore, teacher meetings form a foundation of successful co-teaching arrangements, enabling effective integration of language support within content instruction.

Despite the transformative potential of teacher meetings, challenges such as limited time, resource constraints, and institutional barriers often hinder their effectiveness. Insights from Morgado et al. (2015) highlight the importance of institutional support in mitigating these challenges, particularly through flexible scheduling and equitable resource allocation. Additionally, referring to prior decisions and focusing discussions on actionable outcomes can enhance efficiency, ensuring that meetings yield tangible improvements in teaching practices (Vangrieken et al., 2015).

This chapter has provided an exploration of interdisciplinary collaboration within the ICLHE framework, emphasising the significance of effective communication, co-teaching models, and collaborative practices between ESP and content teachers. By examining the

theoretical foundations and practical aspects of collaborative teaching, this discussion lays the groundwork for understanding the complexities of integrating language and content instruction in higher education.

The theoretical perspectives presented in this chapter establish a foundation for the research journey. Language policies, instructional approaches, and collaborative teaching in higher education converge to inform the case study's design and execution. This research aims to shed light on the decision-making processes of ESP and content teachers engaged in collaborative teaching in a higher education institution. Future exploration of participants' receptiveness will be essential, as their openness to collaboration significantly impacts the effectiveness of these practices and their transformative potential.

## **4. Receptiveness: Social cognitive and motivational insights**

### **Introduction**

Understanding receptiveness is crucial for fostering successful interdisciplinary collaboration in educational settings. This part delves into the willingness and ability of key stakeholders—ESP and content teachers, faculty directors, and students—to embrace collaborative practices and innovative teaching methodologies. Receptiveness is shaped by various factors, including personal beliefs, social dynamics, and institutional support structures, all of which influence the adoption of new practices. By drawing on Social Cognitive Theory (SCT) and Expectancy-Value Theory (EVT), this section examines how beliefs, motivations, and perceived value shape participants' readiness to engage in interdisciplinary approaches. These theoretical frameworks provide a lens through which to analyse the interplay of individual and contextual factors, offering valuable insights into the processes that enhance or hinder engagement with collaborative teaching strategies.

#### **4.1. Social Cognitive Theory (SCT)**

SCT, developed by Albert Bandura (1986), offers a comprehensive framework for understanding how individuals learn through social interaction, observation, and self-regulation. In the context of second language learning and interdisciplinary collaboration, SCT provides valuable insights into how learners' receptiveness—openness, willingness, and ability to engage with collaborative practices—can significantly impact their success in language acquisition and collaboration across disciplines. SCT posits that learning occurs not only through direct experiences but also through observational learning, where individuals acquire new behaviours by observing the actions of others and the subsequent outcomes. This is particularly relevant to interdisciplinary collaboration, as it emphasises how teachers and students can model effective collaborative behaviours, which, when observed, can enhance participants' receptiveness to working together and learning from each other's expertise.

In the context of second language learning, SCT emphasises several interconnected components—such as self-efficacy, outcome expectations, self-regulation, and observational learning (Bandura, 1997) – critical to receptiveness. These components help explain how language learners and educators engage with and adapt to interdisciplinary teaching methods, thus enhancing their motivation, perseverance, and overall engagement in the collaborative process. Bandura adds “In competency development and aspirational pursuits, the personal standards of merit are progressively raised as knowledge and competencies are expanded and challenges are met” (2020, p. 319). Understanding how these elements work in tandem can help foster a more receptive attitude toward interdisciplinary collaboration, making it a vital tool for successful language learning in collaborative educational environments.

- Self-efficacy refers to an individual's belief in their ability to perform tasks and achieve goals. High self-efficacy leads to greater motivation and persistence, while low self-efficacy can hinder performance. In the context of this study, understanding the self-efficacy of teaching staff and students can show how confident they feel about participating in interdisciplinary collaboration.
- Outcome Expectations involve beliefs about the likely consequences of actions. Understanding the expectations of all participants regarding their collaborative efforts can inform strategies to enhance their engagement and motivation.
- Reciprocal Determinism illustrates the dynamic interaction between personal factors, environmental influences, and behaviour. This concept can help analyse how the collaborative environment in this particular HEI affects the receptiveness of teachers and students.
- Observational Learning (Modeling) highlights the importance of learning through the observation of others. This can be particularly relevant for students in interdisciplinary collaboration, as they can observe and learn from the behaviours of their peers and instructors. When students witness successful examples of collaboration, language use, and problem-solving in the context of second language learning, they are more likely to become receptive to similar

approaches in their own learning. Observational learning can, therefore, enhance students' engagement and openness to collaborative practices, positively influencing their motivation and participation.

- Behavioural Capability refers to having the necessary skills and knowledge to perform specific tasks. Exploring participants' capabilities in the context of interdisciplinary collaboration can provide insights into areas where additional support or training may be needed.
- Emotional and Affective Responses acknowledge that emotions can significantly influence learning and engagement. Positive emotions, such as confidence and enthusiasm, can enhance students' motivation to engage in collaborative activities. However, negative emotions, like anxiety or fear of failure, can hinder receptiveness, particularly in language learning where students may feel self-conscious about their skills. Similarly, teachers' emotions—such as stress or excitement—can affect the success of collaboration. Understanding these emotional responses helps identify barriers and facilitators, enabling educators to create supportive environments that foster engagement and reduce negative emotional impacts.
- Goals and Intentions can impact motivation and performance. Investigating the goals of ESP and content teachers and students can highlight how aligned or misaligned objectives affect receptiveness.
- Self-regulation involves monitoring and controlling thoughts and actions. Examining how participants self-regulate their engagement in collaborative teaching can inform strategies for enhancing receptiveness.

By applying SCT, it is possible to explore how self-efficacy and outcome expectations impact participants' receptiveness to collaborative practices. For instance, if teaching staff feel competent in working collaboratively with ESP teachers, they may be more likely to engage positively in the process.

## 4.2. Expectancy-Value Theory (EVT)

EVT, proposed by Wigfield (1994), focuses on student's beliefs about their capabilities and the value they place on a task, which influences their motivation and achievement.

The critical components of EVT are:

- **Expectancies for Success:** This refers to students' beliefs about how well they can perform a task. In this case study, exploring the expectancies of first-year undergraduates, third-year undergraduates, and master's students regarding their engagement in interdisciplinary learning could reveal critical insights into their motivation levels.
- **Task Value:** EVT posits that students are more motivated when they find the task meaningful. This includes intrinsic interest, utility value (how the task helps them achieve future goals), and attainment value (the importance of doing well on the task). Understanding how students and faculty directors perceive the value of interdisciplinary collaboration in ICLHE can guide the design of interventions that enhance motivation and receptiveness.
- **The interaction between Expectancies and Values:** EVT emphasises that motivation is determined by the interplay between expectancies for success and the value placed on the task. Examining how these factors affect the receptiveness of all participants—teaching staff, faculty directors, and students—will be essential in understanding how to foster a supportive learning environment.

The established frameworks of SCT and EVT have been frequently applied in research within HEIs to understand and enhance student learning and motivation. Studies by Alalwan et al. (2019) and Gaspard et al. (2018) illustrate how students' beliefs about their abilities and the value they assign to tasks significantly impact their engagement and academic success. Alalwan et al. (2019) conducted a study that examined the role of self-efficacy in students' academic performance in an online learning environment. Their findings indicated that higher self-efficacy correlated positively with student engagement

and persistence, reinforcing the importance of developing students' beliefs in their capabilities. This aligns with SCT's focus on self-efficacy, emphasising that students are more likely to engage actively in their learning when they believe they can succeed.

Similarly, Gaspard et al. (2018) investigated the influence of expectancy-value beliefs on students' choices and performance in higher education. Their research highlighted that when students perceive a task as valuable and relevant to their goals, they are more likely to invest effort and time in that task. This supports EVT's emphasis on the importance of task value, illustrating that the interplay of expectancies for success and the perceived value of tasks directly influences students' motivation and engagement.

Guo et al. (2017) also contributed to this discourse by exploring how self-efficacy and task value predict academic performance in university students. Their study reinforced the idea that both self-efficacy beliefs and the perceived utility of a task are crucial in fostering students' motivation and commitment to their studies. This finding is significant for developing questionnaires, as it indicates that assessing self-efficacy and task value can provide valuable insights into students' academic behaviour.

Further supporting these frameworks, Meyer et al. (2020) focused on the role of self-regulated learning in higher education. They found that students who are capable of self-regulating their learning are more likely to exhibit high levels of self-efficacy and motivation, which aligns with SCT's principles. This underscores the importance of effectively equipping students with strategies to monitor their learning and outcomes.

Mishra (2020) and Van Dinther et al. (2011) also underscore the significance of SCT and EVT in understanding student motivation and learning. Mishra's research highlights the role of intrinsic motivation in educational contexts, which is closely linked to self-efficacy and outcome expectations. It essentially asks, "Can I successfully complete this?" While similar to self-efficacy from SCT, this concept, as highlighted by Wigfield and Eccles (2000a) focuses on a specific task and future outcomes. Previous experiences influence this belief, how challenging the task appears, and input received from others. Van Dinther et al. (2011) provide a comprehensive review of how these theories help explain variations in student

engagement across different disciplines, indicating that the principles of SCT and EVT are universally applicable in higher education settings.

While there is a lack of research specifically applying SCT and EVT to teachers and faculty directors in higher education institutions, these theories remain highly relevant for understanding the dynamics of receptiveness among these groups. SCT and EVT have been extensively utilised in the context of student learning and motivation, providing a solid theoretical foundation for investigating the beliefs and motivations of teachers.

The principles of SCT and EVT can be effectively applied to teachers and faculty directors, as self-efficacy and outcome expectations play critical roles in their collaborative efforts and instructional practices. Pajares (1996) further supports this notion, illustrating that teachers' self-efficacy beliefs impact their instructional practices, highlighting that confident teachers are more likely to engage meaningfully in collaborative initiatives. Similarly, Tschannen-Moran and Hoy (2012) examine teacher efficacy and its correlation with professional collaboration and engagement in development initiatives. Supporting this perspective, Klassen and Tze's (2014) meta-analysis found that teachers' self-efficacy contributes positively to teaching effectiveness, including their ability to engage meaningfully in collaborative and interdisciplinary initiatives, thus enhancing overall instructional quality.

Moreover, Meyer and Turner (2006) note the importance of teachers' beliefs and expectations in fostering student engagement, which can be mirrored in how teachers collaborate within interdisciplinary settings. Ryan and Deci (2000) discuss the relationship between motivation and engagement, providing insights into how outcome expectations shape teachers' and students' willingness to embrace collaborative practices. They argue that intrinsic motivation is catalysed by supportive conditions that meet basic psychological needs, like autonomy and competence, which are essential for sustaining engagement in collaborative or challenging tasks. This is relevant for interdisciplinary collaboration, as it suggests that when teachers experience autonomy and support, their willingness to participate in collaborative practices can increase, directly impacting their

motivation to engage effectively in these settings. Guskey (1986) highlights the significance of teacher beliefs in implementing change initiatives, illustrating the link between efficacy and collaborative practices. Finally, research by Zee and Koomen (2016) reveals the multilevel relationship between teacher self-efficacy and student engagement, underscoring that teachers' beliefs profoundly affect their collaborative efforts and overall instructional effectiveness.

In this study, SCT and EVT were employed to assess the receptiveness of participants—including ESP teachers, content teachers, faculty directors, and students—to interdisciplinary collaboration. Rather than relying on simplistic yes/no questions, this approach aims to explain participants' beliefs, motivations, and expectations regarding collaborative practices. By examining factors such as self-efficacy, outcome expectations, and the perceived value of interdisciplinary collaboration, the study aims to uncover the underlying attitudes that influence receptiveness. Participants were prompted to reflect on their confidence in their collaborative abilities, their expectations for positive outcomes, and the importance of integrating language and content.

The following definitions clarify the key theoretical concepts used in the study, specifically focusing on how self-efficacy, value, and expectancy apply to different groups of participants:

**Self-Efficacy:** This refers to participants' beliefs about their ability to succeed in tasks related to English and interdisciplinary collaboration. For students, this includes confidence in their language skills and engagement with interdisciplinary learning. For faculty directors, teaching staff, ESP and content teachers, it reflects confidence in managing, supporting, and participating in interdisciplinary collaboration and effectively integrating content and language. Bandura (1997) describes self-efficacy as a core component influencing motivation and performance, with studies indicating its relevance in both student and teacher contexts (Klassen & Tze, 2014; Pajares, 1996).

**Value:** This denotes the perceived importance and utility of learning English and engaging in interdisciplinary methods. For students, this is linked to how relevant they

perceive interdisciplinary collaboration to their academic and future career success. For faculty directors and teaching staff, it reflects the perceived institutional benefits of fostering such collaboration, including alignment with institutional goals. For ESP and content teachers, value relates to the perceived advantages of combining language and content teaching, enhancing student engagement and learning outcomes. The expectancy-value model developed by Eccles et al. (1983) emphasises the role of perceived value in determining individuals' choices and engagement in educational settings, showing how high-value tasks are more likely to elicit motivation and sustained effort.

Expectancy: This encompasses participants' beliefs about the likelihood of success in tasks related to interdisciplinary collaboration. This involves expectations of success in language learning and collaborative tasks for students. For faculty directors and teaching staff, expectancy reflects their belief that interdisciplinary initiatives will lead to positive academic outcomes and improved teaching practices. For ESP and content teachers, expectancy involves their belief in the success of their collaboration and its impact on student learning and engagement. Expectancy theory (Vroom, 1964) highlights the significance of individuals' beliefs about their success in determining their effort and engagement, an idea further developed in the educational context by Wigfield and Eccles (2000), who emphasise expectancy as a primary motivator for participation and performance.

As Part I concludes, this study transitions into examining the implementation and outcomes of interdisciplinary collaboration at a higher education institution, focusing on the practical application of the theories and models explored. The following chapters will discuss the research methodology, findings, and implications for enhancing collaborative teaching practices in a Portuguese higher education institution.

## Part II The Study

## **5. Methodology and design**

### **Introduction**

This section begins by outlining the purpose of the research, encompassing the circumstances leading to the study, its objectives, and the central research inquiry it aims to address. Subsequently, it explains the reasoning behind a mixed methods paradigm, integrating qualitative and quantitative approaches to provide a comprehensive analysis. A case study methodology was employed within this framework to explore the phenomenon in-depth. This mixed methods case study design allowed for the collection and integration of qualitative and quantitative data to enhance the understanding and validity of the research findings. In addition, it highlights the examination of the HEI's receptiveness to interdisciplinary collaboration with all of the teaching staff and directors of the polytechnic schools, which is a critical aspect of this study. The specific case study parameters are outlined, clarifying which elements will be examined, including the ESP and the three content teachers, their teaching contexts, and the higher education institution. The section then details the data collection methods and tools employed, providing a timeline of how the research was conducted and explaining all the processes related to specific data-gathering tools. It concludes by describing how the collected data were processed and analysed.

#### **5.1. Purpose of the study**

This study seeks to bridge the gap between content teachers' willingness to embrace interdisciplinary collaboration and the practical knowledge and methodologies required to make such collaborations successful. By examining the specific challenges and uncertainties faced by both content teachers and an ESP teacher, this research responds to the expressed enthusiasm. It provides a structured framework for meaningful collaboration. The insights gained from this study are expected to benefit the immediate academic community and serve as a resource for teachers in HEIs who share a similar interest in enhancing their teaching through interdisciplinary partnerships.

The researcher of this PhD thesis actively engaged in the CLIL-ReCLes.pt project. This initiative aimed to equip content teachers with the necessary tools for English language instruction, encompassing assistance in selecting appropriate materials and structuring classroom sessions. One of the participating HEIs in the project was the Castelo Branco Polytechnic University. As the project progressed, the researcher took a reflective stance, ultimately realising that the support required by teachers far exceeded initial expectations. These experiences and reflections revealed the immense potential for collaboration between ESP teachers and content teachers in HEIs, especially in the context of internationalisation. Recognising that this collaborative approach could significantly benefit teachers and students, the researcher embarked on this study to examine the dynamics, challenges, and solutions inherent in such partnerships.

Over the years, informal conversations with content teachers at the Castelo Branco Polytechnic University have consistently revealed their enthusiasm and willingness to explore and incorporate interdisciplinary collaboration into their teaching practices. These teachers expressed a genuine interest in the concept, albeit intrigued about how such collaborations could be effectively implemented. While recognising the potential benefits, they often needed clarification about the practicalities and intricacies involved. It was within this context of genuine interest and curiosity that this research was conceived and subsequently pursued.

The scope of this study extends beyond the immediate participants in interdisciplinary collaboration. To create a solid foundation for understanding the receptiveness of the entire teaching community to interdisciplinary collaboration with ESP teachers, all teaching staff and school directors within the HEI were invited to contribute their opinions and insights. This inclusive approach captures a holistic view of the institution's readiness and openness to such collaborative endeavours. The insights gathered from the broader teaching community may inform the research and contribute to developing a nuanced and practical approach to fostering effective collaboration within the HEI, aiming to enhance the educational experience for both teachers and students.

## 5.2. Aims and research questions

The study has four specific aims:

1. To assess the receptiveness of the HEI, including students, ESP teachers, and content teachers, to interdisciplinary collaboration.
2. To study the process of developing an intervention plan to support collaborative teaching.
3. To reflect on teaching practices by examining the benefits and challenges experienced by teachers in interdisciplinary collaboration.
4. To evaluate the impact on student learning outcomes, specifically regarding the acquisition of technical language relevant to their content area. This draws on teacher reflections, student feedback, and assessment data to determine the effectiveness of the collaborative approach.

These research aims collectively guide the study in investigating the receptiveness and implementation of interdisciplinary collaboration within a specific higher education institution, understanding the process of creating intervention and teaching plans, and assessing the impact of these collaborative practices on teaching and learning. Drawing from Pavón and Ellison (2013), who highlight the need for close collaboration to ensure content mastery alongside language development, this research will assess how collaborative roles are defined and implemented within the institution. Special attention will be given to the impact of co-planning, co-teaching models, and joint decision-making on teaching quality and student outcomes. It will examine how these practices contribute to balancing content and language learning objectives, as discussed by Coyle et al. (2010), Pavón and Ellison (2013), and Marsh (2002). Marsh emphasises the importance of collaborative efforts between content and language teachers in creating assessments and lesson plans that integrate language and content learning, which is critical for successful ICLHE implementation.

To address these aims, the study poses the following research questions:

1. How receptive is the higher education institution to implementing interdisciplinary collaboration between ESP teachers and teachers from other subject areas?
2. What key elements should be included in the intervention plan for interdisciplinary collaboration?
3. What are the benefits and challenges experienced by teachers in interdisciplinary collaboration, and how do these influence their teaching practices and curricular choices?
4. To what extent does the interdisciplinary collaboration enhance students' learning of the specific technical language of their content area?

### **5.3. Research design with quantitative and qualitative methods**

This study uses a mixed-methods research paradigm. Mixed-methods research combines both quantitative and qualitative research methods to provide a comprehensive understanding of a research problem. It is characterised by its ability to use a variety of data collection and analysis techniques to address research questions or objectives from different angles. Presented below is an analysis of how the elements of the study align with a mixed-methods research paradigm:

- Quantitative research methods were employed, utilising questionnaires designed to gather structured data. These questionnaires contain specific inquiries to measure receptiveness within the higher education institution.
- Qualitative methods provided in-depth, context-rich data. Analysing lesson plans and decision-making processes offered a deeper understanding of the collaborative teaching approach. Teacher reflections also provided qualitative insights into their experiences and perspectives.
- The study followed a sequential explanatory design within the mixed-methods paradigm. Initially, quantitative data (e.g., questionnaires) were collected and analysed to assess receptiveness broadly. Then, qualitative data (e.g., student

assessments, questionnaires, and teacher reflections) were collected and analysed to examine the interdisciplinary collaboration processes, experiences, and perspectives.

- Within the qualitative component of the research, the case study involved an in-depth examination of the collaborative teaching process within its real-world context (the higher education institution).

Mixed methods research involves the collection, examination, and integration of both quantitative and qualitative data within a single investigation or a series of studies. Its core premise is that concurrently using quantitative and qualitative approaches offers a more thorough understanding of research questions and issues than relying solely on either approach (Cohen et al., 2017). This approach is based on recognising that different data types provide unique insights and that complex research problems often require diverse methods to be fully understood. Consequently, relying on just one kind of data or methodology, a singular research paradigm, or a uniform perspective may not capture the full complexity of the research problem (Creswell, 2018).

The research design employed in this study follows a comprehensive three-stage mixed-methods approach, each contributing crucial insights to the investigation.

**Stage 1: Collaboration Receptiveness Evaluation.** In the initial phase, the study assesses the HEI's readiness for interdisciplinary collaboration between ESP and subject-area teachers. This stage directly relates to research question 1. The study uses questionnaires distributed to academic staff and students to explore collaboration receptiveness, including policies and attitudes within an ICLHE context. The findings aim to understand the HEI's preparedness for successful interdisciplinary collaboration.

**Stage 2: Planning and implementation of intervention plan.** Building on the findings from Stage 1, this phase focused on developing and executing an intervention plan tailored to the HEI's specific needs. Key activities, including content selection, lesson planning, and student assessments, were documented through teacher meetings and questionnaires, highlighting the integration of language and content instruction within the ICLHE

framework. The qualitative data collected during this stage addressed research questions 2 and 3, which examined the key elements of interdisciplinary collaboration and the associated benefits and challenges. This phase also documented teachers' decision-making processes, curricular choices, and reflections, aligning with the case study approach and offering insights into how interdisciplinary collaboration was operationalised within the institution.

**Stage 3: Post-collaboration phase.** In the final stage, post-collaboration evaluations gathered through teacher and student reflections, questionnaires, and student assessments were used to evaluate the impact of the interdisciplinary collaboration on student learning outcomes, particularly their acquisition of specific technical language. The qualitative data from teacher and student reflections provided insights into their experiences, challenges, and successes, directly addressing research question 3, which explores the benefits and challenges of collaboration, and research question 4, which examines the students' acquisition of technical language. Additionally, the student assessment data provided empirical evidence that interdisciplinary collaboration fosters language proficiency, addressing research question 4 through quantitative analysis of student progress.

Throughout each research design stage, planning and establishing evaluation criteria provided a guiding framework to ensure the reliability, validity, and effectiveness of the research tools and methods. By aligning research objectives with the design and implementation of these tools, this study aims to yield comprehensive insights into interdisciplinary collaboration, its challenges, and its potential benefits within higher education settings.

#### **5.4. Case study**

When this study was first envisioned, the original intent was to pursue a single case study of an experience of interdisciplinary collaboration at the Polytechnic as part of the research project. After analysing the aims and objectives of a case study in more depth in

this context, it was felt that the research would be more compelling and authentic. Instead of focusing on one experience, the decision was to have a case study that included various classes and participants with contrasting backgrounds. Since this study seeks to add insight into interdisciplinary collaboration in a HEI and the development of an intervention plan, it was essential to understand the factors that impact the collaboration process and the factors that support successful collaborations.

There are variations in how researchers define the concept of a case study. For some, a case study is considered the subject of examination (Stake, 2000), while others view it as a methodological investigative process (Creswell, 2002). Creswell defines a case study as "an extensive data collection-based, in-depth exploration of a bounded system, such as an activity, event, process, or individuals" (2002, p. 485). Creswell suggests using the case study methodology when the research problem involves gaining a profound understanding of a specific "case" or bounded system (2002, p. 496), especially when the aim is to comprehend "an event, activity, process, or one or more individuals" (2002, p. 496).

Yin's contributions to case study research (Yin, 1994, 2002, 2009) have played a vital role in establishing it as a legitimate and valuable research method. This method provides researchers with a powerful tool for understanding complex real-world phenomena. Within this context, exploring Yin's approach to case study research can yield valuable insights into the effective design, execution, and analysis of case studies. In educational research, Yin advocates for the adoption of case study research as a valuable method for investigating intricate educational phenomena (Yin, 2002). Yin posits that case study research aligns with educational inquiries because it facilitates examining educational practices and policies within authentic settings (2002, p. 14).

Educational researchers Kemmis and McTaggart (1988) propose using case studies in action research, emphasising their value in comprehending complex social issues and driving change. Case studies offer a nuanced, context-specific understanding, enabling the identification of root causes and the development of practical solutions. They advocate for participatory, collaborative, and iterative case studies involving all stakeholders and

prioritising reflection and learning (Kemmis & McTaggart, 2005). Although rooted in action research, this perspective on case studies is relevant to this project's choice of case study methodology. Furthermore, Kemmis and McTaggart emphasise the role of participatory democracy in action research:

Participatory democracy is the underlying principle of action research. It is based on the belief that all stakeholders have a right to be involved in decisions that affect their lives and that decisions should be made through dialogue and negotiation. (2005, p. 31)

The concept of participatory democracy in action research aligns with principles of inclusivity, dialogue, empowerment, contextual decision-making, and the pursuit of positive social change. It serves as a guiding framework for researchers and practitioners committed to engaging stakeholders in meaningful ways to address complex issues. The collaborative nature of this case study is paramount to understanding the decision-making process of interdisciplinary collaboration.

A case study can encompass a wide array of topics, including individuals, groups, schools, and communities (Merriam, 1998), or it can extend to encompass "programs, events, or activities" (Creswell, 2002, p. 485). In the context of this case study, the bounded system includes collaboration between content teachers and the students participating in the classes. The boundaries of the case study are defined by the individuals and groups involved in the interdisciplinary collaboration.

The boundaries of this case study are as follows:

1. **Context and participants:** The study was situated within Castelo Branco Polytechnic University, a higher education institution, during the 2022-2023 academic year. It involved interdisciplinary collaboration between one ESP and three content teachers.
2. **Focus:** The primary focus of the study was to assess the collaboration receptiveness between ESP and content teachers and to track the implementation of an

- intervention plan. This plan involved various strategies, including meetings, shared lesson planning, collaborative teaching, and continuous communication.
3. **Teaching method:** This study employed a co-teaching approach grounded in the principles of ICLHE. The ESP and content teachers collaborated closely to design the lesson plans. They jointly determined the most appropriate teaching/co-teaching methods to use in the specific classes, ensuring that the interdisciplinary collaboration was effectively integrated into the ICLHE framework.
  4. **Research approach:** The study followed a three-stage mixed-methods approach. Stage one utilised questionnaires to evaluate collaboration receptiveness. Stage two concentrated on planning and implementation, covering content selection, lesson planning, and assessments documented through meetings and questionnaires. The final stage captured teachers' and students' feedback, reflections, and reactions.
  5. **Data collection methods:** The research employs various data collection instruments, including questionnaires and document analysis. These instruments were designed with specific criteria to promote the reliability, validity, and overall effectiveness of the data collected.

By providing these boundaries, the study effectively outlines the scope, context, participants, and research methods, offering a framework for understanding the objectives of the research project.

### **5.5. The sample**

The goal of sampling in the study was to ensure that the group selected was diverse enough to capture the population's range of characteristics and experiences. All participants gave informed consent before data collection, and their confidentiality was maintained through anonymised data and secure storage. The study received ethical approval from the University of Porto's ethics committee.

### **5.5.1. The Castelo Branco Polytechnic University**

The Polytechnic University offers 32 Undergraduate degrees, 23 Master's degrees, 4 Postgraduate Degrees, and 28 "Cursos Técnicos Superiores Profissionais" (CTeSP) 1. These courses are offered in six different schools: the School of Agriculture, the School of Education, the School of Applied Arts, the School of Health, the School of Management, and the School of Technology.

According to the institution's website, in the academic year of 2022/2023, the institution enrolled 4395 students. One thousand seven hundred fourteen new students enrolled in this academic year, distributed among undergraduate courses (1238), professional higher technical courses (173), and master's degrees (303). In addition, 273 students joined the institution through different programmes or partnerships (Erasmus, isolated courses, partnership with Universidade Aberta or Politécnico de Macau). In total, 1987 students attended the IPCB for the first time this year.

### **5.5.2. School directors and academic staff**

Following necessary authorisation from the Dean of the Castelo Branco Polytechnic University, the school's directors, deputy directors and teachers from all associated schools were involved through the institution's mailing list. Upon receiving detailed information about the study, the Dean officially approved the distribution of questionnaires using the mailing list. In alignment with one of the central objectives of this research, which pertained to gauging the receptiveness towards the adoption of interdisciplinary collaboration, the directors and deputies (12) and all teachers (396 teachers affiliated with IPCB )were asked for their perspectives on this pedagogical approach.

Gathering school directors' input on the interdisciplinary teaching standpoint is essential for various reasons: school directors hold the authority to promote interdisciplinary teaching initiatives, and collecting their views gauges their openness and willingness to allocate resources, devise policies, and endorse interdisciplinary collaboration; their perspectives on interdisciplinary teaching reveal how well it aligns with

the institution's strategic objectives and educational philosophy; they can provide insights into allocating resources like funding and physical spaces for interdisciplinary teaching; their opinions mirror the teaching staff's views on interdisciplinary teaching, helping identify potential barriers to collaboration; their input informs faculty development programs tailored to enhance interdisciplinary teaching skills; they influence curriculum design, course development, and interdisciplinary programme establishment decisions; it helps evaluate the recognition of interdisciplinary teaching in promotion and tenure processes; and their receptiveness influences the institution's culture, fostering an environment that encourages interdisciplinary approaches.

By gathering school directors' opinions, the researcher could assess readiness for interdisciplinary approaches, identify areas for improvement, and suggest strategies to foster collaboration, enhancing the educational experience. Section 5.7.2 includes a table (see Table 5, p.122) outlining the questionnaires developed for the research project with criteria used to analyse the responses. The questionnaire is included in this document as Appendix A1 (p.352).

Gaining insights from all teaching staff at the higher education institution was crucial for several reasons. The diversity of expertise and experiences among these staff members provides a holistic understanding of interdisciplinary teaching practices. Their feedback informs decision-making, curriculum development, and professional development initiatives related to interdisciplinary teaching. Involving all staff fosters engagement and ownership, promoting a collaborative culture. A questionnaire was designed to gather these insights and is included in this document as Appendix A2 (p.354). The IPCB academic staff was invited to participate in the study and contribute their opinions and insights on interdisciplinary collaboration between content and ESP teachers.

### **5.5.3. Teacher participants in the case study**

Subsequently, the case study was conducted within the confines of the School of Applied Arts (ESART), the institutional locus of the three content teachers under scrutiny. Notably, this school has an enrollment of approximately 800 students. Following the

selection of participating teachers for collaborative efforts, a concurrent process was employed to identify the specific courses and classes involved, thereby identifying the relevant student cohorts.

Three content teachers were chosen to collaborate with the ESP teacher in their course subjects. The ESP teacher in the study is also the researcher. The table below indicates the units of analysis who are the teachers involved in the case studies.

**Table 2***Teachers participating in the case study.*

<b>Participants</b>	<b>Teaching Area</b>	<b>Academic background</b>
T1	EAP/ESP for: design, law, agriculture, medicine, marketing, business, tourism, culinary  Cambridge certificate courses and International English Language Testing System (IELTS)	Translator and proofreader of academic texts, English teacher, and ESP teacher
T2	<b>Fashion and Textile Design:</b>  Textile, Structures, Materials and Manufacturing Techniques, Technical sheets, Fabrics, Symbolism	PhD in Design  Master's in design and marketing  Full researcher at CIAUD- area of Design (Research Centre for Architecture, Urbanism, and Design)  Adjunct Professor
T3	<b>Communication Design:</b> Visual communication  Branding, Brand Management, Communication and interface design	PhD in Design  Associate Professor of Communication Design Master's degree in Design, Materials, and Product Management,  Investigator in the Design area (CIAUD)
T4	<b>Technological and Graphic Design:</b>  Packaging and exhibit design  Visual and cognitive ergonomics	PhD in Design  Adjunct Professor, Arts, Architecture, and Design.

The criteria used here to select the participants stemmed from their long-time interest in collaboration with the ESP teacher. To different degrees, the teachers had doubts and queries about collaboration. One of the primary concerns raised by content teachers was

role clarification—they questioned how responsibilities would be divided between themselves and the ESP teacher, as well as what their specific duties would be regarding lesson planning and content delivery. Another issue highlighted was the level of English proficiency to expect from students, particularly when facing a range of language abilities within the classroom. Assessment was also a significant concern, as teachers sought clarity on how content knowledge and language skills would be evaluated and whether language proficiency would impact the grading of content-related work. Additionally, time management emerged as an important topic, with teachers recognising the need to balance the additional planning and coordination required for co-teaching. These concerns mirror findings in research already discussed in Part I, which also highlights the challenges of interdisciplinary collaboration in CLIL and ICLHE contexts (Airey, 2012; Coyle et al., 2010a; Cummins, 2008, 2000; Dalton-Puffer, 2007; D. Marsh, 2002; Pavón & Ellison, 2013). When approached with an invitation to participate, they were all willing to dedicate time to the study over an academic year.

In formulating the study's methodology, particular emphasis was placed on addressing the diverse English proficiency levels among content teachers. Notably, teachers in higher education institutions exhibit a spectrum of English proficiency, as discussed in Section 2.2. During the planning of the interdisciplinary collaboration, different co-teaching methods were decided on accordingly, also considering the content teacher's English proficiency. In Table 11 (p.146) Course Curriculum and Lesson Plan Schedule, included in Section 5.8.2.2, the teaching method is included, indicating the teacher/s responsible for teaching. The extent to which content teachers are comfortable using technical language in English within their respective subject areas can impact their contributions to decision-making processes related to lesson planning and student assessment.

#### **5.5.4. Student participants in the case study**

The students participating in the case study were selected collaboratively by the content teachers T2, T3, and T4, following the same decision-making process that occurs when teachers enter an interdisciplinary collaboration project with an ESP teacher. At the

start of the case study, meetings were held between the teachers, which had the purpose of outlining the collaboration and making decisions regarding content, materials, vocabulary, language, teaching methods, timetables, student assessments and, of course, the students that would be participating in the study. The teachers involved in the case study teach several curricular units and different courses and levels at the higher education institution. A final sample was chosen by all the teachers during the initial teacher meetings, where all the teachers were present, in a collaboration that would better fit the study's objectives and reflect the student community. Each of the content teachers made suggestions as to which classes they taught that would, in their opinion, benefit from the interdisciplinary collaboration. This also considered the time-constraints of the classes and lesson planning. The study involved 91 students who were distributed over three different courses. The table below outlines the characteristics of the students in the case study.

**Table 3**

*Outline of the characteristics of the students participating*

<b>Course</b>	<b>Number of Students</b>	<b>Ages (between)</b>	<b>Male</b>	<b>Female</b>	<b>Level of English</b>
Fashion Design and Textile	38	18-20	6	32	Average to high
Fashion Design and Textile Master's	11	22-37	1	10	Average to high
Communication and Audio visual Design	37	19-48	11	26	Average to high
Technological and graphic design: Master's	8	18-24	3	5	High

A student on the course with a hearing impediment is considered a special needs student, and an Erasmus student participated in the study. The special needs student could only attend some classes with specific assistance. The teachers found it essential to include the student in the study and report any extra support and materials needed. This would reflect the reality of teachers in higher education institutions. The Erasmus student was not present in the second semester but was in the classes in the first semester. The teachers also found recording these students' opinions of the classes is essential since it is common in academic teaching environments. The conclusions have these issues reported.

The students' feedback on the classes was crucial in helping to understand their perspective of the experience. The students were asked to respond to the questionnaires relating to the classes before and after these happened. Research has shown that gathering student feedback through questionnaires effectively improves the quality of higher education courses (Brennan et al., 2003). Studies have demonstrated that student feedback can provide valuable insights into the effectiveness of teaching methods, course content, and learning resources (Arnó-Macià et al., 2020; Dima & Raluca Ștefan, 2021, p. 97; Walker, 1973). Furthermore, research indicates that students who participate in providing feedback (Cook-Sather & Alter, 2011; Kane et al., 2008) tend to be more engaged in the learning process and feel a greater sense of ownership and responsibility for their education. Their involvement fosters a stronger sense of ownership and responsibility for their education (Amerstorfer & Freiin von Münster-Kistner, 2021)rein von Münster-Kistner, 2021) and contributes to a more learner-centred educational environment.

## **5.6. Researcher participant**

At this stage, it is crucial to address the unique aspect that the researcher assumes a dual role as both investigator and participant within the case study. Several ethical considerations come to the forefront. This unique position of the researcher in the case study introduces two pivotal concerns. Firstly, it pertains to the researcher's dual role in conducting interviews and their active participation in the case study. These aspects engender profound inquiries concerning the integrity and genuineness of the case studies,

the subsequent scrutiny of data, and the ensuing conclusions (Fink, 2000). The potential for bias in the research further accentuates the importance of these concerns. Nevertheless, it is essential to acknowledge that these concerns are manageable and have been addressed in the existing literature.

There has been a growing discourse advocating that teachers should engage in research within their classrooms, especially within the framework of action research—a self-reflective form of inquiry (Hine, 2013; Kemmis, 2009; Mills, 2014). This perspective implies that “the professional development of teachers requires that they adopt a research stance towards educational practice” (Carr & Kemmis, 1986, p. 2). Bartlett and Burton (2003) describe a case study where teachers experienced a significant shift in their perception of research within classroom settings, leading them to embrace diverse data collection approaches and recognise the importance of personal data interpretation. Their concerns regarding potential bias were mitigated through the adoption of multiple research methods, the incorporation of various perspectives, and the practice of sharing findings with participants and fellow teachers. Their overarching goal was to uphold honesty and methodological rigour, cultivating a deeper understanding of various educational facets and making their insights relatable to their peers.

Reflection and enhancement are seen as a way to empower teachers and are considered integral to teachers' professional growth (Bognar & Strossmayer, 2013; Hine, 2013). According to McNiff (McNiff & Whitehead, 2002), the inquiry process should foster in teachers a sense of autonomy, a willingness to engage with fresh concepts, and a determination to challenge attempts by established authorities to conclude their thought processes prematurely. McNiff also pointed out how research conducted by practitioners would shed light on the unpredictable aspects of their professional journeys.

In this case study, the teacher researcher collaborated with other teachers to develop an intervention plan for interdisciplinary collaboration. While developing the plan, the teachers created lesson plans, chose content and materials for the classes, and decided on student assessments. Given the involvement of various classes and teachers, the study

provides an opportunity to identify and address problems and practices within their teaching methods, intending to improve and evolve these practices for future classes. Collaborating with other teachers is fundamental to the success of the case study and the intervention plan. This approach aligns with the concept of participatory action research explored by Kemmis and McTaggart (2005), who present it as an alternative research philosophy encompassing various approaches, including 'classroom action research' in educational contexts. They argue that participatory action research involves participants adopting dual perspectives: as insiders with intimate, potentially partial views and as outsiders with detached perspectives lacking inside knowledge (2005, p. 590).

A final concern is the issue of subjectivity. The researcher acknowledges a certain degree of subjectivity within their work; however, it remains a valuable form of research. On one hand, it can be contended that subjectivity is an inherent aspect of all research, given that "researchers cannot help being socially situated individuals" and that "[w]e invariably bring our life experiences and personal subjectivities into every phase of the research process, shaping the questions pose and the methodologies we employ" (Cameron et al., 2019, p. 5). Moreover, "the subjectivity of the observer should not be regarded as an unfortunate interference but rather as a constituent element in the human interactions that constitute our object of study" (p. 5). Conversely, in light of this awareness of the subjectivity inherent in the researcher's perspective, it was possible to mitigate it through specific approaches, including different data collection methods, including interviews, questionnaires, meeting recordings, and data sources through different participants ( teachers and students).

The approaches outlined earlier enabled the researcher to perform triangulation at both the methodological and data levels, serving as a mechanism to validate the researcher's interpretations and juxtapose them against the perspectives of others. As previously mentioned, the researcher actively collected and integrated diverse viewpoints, including their perspective as a teacher participating in the study. Data collection tools, such as questionnaires, were prepared before the teaching phase began. At this stage, the researcher assumed the role of a researcher. However, during the teaching phase, which

involved developing lesson plans, assessing students, and responding to questionnaires specifically related to teaching, the researcher acted as an ESP teacher. This distinction highlights their participation in the study at separate, clearly defined moments.

By granting voice to various perspectives, as advocated by Lincoln and Guba ( 2002, p. 197), “interweaving of viewpoints, for the incorporation of multiple perspectives”, could effectively tackle the subjectivity issue. Simultaneously, this approach promised to provide a more intricate and holistic understanding of all facets of the research. Examining and exploring different viewpoints and diverse data sets also facilitated the emergence of pertinent themes and concerns, enabling the researcher to construct meanings and interpretations.

### **5.7. Data collection methods**

Data collection spanned from September 2022 to June 2023. Ethical considerations, including informed consent and confidentiality, were adhered to. Different data collection methods were used during the study. Each method was chosen after carefully considering its uses and specific objectives. Table 4 below outlines the different methods used in the study. The table also sets out reasons for choosing the methods since these were important in considering each method at the different stages of the study and the participants.

**Table 4***Description of the data collection methods used*

<b>Method and research questions addressed</b>	<b>Description</b>	<b>Rationale for selection</b>
Teacher meeting recordings  RQ3, RQ2	Audio recordings of teacher meetings for qualitative analysis	Day-to-day workings of the educational environment, allowing researcher to explore the nuances of teacher collaboration, instructional strategies, and decision-making
Questionnaires  RQ1, RQ3, RQ4	Collecting data through a set of standardized questions that can be administered to a large sample of participants.	Efficient and cost-effective, allows for large-scale data collection, can be easily analysed using statistical methods.
Informal data collection strategies  RQ2,	Collecting data from emails, resource analysis, lesson plan evaluation, proposal review	Complemented the formal interview and questionnaire processes by capturing authentic, unfiltered narratives  Genuine interactions and facilitated authentic collaborative experiences among participants, thereby capturing the intricacies inherent in interdisciplinary collaboration within higher education
<b>Student assessments</b>  RQ4	Collection of students' performance data from tests, projects, or assignments.	Empirical evidence to evaluate the impact of interdisciplinary collaboration on student outcomes, particularly in content comprehension and technical language.

In this study, student assessments refer to the various evaluative tools (e.g., tests, projects, quizzes) used to measure students' performance. These assessment tools were a key data collection method, providing quantitative and qualitative data about students' acquisition of specific technical language and content comprehension.

The resulting student assessment data served as the outcome, revealing insights into the efficacy of interdisciplinary collaboration in enhancing student learning outcomes. Thus, while the tools represent the method, the data from these assessments represents the evidence used to evaluate the study's research objectives.

The selection and implementation of these tools and resources are crucial for acquiring data to effectively address the research objectives (McNiff, 2010; Yin, 2002). The following sections provide an overview of the tools and resources employed, outlining their significance, functionality, and alignment with the chosen methodologies. This includes survey questionnaires, records of teacher meetings, lesson plans, student assessments, and other relevant documentation. As the quality and validity of research findings greatly depend on (Cohen et al., 2017; McNiff, 2013; McNiff & Whitehead, 2010; Rossman & Rallis, 2017)d, 2010; Rossman & Rallis, 2017), attention was devoted to selecting appropriate tools and resources that align with the research objectives and methodology.

The study employed a sequential explanatory design, where the initial collection of quantitative data through questionnaires was followed by a more in-depth qualitative investigation of the collaborative process and its impact. This design allowed the researcher to first gain a broad understanding of the institution's receptiveness to interdisciplinary collaboration and then delve deeper into the collaborative teaching practices and outcomes. The integration of both quantitative and qualitative data provided a holistic view of the research problem, demonstrating the value of mixed-methods research in addressing complex phenomena like interdisciplinary collaboration.

By aligning the data collection tools with the research objectives, this mixed-methods approach aimed to gather that both broad trends and detailed, context-specific insights. This combination of methods allowed for an understanding of the processes and outcomes

associated with interdisciplinary collaboration, aiming to enhance the study's validity and depth.

With the foundation of the research objectives and context established, the following sections will describe the research tools employed in this study. These descriptions offer insight into the precise strategies and instruments harnessed to investigate and address the research inquiries effectively.

#### **5.7.1. Teacher meeting recordings**

The research intentions behind the teacher meetings within the ICLHE methodology were to facilitate and document interdisciplinary collaboration between the ESP teacher and content teachers. These meetings were intended to create a structured environment where teachers could collaboratively design and refine lesson plans, align content with English language teaching objectives, and develop effective student assessments. This was to be achieved through discussions on selecting course content with language objectives, planning lessons, scheduling classes, and choosing instructional materials.

Establishing an agenda was meant to guide these meetings, ensuring that teachers could prepare in advance and contribute effectively. The meetings aimed to focus on collaborative efforts, defining specific content, and clarifying learning objectives. Discussions were expected to cover technical language considerations, selection of materials (visual aids, texts, videos, and supplementary resources), and student assessment strategies.

The meetings also intended to foster a clear division of responsibilities among teachers. Actionable items and tasks were to be identified, and responsibilities were to be assigned. This planning included coordination on material selection, lesson plan development, and creation of student assessments, with a follow-up plan to ensure effective task completion.

Another key intention was to establish a timeline for future interactions, setting clear deadlines for communications and information sharing. This structured approach aimed to support ongoing collaboration and continuous improvement in teaching practices.

Conducting the meetings in Portuguese was intended to facilitate communication among participants, given that it was the native language of the content teachers. The ESP teacher's proficiency in Portuguese ensured that language barriers would not impede the collaboration. Transcribing and translating the meeting content into English for research analysis was intended to allow for a thorough examination of the collaborative dynamics and discussions, ensuring accessibility and consistency in the research.

Finally, the documented data from these meetings, presented systematically in a tabular format, served as a cornerstone for research analysis. This data was expected to be instrumental in developing a comprehensive intervention plan, guiding decision-making, and identifying teachers' roles within the interdisciplinary framework. It was aimed at providing insights into the strengths and challenges of interdisciplinary collaboration.

### **5.7.2. Questionnaires**

In this study, questionnaires were administered to participants in person and via email in a digital format. Various question types were used, including opinion-based questions with scales and multiple-choice formats. These questionnaires were designed to gather comprehensive data on the participants' views and experiences with interdisciplinary collaboration in higher education.

The development of the questionnaires was informed by previous research and surveys conducted within higher education institutions (HEIs). Insights from these studies, particularly those focused on student experiences in university settings and interdisciplinary education, were used to refine the structure and content of the questionnaires (Aguilar & Rodríguez, 2012; Mestre-Segarra & Ruiz-Garrido, 2022a; Urgal, 2019; Walker, 1973; Zhou et al., 2020). To ensure the questionnaires were clear, relevant, and effective, a pilot test was conducted with a small sample of participants from the target population. This pilot test aimed to assess the clarity, relevance, and effectiveness of the initial questions. Feedback from the pilot study prompted revisions to the questionnaires, which included rephrasing questions, adding or removing items, and

adjusting the question order for improved flow and user-friendliness. The final version of the questionnaires was designed to balance depth of information with manageability, ensuring they were easy for participants to complete while capturing the necessary data.

The study emphasises methodological and empirical validation in developing questionnaires to measure receptiveness. The questionnaire criteria include SCT's focus on self-efficacy and outcome expectations and EVT's emphasis on task importance, and utility. SCT provided the foundation for assessing self-efficacy and outcome expectations, while EVT focused on task importance and utility. These concepts were central to understanding participants' receptiveness to interdisciplinary collaboration and their engagement in learning and teaching.

While SCT and EVT are predominantly used in research to understand student learning and motivation, this study adapted these frameworks for the school directors teaching staff and to examine the experiences of teachers involved in interdisciplinary collaboration. Although there is limited existing research on the use of SCT and EVT in these contexts, these theories were particularly valuable for exploring beliefs and motivations as well as engagement in interdisciplinary teaching.

In total, 11 questionnaires were developed for this research project (see Appendix A, p.352). These questionnaires were designed to assess various aspects of interdisciplinary collaboration, including receptiveness, planning, implementation, feedback, and outcomes. Two of the questionnaires were disseminated via the HEI's mailing list to all faculty members, school directors, and deputies. The remaining nine were administered within the context of the interdisciplinary collaboration case study at ESART, involving students and teachers directly engaged in the interdisciplinary initiatives.

To ensure compliance with data protection regulations, copies of the questionnaires, consent forms, and the comprehensive data management protocol were submitted to the University of Porto's Data Protection Unit. This ensured that the study adhered to ethical standards and protected the confidentiality of the participants' data.

The evaluation criteria in the questionnaires were explicitly linked to SCT and EVT concepts; these are outlined in Table 5 below. Self-efficacy, outcome expectations, and task value were used to frame questions, enabling the study to track how these factors influenced students' and teachers' receptiveness and experiences. To aid in understanding the concepts presented in the table below, a brief recap of the terms is provided:

- **Task Value** refers to the perceived importance or intrinsic value of completing a specific task, influencing motivation and engagement in a given activity. It includes aspects like the enjoyment, usefulness, or relevance of the task.
- **Outcome Expectations** are beliefs about the likely outcomes of a task or behaviour, such as the belief that success in the task will lead to positive results or benefits.
- **Self-Efficacy** denotes an individual's confidence in their ability to complete a task based on previous experiences and perceived capabilities.

**Table 5**

*Questionnaires developed with evaluation criteria and alignment with SCT and EVT*

<b>School Directors and Deputies' Questionnaire (Appendix A1, p.352)</b>		
<b>Evaluation Criteria</b>	<b>Questions</b>	<b>SCT/EVT</b>
Perception of the importance of interdisciplinary collaboration (IC)	5	Task Value
Existing initiatives and structures	4	Outcome Expectations
Institutional policies and support	3	Task Value
Barriers and challenges	9	Outcome Expectations
Collaboration facilitation mechanisms	7	Task Value

Support for faculty and student involvement	8	Self-Efficacy
Vision and future goals	8	Outcome Expectations

**Academic Teaching Staff's Questionnaire** (*Appendix A2, p.354*)

Familiarity and understanding of IC	7	Self-Efficacy
Experience and involvement in IC	8, 9, 10	Self-Efficacy & Outcome Expectations
Perceived Benefits of IC	12, 13	Task Value
Barriers and challenges to the English language	11, 12, 13	Outcome Expectations
Language Proficiency and Pedagogical Skills	14, 15	Self-Efficacy

**Students' Pre-Class Questionnaire** (*Appendix A3, p.357*)

Awareness of IC	12, 13	Task Value
Expectations and motivations	6, 14	Outcome Expectations
Perceived benefits of IC	6, 14	Task Value
Prior experiences (Language skills and proficiency)	7, 8, 9, 10, 13	Self-Efficacy
Use of English in context	8, 11, 15	Self-Efficacy
Expectations of collaboration	6, 12, 13, 14	Outcome Expectations

**Students' Post-Class Questionnaire (Appendix A4, p.360)**

Clarity of Learning Objectives	5	Task Value
Integration of Disciplines	7	Task Value
Active Learning Opportunities	8	Task Value
Facilitation of Interdisciplinary Dialogue	9	Self-Efficacy
Assessment Methods	10, 11	Outcome Expectations
Faculty Support and Guidance	12	Outcome Expectations
Resources and Materials	13	Task Value
Student Feedback and Reflection	14, 15	Self-Efficacy
Overall Satisfaction	16, 17	Task Value

**Students' Final Questionnaire (Appendix A5, p.362)**

Overall learning experience	4, 5, 6, 7, 15, 18, 19	Task Value
Impact on language skills	16	Self-Efficacy
Integration of interdisciplinary content	12, 13, 14	Task Value
Collaboration and teamwork	10, 11	Self-Efficacy
Suggestions for future improvements	20, 21	Outcome Expectations

**Content Teachers' Pre-Class Questionnaire (Appendix A6, p.364)**

Familiarity with IC	4, 5	Self-Efficacy
Expectations and motivations	7, 11	Outcome Expectations
Perceived Benefits of IC	7, 16	Task Value
Readiness and support needs	12, 14	Outcome Expectations
Collaborative expectations	11, 13	Self-Efficacy
Desired learning outcomes	8, 9	Expectancies for Success
Integration of content and language	8, 10	Task Value
Perceived challenges and solutions	14, 15	Outcome Expectations
Collaboration expectations with the English teacher	11, 13	Self-Efficacy

**Content Teachers' Post-Class Questionnaire (Appendix A7, p.368)**

Reflection on the IC	4, 19, 22	Self-Efficacy & Outcome Expectations
Integration of content and language	4, 7, 8, 9, 15, 17	Task Value
Impact on student learning	5, 6, 15, 16, 18	Outcome Expectations
Collaboration and communication	19, 20, 21	Self-Efficacy
Student engagement and motivation	15, 16	Outcome Expectations
Professional growth and development	22	Task Value
Student Outcomes and Assessment	5, 6, 12, 13, 14	Outcome Expectations
Support and resources	17, 18	Task Value

Transferability and sustainability	11, 18, 21	Task Value
Recommendations for improvement	11, 21	Outcome Expectations

**Content Teachers' Final Questionnaire (Appendix A8, p.370)**

Overall satisfaction	3	Task Value
Impact on teaching practices	4, 28	Outcome Expectations
Student engagement and learning outcomes	14, 22, 23, 32, 34	Outcome Expectations
Collaboration and teamwork	5, 6, 7, 11, 12, 13, 19, 20, 35, 37	Self-Efficacy
Integration of content and language	4, 9, 18	Task Value
Professional growth and development	28, 34, 35	Task Value
Benefits and challenges	30, 32	Outcome Expectations
Transferability and sustainability	36, 38	Task Value
Support and resources	16, 26	Task Value
Final reflections and recommendations	37, 38	Outcome Expectations

**ESP Teacher's Pre-Class Questionnaire (Appendix A9, p.373)**

Expectations and goals	5, 8, 9	Outcome Expectations
Communication and coordination	25, 26, 27	Outcome Expectations
Language support strategies	7, 22, 29	Self-Efficacy, Task Value
Content integration	6, 14, 23	Task Value
Resources and materials	15, 17, 18	Task Value

Professional development needs	24	Outcome Expectations
Support and guidance	21	Task Value
Interdisciplinary competencies	2, 3, 22	Self-Efficacy
Collaboration expectations	19, 20, 21	Outcome Expectations
Anticipated challenges	28, 30	Outcome Expectations

**ESP Teacher's Post-Class Questionnaire (Appendix A10, p.375)**

Reflection on the IC	4, 7, 22	Self-Efficacy
Integration of language and content	3, 5, 6, 11, 12	Task Value
Student engagement and learning outcomes	14, 15, 16	Outcome Expectations
Collaboration and communication	19, 20, 21	Self-Efficacy
Assessment and feedback	8, 9, 10, 11, 12, 13	Outcome Expectations
Professional growth and development	22	Task Value
Support and resources	17, 18	Task Value
Recommendations for improvement	10, 18, 21	Outcome Expectations

**ESP Teacher's Final Questionnaire (Appendix A11, 377)**

Reflection on the IC	3	Self-Efficacy
Collaboration dynamics	6, 7, 14, 15, 16	Self-Efficacy
Integration of language and content	4, 5, 21	Task Value
Student engagement and learning outcomes	9, 10, 19, 28, 29, 30	Outcome Expectations

Assessment and feedback	12, 13, 23, 24, 27	Outcome Expectations
Professional growth and development	34	Task Value
Challenges and lessons learned	18, 20, 26, 31, 32	Outcome Expectations
Recommendations for improvement	35, 37	Outcome Expectations
Long-term impact and sustainability	36	Task Value
Final reflections	38	Outcome Expectations

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### 5.7.3. Informal data collection strategies

In the context of this case study, incorporating informal data collection strategies, such as email exchanges and resource sharing, assumes a position of paramount significance. These dynamic strategies are pivotal in engendering authentic and real-life interactions among the study's participants, fostering an environment that naturally encourages communication and promotes genuine collaborative experiences. This multifaceted approach serves as a vital instrument for capturing the intricate dynamics of interdisciplinary collaboration. It enables an in-depth exploration of the multifarious facets of the higher education institution.

These tools offer a broad and inclusive view, integrating qualitative insights from teacher interactions with quantitative data on attitudes and perceptions. Additionally, they offer assessments of student learning outcomes, leading to a multi-faceted understanding of the case study. This approach gives the researcher a deep understanding of the educational context, informing the development of thoughtful recommendations for improving educational practices.

Aligned with the research aims and objectives, which emphasise following the decision-making process to contribute to the development of an intervention plan for incorporating

interdisciplinary collaboration between an ESP teacher and content teacher using ICLHE teaching methodologies, these data collection strategies are poised to offer an examination of interdisciplinary collaboration within the higher education setting. This research methodology sheds light on its dynamics and potential avenues for improvement.

The table below provides a structured overview of some informal data collection efforts. Each entry details the specific strategy employed, its relevance to the research objectives.

**Table 6***Informal data collection strategies*

<b>Data collection strategy</b>	<b>Relevance to research</b>	<b>Observations /insights</b>	<b>Use in decision-making</b>
Email exchanges	Informed collaboration dynamics	Detailed discussion on content selection	Contributed to lesson planning
Resource analysis	Evaluated available teaching materials	Limited availability of certain resources	Influenced material selection
Lesson plan evaluation	Assessed lesson plan effectiveness	Identified areas for improvement	Guided lesson plan revisions
Material review	Examined teaching materials	Discovered outdated content	Informed material update
Student assessment review	Analysed assessment strategies	Noted need for more diverse assessment methods	Enhanced assessment design

This tabulated record underscores the diversity of approaches taken in the research and the significance of these strategies in contributing to the findings.

#### **5.7.4. Student assessments**

Student assessments are a crucial data collection tool for evaluating the effectiveness of interdisciplinary collaboration. They can provide measurable insights into how well content and language learning are integrated, gauge student engagement and learning outcomes, assess collaborative skills, and offer feedback for continuous improvement. Additionally, they ensure fairness and objectivity in evaluations. This approach to student

assessment supports the research findings and contributes to an understanding of the benefits and challenges. Defining clear assessment criteria and providing scoring guides are critical for consistency and transparency. These criteria establish expectations and standards for student performance, ensuring that assessment outcomes are fair and reliable. It also ensures fairness by assessing all students based on the same standards (Jitpaiboon & Sripicharn, 2022; Mehisto, 2012).

Furthermore, these resources facilitate effective feedback, supporting students' learning journey by guiding strengths and areas requiring further development. The criteria promote interdisciplinary understanding, integrate language skills with subject matter, and offer a clear framework for assessing student work. Table 7 below provides an overview of the criteria considered when developing student assessments within the collaborative teaching context using CLIL methodology in the study.

**Table 7***Criteria for developing student assessments*

<b>Criteria</b>	<b>Description</b>
Language proficiency	Assess students' proficiency in content-specific vocabulary and English language skills.
Content knowledge	Assess students' understanding of the subject matter being taught.
Integrated skills	Assess student's ability to integrate content and language skills effectively.
Collaborative skills	Assess students' ability to work collaboratively and communicate ideas with peers.
Authenticity	Design assessments that mirror real-world situations and tasks.
Formative and summative assessments	Include both ongoing formative assessments and final summative assessments.
Differentiation	Adapt assessments to accommodate diverse learning styles and abilities.
Rubrics and criteria	Define assessment criteria and provide scoring guides for consistency and transparency.
Reflection and self-assessment	Encourage students to reflect on their learning progress and self-assess their skills.
Continuous improvement	Regularly review and refine assessments based on feedback and effectiveness.

Rubrics and scoring guides were developed to assess student work in the context of interdisciplinary collaboration using the CLIL methodology. These rubrics cover various assessments, including class participation, group work, gap fills, grammar questions, vocabulary exercises. A total of 8 rubrics were created: class participation, group work, gap fills, grammar questions, vocabulary exercises, project work, research tasks and other assessments (e.g., presentations, debates).

Each of these had a scoring guide:

Level 1 (0-1 points):

- Language proficiency: Limited language proficiency, with frequent errors hindering comprehension.
- Content knowledge: Minimal understanding of subject-specific content.
- Integration of Skills: Limited ability to integrate language skills with content knowledge.
- Limited engagement in interdisciplinary collaboration activities.

Level 2 (2-3 points):

- Language proficiency: Basic language proficiency, with occasional errors affecting comprehension.
- Content knowledge: Adequate understanding of fundamental subject-specific content.
- Integration of Skills: Some ability to integrate language skills with content knowledge, though inconsistently.
- Collaboration: Moderate engagement in interdisciplinary collaboration activities.

Level 3 (4-5 points):

- Language proficiency: Good language proficiency, with occasional minor errors that do not impede comprehension.
- Content knowledge: A clear understanding of key subject-specific content.
- Integration of Skills: Effective integration of language skills with content knowledge, demonstrating understanding and application.
- Collaboration: Active engagement and participation in interdisciplinary collaboration activities.

Level 4 (6-7 points):

- Language proficiency: Advanced language proficiency, with rare errors and high fluency.
- Content knowledge: Comprehensive understanding of complex subject-specific content.
- Integration of Skills: Seamless integration of language skills with content knowledge, demonstrating proficiency and critical thinking.
- Collaboration: Proactive leadership and exceptional contribution to interdisciplinary collaboration activities.

The scoring guides allocate point ranges for each level, allowing for a more detailed assessment of students' performance across various tasks. These tools supported consistent evaluation, informed decision-making, and effective feedback, ultimately contributing to students' learning and development. In this approach, students may score at different levels for different criteria. For example, a student might score at Level 3 for language proficiency and Level 2 for content knowledge, reflecting their relative strengths and areas for improvement in each domain. This allows for an evaluation where

performance in one area (such as language) can be assessed separately from performance in another area (such as content knowledge or collaboration).

## **5.8. Research procedure**

The research procedures combine qualitative and quantitative data collection methods using the previously outlined mixed-method approach. It aims to offer a clear and systematic account of how data was gathered and analysed at various stages of the study. The study was divided into stages, as expressed in 5.3 (Research design with quantitative and qualitative methods): Stage 1, 2, and 3. Together, these stages form a comprehensive research design, providing insights into the complexities and benefits of interdisciplinary collaboration in higher education. The research procedures are detailed at each stage.

### **5.8.1. Stage 1: Receptiveness**

The study assesses the HEI's readiness for interdisciplinary collaboration using questionnaires distributed to all academic staff, including teachers and school directors affiliated with IPCB. All participants in the interdisciplinary collaboration classes (content and ESP teachers and students) were also asked about their receptiveness to implementing interdisciplinary collaboration in their pre-class questionnaire (see Table 5, p.121). To assess receptiveness, the study draws on principles from SCT and EVT.

The content teachers' receptiveness to interdisciplinary collaboration was further assessed through post-class questionnaires administered after each class, providing insights into their perceptions and experiences throughout the project (see Table 5, p.121). These responses were linked to aspects of SCT, such as teachers' evolving self-efficacy in managing the challenges of interdisciplinary collaboration and their outcome expectations regarding the success of integrating content and language teaching. EVT was employed to understand shifts in how teachers perceived the value of interdisciplinary collaboration over time, including how beneficial or relevant they found it to be for their professional roles.

Analysing the teachers' perspectives throughout the case study term is crucial, as it highlights shifts in their receptiveness and identifies factors that influence their willingness to engage in interdisciplinary practices. By incorporating SCT and EVT, this study captures both the cognitive beliefs and the motivational drivers that shape participants' receptiveness to collaboration. Ultimately, teachers' receptiveness, along with the adoption of ICLHE, plays a critical role in the success of an interdisciplinary collaboration project, enhancing the likelihood of achieving the desired learning outcomes and research objectives.

### **5.8.2. Stage 2: Intervention plan (teaching classes based on ICLHE principles)**

Planning and implementing the intervention plan refers to the case study aims A2 and A3:

A2. To study the process of developing an intervention plan for collaborative teaching.

A3. To reflect on teaching practices by examining the benefits and challenges experienced by teachers in interdisciplinary collaboration.

These directly link to the research questions 2, 3 and 4:

1. What key elements should be included in the intervention plan for interdisciplinary collaboration?
2. What are the benefits and challenges experienced by teachers in interdisciplinary collaboration, and how do these influence their teaching practices and curricular choices?
3. To what extent does the interdisciplinary collaboration enhance students' learning of the specific technical language of their content area?

This documents the content selection, lesson planning, and student assessments. This documentation was facilitated through comprehensive teacher meetings and structured questionnaires to gather valuable insights. By documenting each step in this journey, the aim was to contribute valuable insights to interdisciplinary collaboration and ICLHE, ultimately fostering enhanced educational experiences within the academic community.

This research stage represented the most extensive data collection phase of the case study. It employed diverse research tools and strategies, including teacher meeting recordings, questionnaires, and lesson planning. These tools allowed for analysing content and ESP teachers' experiences, perceptions, and challenges in interdisciplinary collaboration classes.

Furthermore, these formal data collection methods were supplemented with informal strategies, enriching the insights further. It is essential to underscore that these research tools were consistently applied across multiple classes throughout the academic year 2022-2023. This repetition has allowed the research to capture a holistic view of the evolution of interdisciplinary collaboration within our academic community.

The following table outlines the different research tools used in this stage:

**Table 8**

*Research tools used in Stage 2*

Research tools	Respondents	Timing / Dates <sup>1</sup>
Teacher meeting recordings (in Portuguese)	Content teachers ESP teacher	September /October 2022
Lesson plans	Content teachers ESP teacher	September-Dec 2022 / January-May 2023
Informal data collection	Content teachers ESP teacher	September-Dec 2022 / January-May 2023
Student assesments (English & Portuguese)	Content teachers ESP teacher	September-Dec 2022 / January-May 2023

### **5.8.2.1 Teacher meeting recordings**

Various thematic categories were selected to guide the analysis of the teacher meeting transcripts between the ESP and content teachers. These themes were essential for understanding how research-based decisions, pedagogical alignment, and collaborative practices influence the development of lesson plans, assessments, and intervention strategies. The thematic categories chosen here were pedagogical alignment, collaborative

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<sup>1</sup> All the dates for the lesson plans, informal data collection, post-class questionnaires, students assessments and final questionnaires are all on the individual data collection tools.

decision-making, interdisciplinary communication, teacher reflection and learning, student-centred focus, language-specific scaffolding and assessment and feedback.

#### 1. Pedagogical Alignment:

- **Content-Language Integration:** This theme examines how ESP and content teachers integrate language learning and disciplinary content. Content analysis can reveal discussions about balancing subject-specific content with language support, such as "How do we scaffold this concept for non-native speakers?" This mirrors the integrated learning approach discussed by Coyle et al. (2010) in CLIL contexts.
- **Alignment of Learning Outcomes:** Negotiating shared objectives for language and content learning is a critical theme. Content analysis of teacher interactions may reveal strategies for achieving these dual goals, echoing the alignment challenges discussed in Airey (2012). A counterbalanced approach integrating content-based and form-focused instructional options, as outlined by Lyster (2007), can be an effective strategy. This approach helps teachers engage second language learners across the curriculum, developing both their interlanguage systems and their content knowledge simultaneously.
- **Negotiation of Pedagogical Focus:** Teachers may engage in discussions about whether to emphasise disciplinary content or language proficiency during lessons, particularly when negotiating the roles and responsibilities within interdisciplinary collaboration. In ICLHE contexts, these discussions reflect the balancing act between subject-specific mastery and language support, which is essential for effective teaching (Coyle, Hood, & Marsh, 2010; Airey, 2012). Content analysis can reveal moments of negotiation, where teachers weigh the importance of subject mastery versus language acquisition, a dynamic also noted by Airey (2012) in EMI settings.

## 2. Collaborative Decision-Making

- **Task Design:** This theme highlights how teachers co-design tasks that integrate both language and content objectives. For example, content teachers might collaborate with ESP specialists to create tasks that develop disciplinary literacy, such as technical writing or report drafting in engineering or law courses (cf. Hyland, 2016).
- **Problem-Solving:** Teachers regularly collaborate to address challenges such as accommodating students with varying language proficiency levels. They might adapt materials or rethink assessments to ensure that language learners can access the content, a process similar to what Gustafsson (2011) described in ICLHE collaboration.
- **Consensus Building:** The decision-making process in teacher meetings often involves negotiation and consensus. Content analysis might show how ESP and content teachers divide responsibilities, with ESP specialists leading on language-related decisions and content teachers focusing on subject-specific rigor.

## 3. Interdisciplinary Communication

- **Cross-Disciplinary Knowledge Exchange:** Collaboration between ESP and content teachers often involves the exchange of disciplinary knowledge. ESP teachers might explain concepts like academic discourse or language structure, while content teachers clarify technical concepts or terminology. This process aligns with Bandura's Social Cognitive Theory (SCT) (1986), which emphasises the reciprocal interaction between individuals, their environment, and behaviours, where such exchanges enhance mutual understanding and facilitate learning.
- **Clarification and Reiteration:** Teachers frequently seek clarification on each other's disciplinary goals. For example, a content teacher may ask an ESP teacher for clarification on the academic writing conventions required in a

specific field, making the collaboration more effective. This back-and-forth communication is key to interdisciplinary success, as noted by Dafouz & Smit (2016).

#### 4. Teacher Reflection and Learning

- **Reflective Practice:** Teachers often reflect on the effectiveness of their lessons or instructional strategies. Content analysis can reveal moments where teachers discuss what worked or did not work in past classes. This aligns with the concept of reflective teaching described by Schön (1987), where teachers engage in continuous learning from their own practice. Schön emphasises "reflection-in-action"—the ability to think critically and adapt teaching strategies in the moment—and "reflection-on-action", where practitioners evaluate their experiences post-lesson to inform future decisions.
- **Professional Growth:** Collaborative work in ICLHE settings fosters professional learning for both ESP and content teachers. As they work together, they expand their understanding of interdisciplinary teaching and their roles, as suggested by Vangrieken et al. (2015), who explore how interdisciplinary collaboration contributes to professional development.

#### 5. Student-Centred Focus

- **Focus on Student Needs:** Discussing student performance and specific language challenges. These discussions inform decisions on how to adjust lesson plans or tasks to better address student needs. Teachers might note how students engage with both the language and the content, ensuring that neither is neglected in the process.
- **Differentiation:** Discuss strategies for differentiating instruction to accommodate students with varying language proficiency levels. This

differentiation may involve adjusting assessment tasks or providing extra support, aligning with theories of adaptive teaching.

## 6. Language-Specific Scaffolding

- **Scaffolding Techniques:** Planning specific techniques to scaffold complex disciplinary concepts for students. This might involve simplifying texts or using visuals, a strategy similar to that described by Wood, Bruner, and Ross (1976) in their theory of scaffolding.
- **Academic Language Development:** ESP teachers particularly focus on academic language—ensuring that students understand and can use the appropriate language conventions in their respective fields. This may involve teaching the specific discourse structures of academic writing, an essential element in ESP teaching, as highlighted by Hyland (2006).

## 7. Assessment and Feedback

- **Assessment Design:** Teachers collaborate to design assessments that evaluate both language proficiency and content mastery. They might discuss how to create rubrics that balance linguistic accuracy with subject knowledge, a practice necessary in ICLHE contexts (Airey, 2012).
- **Feedback on Student Performance:** Discussing how to provide feedback that supports both language development and content understanding. ESP teachers may focus on language use, while content teachers emphasise conceptual clarity, making sure that feedback align (Dudley-Evans & St. John, 1998).

The thematic categories (e.g., Pedagogical Alignment, Collaborative Decision-Making, Interdisciplinary Communication, etc.) were developed to help guide the analysis of the teacher meeting transcripts. These categories reflect the key areas of interdisciplinary collaboration that are critical in ICLHE contexts, where both content and language objectives need to be integrated effectively.

The recordings of the teacher meetings were transcribed and translated into English to ensure consistency and facilitate analysis. During the transcription process, the content was categorised based on thematic keywords that emerged from the discussions. This categorisation helped identify the main discussion topics, such as content selection, teaching strategies, student assessment, and collaboration strategies, which were aligned with the thematic categories listed above.

The categorisation process provided a clear structure for analysing the findings in relation to the research questions. Table 9 below lists the thematic categories alongside the relevant keywords that emerged in the discussions, allowing for a focused analysis of each category. For example, the "Assessment and Feedback" category helped highlight discussions about student assessment methods (e.g., grading rubrics, assessment criteria), while the "Collaborative Decision-Making" category examined how teachers co-design tasks and share responsibilities. By categorising the data this way, the study was able to track the specific roles of ESP and content teachers in shaping lesson plans, assessments, and teaching strategies, providing insight into their collaborative practices.

**Table 9**

*Transcript categories, keywords, and corresponding thematic categories*

<b>Category</b>	<b>Keywords</b>	<b>Thematic Category</b>
Content selection	course topics, subject matter, curriculum, content areas, learning objectives, educational content	1 - Pedagogical Alignment
Materials and Resources	textbooks, supplementary materials, teaching aids, multimedia resources, online resources, classroom materials	3 - Interdisciplinary Communication

Scheduling dates for classes	class dates, timetable, lesson scheduling, meeting times, calendar, course schedule	2 - Collaborative Decision-Making
Student assessments	assessment methods, grading criteria, testing, rubrics, student performance	7 - Assessment and Feedback
Teaching strategies	instructional methods, pedagogical approaches, teaching techniques, learning strategies, classroom strategies, active learning	1 - Pedagogical Alignment
Student engagement	student participation, active involvement, interaction, engagement strategies, in-class activities, discussion-based learning	5 - Student-Centered Focus
Language assessment criteria	language proficiency criteria, language evaluation, language skills assessment, language learning objectives, language proficiency standards, language criteria	6 - Language-Specific Scaffolding
Content integration	integrating content and language, content-language alignment, content-based language learning, cross-disciplinary teaching, interdisciplinary teaching, content-language integration strategies	1 - Pedagogical Alignment
Evaluation and reflection	assessment feedback, reflection on teaching, assessment review, post-class evaluation, self-assessment, continuous improvement	4 - Teacher Reflection and Learning

Resource sharing	sharing materials, resource exchange, collaborative resources, shared teaching tools, teaching resource sharing, resource distribution	2 - Collaborative Decision-Making
Adaptations for diverse learners	differentiated instruction, meeting diverse needs, inclusive teaching, addressing diverse learning styles, adapting for various abilities, tailoring instruction	5 - Student-Centered Focus
Interdisciplinary learning objectives	learning goals, interdisciplinary objectives, cross-disciplinary outcomes, learning outcomes, educational objectives, collaborative learning goals	2 - Collaborative Decision-Making
Cultural and contextual considerations	cultural sensitivity, cultural awareness, contextual factors, cultural diversity, cultural competence, contextual influences	5 - Student-Centered Focus

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The categorisation process served two main functions. First, it created a framework for analysis by organising the data into thematic groups using specific keywords. For example, when teachers discussed course materials, teaching aids, and instructional strategies, these conversations were categorised under *pedagogical alignment* and *interdisciplinary communication*. This process ensured the data were systematically arranged, making it easier to identify patterns and trends across different meeting discussions. Second, the categorisation helped track teacher roles and collaborative practices. Each keyword and its thematic category enabled an understanding of how teachers navigated their roles in interdisciplinary collaboration. For instance, discussions on addressing language proficiency in assessments were categorised under *language-specific scaffolding* (thematic category 6). This categorisation helped identify how teachers adapted strategies to

integrate language support into content learning. Similarly, discussions on content integration were categorised under *pedagogical alignment* to reflect the balancing of content and language objectives.

There was a triple categorisation referring to the following process. The first layer included the overarching themes, such as *pedagogical alignment* and *collaborative decision-making*, reflecting key interdisciplinary collaboration areas. The second layer involved keywords—specific words or phrases that emerged from teacher discussions within each theme (e.g., "assessment methods" or "teaching strategies"). The third layer consisted of the thematic categories, numbered 1-7, corresponding to the observed collaboration areas. These categories captured various aspects of the teachers' interdisciplinary efforts, such as collaborative planning and content integration. This structure created a clear map for analysis, showing how specific aspects of collaboration (keywords) relate to broader themes (e.g., Pedagogical Alignment) and ultimately to the research objectives (e.g., understanding how teachers integrate language and content). It was then possible to tabulate the comments extracted from the transcripts as shown in Appendices D (p.393).

It is important to note that the process of categorising the data also highlighted logistical challenges. The planned regular teacher meetings were only sometimes feasible due to time constraints and scheduling conflicts, which are common in higher education. Despite these challenges, the study captured sufficient data to analyse the collaborative decision-making process.

#### **5.8.2.2 Lesson plans**

The lesson plans outline the procedures for delivering the intervention, ensuring alignment with the study's aims and objectives. They facilitate the examination of the decision-making process involved in developing a comprehensive intervention plan through interdisciplinary collaboration.

It is important to note that, apart from the ESP teacher, the content teachers involved did not have any prior experience in creating lesson plans within an ICLHE context. Several

factors need to be considered when preparing pre-lesson planning for interdisciplinary collaboration. Table 10 below outlines the criteria used during the pre-lesson planning stage, involving collaborating teachers, to provide a structured framework for the lesson planning process. The teachers used these criteria to develop the lesson plans that would be used in the teaching process. These criteria contributed to developing final lesson plans, incorporating Mehisto's guidelines (2012) and other sources of best practices and suggestions (CETAPS, n.d.; Morgado, Coelho, et al., 2015) for comprehensive and effective lesson plans. This process also involved selecting materials and conducting student evaluations to ensure a comprehensive approach to lesson planning. Additionally, the criteria expanded to incorporate content-language integration strategies, task-based learning, and differentiation techniques, ensuring that content and language objectives were addressed. This combined approach guided the creation of interdisciplinary lesson plans within the ICLHE context.

**Table 10**

*Outline of criteria for pre-lesson planning and ICLHE*

<b>Criteria</b>	<b>Description</b>
Learning objectives	Clearly define the learning objectives for the lesson, including content knowledge and interdisciplinary skills. Specify what students should acquire by the end of the lesson.
Subject integration	Identify and interconnect specific subjects or disciplines within the lesson. Determine how content and skills from each subject will contribute to the overall learning experience.
Alignment with standards	Ensure the lesson aligns with relevant curriculum standards and frameworks in each subject area. Check for coherence in addressing the desired learning outcomes.
Common ground	Find connections and overlaps between disciplines that can enhance learning. Identify shared themes or concepts that bridge the gap between subjects.

Collaboration with colleagues	Collaborate with colleagues from different disciplines to brainstorm, share expertise, and determine strategies for integrating content and skills.
Resources and materials	Gather appropriate materials, including textbooks, multimedia, and online resources, that support content integration and meet language learning needs.
Assessment and evaluation	Plan assessment tasks that evaluate both content and language proficiency. Use tools such as rubrics or formative assessment techniques to guide student progress.
Differentiation	Plan for differentiation strategies to address students' diverse learning needs, including various language proficiency levels and learning styles.
Time management	Allocate time effectively for each component of the lesson, balancing content coverage and skill development to ensure active student engagement.
Reflection and adaptation	Build in opportunities for teachers to reflect on past lessons, evaluate their effectiveness, and make improvements based on student feedback and learning outcomes.
Content and language integration	Ensure content and language objectives are clearly defined and integrated throughout the lesson. The content should provide meaningful contexts for language learning.
Language support	Identify students' language needs and provide appropriate scaffolding, such as pre-teaching essential vocabulary and offering language practice opportunities.
Authenticity	Incorporate real-world materials and resources that reflect the taught content's real-world relevance, increasing student engagement and motivation.
Task-based learning	Design tasks that require students to actively use both content knowledge and language skills, promoting critical thinking and collaboration.

Cultural awareness	Integrate cultural elements into lessons to foster intercultural understanding, reflecting on diverse cultural perspectives related to the content being taught.
Collaboration	Engage with other educators to ensure effective content-language integration, share resources, and adapt teaching strategies to enhance interdisciplinary learning.

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By considering specific criteria during pre-lesson planning, the objective was that the teachers could create interdisciplinary lessons to effectively integrate content and skills, providing students with holistic learning experiences. Subsequently, this paved the way for a transition to the lesson plans used in the case study. By having an outline for the lesson planning, the collaborating teachers could follow the criteria to facilitate the process of interdisciplinary collaboration within an ICLHE context.

Recognising the need for a structured approach to lesson planning, the ESP teacher introduced a lesson plan format commonly used in CLIL as a starting point. This format was a foundation for the teachers to collaboratively build and customise lesson plans that integrated subject content with language proficiency objectives. A template was drawn up, and an example of a lesson plan used in the case study is included in Appendix C (p. 381). Additionally, lesson planning considered the teachers' active roles during classes.

Table 11 presents the course curriculum and lesson plan schedule, outlining the subjects, teachers, and corresponding dates for each session.

**Table 11***Course curriculum and lesson plan schedule*

<b>Course</b>	<b>Subject</b>	<b>Teacher</b>	<b>Dates</b>
<b>Technological and graphic design</b>	Terminology and technical language: concepts and uses	ESP	30/11/2022
	Brands and logos	ESP/Content	07/12/2022
	Researching in Design	ESP/Content	26/01/2023
<b>Communication and audio-visual design</b>	Way finding	ESP/Content	03/01/2023
	Wayshowing	ESP	10/01/2023
	ISO Part 1: importance and uses	ESP	08/05/2023
	ISO Part 2:	ESP/Content	09/05/2023
	Report writing	ESP	16/05/2023
<b>Fashion and textile Design</b>	Technical language and research	ESP	22/11/2022 14:00
	Recycling.... Textile, fabric and fashion	ESP	28/11/2022
	New materials: innovation, technology and sustainability	ESP/Content	28/11/2022
	Poster design: language for Poster for a conference	ESP/Content	13/12/2022

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Embroidery: Understanding Cultural Significance of Embroidery Symbolism	ESP	18/10/2022
Embroidery: Exploring Castelo Branco Embroidery and Globalisation	ESP/Content	18/10/2022
Sustainability: Circular Economy Circular Design Principles Sustainable Textile Standards	ESP	22/11/2022
Urbanisation: What it is and its visual impact on the landscape	ESP	22/11/2022
Mood and Tone: Part 1 Mode ...the emotional atmosphere created for the reader... for the person looking etc	ESP	14/12/2022 15/12/2022
Mood and Tone: Part 2 Tone ... the author's attitude or approach toward the subject matter or the audience. In this case the designer	ESP	18/01/2023 19/01/2023
Exploring the senses	ESP	23/01/2023
Tecidoteca: Creating a physical glossary of materials in textile	ESP/Content	26/04/2023
	ESP/Content	10/05/2023
	ESP/Content	11/05/2023
	ESP/Content	17/05/2023

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The lesson plan became a comprehensive tool, guiding the ESP teacher in providing language instruction tailored to the specific content. It ensured that language proficiency was developed in tandem with content mastery, even in the absence of co-teaching.

### **5.8.2.3 Student assessments**

The assessments measured content mastery, language proficiency, student engagement, and collaborative skills. They were conducted in various formats at different points in time, both during lessons and as assignments for students to complete independently or in groups, depending on the nature of the work.

Assessments were tailored to the needs of each lesson, aligning with ongoing tasks and learning objectives. Some assessments were administered in class, allowing for immediate evaluation and feedback, while others were assigned as homework to give students more time for completion. Additionally, assessments varied in structure: some were completed individually, fostering personal accountability and reflection, while others required group collaboration, encouraging teamwork and interdisciplinary engagement.

To ensure consistency and fairness across all assessments, standardised rubrics and scoring guides (see section 5.7.4 for detailed rubrics, p.132), were used by the ESP and content teachers involved in the collaboration. These rubrics outlined clear criteria for evaluating student performance on language proficiency, content mastery, or both, depending on the focus of the assessment. By adhering to the same rubric, all teachers could evaluate student work using the same standards, regardless of the specific assessment type or format. This consistency in scoring supported objective evaluations and ensured that student outcomes were assessed fairly across the interdisciplinary learning experience.

The assessment process itself was collaborative, with the content or ESP teacher taking the lead depending on the primary objective of the assessment. The content teacher graded students on their mastery of subject-specific knowledge for content-focused assessments, while the ESP teacher assessed language accuracy and academic

communication skills. When assessments involved content and language aspects, the teachers worked together to ensure a balanced evaluation of both areas.

This use of rubrics, coupled with the collaborative evaluation approach, ensured that the research data collected from student assessments was reliable and consistent. The standardised scoring guides provided a clear framework for all teachers, supporting effective feedback and informed decision-making in the ongoing refinement of interdisciplinary teaching strategies.

#### **5.8.2.4 Informal data collection**

The data collected through these informal strategies were pivotal in guiding decision-making throughout the research journey. Whether refining teaching methodologies, addressing challenges, or identifying opportunities for improvement, the insights derived from these interactions inform actions and recommendations. Table 12 presents a structured overview of these informal data collection efforts, focusing on how each strategy was used in decision-making.

**Table 12***Informal data collection strategies: Use in decision-making*

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<b>Data Collection Strategy</b>	<b>Use in Decision-Making</b>
59 email exchanges	<ul style="list-style-type: none"><li>- Guided scheduling of collaborative meetings.</li><li>- Adjusted content selection based on language integration insights.</li><li>- Developed a shared teaching strategy utilising each teacher's strengths.</li></ul>
17 resource analysis	<ul style="list-style-type: none"><li>- Informed resource gathering and allocation to address gaps.</li><li>- Curated a resource repository tailored to interdisciplinary goals.</li><li>- Selected materials that balance content and language integration.</li></ul>
22 lesson plan evaluations	<ul style="list-style-type: none"><li>- Prompted revisions to lesson plans for clarity and engagement.</li><li>- Created standardised lesson plan templates for consistency.</li><li>- Developed adaptable lesson plan structures.</li></ul>
16 material reviews	<ul style="list-style-type: none"><li>- Updated outdated content in text.</li><li>- Developed language-focused supplementary materials.</li><li>- Created guidelines for incorporating language learning activities.</li></ul>
23 Student Assessment Reviews	<ul style="list-style-type: none"><li>- Diversified assessment methods to enhance inclusivity.</li><li>- Implemented regular formative assessments for feedback.</li><li>- Revised rubrics and assessment criteria for consistency and clarity.</li></ul>

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As Stage 2 concluded with the planning and implementation of the intervention plan, the research transitioned into Stage 3, the "Post-collaboration phase." This critical phase involved reflecting on teaching practices by assessing curricular choices, considering teachers' reflections, and analysing student feedback and assessments.

### **5.8.3. Stage 3: Post-collaboration phase.**

This stage of the research refers to the case study aim 4. Reflect on teaching practices by assessing curricular choices, considering teachers' reflections, and analysing student feedback and assessments. This is directly linked to the research questions:

Q1. How receptive is the higher education institution to implementing interdisciplinary collaboration between ESP teachers and teachers from other subject areas?

Q4. To what extent does the interdisciplinary collaboration enhance students' learning of the specific technical language of their content area?

This final stage played a pivotal role in the comprehensive three-stage mixed-methods approach. It focused on gathering valuable feedback and reflections from teachers and students who had actively participated in the interdisciplinary collaboration between ESP and subject-area teachers within a CLIL context. The aim was to gain a deep understanding of the practical implications of interdisciplinary collaboration efforts, including the evaluation of the effectiveness of the criteria, procedures, and methods used throughout the study.

#### **Specific activities for the final aim:**

1. **Data Collection:** Systematically gather feedback and reflections from teachers and students engaged in the interdisciplinary collaboration process. Special attention was given to the appropriateness and adequacy of the criteria and methods used during the collaboration.
2. **Issue Identification:** The focus was on identifying challenges arising during the interdisciplinary collaboration and evaluating how well the procedures and methods addressed these challenges. This included assessing the clarity of

communication, workload management, and the alignment of teaching practices with both language and content objectives.

3. **Insights for Improvement:** Feedback and reflections collected in this stage were invaluable for refining interdisciplinary collaboration practices. Specifically, the study examined how effectively the procedures and methods fostered meaningful collaboration and student learning outcomes. Additionally, recommendations for refining criteria for future interdisciplinary efforts were developed based on the gathered insights.

#### **Evaluation of Criteria and Procedures:**

- **Evaluation of Questionnaire Effectiveness:** The feedback collected via the questionnaires, supplemented by qualitative data, helped assess the alignment of learning objectives, the quality of communication, and the integration of content and language in an interdisciplinary context.
- **Teacher and Student Feedback:** The responses were gathered from ESP and subject-area teachers and students to determine the effectiveness of teaching methods and collaborative processes.
- **Criteria and procedures:** These included the criteria established for student assessments for their alignment with the learning objectives of the interdisciplinary curriculum. The thematic categories and keywords employed in the analysis of tapescripts and qualitative data were reviewed for capturing critical aspects of interdisciplinary collaboration. And the overall procedures followed for data collection, analysis, and participant engagement.

By concluding the research with this post-collaboration phase, the aim is not only to reflect on the practical experiences of interdisciplinary collaboration but also to evaluate and suggest improvements to the criteria, procedures, and methods employed throughout the process.

All critical stakeholders involved in the interdisciplinary collaboration process were engaged in this phase. Questionnaires were sent to the participants via a Google Forms link in May 2023. Specifically, these were distributed to gather feedback and reflections from all students who actively participated in the interdisciplinary collaboration and to the ESP and content teachers who played pivotal roles in the collaborative process.

#### **5.8.4. Questionnaires used in Stage 3**

Student's post-class questionnaire (see Appendix A3, p.357)

The research procedures included administering a post-class questionnaire after each interdisciplinary teaching session. By comparing responses before and after the interdisciplinary teaching experience, the researcher could identify changes, patterns, and differences in student perspectives and attitudes. This helped gauge the immediate and long-term impacts of interdisciplinary teaching.

When designing the questionnaire, specific criteria were considered to ensure its effectiveness. This ensured a precise understanding of the questionnaire's objectives and intended to fulfil the research aims. Multiple questions per criterion gathered student feedback on overall satisfaction with interdisciplinary collaborative teaching.

Student's final questionnaire (see Appendix A5, p.362)

As part of this data collection process, the questionnaire addressed several critical criteria used to develop it, as detailed in Table 5 (p.121). The insights gained from the students' perspective are invaluable for assessing the effectiveness of the interdisciplinary collaboration and its impact on their learning journey. This student feedback adds a crucial layer to the research. The responses to these questions helped the researcher understand the multifaceted nature of interdisciplinary collaboration in higher education and its influence on teaching and learning outcomes. The researcher considered the need for questions that students could respond to efficiently without being overly lengthy or time-consuming. The students had been actively filling out questionnaires during the interdisciplinary collaboration and participating in the case study. Their continued

cooperation was immensely valuable, and their insights are crucial in advancing the understanding of interdisciplinary teaching practices.

Content teachers post class questionnaires. (see Appendix A7, p.368)

A questionnaire was provided to each teacher after each lesson. This questionnaire encompassed a range of inquiries, each crafted to address specific aspects of the collaborative teaching experience (see Table 5, p.121)

The collected data aimed to contribute to understanding the collaboration's impact and effectiveness. Having a post-class questionnaire for content teachers after each class in interdisciplinary collaboration is an essential component of the research methodology, and it serves multiple crucial purposes:

1. Immediate Reflection and Feedback
2. Identifying Challenges and Successes
3. Continuous Improvement
4. Individual and Collective Learning
5. Enhancing Collaboration
6. Customised Inquiry
7. Holistic Understanding.

ESP teacher post-class questionnaire (see Appendix A10, p.375)

Including the ESP teacher's feedback in the research procedures was to capture multiple perspectives and provide insights into the interdisciplinary teaching process. This approach facilitated alignment between teaching objectives and informed strategies for effective collaboration. Table 5 (p.121), outlines the alignment of each question in the ESP teacher's post-class questionnaire with the specified criteria.

Including open-ended, qualitative questions in the ESP and the content teacher's post-class questionnaire aimed to capture nuanced and contextual aspects of interdisciplinary collaboration. It allowed them to share their expertise, experiences, and perceptions

comprehensively. Qualitative data collection was essential for holistically understanding the collaborative teaching process and generating insights that could possibly inform future improvements and research findings.

The link between post-class questionnaires for content teachers and the ESP teacher is essential for obtaining a comprehensive, well-rounded view of interdisciplinary collaboration in CLIL settings. It ensures the research captures all relevant aspects, validates findings, and generates practical recommendations for improving the collaborative teaching approach. This interconnected approach strengthens the depth and quality of the research and its potential to contribute meaningfully to the field of education.

ESP and Content teachers' final questionnaire (see Appendix A11, p. 377)

The teachers' final questionnaires allowed for comparing their perspectives before and after the case study, shedding light on the impact of interdisciplinary collaboration on their teaching experience.

This chapter on research methods has explored the multifaceted strategies employed to investigate interdisciplinary collaboration between an ESP and content teachers in the context of this study. Concluding this section on research methods, a dataset has been amassed, offering a view of interdisciplinary collaboration within this higher education institution. The subsequent phase involved data analysis, wherein a detailed examination, interpretation, and extraction of significant insights from the gathered data occurred. The following chapter is the findings and discussion examining the patterns, and implications uncovered through the research methods for a deeper understanding of interdisciplinary collaboration and its impact on teaching and learning in this context.

## 6. Findings and Discussion

### Introduction

This chapter integrates the results and discussion of the study on interdisciplinary collaboration at Castelo Branco Polytechnic University, focusing on the effectiveness of integrating English language instruction with technical content. The analysis draws on data collected from a range of stakeholders, including teaching staff, school directors, students, content teachers, and ESP teachers. The findings are presented and discussed to address the research questions:

1. How receptive is the higher education institution to implementing interdisciplinary collaboration between ESP teachers and teachers from other subject areas?
2. What key elements should be included in the intervention plan for interdisciplinary collaboration?
3. What are the benefits and challenges experienced by teachers in interdisciplinary collaboration, and how do these influence their teaching practices and curricular choices?
4. To what extent does the interdisciplinary collaboration enhance students' learning of specific technical language of their content area?

The chapter is structured according to the stages of the research, which offers a systematic approach to summarising the essential findings and insights from each phase of the study. The three stages of the research design were each aligned with the study's aims and research questions in the following way:

- **Stage 1: Collaboration Receptiveness Evaluation**
  - This stage assessed the higher education institution's readiness for collaborative efforts through questionnaires, providing insights into institutional preparedness (linked to Aim 1 and Research Question 1).

- **Stage 2: Planning and Implementation of the Intervention Plan**

- This stage involved developing and implementing the intervention plan, focusing on interdisciplinary challenges and goals identified through teacher meetings and questionnaires, and emphasising integrating language and content (linked to Aims 2 and 3 and Research Questions 2 and 3).

- **Stage 3: Post-Collaboration Phase**

- After the collaboration, this stage gathered feedback from teachers and students, offering insights for improvement and reflecting on teaching practices (linked to Aim 1 and 3 and Research Questions 1, 3, and 4).

The discussion synthesises these findings to evaluate the receptiveness, effectiveness, and overall impact of the interdisciplinary collaboration, highlighting successes and identifying areas for further development.

## **6.1. Stage 1**

### **6.1.1. School Directors and Deputies**

Overall, the responses indicate a generally positive attitude toward interdisciplinary collaboration with an ESP teacher, with strong agreement on its potential benefits for faculty and students. However, there are mixed opinions regarding faculty receptivity and the ease of implementation. This is in line with other studies specifically referring to concerns of implementing new teaching strategies in HEIs (Newton, 2003; Skoumpopoulou & Robson, 2020; Tyilo, 2017). Challenges in implementing new teaching strategies in HEIs include fit, complexity, training, communication, and consultation. These responses can be understood through the lens of SCT, which emphasises the role of social interaction, observational learning, and self-efficacy in shaping behaviour (Bandura, 1986), and EVT, which explains motivation based on individuals' expectations of success and the value they assign to tasks (Wigfield & Eccles, 2000).

#### Awareness of Language Policy:

None of the four school directors were aware of an existing language policy in their institutions. Despite this, their recognition of the importance of integrating foreign language training highlights their task value from the EVT perspective—directors perceive the integration of English as beneficial for their institution and students, even in the absence of formal policies.

#### Concern for Integrating Foreign Language Training:

All four directors expressed concern about integrating foreign language training into the curriculum, recognising its importance in their academic programs. This is consistent with SCT's outcome expectations, as the directors expect that introducing language programs could improve student performance and institutional success. The high value they placed on this initiative further reflects their positive task value in terms of EVT, reinforcing their belief that integrating English would contribute significantly to their students' academic development.

#### Specific Programs for Technical-Scientific English Instruction:

Two directors confirmed the existence of specific programs for technical-scientific English instruction, indicating their institutions' efforts to support English language learning. For these directors, this reflects SCT's self-efficacy—they believe their institutions can implement these specialised programs effectively. However, the other two directors, who have yet to establish such programs, may have lower expectancies for success as they recognise the potential challenges in introducing these initiatives.

#### Importance of English Language Programs:

All directors agreed on the importance of English language programs, highlighting their shared commitment to promoting interdisciplinary collaboration. This consensus illustrates both SCT's outcome expectations (belief in the positive results of collaboration) and EVT's task value (perceived importance of English for professional and academic success). Directors believe these programs will not only improve students' linguistic

capabilities but also prepare them for global challenges, showcasing their strong support for interdisciplinary collaboration.

#### Receptiveness and Challenges in Implementation:

While the directors acknowledged challenges in implementing interdisciplinary approaches, they remained largely receptive. This reflects their self-efficacy in supporting institutional change, as well as their outcome expectations in terms of the benefits of collaboration. From the EVT perspective, the directors who see high task value in these initiatives are more likely to push for their implementation despite the challenges.

#### Leadership Support and its Impact:

The directors' support for interdisciplinary collaboration highlights the critical role of leadership in fostering institutional change. Their involvement and backing align with SCT, as their self-efficacy—their confidence in their ability to drive change—directly influences their actions. Additionally, from an EVT viewpoint, their recognition of the task value of interdisciplinary collaboration demonstrates their belief in its importance for the institution's success, further motivating them to support its implementation.

These findings suggest a supportive environment for language education and interdisciplinary collaboration, underpinned by positive self-efficacy, outcome expectations, and task value. With continued leadership backing and the necessary resources, the challenges identified by the directors could be overcome, leading to successful interdisciplinary collaboration.

The responses highlight a shared commitment among the directors to integrating foreign language education and promoting interdisciplinary collaboration within their institutions. Their positive attitudes toward English integration and collaboration, alongside high task value and positive outcome expectations, show strong support. However, there are concerns about the practical implementation challenges, suggesting that while they are open and willing, additional institutional support may be necessary to actualise these efforts fully. Research in interdisciplinary teaching (Jensen & Thompson, 2020; Moirano et al., 2020) has indicated that the success of these implementations relies

on institutional and academic support. With the support of the school administration, implementing a new teaching strategy would be beneficial. Despite limited awareness of formal language policies, there is a consensus on the importance of English language programmes. This is also evidenced by studies (Fernandez-Otero & Strotmann, 2020; Moreira, 2020; Pinto & Araújo e Sá, 2020) that demonstrated that the lack of formal language policies does not prevent HEIs from recognising their importance and promoting language learning strategies.

Additionally, the directors demonstrate positive perceptions and high receptiveness to interdisciplinary approaches, showing active involvement and support for such initiatives. Given the evident support from school directors, administrative backing is crucial for fostering effective teamwork, as these leaders play a key role in assigning roles, facilitating communication, and providing necessary training. The literature also underscores the importance of strong leadership support for successful collaboration, as highlighted by J. Ed. Crandall & Kaufman and others (Havnes, 2009; Newton, 2003). Their findings agree that strong leadership is integral to overcoming challenges and enhancing collaborative efforts.

#### **6.1.2. Teaching Staff**

Of 396 teachers affiliated with IPCB, 45 questionnaires were returned. The analysis reveals a broadly positive attitude towards integrating English language instruction within the HEI, with a strong overall receptiveness indicating a readiness to engage in collaborative efforts with an ESP teacher. This positive attitude can be further understood through SCT and EVT, which shed light on the motivational and cognitive aspects influencing teachers' engagement in interdisciplinary collaboration. The following section includes various visual representations, such as pie charts, which illustrate the responses to the questionnaire.

**Figure 1**

*Familiarity with interdisciplinary collaboration*

7. Are you familiar with interdisciplinary collaboration?

45 responses

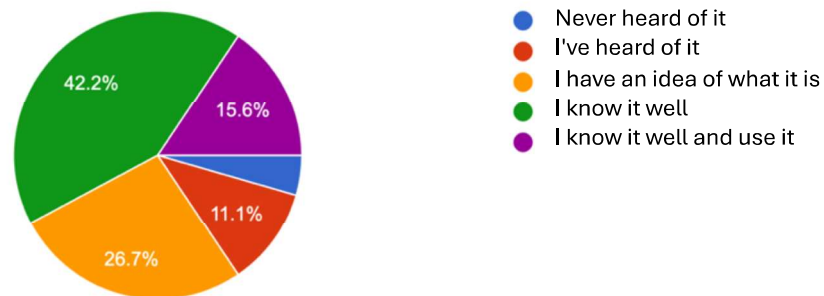


Figure 1 above illustrates the varying levels of familiarity among the teaching staff with interdisciplinary collaboration. It highlights that 42.2% of respondents claim to "know it well", indicating a substantial portion of staff with a strong understanding of the concept. According to SCT, this suggests a high level of self-efficacy. These staff members likely feel confident in their ability to engage in interdisciplinary work, which enhances their openness to collaboration. "I have an idea of what it is" (26.7%) shows that a considerable percentage are aware of interdisciplinary collaboration, indicating the potential for engagement with additional support or information. Their awareness reflects moderate self-efficacy but leaves room for growth in expectancies for success as they may not yet feel fully equipped to collaborate.

The response "I know it well and use it" (15.6%) indicates that a significant portion of staff not only understand interdisciplinary collaboration but are also actively engaged in it. These individuals likely have high expectancies for success, as suggested by EVT, believing their collaborative efforts contribute to positive outcomes like improved student learning or enhanced professional development. In contrast, the responses "I've heard of it" (11.1%) and "Never heard of it" (4.4%) imply that although some staff are aware of interdisciplinary collaboration, barriers to participation remain. These challenges could

potentially be mitigated by boosting self-efficacy through targeted training and stronger institutional support.

The data indicate varying receptiveness among the academic staff to participate in interdisciplinary collaboration. While a significant portion are familiar with it or have some experience with it, there is still room for improvement in raising awareness and encouraging active engagement, particularly among those who have heard of it but have yet to be involved.

Figure 2 (composed of Q8, Q10, and Q13) illustrates the teaching staff's responses to three key questions from the questionnaire. Each image corresponds to a separate question but these are presented together to offer a comprehensive view of the teaching staff's participation in and attitudes toward interdisciplinary projects.

The majority (71.1%) of respondents reported participation in interdisciplinary projects, demonstrating a strong engagement in collaborative practices. According to EVT, such engagement aligns with the theory's premise that individuals are motivated by the expectation that their efforts will lead to meaningful outcomes for their students and themselves. This high level of participation is consistent with SCT, which emphasises the role of self-efficacy in driving behaviour; these respondents exhibit confidence in their ability to contribute effectively to interdisciplinary initiatives, a fundamental tenet of SCT.

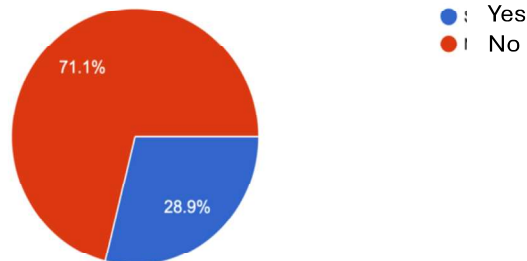
However, some respondents (28.9%) have not yet participated in interdisciplinary projects, which may indicate lower expectancies for success. These individuals may be aware of interdisciplinary collaboration but face barriers, such as a lack of confidence or opportunities to participate. Addressing these barriers through institutional support could raise their self-efficacy and outcome expectations.

**Figure 2**

*Participation in interdisciplinary collaboration (Q8, 10 & 13)*

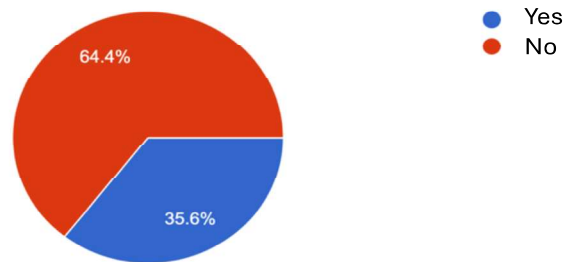
8. Have you ever been involved in interdisciplinary projects?

45 responses



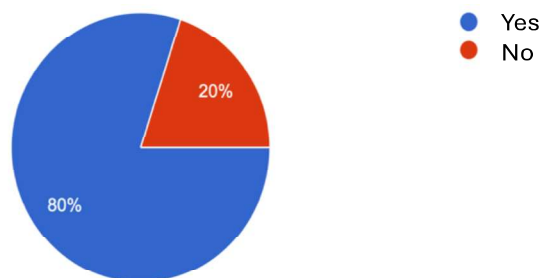
10. Have you ever taken part in interdisciplinary collaboration?

45 responses



13. I would like to take part in a collaborative teaching experience with English

45 responses



The percentage of respondents who have never participated in interdisciplinary projects (71.1%) is higher than those who have never heard of interdisciplinary collaboration as illustrated in Figure 1 (4.4%). This indicates that while the concept is

recognised, there are factors which hinder active participation that can be researched further. Addressing these challenges and emphasising the task value (EVT) of interdisciplinary collaboration—its importance for professional development and student success—could help increase engagement.

The high percentage of teaching staff (80%), shown in Figure 3 below, expressing a desire to participate in interdisciplinary collaboration with an ESP teacher reflects strong interest and willingness among the teaching staff to engage in collaborative efforts involving cross-disciplinary interaction. This positive attitude towards interdisciplinary collaboration is closely aligned with SCT's concept of self-efficacy—teachers confident in their ability to collaborate effectively are more likely to engage. Furthermore, these teachers report collaborative practices aligned with positive outcome expectations, as described in SCT. They engage in interdisciplinary collaboration with the understanding that it can lead to tangible benefits, such as improved communication with international students and enhanced teaching practices. Research by Zonoubi et al. (2017) highlights that teachers' self-efficacy—their confidence in their ability to use English in teaching contexts—is a significant factor influencing their willingness to participate in interdisciplinary collaboration.

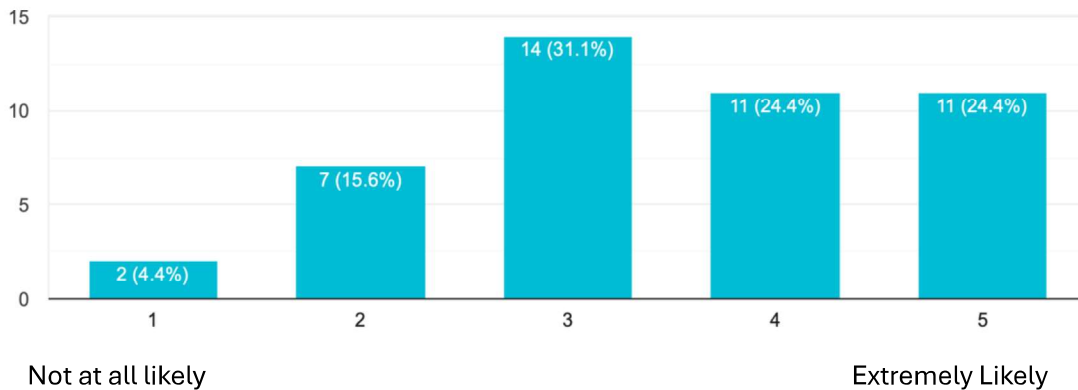
In addition, from the perspective of EVT, this high level of interest suggests that teachers place high task value on interdisciplinary collaboration. Research shows that individuals who perceive high task value in a collaborative effort—such as improving language skills for professional growth—are more likely to engage (Wigfield & Eccles, 2000; Zee & Koomen, 2016). Teachers who believe participating in interdisciplinary collaboration will enhance their teaching methods and career prospects (high task value), and those with strong expectancies for success are more inclined to engage in such initiatives.

**Figure 3**

*Likelihood of participation in interdisciplinary collaboration with an ESP teacher*

12. Given the chance to take part in a collaborative teaching experience with an English teacher, how likely would you be to do so?

45 responses



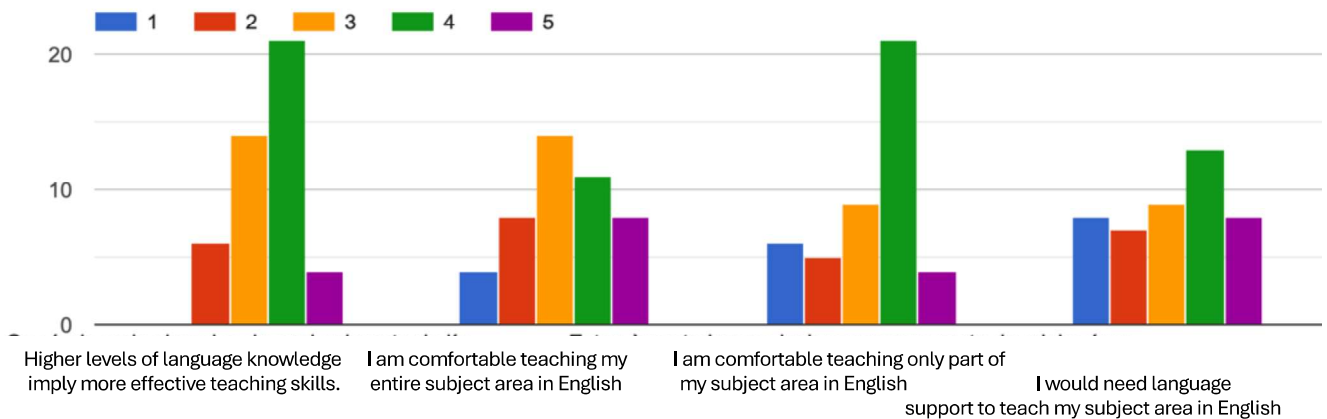
The expectations for success among these teachers are also strong. Although participation rates in interdisciplinary projects are slightly lower, the overwhelming interest in working with an ESP teacher points to a strong potential for further interdisciplinary engagement within the institution. Providing additional support to increase self-efficacy and expectancies for success could help translate this interest into actual participation. This is in line with studies that have shown teachers have significantly expressed a keen interest in enhancing their English language skills to better communicate with international students, participate in global academic networks, and effectively convey subject-specific knowledge (Moreira, 2020; Morgado & Coelho, 2013).

The teaching staff reported varying levels of comfort with teaching in English, with moderate scores on statements such as teaching part or all of their disciplinary area in English (average scores of 3.33 and 3.31). Figure 4 shows an average score that reflects moderate to high comfort, suggesting a generally positive attitude toward English-medium instruction. This suggests that while teachers generally feel positive about teaching in English, there is a need for additional linguistic support.

**Figure 4**

*Comfort with teaching in English and need for linguistic support*

14. Below are some statements to which we ask you to respond according to these options: 1 - I completely disagree; 2 - I disagree; 3 - I neither disagree nor agree; 4 - I agree; 5 - I completely agree



Teaching staff showed moderate to high agreement with the statement that higher language proficiency implies more effective pedagogical skills (average score: 3.42). Figure 4 demonstrates the teaching staff's perceptions regarding the need for linguistic support to effectively teach their subjects in English, with an average score indicating a moderate overall need for assistance in language skills. This indicates that they see improving their English language proficiency as beneficial for their teaching, which aligns with SCT's self-efficacy—teachers with higher proficiency likely feel more capable of managing English-medium instruction.

The analysis indicates a generally positive attitude towards interdisciplinary collaboration. The teaching staff perceive higher language proficiency as beneficial for pedagogical effectiveness, demonstrating a moderate to high level of comfort with teaching in English, either partially or fully. This aligns with the discussion in the theoretical framework, which highlighted the importance of teachers' language proficiency for effective teaching in a foreign language (McKinley & Rose, 2022). Teachers may need extra

assistance with vocabulary, grammar, pronunciation, and other linguistic elements, as deficiencies in these areas can hinder their ability to communicate effectively (Lasagabaster & Doiz, 2021).

This aligns with SCT's concept of self-efficacy—teachers who feel confident in teaching content in English are more likely to engage in interdisciplinary collaboration. Teachers also have positive outcome expectations (SCT), as they anticipate that collaboration with an ESP teacher will lead to beneficial outcomes for both themselves and their students.

From an EVT perspective, teachers assign high task value to improving their English proficiency and engaging in interdisciplinary collaboration. They see this as a crucial component of professional development and student success, particularly in internationalised contexts (Morgado & Coelho, 2013). Teachers with higher expectancies for success (EVT) are more likely to participate, confident that their collaboration with ESP teachers will lead to effective educational outcomes.

Linguistic competence, pedagogical adaptability, and interdisciplinary synergy are key areas where interdisciplinary collaboration with ESP teachers can enhance teaching. Teachers who feel comfortable with their English proficiency will likely engage in meaningful exchanges that improve student learning, particularly with Erasmus students. The collaborative exchange fostered between ESP and content teachers not only supports cultural exchange but also facilitates better academic outcomes, as highlighted by Zappa-Hollman (2018). This interdisciplinary synergy is vital for integrating language and content in higher education settings, promoting cross-cultural communication and enriching educational experiences.

The overall receptiveness of both teaching staff and school directors to interdisciplinary collaboration, particularly with an ESP teacher, reflects a positive learning environment where innovation and cross-disciplinary exchange are valued. The integration of SCT and EVT underscores that this receptiveness is driven by teachers' confidence in their abilities, positive expectations for collaboration outcomes, and the perceived value of interdisciplinary efforts.

### **6.1.3. Students**

The data include all three academic years used in the study: 1st-year students, 3rd-year students, and master's students. Due to variations in class sizes and participation rates, the findings have been presented as percentages relative to the number of respondents.

An overwhelming majority (97.2%) of students reported having English language education in school or at a language centre. This indicates that a substantial portion of the student population has a strong foundation in English, which is beneficial for interdisciplinary collaboration involving English language instruction. A smaller proportion of students (40.8%) reported having English as a formal subject in their course curriculum. This suggests that while English language learning is prevalent, it is only sometimes formally integrated into their academic programmes. Despite this, a significant majority (72.4%) expressed interest in incorporating English into their course curriculum, demonstrating a strong desire to further integrate English language education into their academic experience. This openness aligns with SCT, as students' prior exposure to English enhances their self-efficacy, making them more confident in engaging in collaborative learning.

The varied results related to CLIL indicate that its effectiveness depends on several factors, including the learning context, students' current language proficiency, cognitive abilities, age, and the relevance and potential application of the target language beyond the classroom (Dalton-Puffer, 2011; Nieto Moreno de Diezmas, 2016; Paran, 2013). Researchers emphasise that learners must have adequate language skills to handle the content in a CLIL setting effectively, as inadequate proficiency may lead to difficulties (Bruton, 2013; Lorenzo, 2007). Nonetheless, there is no clear agreement on the specific language proficiency levels or the optimal age to start CLIL programmes.

**Receptiveness:**

The high prior exposure to English shows a foundation that supports their use of English as a medium of instruction in interdisciplinary settings. Their substantial interest in integrating English into the curriculum indicates recognition of its importance for their academic and professional development. This favourable attitude suggests high receptiveness to interdisciplinary collaboration, including English language instruction. The combination of prior exposure and interest in English curriculum integration creates an opportunity for enriched interdisciplinary learning experiences. This environment is conducive to implementing interdisciplinary collaboration classes in an ICLHE context.

Most students indicated familiarity with technical vocabulary in their field of study before entering the course, with 70 students agreeing or strongly agreeing. Additionally, most students found the vocabulary of technical terms in English accessible, with 68 students agreeing or strongly agreeing. A significant proportion of students felt confident communicating technical terms in English, with 67 students agreeing or strongly agreeing. This confidence in their technical vocabulary aligns with SCT's self-efficacy, indicating that students believe in their ability to effectively use English in their academic contexts.

A narrow majority of students (51.3%) indicated familiarity with interdisciplinary teaching, while 48.7% reported unfamiliarity with it. This suggests a mixed prior exposure or understanding of interdisciplinary teaching. Although only 30.7% reported participating in interdisciplinary teaching, a significant majority of students (88.7%) expressed interest in participating in a collaborative teaching format between English and another discipline, with 55.3% responding "Yes" and 33.4% responding "Maybe." This high receptiveness and enthusiasm reflect high task value from EVT, as students perceive this collaboration as beneficial to their learning.

### **Self-evaluation of English proficiency:**

Students were asked to rate their overall perception of their English proficiency. The distribution of ratings was as follows:

- No students rated their English level as 1 (Very Weak).
- 20% rated their English level as 2 (Weak).
- 30.7% rated their English level as 3 (Fair).
- 44% rated their English level as 4 (Good).
- 5.3% rated their English level as 5 (Excellent).

Most students (74%) rated their English level as fair or good, suggesting a significant portion perceived their English proficiency as intermediate to advanced. While variability exists in self-assessment ratings, the low percentage of excellent indicates room for improvement.

This self-evaluation provides insight into their perceived readiness for interdisciplinary collaboration involving English. The high task value assigned to English proficiency reflects students' recognition of its importance for future employment and academic success, which mirrors findings in studies by Wigfield and Eccles (2000), who noted that task value plays a crucial role in students' motivation to engage in learning. There is research that supports the view that students with strong expectancies for success are more likely to engage in interdisciplinary collaboration. Studies grounded in EVT, such as those by Eccles and Wigfield (2002), highlight that students' belief in their likelihood of success is a key motivator for engaging in challenging tasks, including interdisciplinary activities.

When students feel confident that their efforts will lead to positive outcomes, they are more willing to participate in collaborative and interdisciplinary tasks, including those involving language learning. Research has shown that students who perceive their academic tasks, including language acquisition, as both important and achievable (high task value and expectancies for success) are more likely to invest effort in such tasks. This has been observed in various educational contexts, including language (Gaspard et al.,

2018; Rosenzweig et al., 2019; Rosenzweig & Wigfield, 2016)<sup>1</sup>(Gaspard et al., 2018; Rosenzweig et al., 2019; Rosenzweig & Wigfield, 2016). These studies suggest that students with strong expectancies for success are more likely to engage in activities where they anticipate positive outcomes, such as interdisciplinary collaboration between ESP and content teachers.

#### **Frequency of English use in various contexts:**

Most students reported frequently using English in their studies, indicating a high level of integration into academic activities. They frequently used English to read technical language, attended Erasmus Programs, and participated in international academic exchanges. This consistent use of English supports their self-efficacy and reflects expectancies for success. Additionally, students reported frequent use of English in professional contexts, such as future employment, highlighting the perceived importance of English proficiency for career aspirations. This frequent use aligns with SCT, enhancing students' self-efficacy and reinforcing their confidence in using English in real-world, high-stakes situations. From an EVT perspective, students' engagement with English in professional contexts demonstrates high task value, as they view English as essential for their future career success.

The aspects of technical vocabulary, familiarity, English proficiency and frequency of use of English are important factors for student motivation and receptiveness to this teaching method. These factors were points identified as criteria for measuring student receptiveness and motivation from previous studies and have proven to be fundamental in this case as well. Research (Jiang et al., 2019) acknowledges that student motivation is often driven by context and individual needs.

Most students showed high interest in participating in interdisciplinary collaboration classes with an English teacher, indicating a strong motivation to engage in collaborative learning experiences that integrate language instruction with disciplinary content. The overwhelming prior exposure to English education supports students' readiness for interdisciplinary collaboration involving English language instruction. While there is

variability in proficiency, the overall perception is that students feel prepared to engage in such collaboration. Their frequent use of English suggests comfort and familiarity with the language, facilitating participation in interdisciplinary activities.

These responses suggest that many students perceive themselves as having some prior knowledge of technical vocabulary and believe it is easy to learn. Researchers perceive this as an advantage (Bruton, 2013; Lorenzo, 2007; Vega & Moscoso, 2019). Students also express confidence in their ability to use technical terms, suggesting readiness to employ English language skills in their academic and professional contexts. Student's confidence could positively influence their participation in interdisciplinary collaboration classes. This confidence aligns with SCT's self-efficacy, indicating that students believe in their ability to use English in academic contexts. This finding is consistent with research by Bandura (1997), who emphasised the role of self-efficacy in determining students' willingness to engage in challenging tasks. Similar studies, (Chao et al., 2019; Chen, 2020; Dunbar et al., 2018; Saunders-Wyndham & Smith, 2020) , have found that high self-efficacy in language learning contexts positively influences student participation in collaborative learning environments. Paran (2013) highlights that the "selective implementation" of students is crucial to the success of CLIL programmes (p. 325). Typically, students are either chosen for CLIL programmes based on their proficiency in English or their content knowledge, or they self-select, often resulting in a cohort of highly motivated and high-achieving individuals (p. 326). In this case, however, students were not selected based on their proficiency levels but instead asked to self-assess their language skills.

The data reveal a positive environment for interdisciplinary collaboration among students, highlighting their readiness and enthusiasm for integrating English language instruction with disciplinary content. Various studies (S. Evans & Morrison, 2011; Jiang et al., 2019) have shown that specifically, students encounter key challenges during their first year at university, such as understanding technical vocabulary, comprehending lectures, achieving an appropriate academic style, and meeting institutional and disciplinary requirements. However, evidence suggests that students overcome these difficulties

through a combination of “strong motivation”, diligent effort, effective learning strategies”, and supportive peer networks (S. Evans & Morrison, 2011, p. 202) .

SCT offers insight into how students’ self-efficacy—their confidence in their ability to use English in academic and professional contexts—and outcome expectations—their beliefs about the positive results of collaboration—shape their willingness to engage in interdisciplinary practices. Students with higher self-efficacy are more likely to view interdisciplinary collaboration as an opportunity to enhance their language skills and achieve academic and career success.

EVT, on the other hand, helps illuminate the task value students assign to English proficiency, particularly in the context of future employment and international engagement. Students who perceive English as valuable for their professional aspirations demonstrate stronger expectancies for success and are thus more motivated to participate in interdisciplinary collaboration. By integrating these two theories, this study captures both the cognitive (SCT) and motivational (EVT) factors that influence students' engagement, revealing that students' prior experiences, confidence, and career goals all shape their receptiveness to interdisciplinary learning environments.

Overall, the data indicates students' high level of receptiveness toward interdisciplinary collaboration involving English language instruction. The combination of exposure to English, confidence in technical vocabulary, frequent use of English in academic and professional contexts, and interest in integrating English into the curriculum suggests that students are prepared and motivated to engage in these collaborative learning experiences.

This receptiveness is further supported by their high self-efficacy and positive outcome expectations (SCT), along with their recognition of the value of English proficiency for career success (task value from EVT). Students' willingness to participate in interdisciplinary collaboration demonstrates that they view these initiatives as beneficial to their academic and professional development, making them well-suited for interdisciplinary approaches such as ICLHE.

#### **6.1.4. Content Teachers**

The three content teachers selected for collaboration were as follows: T2, an adjunct professor specializing in Fashion and Textile Design with a PhD in Design; T3, an associate professor in Communication Design, also holding a PhD in Design; and T4, an adjunct professor in Technological and Graphic Design, who has a PhD in Design.

In the pre-class questionnaire, all three teachers rated the benefits of collaboration as high (5 out of 5), indicating a strong belief in the potential advantages of interdisciplinary collaboration with an ESP teacher. This reflects a high level of self-efficacy as defined by SCT; the teachers' confidence in the value of collaboration suggests they believe they can effectively engage in and benefit from this interdisciplinary approach. The teachers expressed positive expectations for the collaborative teaching experience with the ESP teacher, emphasising goals such as expanding knowledge, improving language skills, and fostering interdisciplinary understanding. Their initial expectations for participating in collaborative teaching with an ESP teacher were highly positive (rated as 5 out of 5), indicating strong expectancies for success—the belief that the collaboration will yield positive outcomes. Research has shown that positive expectations significantly influence teachers' motivation to engage in new teaching methods (Wang & Eccles, 2013). All teachers reported having immediate ideas for sharing content and teaching strategies to use or experiment with. Two of the three teachers expressed high confidence (rated 1 out of 5) in implementing collaboration in their classes, indicating a strong sense of preparedness and comfort with integrating interdisciplinary approaches into their teaching practices. This confidence aligns with SCT, where teachers who feel capable are more likely to engage in collaborative initiatives (Tschannen-Moran & Hoy, 2001). One teacher reported concerns about students with more significant English language proficiency gaps, highlighting a potential challenge requiring additional support or resources. This concern reflects the need for enhancing self-efficacy in students, as addressing language proficiency could increase their confidence and participation in interdisciplinary collaboration.

Overall, the teachers perceived student receptivity to the collaborative classes as good to excellent (rated as 4 or 5 out of 5), suggesting confidence in students' ability to engage and benefit from the interdisciplinary learning experience. Their anticipation of significant learning benefits for students (5 out of 5) underscores their belief in the positive impact of interdisciplinary collaboration on student learning outcomes, further enhancing their task value (EVT). The perception that the collaborative approach would be manageable within their existing workload indicates that they view the collaboration as a feasible enhancement to their teaching practices.

None of the teachers anticipated that collaboration would significantly increase their preparation or assessment time, indicating a perception that the collaborative teaching approach would be manageable within their existing workload.

This study examined the perspectives of content teachers before they engaged in interdisciplinary collaboration with an ESP teacher. This approach is notable because, unlike previous research, which often focuses on teachers' responses to specific teaching techniques or training programmes (Axelrod, 2014; Cihat Yavuz et al., 2020; Davison, 2006; Giles & Yazan, 2019; Vilkancienė & Rozgienė, 2017), this study explored attitudes and expectations in the context of an ongoing, integrated teaching experience. The pre-class questionnaire aimed to capture content teachers' initial perspectives, including their expectations, perceived challenges, and attitudes towards integrating English language instruction with their disciplinary content. This baseline data was crucial for understanding how these perspectives may shift as they participated in the interdisciplinary collaboration.

Applying SCT and EVT makes it evident that the content teachers' receptiveness at the start of the research is influenced by their strong self-efficacy, positive outcome expectations, high task value, and robust expectations for success. Their belief in the benefits of collaboration, combined with confidence in their abilities, set a solid foundation for their willingness to engage in interdisciplinary efforts with an ESP teacher. Addressing any concerns—such as those related to language proficiency gaps—would further enhance their receptiveness and participation in collaborative teaching practices.

This approach provided an insight into the initial attitudes of content teachers and set the stage for how these attitudes evolved during and after the collaborative teaching experience.

#### **6.1.5. ESP teacher**

The teacher rated their experience with CLIL methodology as 4 out of 5, reflecting a high level of satisfaction and familiarity with this approach. This rating, combined with their previous experience collaborating with disciplines such as Fashion and Textile Design, demonstrates high self-efficacy (SCT) the teacher's confidence in their ability to manage interdisciplinary collaboration effectively.

Their approach to integrating language learning with content is methodical and strategic. The teacher advocates for defining clear objectives for both content and language, implementing scaffolding techniques to support students in understanding complex concepts, and developing assessments that evaluate both language proficiency and content knowledge (Coyle et al., 2010; Dalton-Puffer, 2011). This structured approach highlights the teacher's expectancies for success (EVT)—they believe that by synchronising language and content goals, they will achieve positive student learning outcomes. The teacher identified technical subjects within design as particularly suitable for interdisciplinary work due to the technical language involved and the significant role of English in professional and research contexts (J. Ed. Crandall & Kaufman, 2002; O. Meyer, 2013).

By focusing on content-specific language, the teacher is addressing both language and content objectives. This reflects the teacher's understanding of the task value (EVT) of interdisciplinary collaboration, where the relevance of technical English is perceived as valuable for both academic and professional success. In addressing both content and language objectives, the teacher emphasises considering students' language skills and focusing on relevant vocabulary (Morgado, Coelho, et al., 2015), which aligns with the effective language teaching practices discussed by Van de Craen et al. (2007) and Cook (1995). This student-centred approach ensures that language support is tailored to meet

students' proficiency levels, reinforcing self-efficacy in students, as well as the teacher's belief in their ability to support language development.

For assessing students' language proficiency and content knowledge, the teacher proposed using a combination of class activities, group work, and specific tasks, including projects and presentations that integrate both language and content (Airey, 2020a; Bowles & Murphy, 2020; Doiz et al., 2013; Murata, 2019). These assessment methods reflect the teacher's belief in the positive outcomes (SCT) of interdisciplinary teaching and collaboration. The teacher also stressed the need for clear assessment criteria, diverse formats, and alignment with learning objectives to ensure fairness and validity in evaluations.

Regarding resources and materials, the teacher utilises a variety of tools, including textbooks, online platforms, and authentic materials. They recommend content-specific textbooks that integrate language learning and authentic materials such as scientific articles and historical documents. These resource choices highlight a strategic approach to supporting both language and content learning. This focus on real-world materials also demonstrates the teacher's understanding of the task value (EVT) of using relevant resources to enhance learning and engagement.

To foster effective collaboration, the teacher suggested holding regular planning meetings, using shared calendars to coordinate schedules, and participating in CLIL training workshops and interdisciplinary seminars for professional development. These proactive strategies reflect high self-efficacy (SCT) and expectancies for success (EVT), as the teacher is confident in their ability to manage challenges and improve their interdisciplinary collaboration. These recommendations reflect a proactive attitude toward enhancing collaborative efforts and ongoing professional growth.

The teacher also acknowledged potential challenges, such as time constraints and varying levels of student language proficiency. To address these issues, they proposed strategies including establishing clear agendas, using technology for document sharing, delegating tasks, and implementing differentiated instruction. These strategies indicate a

readiness to tackle obstacles and adapt practices to better meet students' needs. Addressing challenges like time constraints and varying student language proficiency with practical solutions further indicates the ESP teacher's readiness to adapt and refine collaborative practices. Overall, their positive attitude and strategic planning illustrate a strong foundation for successful interdisciplinary collaboration aimed at improving student learning outcomes through effective integration of language and content. By combining the teacher's approach to integrating language and content with their high self-efficacy and strong expectancies for success, the analysis reveals that the ESP teacher is highly receptive to interdisciplinary collaboration. Their proactive strategies and clear objectives align well with both SCT and EVT, which explain their confidence and motivation to engage in successful interdisciplinary teaching within the ICLHE framework.

## **6.2. Stage 2 Intervention (teaching classes)**

In this stage, the focus was on developing and implementing an intervention plan to address interdisciplinary challenges and achieve specific educational goals. The decision-making sequence and collaborative dynamics are illustrated by tables and flow charts.

### **6.2.1. Informal Data Collection**

The collected data included email exchanges, resource analysis, lesson plan evaluation, material review, and student assessment review. These informal data collection strategies were systematically analysed to extract recurring themes and actionable insights. The findings are summarised in Table 13 below, which outlines the specific strategy used, the key observations made, and the resulting actions or decisions. This table not only tracks the role of these strategies in the research process but also illustrates how the insights were applied in decision-making during interdisciplinary collaboration. It provides a comprehensive view of the contributions of each strategy to balancing content and language needs, enhancing the effectiveness of collaboration between the ESP and content teachers.

**Table 13***Analysis of informal data collection strategies*

<b>Data collection strategy</b>	<b>Key observations</b>	<b>Action taken / Decision impact</b>
Email exchanges between the ESP and content teachers (59)	<ul style="list-style-type: none"> <li>- Noted variations in email response times, indicating busy schedules.</li> <li>- Observed an increased emphasis on language integration in later exchanges.</li> <li>- Identified the preference for specific teaching approaches through email discussions.</li> <li>- shared resources and lesson plan ideas</li> <li>- discussed materials and concerns of content and language</li> </ul>	<ul style="list-style-type: none"> <li>- Guided the scheduling of collaborative meetings to accommodate busy periods.</li> <li>- Resulted in the adjustment of content selection based on insights into language integration.</li> <li>- Contributed to the development of a shared teaching strategy that capitalizes on each teacher's strengths.</li> </ul>
Resource analysis done by both the ESP and content teachers (17)	<ul style="list-style-type: none"> <li>- Observed a shortage of up-to-date content in specific subject areas.</li> <li>- Noted a surplus of certain materials that were underutilised.</li> <li>- Identified materials that effectively supported language learning.</li> </ul>	<ul style="list-style-type: none"> <li>- Informed decisions about resource procurement and allocation to fill gaps.</li> <li>- Led to the curation of a resource repository tailored to interdisciplinary goals.</li> <li>- Guided the selection of materials that balance content and language integration.</li> </ul>

Lesson plan evaluation done by both the ESP and content teachers (22)	<ul style="list-style-type: none"> <li>- Discovered that some lesson plans led to higher student engagement than others.</li> <li>- Observed a need for more clarity in certain lesson plan instructions.</li> <li>- Recognised the adaptability of lesson plans for different content topics.</li> </ul>	<ul style="list-style-type: none"> <li>- Prompted revisions to lesson plans to enhance clarity and engagement.</li> <li>- Informed the creation of standardised lesson plan templates for consistency.</li> <li>- Resulted in the development of adaptable lesson plan structures.</li> </ul>
Material review done by both the ESP and content teachers (16)	<ul style="list-style-type: none"> <li>- Discovered outdated content in several textbooks used in the curriculum.</li> <li>- Observed opportunities to incorporate language learning activities into content materials.</li> <li>- Noted that some materials required supplemental resources for effective integration.</li> </ul>	<ul style="list-style-type: none"> <li>- Initiated a process to update outdated content in textbooks. - Guided the development of language-focused supplementary materials.</li> <li>- Led to the creation of guidelines for incorporating language learning activities into content materials.</li> </ul>
Student assessment review done by both the ESP and content teachers (23)	<ul style="list-style-type: none"> <li>- Identified a need for more varied assessment methods to cater to diverse learning styles.</li> <li>- Observed differences in student performance across assessments.</li> <li>- Recognised the importance of feedback and assessment transparency.</li> </ul>	<ul style="list-style-type: none"> <li>- Resulted in the diversification of assessment methods to enhance inclusivity.</li> <li>- Prompted the implementation of regular formative assessments for feedback.</li> <li>- Guided the revision of rubrics and assessment criteria for consistency and clarity.</li> </ul>

The analysis of 59 email exchanges (see Appendix E, p.416) between the ESP and content teachers highlights key aspects of their collaborative efforts to enhance interdisciplinary teaching strategies. These emails were categorised into five primary strategies: email exchanges, resource analysis, lesson plan evaluation, material review, and student assessment review. Each category sheds light on distinct elements of the collaboration, offering insights into how the integration of language learning and subject-specific content was achieved. Below, the findings are summarised by category, supported by representative email excerpts to demonstrate key observations and actionable outcomes.

Email exchanges primarily facilitated logistical coordination and the sharing of ideas and feedback. These emails underscored the dynamic nature of collaboration and the mutual effort to address both technical content and language learning needs.

Key observations:

- Variations in email response times reflected the busy schedules of content teachers, prompting more flexible scheduling practices.
- Discussions emphasised integrating language learning into technical lessons, tailoring strategies to fit each teacher's expertise.

Example: In Email 12, the ESP teacher proposed scheduling a meeting around the content teacher's availability:

*"Would Thursday at 11 AM work for our next class? We can also meet after class to finalize the glossary and handouts."*

This led to improved planning and better alignment of lesson materials with students' needs. Another email (Email 24) focused on incorporating peer-to-peer vocabulary exercises:

*“Students are still unfamiliar with some technical terms. Could we introduce a short activity where they describe their work using the glossary terms?”*

These exchanges supported the scheduling of collaborative meetings, the refinement of teaching strategies, and the efficient use of teacher expertise.

1. Resource analysis done by both ESP and content teachers: This category highlights discussions on identifying resource gaps and leveraging supplementary materials to support student learning. The analysis revealed a shortage of updated materials and an underutilisation of existing resources.

Key observations:

- Gaps in textbooks, such as missing definitions and outdated examples, hindered student comprehension.
- Additional materials, including glossaries, videos, and case studies, were proposed to enhance learning outcomes.

Example: In Email 37, the content teacher acknowledged gaps in existing resources:

*“I agree the textbook lacks definitions. I’ll prepare a handout with detailed material definitions and include illustrations to support understanding.”*

The ESP teacher proposed incorporating external resources (Email 41):

*“Could we add some interactive links to online fabric glossaries or virtual textile libraries? These resources might help students visualize the materials and practice technical language.”*

These collaborative efforts informed decisions about resource procurement, resulting in a Moodle repository tailored to interdisciplinary goals.

2. Lesson plan evaluation done by both esp and content teachers: Lesson plan evaluations focused on improving clarity and student engagement while addressing language integration. Teachers revised instructions and activities based on observations of student challenges and successes.

Key observations:

- Some lesson plans led to higher engagement, particularly those incorporating real-world examples.
- Clearer instructions and scaffolding were needed to support language learners.

Example: In Email 19, the ESP teacher suggested simplifying instructions:

*“Some students struggled to follow the instructions for fabric manipulation. Could we simplify the steps and add a visual guide to make it clearer?”*

The content teacher responded in Email 20:

*“That’s a great suggestion. I’ll revise the instructions and include a vocabulary warm-up activity to ensure they understand the terms before starting.”*

This collaborative process resulted in standardised templates for lesson plans, ensuring consistency and accessibility.

4. Material review done by both ESP and content teachers: Material reviews emphasised the need to update content and enhance accessibility through visuals and supplementary activities. These discussions balanced technical density with language learning needs.

Key observations:

- Outdated materials limited their relevance, while text-heavy resources hindered comprehension.
- Visual aids and real-world examples were suggested to bridge gaps.

Example: In Email 44, the content teacher proposed adding visuals:

*“Many of the terms in the textbook are difficult to grasp without visuals. Could we include diagrams or pictures to illustrate each fabric manipulation process?”*

The ESP teacher added to this idea in Email 45:

*“We could include case studies that demonstrate these techniques in practice, helping students connect the terms to actual applications.”*

These exchanges led to the revision of PowerPoints and handouts, incorporating visuals, glossaries, and case studies for better student engagement.

4. Student assessment review done by both ESP and content teachers: Discussions on assessment focused on creating diverse methods to evaluate both technical skills and language proficiency. Teachers sought to provide transparency and support through formative assessments and rubrics.

Key observations:

- Students struggled with articulating their ideas in English, particularly in written assessments.
- Peer reviews and guided prompts were proposed to support language use during critiques.

Example: In Email 53, the ESP teacher suggested incorporating guided prompts:

*“Students are struggling with explaining their designs in English. Could we include prompts or sentence starters in the assessment to guide their responses?”*

The content teacher expanded on this idea in Email 54:

*“I’ll revise the rubric to include a section for assessing their use of technical terminology and clear explanations.”*

These efforts resulted in diversified assessments, including self-assessments, peer reviews, and oral presentations, fostering inclusivity and language development.

### **6.2.2. Impact of collaborative processes**

The email exchanges demonstrated a dynamic and iterative collaboration between the ESP and content teachers. The actionable outcomes included:

1. Enhanced resources: Gaps in textbooks were addressed through glossaries, visuals, and supplementary materials hosted on Moodle for easy access.
2. Improved lesson plans: Teachers revised lesson plans to include scaffolding, real-world examples, and standardized templates, improving clarity and engagement.
3. Inclusive assessments: Rubrics and assessment formats were diversified to balance technical and language objectives.
4. Efficient communication: Flexible scheduling and regular feedback ensured alignment of teaching goals and student needs.

These findings underscore the importance of informal data collection in guiding collaborative decision-making and enhancing interdisciplinary teaching practices

Table 14 below summarises representative email excerpts, the observations made, and the resulting actions taken in each category. This table highlights the practical outcomes of the collaborative processes between ESP and content teachers.

**Table 14**

*Table for representative emails*

Category	Email excerpt	Observation	Action taken
Email exchanges	<i>"I noticed that students struggled with fabric terminology. Could we integrate a short glossary of terms?"</i>	Need for language scaffolding to support technical terms.	Added glossary and visuals in lesson materials.
Resource analysis	<i>"I agree the textbook lacks definitions. I'll supplement it with a handout that includes definitions."</i>	Lack of clarity in existing textbook resources.	Developed supplementary materials with definitions and examples.
Lesson plan evaluation	<i>"I'll simplify fabric terms and add a visual vocabulary list."</i>	Need for clearer lesson instructions.	Simplified terminology and added visual aids.
Material review	<i>"Could we add diagrams to illustrate the terms?"</i>	Difficulty with text-heavy materials.	Added visuals and glossaries to materials.
Student assessment	<i>"Could we include prompts to guide their use of vocabulary during assessments?"</i>	Difficulty in balancing content and language skills.	Adjusted assessments to include guided prompts and vocabulary.

The synthesis of insights from the collected data highlights the critical role of communication, resource evaluation, lesson planning, material review (textbooks,

supplementary resources (workbooks, articles, videos), multimedia resources (presentations, digital content), assessment tools (tests, quizzes), and assessment strategies. Each strategy provided valuable insights that informed decision-making.

### **Integration with initial planning phase**

#### **1. Building the Intervention Plan:**

The communication and resource allocation insights underscored the necessity of a structured, collaborative approach to address interdisciplinary teaching requirements.

**Aligning Objectives:** The alignment of content and language objectives through regular communication and structured lesson plans emphasised the importance of interdisciplinary collaboration in meeting educational goals.

#### **2. Developing the Interdisciplinary Teaching Plan:**

Carefully selecting and evaluating teaching materials and resources facilitated the integration of content and language learning within the CLIL framework. This ensured that the teaching plan supported comprehensive learning outcomes in both areas.

The collaborative development of lesson plans and evaluation criteria highlighted the benefits of interdisciplinary collaboration, including the teachers' shared responsibility and diverse perspectives. The criteria outlined in Table 10 (5.8.1) played a significant role in the development process.

Each lesson plan was structured to achieve specific learning outcomes that targeted both content knowledge and language proficiency. For instance, the plans focused on integrating technical terminology with practical applications, such as creating symbolic embroidery pieces or understanding sustainability in textiles. These activities were designed not only to enhance subject matter understanding but also to support students in applying language skills in real-world contexts.

The informal data collection indicates that a considerable amount of collaboration was organised through email exchanges and meetings ( formal and informal), and that it was crucial in aligning teaching objectives and strategies. This approach not only facilitated the

integration of content and language teaching but also highlighted several key elements essential for the intervention plan for interdisciplinary collaboration (RQ 2). Among these elements, flexible scheduling and adaptive planning emerged as critical components, as they accommodated teachers' busy schedules and promoted engagement in the collaborative process. The necessity of these strategies was justified by the positive impact they had on teachers' participation and the overall effectiveness of the collaboration, demonstrating that adaptability was vital for successful interdisciplinary efforts.

The informal data collection and the teacher meeting transcripts provided a continuous flow of information to inform the ongoing planning and adjustment processes.

### **6.2.3. Teacher meetings**

The transcripts of the teachers' meetings were created, capturing the full content of the discussions. Only the information relevant to the research was extracted from these transcripts, as the meetings included everyday conversations and "chit-chat" that were not pertinent to the study. The extracted relevant information was then organised and tabulated. The data were categorised into five themes: content, material and resources, dates, evaluation, and reflection. Each table corresponds to a specific teacher and study area and is annexed to this thesis (Appendices D). The organisation of this section is done according to the individual content teacher and the topic addressed:

#### Fashion and Textile Design

- Researching materials and technical language
- Symbolism in embroidery
- Sustainability and Urbanisation

#### Communication and Audio-Visual Design

- Signage and research materials
- Technical language (ISO Standards)

#### Technological and Graphic Design

- Logos and brands
- Technical language and terminology

## **Fashion and Textile Design (FTD)**

The collaboration between T1 (ESP) and T2 (FTD) closely follows the "teaching team" model of co-teaching, as described by Castro Zubizarreta et al. (2017). In this model, both teachers actively engaged in instruction, making their roles fluid and integrated. For instance, T1 focused on explaining language aspects while T2 demonstrated practical applications, but both contributed equally to classroom discussions, asking questions and facilitating student understanding. As Christensen et al. (2021) and Moirano et al. (2020) note, interdisciplinary collaboration is essential for tackling complex problems.

The following analysis is based on three meetings between two teachers, T1 (ESP) and T2 (FTD), who collaborated to integrate language and content in fashion and textile design. The tabulated comments (Appendix D1, p.402) focus on various aspects of the curriculum, such as researching materials and technical language, exploring the symbolism in embroidery, and addressing the themes of sustainability and urbanisation in design. Three tables of comments were analysed in this section, each corresponding to specific topics within the study areas of ESP and FTD. For each table, the successes, challenges, and effectiveness of the intervention are discussed, along with the reflections of both teachers on their collaborative approach.

### **Analysis for T1 (ESP) and T2 (FTD)**

#### **Table of comments 1: Fashion and Textile Design – Researching materials and technical language**

- **Successes:**

- 1. Integration of technical language and content:**

- **T1 (ESP):** T1 highlighted the importance of integrating English with content by asking, *“What exactly is the language area that you want them to understand in English?”* This focus on clarifying the specific terminology students needed helped align language and subject matter, particularly around materials and project development.

- **T2 (FTD):** T2 emphasised research into materials and the technical language used in fashion and textile design, *“Materials and technical language are what I am doing with the master’s students.”* This focus on both areas encouraged students to see the value of language in supporting their understanding of project development and research.
- **Reflection:** The collaboration ensured students grasped both technical and linguistic aspects of fashion design. This approach mirrors the ICLHE (Integrating Content and Language in Higher Education) framework by embedding language learning within content-rich tasks, especially research and technical terminology.

## **2. Practical and project-based learning:**

- **T1 (ESP):** T1 stressed the importance of practical learning through reports and presentations, stating, *“I am looking at report writing and language for presentations,”* ensuring students developed key skills for their future careers.
- **T2 (FTD):** T2 underscored the value of practical, real-life examples for students' learning, *“Since it is essential that these students have practical, real-life examples, the project development steps are important.”* This emphasis on practical application helped students connect technical language to their project work.
- **Reflection:** This method proved successful in helping students understand how language and design skills are integrated. Engaging students with hands-on activities encouraged both language use and content understanding, contributing to deeper learning.

## **Effectiveness of the intervention:**

### **1. Structured report writing and presentation skills:**

- **T1 (ESP):** T1 provided support for report writing and presentation skills, *“We can look at reports which are concise and have a formal structure...each have their own headings and sub-headings.”* This helped students break down complex tasks into manageable parts, aiding their comprehension.

- **T2 (FTD):** T2 encouraged students to apply research into materials and technical language in English directly to product development. *“Summarizing and consolidating the work in English will be much more productive for the work in the long run.”*
- **Reflection:** Both teachers’ focus on breaking down report structures and encouraging applied learning in English was effective. This structured approach enabled students to make connections between the technical content and the language needed to express it.

## 2. Encouraging student engagement:

- **T1 (ESP):** T1 reflected positively on the students’ engagement, *“I was surprised with how engaged they were. I need to do more practical activities because they all appeared to enjoy them.”*
- **T2 (FTD):** Similarly, T2 noted the success of the practical components, *“The practical parts of the lesson were really good and I was impressed with how they participated.”* Both teachers observed that students were more involved when practical tasks were integrated with technical language.

**Reflection:** The high level of student engagement, particularly in practical activities, highlighted the success of an active learning approach.

## Challenges:

### 1. Balancing creativity with project development:

- **T2 (FTD):** T2 pointed out that students often focused too much on creativity and neglected the structured steps of project development, *“Students are focused on the creative part...they forget the project development of the product has to be followed.”* The challenge was getting students to balance both aspects.
- **Reflection:** The struggle to balance creativity with project development reflects a common challenge in interdisciplinary teaching, where technical knowledge and creative expression must coexist. A more structured approach to help students see

how creativity fits into a well-defined project could mitigate this issue. This tension can hinder students from fully integrating both aspects of the learning process (Lillis, 2013; Van de Craen et al., 2007).

## 2. Language challenges:

- **T2 (FTD):** T2 also noted that students struggled with writing product development reports, *“Students already have problems with these in Portuguese, and the fact that most of the work even needs to be in English is another challenge.”* This created an additional layer of difficulty in the learning process.
- **Reflection:** Language barriers can hinder the learning of complex content in technical fields. However, T1 and T2’s collaborative focus on integrating technical language helped address these barriers by scaffolding language learning into the student’s research and project work as expressed in 6.2.1 in the e-mail exchanges.

The second table of comments (Appendix D1, p.402) focuses on the topic of symbolism in embroidery within the context of fashion and textile design. The conversation between T1 (ESP) and T2 (FTD) highlights the importance of understanding the deeper cultural and historical meanings behind the materials used in fashion design. The teachers explored the symbolism in “Bordado de Castelo Branco”, a traditional Portuguese embroidery, to encourage students to move beyond surface-level aesthetics and engage critically with the cultural significance of their designs.

These comments reveal successes and challenges in integrating cultural, historical, and technical knowledge into the students' learning process. The teachers collaborated on using real-world examples, such as museum materials and global perspectives, to deepen students’ research and critical thinking skills. However, they also noted the difficulty in guiding students to balance their creative instincts with the structured analysis required to fully appreciate the symbolic meanings embedded in embroidery.

## Table of comments 2: Fashion and Textile Design – Symbolism in embroidery

### Successes:

#### 1. Focus on symbolism in embroidery:

- **T1 (ESP):** T1 and T2 both agreed on focusing on Bordado de Castelo Branco as a rich source of cultural and religious symbolism. T1 highlighted the importance of understanding the deeper cultural meaning behind the materials, *“There is a lot of history behind this embroidery and I think it would be a good idea to look at the origins of the embroidery.”*
- **T2 (FTD):** T2 reinforced the idea that students needed to understand more than just the physical appearance of embroidery, *“It’s not just a piece of embroidery, there is a lot more than just the physical piece of embroidery.”*
- **Reflection:**  
By integrating cultural and historical research with the technical aspects of embroidery, the teachers helped students gain a broader understanding of fashion design, emphasising the importance of contextual knowledge. This is evidenced from the student’s and teachers’ post-class questionnaires following this class and analysed in the 6.3 Post collaboration stage.

#### 2. Encouraging analytical thinking:

- **T2 (FTD):** T2 observed that students often failed to understand the deeper meanings behind the symbols used in embroidery. *“Students really don’t seem to understand the importance of the background they need for their projects and works.”* The challenge was to encourage a deeper analysis of symbolism beyond its aesthetic value.
- **Reflection:** The focus on symbolism helped students engage with critical thinking and analytical skills. This deeper level of analysis is crucial for students in creative fields, where understanding the meaning behind their designs can lead to more informed and innovative outcomes.

## Effectiveness of the intervention:

### 1. Using historical and cultural context to support research:

- **T1 (ESP):** T1 provided useful materials and images from museums to support students' research, *"I have a collection of images from the embroidery and texts from several museums about the embroidery."* This helped students connect their research with real-world examples.
- **T2 (FTD):** T2 wanted students to look at symbolism globally to broaden their understanding beyond local contexts, *"Students need to see the different interpretations of the images as well as to see the similarities worldwide."*
- **Reflection:**  
The emphasis on both local and global perspectives helped students see embroidery within a wider cultural framework, aiding their research and critical thinking skills.

## Challenges:

### 1. Students overfocus on creativity:

- **T2 (FTD):** As in the previous transcript, T2 again noted that students tended to prioritise creativity over structured project development, *"Students focus on the creative and visual part of the embroidery and they need to understand the cultural and religious weight that embroidery has."*
- **Reflection:** This challenge reflects a broader issue in design education, where students often struggle to balance creativity with research and development. Integrating more research-driven tasks that require critical thinking and analysis could help shift the balance.

The third table of comments (Appendix D1, p.406) refers to the meeting, which explored the integration of sustainability and urbanisation into fashion and textile design, addressing how these themes can influence design projects. In this conversation, T1 (ESP) and T2 (FTD) discussed the relevance of these contemporary topics and their implications

for the fashion industry. T1 initiated the exploration of urbanisation, focusing on patterns and colours as sources of inspiration for design, while T2 emphasised the importance of understanding the connection between sustainability and urbanisation in fashion design.

The comments reflect the teachers' efforts to link design projects with real-world, socially relevant issues, encouraging students to consider both environmental sustainability and urban influences. However, challenges arose as students tended to rely too heavily on external sources like Pinterest for inspiration, limiting their creative expression. To counter this, T1 introduced mood and tone exercises, aimed at broadening students' interpretations of urbanisation and fostering creative thinking.

These comments, like the previous ones, highlights the ongoing effort to balance technical knowledge, creativity, and critical thinking in fashion education. It illustrates how the integration of pressing global issues, such as sustainability, can enhance students' learning experience and further develop their analytical and creative abilities.

#### Tabulated Comments 3: Fashion and Textile Design – Sustainability and Urbanisation

##### **Successes:**

##### **1. Exploring sustainability and urbanisation:**

- **T1 (ESP):** T1 initiated discussions on urbanisation and its patterns and colors as inspiration for design projects, *“I can look at urbanisation as a whole and use texts and images.”*
- **T2 (FTD):** T2 highlighted the importance of students understanding how sustainability and urbanisation are integrated into fashion design, *“For urbanisation, I need students to look at the colours and patterns that they find in urbanisation.”*
- **Reflection:** By integrating the themes of sustainability and urbanisation into design projects, T1 and T2 provided students with relevant and timely subject matter, reinforcing the connection between fashion and societal challenges.

## Challenges:

### 1. Creative limitations and over-reliance on external sources:

- **T2 (FTD):** T2 noted that students often limited their creativity by relying on platforms like Pinterest for their ideas, *“The students limit their searches to images and often fail as they use Pinterest as a source of images and ideas for their work.”*
- **Reflection:** Encouraging students to develop their own original interpretations instead of relying on pre-existing sources could enhance their creativity and independence in research.

## Effectiveness of the Intervention:

### 1. Developing Creativity Through Mood and Tone:

- **T1 (ESP):** T1 suggested using mood and tone exercises to encourage students to think creatively about urbanization, *“Mood and tone can be an exercise that we do at the end to inspire students to think about all of their senses and concentrate on their interpretation.”*
- **T2 (FTD):** T2 supported this by acknowledging the importance of pushing students beyond their usual interpretation, *“I like the mood and tone idea as it forces students to think outside the normal interpretation of urbanization.”*
- **Reflection:** Using mood and tone exercises allowed students to explore urbanization through a sensory lens, broadening their creative interpretations and enhancing their design work. This is evidenced in the 6.3 from the teachers’ and students’ post class questionnaires in the post-collaboration phase of the study.

The collaboration between T1 and T2 in these three transcripts shows a focus on blending technical knowledge, creativity, and language learning. While creativity and language challenges emerged, the structured, practical activities and integration of real-world examples and cultural context led to significant student engagement and progress in both content and language acquisition. The incorporation of sustainability, symbolism,

and urbanisation into fashion design further deepened students' critical thinking skills (see analysis of student questionnaires 6.3.2).

Table 15 provides an overview of key decisions and focus areas identified from the transcript analysis. The detailed discussion that follows explores the dynamics of these decisions, highlighting how T1 and T2 collaborated, the challenges they faced.

**Table 15**

*Overview of collaborative decisions and focus areas based on transcript*

<b>Aspect</b>	<b>T1 (ENG)</b>	<b>T2 (FTD)</b>
Preferences and Objectives (Key Decisions and Focus Areas)	<ul style="list-style-type: none"> <li>- Preferences for conducting materials and research classes.</li> <li>- Specifics about the content and objectives of the materials-related class.</li> <li>- Deciding on vocabulary and language use.</li> <li>- Integration of innovative research areas.</li> <li>- Structuring classes focusing on report writing and presentation language.</li> </ul>	<ul style="list-style-type: none"> <li>- Areas of focus: materials, technical language, and symbolism in embroidery.</li> <li>- Structuring classes around technology, new materials, and textile and fashion design.</li> <li>- Organising classes to research these areas comprehensively and apply findings to product development.</li> <li>- Emphasis on the practical application and presentation of projects in English.</li> <li>- Structuring classes to include project development steps and their importance.</li> </ul>

Material	<ul style="list-style-type: none"> <li>- Using abstracts and search engine simulations to identify innovative materials.</li> <li>- Teaching the structure of formal reports and useful expressions for organising work.</li> </ul>	<ul style="list-style-type: none"> <li>- Importance of writing product development reports to help organise student work effectively.</li> <li>- Addressing challenges and opportunities of working in English from the start.</li> </ul>
Dates	<ul style="list-style-type: none"> <li>- Agreement on dates for classes.</li> </ul>	<ul style="list-style-type: none"> <li>- Scheduling a final project for the end of the semester.</li> </ul>
Assessments	<ul style="list-style-type: none"> <li>- Assessments based on texts and language relating to the three key areas.</li> <li>- Assessing the product development phase through structured steps and language.</li> </ul>	<ul style="list-style-type: none"> <li>- Requirement for students to follow the product development stages and conduct appropriate research using key terms.</li> </ul>

From Table 15 above the teachers focused on integrating content with language learning in their shared objectives and approach. Both teachers outlined key areas of interest and content focus, ensuring that their individual strengths complemented one another.

Regarding preferences and objectives, T1 emphasised the importance of conducting materials and research classes, with a particular focus on vocabulary, language use, and innovative research areas. T2, on the other hand, prioritised materials, technical language, and symbolism in fashion and embroidery. Their decision to collaborate involved a careful alignment of goals, allowing T2 to structure the classes around technology, new materials, and practical applications in fashion design, while T1 supported this by focusing on the language skills necessary to discuss and present these concepts.

In terms of materials, T1 introduced the use of abstracts and search engine simulations to help students identify innovative materials. This process aimed to reinforce the importance of structured report writing and language application for research. T2 worked to ensure that students understood the significance of writing product development reports and integrating language learning directly into their work, thus complementing T1's efforts in fostering language acquisition through practical tasks.

When it came to dates, there was an agreement on class scheduling to ensure sufficient time for both the theoretical and practical aspects of their work. T1 and T2 planned the timeline to align their teaching objectives with the progression of the students' understanding and project development, while T2 specifically emphasized the final project as a culmination of the semester's work.

Assessment was another area where both teachers worked collaboratively to ensure a cohesive assessment strategy. T1 focused on evaluating students based on their understanding of texts and language, linking these elements to the three key areas of their study. Meanwhile, T2's assessment methods were designed to assess students' ability to follow structured product development steps, ensuring that both content and language skills were incorporated into the final assessment.

These points cover the logistical and structural aspects of organising the classes, including setting objectives, determining the content and focus areas, scheduling, and evaluation methods. The data indicates that the decisions for organising the classes appear to follow a chronological order from initial planning and content definition to practical implementation and evaluation. The sequence in which decisions were made based on the transcripts is outlined in Figure 5 below. This visual representation highlights the collaborative process and the steps taken to structure their teaching approach effectively.

Following this diagram, Table 16 provides a detailed summary of each teacher's specific roles and responsibilities extracted from the tabulated comments (Appendix D1, p.402). It presents the responsibilities of T1 (ESP) and T2 (FTD) in relation to class organisation, as well as their shared duties in ensuring the alignment of content and language objectives

for the students. This table serves as a guide to understanding how both teachers contributed to the planning and execution of the course structure and their collaborative approach to addressing the needs of the students.

**Figure 5**

*Sequence of decision-making T1 and T2*

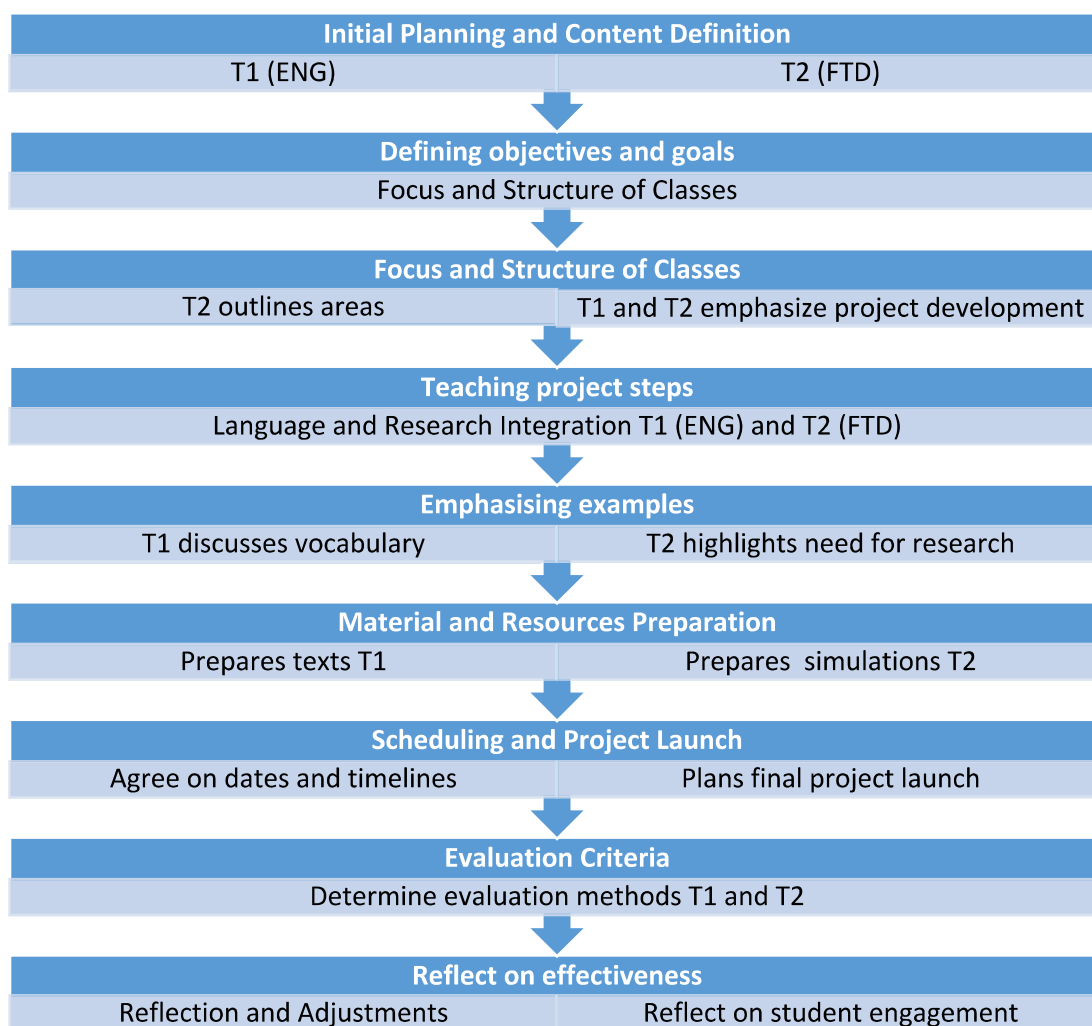


Table 16 below outlines the specific roles and responsibilities of T1 (ESP) and T2 (FTD) as well as their joint responsibilities in the planning and execution of their interdisciplinary courses. The division of duties focuses on various aspects of teaching, including language and technical vocabulary, material preparation, class content, and project development. This table also highlights areas where both teachers collaborated for an alignment between content knowledge and language learning objectives, and reflects on their shared

commitment to supporting student engagement and success. Through this collaborative approach, both T1 and T2 worked together to provide a comprehensive learning experience for their students

**Table 16**

*Roles and Responsibilities T1 and T2*

<b>Roles/ Responsibilities</b>	<b>T1 (ESP)</b>	<b>T2 (FTD)</b>	<b>Joint Responsibilities</b>
Language and technical vocabulary focus	<ul style="list-style-type: none"> <li>- Emphasises technical vocabulary and language for presentations and reports</li> <li>- Focuses on understanding cultural meaning in design (e.g., embroidery)</li> <li>- Supports students' ability to articulate design steps in English</li> </ul>	<ul style="list-style-type: none"> <li>- Highlights importance of technical language</li> <li>- Emphasises understanding the context behind the technical terms (e.g., symbolism in embroidery)</li> </ul>	<ul style="list-style-type: none"> <li>- Focus on integrating technical language into practical design and research</li> </ul>
Material preparation	<ul style="list-style-type: none"> <li>- Prepares texts, abstracts, and search simulations</li> <li>- Provides historical and cultural materials for research (e.g., museum texts on embroidery)</li> <li>- Teaches report structure and key expressions</li> </ul>	<ul style="list-style-type: none"> <li>- Encourages students to independently research materials</li> <li>- Guides students on applying research to product development</li> </ul>	<ul style="list-style-type: none"> <li>- Agree on necessary materials and research tasks for projects</li> </ul>
Class content and structure	<ul style="list-style-type: none"> <li>- Ensures classes cover innovative materials and</li> </ul>	<ul style="list-style-type: none"> <li>- Focuses on practical, real-life examples</li> </ul>	<ul style="list-style-type: none"> <li>- Design class objectives and focus</li> </ul>

	cultural aspects (e.g., symbolism in embroidery)	for project development	areas (e.g., project development steps)
	- Breaks down report structures to aid student comprehension	- Organises content around innovation and new technologies in design	- Focus on balancing creativity and structure
Evaluation	- Bases evaluation on language use in reports and presentations  - Reflects on student engagement with practical tasks	- Evaluates students' understanding of project steps and research, including cultural significance of designs	- Assess students on language comprehension, project development, and practical engagement
Reflection	- Reflects on student engagement and positive response to practical activities  - Considers student suggestions for improving language tasks	- Reflects on student English proficiency and successful practical work  - Notes challenges with balancing creativity and structure	- Reflect on how to improve the balance between creativity, research, and technical language
Focus areas	- N/A	- Emphasises two main areas: materials/technical language, and symbolism in embroidery	- Focus on project development and integrating research

Project development	- Supports students in understanding and articulating project steps in reports and presentations	- Guides students through practical project steps - Stresses real-life examples in project development	- Focus on ensuring students follow structured project development processes
Language integration	- Recommends using technical glossaries and language exercises in research and reports	- Emphasises the need to understand and use technical language in English - Highlights benefits of studying developments in design in English	- Collaboratively integrate technical language into project research and product development
Scheduling	- N/A	- Plans for final project launch at semester's end	- Schedule and agree on key dates for classes, evaluations, and final projects

The roles of the ESP teacher (T1) and the content teacher (T2) in the collaborative process highlight the integration of language and content expertise in ICLHE contexts. T1 (ENG) primarily focuses on language-related aspects, such as material preparation and evaluating students' language use.

On the other hand, T2 (FTD) concentrates on the technical aspects of project development, research application, and the practical focus areas within the discipline. This division of responsibilities reflects the balance between content mastery and language proficiency, as discussed by Coyle (2007, 2010), where both teachers work together to

integrate the 4Cs framework—Content, Communication, Cognition, and Culture—into the curriculum which is evidenced by the lesson plans.

The collaboration between T1 and T2 is evident in their joint efforts to plan, schedule, and reflect on lessons, demonstrating the co-teaching approach described by Dalton-Puffer (2007) and Pavón and Ellison (2013). This process ensures that both language and content goals are addressed simultaneously, contributing to more effective interdisciplinary teaching and assessment strategies, which are evidenced by the assessments developed by the teachers and incorporated in the lesson plans included in the appendices.

The high level of student involvement, as expressed by the comments and the post class questionnaires for both teachers and students (6.3), highlights the success of integrating content and language, as students found the practical activities engaging and relevant. Research by Amerstorfer and Freiin von Münster-Kistner (2021) and Dima and Raluca Ștefan (2021) underscores the importance of active participation in enhancing motivation, with Amerstorfer's problem-based learning (PBL) framework proving especially pertinent to the teaching strategies used. As Amerstorfer and Freiin von Münster-Kistner (2021, p. 12) note, "The authentic, interesting topics and the problem-solving set-up made them experience their learning gains as sustainable," which aligns with the practical focus of this intervention.

Both teachers observed the effectiveness of hands-on learning in this interdisciplinary context, supporting Meyer's (2013) view that practical exercises can effectively teach complex content and language simultaneously. Student feedback and willingness to offer suggestions (outlined in the student feedback analysis 6.3.2) further demonstrate their engagement and investment in the learning process, highlighting the importance of adaptable, student-centered curricula (Dima & Raluca Ștefan, 2021; Walker, 1973).

However, the challenge of balancing creativity with structured project development was a recurring theme, suggesting the need for strategies to meet both language and content objectives without one overshadowing the other (Coyle et al., 2010). Additionally,

the dual challenge of technical language in both Portuguese and English points to the necessity for enhanced scaffolding techniques and targeted language support (Morgado, Coelho, et al., 2015; Vega & Moscoso, 2019).

The success of using real-world examples to ground theoretical concepts was a key finding, as was the importance of continuous feedback and collaborative teaching. Future iterations should focus on reinforcing language support and ensuring that project development receives balanced attention, enabling students to achieve both creative and structured learning goals.

### **Communication and Audiovisual Design (CAD)**

In this collaboration, the "Complementary Co-Teaching" model was implemented, with T1 taking the lead in delivering the technical content, while T3's role was to support and enhance this instruction. This model aligns with the co-teaching framework outlined by Castro Zubizarreta et al. (2017), where one teacher complements the teaching of the other by offering additional support, such as paraphrasing or pre-teaching. Rather than following the traditional division of roles where the content teacher handles only subject-specific knowledge, T1 (ESP) integrated both technical content and language instruction, demonstrating the interdisciplinary approach they applied in their collaboration. The analysis of their teaching practices is presented in the tabulated comments (Appendix D2, p.412).

### **Analysis for T1 (ESP) and T3 (CAD)**

Tabulated comments: Communication and Audio-Visual Design - classes on signage and researching materials and technical language (Standards).

In examining the planning and execution stages of the interdisciplinary teaching intervention, both achievements and obstacles are found, offering insights into the efficacy of the methodology. These provided a critical reflection of the process.

- **Successes:**

### **1. Engagement and participation:**

- **T3 (CAD):** *"The students participate a lot in these classes, so it would be good to see them participate in English."*
- **T1 (ESP):** *"Student participation is also good to check the receptiveness of the class."*
- **Reflection:** Both teachers observe that student participation is a key indicator of engagement. Encouraging students to use English in discussions adds an additional layer of challenge and skill-building.

### **2. Practical activities:**

- **T3 (CAD):** *"Giving the students an exercise in the class is an excellent idea as it forces them to look closely at the concepts and the technical language that is used."*
- **T1 (ESP):** *"I would like to give students a gap-fill exercise that needs them to place specific language relating to the concepts in the correct gap and give them images that they can relate to the different ideas."*
- **Reflection:** Practical activities, such as exercises and gap-fills, help reinforce technical concepts and language learning. Both teachers see value in this hands-on approach.

### **3. Student suggestions:**

- **T3 (CAD):** *"Normally, information design projects are aligned with a component of promoting areas of tourism and valuing artisans, etc."*
- **T1 (ESP):** *"I would like to present the students with the concepts and ask students to provide examples during the lesson."*
- **Reflection:** Student suggestions and involvement in providing examples are seen as a way to personalise learning. Both teachers note the importance of connecting course content to students' real-life experiences and ideas.

## Challenges:

### 1. Language barriers:

- **T3 (CAD):** *"What I'm doing is a curricula unit which is information design, and curiously, it has some of the reality...the nomenclature, as well as the descriptions and the definition of concepts, is very Anglo-Saxon rather than Portuguese."*
- **T1 (ESP):** *"In other classes, there has been an option to use academic language in the development of a project, which requires students to consolidate theory and do research in that specific area."*
- **Reflection:** The technical, Anglo-Saxon terminology presents a significant challenge for students, especially for non-native English speakers. T3 (CAD) focuses on this issue, while T1 (ESP) emphasizes the importance of using academic language in project development to overcome these barriers.

### 2. Project Development Focus:

- **T3 (CAD):** *"One of the issues that I have noticed is that there has been a move away from design."*
- **T1 (ESP):** *"The literature on the two concepts is interlinked."*
- **Reflection:** There is concern about a shift in focus from the creative side of design towards more technical aspects. T1 (ESP) points to the importance of integrating literature and theory, while T3 (CAD) notices a trend away from design-centric projects.

## Effectiveness of the Intervention:

### 1. Integration of Content and Language:

- **T3 (CAD):** *"These concepts are in a very technical context, which really isn't Portuguese, and frequently what happens is the nomenclature, as well as the descriptions and the definition of concepts, is very Anglo-Saxon rather than Portuguese."*

- **T1 (ESP):** *"The concepts are all explained in images and signage."*
- **Reflection:** Both T1 and T3 acknowledge the challenge of integrating technical content and language. T3 (CAD) highlights the complexity of technical terms, while T1 (ESP) supports understanding through visual aids and signage.

## **2. Practical, real-life examples:**

- **T3 (CAD):** *"Information design projects are aligned with a component of promoting areas of tourism and valuing artisans."*
- **T1 (ESP):** *"I would like to present the students with the concepts and ask students to provide examples during the lesson."*
- **Reflection:** Real-life examples are seen as crucial for making abstract concepts more relatable. Both T1 and T3 value the role of practical, real-life applications in the learning process.

## **3. Continuous feedback and adaptation:**

- **T3 (CAD):** *"We can both check the students' understanding with the examples, and it's good to do this in class."*
- **T1 (ESP):** *"An exercise that asks students to provide their examples as well as place the ones given in class into the appropriate categories will test students' understanding of the class."*
- **Reflection:** Both teachers see continuous feedback as essential for gauging student understanding and adapting the course. In-class evaluations and exercises are key to this process.

In the collaboration between T1 (ESP) and T3 (CAD), the "Complementary Co-Teaching" model was applied, where T1 took the lead in delivering the technical content, while T3's role was to complement and enhance this teaching. This aligns with the co-teaching framework outlined by Castro Zubizarreta et al. (2017), where one teacher enriches the learning provided by the other through actions such as paraphrasing or pre-

teaching skills. Unlike traditional roles where the content teacher typically focuses on subject matter, T1 (ESP) blended both technical content and language instruction, demonstrating the interdisciplinary nature of their collaboration.

This model reflects the broader significance of interdisciplinary collaboration in higher education, as noted by Christensen et al. (2021) and Moirano et al. (2020), who emphasise the need for various disciplines to work together to tackle complex problems. In this case, T1's delivery of design-related content was supported by T3 (CAD), who enhanced students' understanding of specialised vocabulary and concepts through complementary teaching strategies in English and providing explanations in Portuguese whenever they found it necessary for students who appeared to have difficulties in English.

This co-teaching arrangement ensured that both technical and linguistic demands were met, creating a more holistic learning environment, as recommended by Cummins (2000, 2008), who advocates for integrating language proficiency into content instruction to support students' understanding of complex academic tasks.

Table 17 below provides an outline of the key focus areas, objective definitions, curriculum and materials dates and scheduling, evaluation and feedback for classes related to CAD, and information specific to organising the classes. The classes were held within the timetable of T3.

**Table 17***Overview of collaborative decisions and focus areas based on tabulated comments T1 and T3*

<b>Aspect</b>	<b>T1 (ENG)</b>	<b>T3 (CAD)</b>
Objective definition	Emphasises the use of academic language for project development, aiming to consolidate theory and research.	Focuses on concepts like wayfinding and way showing and notes the shift from design to promoting areas of tourism and artisans.
Curriculum and materials	Concepts are explained using images and signage; plans to have students identify and explain these concepts through examples.	Concentrates on explaining wayfinding and way showing with classic examples from literature.
	Utilizes gap-fill exercises and visual lectures to reinforce understanding.	Supports the use of exercises and videos to help students understand and use technical language in context.
Dates and scheduling	Agrees on the proposed dates.	Notes the current schedule of the Information Design unit, which includes several classes followed by exercises for consolidation.
Evaluation and feedback	In-class evaluations based on vocabulary and visual understanding, with exercises to categorise examples.	Agrees with in-class evaluations and values student participation in English.

Key observations from the table include:

**Objective definition:** T1 focuses on emphasising academic language for project development, seeking to consolidate theory and research. This ensures that students not only learn the technical aspects but also develop the language skills required for articulating their projects. T3, on the other hand, focuses on more practical design concepts, such as wayfinding and way showing, and highlights the shift from pure design principles to applications in tourism and artisan promotion. This suggests that the collaboration successfully integrates both technical language and real-world applications of design theory.

**Curriculum and materials:** T1 and T3 use a mix of visual materials to explain complex concepts. T1 plans to have students identify and explain design concepts using signage images, with exercises such as gap-fills and visual lectures reinforcing understanding. T3 supports these materials by using exercises and videos to deepen students' understanding of technical language and concepts in context. This combined approach of theoretical and visual learning ensures that students can grasp both the language and practical application of their studies.

**Dates and scheduling:** Both teachers agree on the proposed dates, with T3 noting the schedule of the Information Design unit. This includes several classes followed by exercises that help students consolidate their learning. The clear scheduling structure highlights the importance of continuity in the teaching process, ensuring that students have adequate time to grasp both theoretical concepts and practical applications.

**Evaluation and feedback:** Evaluation is based on in-class activities that assess both vocabulary and visual understanding, with T1 focusing on exercises that categorise examples. T3 values student participation in English, aligning with the goal of reinforcing language skills alongside technical knowledge. This approach reflects an integrated evaluation system that assesses both content understanding and language proficiency.

The sequence in which decisions are made based on transcript 4 is outlined in the diagram below:

**Figure 6**

*Sequence of decision-making T1 and T3*

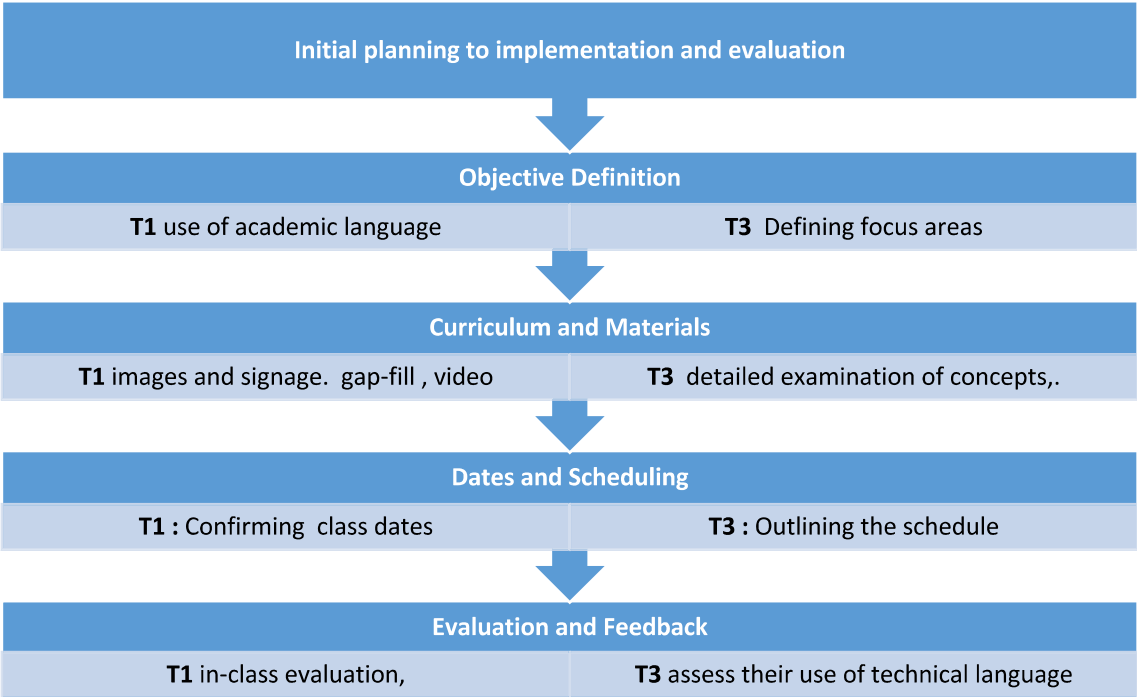


Figure 6 highlights the collaborative process in which T1 and T3 coordinate their teaching methods and content delivery, ensuring an integrated approach to teaching technical language and design concepts. The sequence begins with objective definition, where T1 focuses on integrating academic language with project development, while T3 emphasises the application of wayfinding and tourism-related design concepts. This sets the foundation for how each teacher's focus contributes to the overall course structure, allowing for a complementary balance of theory and practical design.

Next, the curriculum and materials section outlines how teachers complement each other's teaching. T1 uses visual aids and signage to introduce design concepts, while T3 enhances this with videos and exercises that help students contextualise technical language. The decision-making process here reflects a coordinated effort to ensure that

materials are not only relevant to the subject matter but also accessible to students in both a visual and linguistic sense.

The dates and scheduling phase highlights the importance of timing and sequencing in the teaching process. Both T1 and T3 align their class schedules to ensure that their objectives and lesson plans are synchronised, providing students with a structured timeline for learning and application. This coordination is crucial in ensuring that the students can consolidate their learning through exercises after each lecture.

Finally, evaluation and feedback outlines how both teachers assess student progress. T1 emphasises vocabulary and visual understanding, while T3 values student participation in English, ensuring that the evaluation system covers both content comprehension and language proficiency. This decision-making phase ensures that students receive comprehensive feedback, aiding their language development while deepening their technical knowledge.

Figure 6 shows how each teacher's role is interwoven. The sequence of decisions reflects a thoughtful approach to both technical content and language instruction, providing students with the tools needed to succeed in both fields.

Table 18 summarises each participant's specific roles and responsibilities (T1 and T3) extracted from the transcripts in the context of class organisation and their joint responsibilities.

**Table 18***Roles and Responsibilities T1 and T3*

Aspect	T1 (ENG)	T3 (CAD)	Joint Responsibilities
Objective definition	Responsible for deciding on the use of academic language in projects.	Defines focus areas such as wayfinding and wayshowing. Aligns projects with practical applications.	
	Focuses on integrating innovative research areas into the curriculum.	Teaching information design with a focus on wayfinding and way showing.	
	Use of academic language in project development to consolidate theory and conduct research.	Addressing the technical context of the concepts, often Anglo-Saxon rather than Portuguese.	
	Interlinking of literature on the concepts being taught.		
Content integration			Both teachers collaborate to integrate content

across disciplines  
effectively.

Assessment strategies	Plans in-class evaluations focused on vocabulary and visual understanding.	Participates in planning in-class evaluations using examples.	Both teachers collaborate on assessment strategies that evaluate language and content knowledge.
Feedback mechanisms	Designs exercises to categorize examples and check understanding.	Encourages student participation in English to assess their use of technical language.	Collaborate on providing timely and constructive feedback to students.
Student engagement strategies	Monitors student participation as a metric for engagement and receptiveness.	Uses interactive activities to engage students in discussions.	Jointly develop strategies to maintain high levels of student engagement.
Dates and scheduling	Confirms and agrees on class dates, coordinating scheduling.	Curriculum unit schedule involves ending theory next week, followed by exercises to consolidate learning.	Both teachers are involved in scheduling classes and ensuring the timeline is suitable.

Resource utilization	Develops materials to explain concepts using images and signage.	Uses a video to help students understand and explain project decisions.	Both teachers contribute to developing practical activities and exercises that reinforce integration.
Instructional methods	Plans gap-fill exercises to reinforce language and concept understanding.	Explains concepts with classic examples from literature. Incorporates class exercises for examination.	

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The table above illustrates how T1 and T3's roles and responsibilities are complementary, emphasising the importance of collaboration in an interdisciplinary teaching environment. Their shared responsibilities in curriculum planning, resource development, student engagement, and assessment highlight the effectiveness of their partnership in supporting students' growth in both technical language and design skills. T1 is primarily responsible for integrating academic language into project development, ensuring that students are able to use precise language to articulate theoretical concepts and research. This focus supports students' ability to consolidate their understanding of the subject matter through the use of formal language. On the other hand, T3 focuses on defining practical aspects of the design process, including wayfinding and wayshowing. T3 also ensures that the course content is aligned with practical applications, focusing on bridging theoretical concepts with real-world scenarios in design. Together, they form a balanced approach that combines linguistic proficiency with practical design knowledge, enabling students to apply technical terms in context.

Content integration: The integration of content across disciplines is a joint responsibility, reflecting the interdisciplinary nature of the course. Both T1 and T3 collaborate to ensure that language learning is seamlessly integrated with design concepts, allowing students to see the relevance of technical language in both the academic and practical contexts of design.

Assessment strategies: T1 plans in-class evaluations focused on students' understanding of technical vocabulary and visual comprehension, aiming to assess their linguistic and cognitive engagement with the course material. T3 contributes by planning evaluations based on practical examples and their application, ensuring that students are tested on both technical language use and their ability to contextualize design concepts. Their joint approach to assessment ensures that evaluations reflect both content mastery and language proficiency, promoting holistic student development.

Feedback mechanisms: T1 develops exercises that categorise examples and check for understanding, which provide students with the opportunity to practice both language and content. T3 encourages students to engage in discussions, monitoring their participation to assess their use of technical language in context. Together, they provide a robust feedback system that encourages ongoing student reflection, helping to identify areas where students may need additional support in either language or design understanding.

Student engagement strategies: T1 monitors student participation, using it as a metric for engagement and receptiveness. This is important for gauging how well students are absorbing both the language and content. T3, in turn, uses interactive activities to spark discussions and deeper engagement with the material. By combining these strategies, both teachers ensure that students remain actively involved in their learning process, promoting an environment that fosters both language development and design skills.

Dates and scheduling: T1 and T3 coordinate on scheduling, confirming and agreeing on class dates to ensure that the timeline supports effective learning. T3 notes that the current schedule involves completing theory by the following week, followed by exercises to reinforce learning. Their joint involvement in scheduling ensures that the course

progresses in a structured manner, with ample time for theory consolidation and hands-on practice.

Resource utilisation: T1 contributes to developing materials that explain concepts using images and signage, supporting visual and linguistic learning. T3 complements this by using videos to help students understand and explain their project decisions, enhancing both the visual and contextual learning experience. The collaboration in resource development ensures that students are exposed to a variety of materials that cater to both their language needs and design knowledge.

Instructional methods: T1 uses gap-fill exercises to reinforce understanding of both language and design concepts, helping students develop their ability to use technical language effectively. T3 explains concepts with classic examples from literature, ensuring that students understand the theoretical underpinnings of design. By combining gap-fill exercises with theoretical examples, the teachers provide students with a comprehensive instructional approach that balances language acquisition with design knowledge.

The analysis of T1 (ESP) and T3 (CAD) demonstrates the effectiveness of integrating content and language learning through distinct but complementary approaches. While T3 (CAD) focused on applying technical concepts in real-world contexts, T1 (ESP) emphasised academic language consolidation. Both teachers aimed to engage students through participatory, hands-on activities, fostering deeper comprehension and active use of language. The challenges related to technical language underscore the importance of targeted support, a finding that aligns with the literature on interdisciplinary teaching strategies (Marsh & Langé, 2000; Meyer, 2013).

### **Technological and graphic design (TGD)**

The following analysis is based on meetings between two teachers, T1 (ESP) and T4 (TGD), who collaborated to integrate language and content in the context of Technological and Graphic Design, with a focus on logos, branding, and the technical language associated with these topics. This section is informed by tabulated comments (Appendix D3, p.414),

in which the teachers discuss various aspects of the curriculum, including terminology understanding, visual learning, and student engagement. The comments highlight the importance of practical activities, project-based learning, and the use of real-world examples, such as logos and branding, to enhance students' understanding of both design concepts and technical language. The analysis examines the successes, challenges, and effectiveness of their intervention, as well as the teachers' reflections on their collaborative teaching approach.

### **Analysis for T1 (ESP) and T4 (TGD)**

**Tabulated comments: Technological and graphic design (TGD), classes on logos and brands, technical language and terminology.**

#### **Successes:**

##### **1. Engagement and Participation:**

- **T4 (TGD):** T4 emphasised the importance of correct terminology in the context of Technological and Graphic Design. One key success noted was the active role of the teacher in transitioning from a traditional teachers to a Creative Director, which encouraged students to engage in practical applications of theory. T4 stated, *"At that moment, I stop being the teacher and start being the Creative Director and they have a project to develop,"* highlighting a project-based approach that fosters student participation.
- **T1 (ESP):** T1 supported this by introducing language to help clarify terminology for the students. T1 suggested starting discussions focused on specific vocabulary, saying, *"Starting a class discussion is a good way to address student doubts."*
- **Reflection:** The collaborative approach between T4 and T1 promoted an interactive classroom environment where both language and content were addressed simultaneously. The focus on project-based learning and discussions created opportunities for active student participation and engagement with technical language, aligning with ICLHE principles of integrating language with content.

## 2. Practical Activities:

- **T4 (TGD):** T4 strongly advocated for the use of visuals, particularly logos and brands, as part of the design projects. T4 remarked, *"I really want the students to have a visual idea and the importance of the language when they use the terms,"* emphasising the link between terminology and its practical use in design.
- **T1 (ESP):** T1 echoed this, suggesting that terms should be set alongside visual explanations of the logos or brands. T1 offered, *"The terms that are used can be set alongside the visual explanation of the logo, brand, etc."*
- **Reflection:** The use of practical, real-life examples (e.g., logos and branding) integrated with technical language provided students with hands-on activities that reinforced their understanding of both the content and the language. This approach aligns with the ICLHE framework's emphasis on using meaningful, contextualised content to aid language acquisition.

## 3. Student Suggestions:

- **T4 (TGD):** T4 expressed interest in using more specialised language support, recognising that students often struggled with technical terminology. T4 noted, *"There is an incorrect use of terminology in our area of study, and it would be beneficial to have a specialist in language explain the difference in the terminology."*
- **T1 (ESP):** T1 was willing to adapt materials to student needs, offering to include specific logos or brands for analysis. T1 stated, *"If you have any specific logos or brands you want me to look at, you can let me know,"* demonstrating flexibility and responsiveness to content teacher's preferences.
- **Reflection:** Both teachers' readiness to incorporate student suggestions into the curriculum demonstrated a commitment to fostering a responsive and adaptive

learning environment. This level of flexibility is key to ensuring students' active engagement and addressing their individual needs in an interdisciplinary setting.

### **Challenges:**

#### **1. Language Barriers:**

- **T4 (TGD):** T4 highlighted the challenge of students misusing terminology and expressed the need for clearer language instruction. T4 mentioned, *"There is an incorrect use of terminology in our area of study,"* recognizing that students struggled with the technical language of graphic design, especially when translating between English and Portuguese.
- **T1 (ESP):** T1 supported this by providing additional examples to clarify the differences between similar terms, saying, *"Providing other examples can ensure understanding of language that appears to be so similar but which, in fact, is different."* T1 aimed to address students' confusion by offering varied examples that illustrated nuanced language differences.
- **Reflection:** Language barriers, especially in the use of technical terminology, presented a significant challenge. However, both teachers collaborated to address these difficulties by providing clear examples and fostering discussions, demonstrating the importance of addressing linguistic challenges in interdisciplinary teaching. This evidenced by the lesson plans and the e-mail exchanges.

#### **2. Project Development Focus:**

- **T4 (TGD):** T4 focused on helping students see the relevance of theory to practical design projects, transitioning from theory-based learning to project-based applications. T4 noted, *"So the idea here is why do I need this theory and how do I apply it,"* which revealed a challenge in getting students to see the practical application of theoretical content.

- **T1 (ESP):** T1 added a language perspective by emphasising the need for precise terminology in these projects. However, aligning theory with terminology was sometimes difficult, and T1 observed that there was a need to break down complex vocabulary during project development.
- **Reflection:** The While T4 focused on the creative development process, T1 worked to ensure that students understood the language necessary for these projects. This collaboration was crucial for helping students successfully integrate theory and language into their project work.

### **Effectiveness of the Intervention:**

#### **1. Integration of Content and Language:**

- **T4 (TGD):** T4 consistently emphasised the importance of using correct terminology in design projects, ensuring students understood the connection between language and content. T4 remarked, *"The fact that, as an expert, you realise the difficulties in translating from English into Portuguese, I believe, gives the students valuable insight into the uses of the terminology."*
- **T1 (ESP):** T1 contributed by offering structured discussions and vocabulary-building exercises to complement T4's focus on content. T1's approach of using discussions to clarify language concepts helped ensure that the language component was integrated effectively into the overall curriculum.
- **Reflection:** The collaboration between T4 and T1 resulted in both teachers addressing the importance of correct terminology while engaging students with real-world design projects.

#### **2. Practical, Real-Life Examples:**

- **T4 (TGD):** T4 highlighted the importance of using well-known logos and brands as examples, noting, *"We can pick the logos, and I can send you the ones I use. They are all classics."* This use of recognisable real-world examples aimed to help students apply technical language in a meaningful context.

- **T1 (ESP):** T1 supported this by ensuring that the language used in these examples was well-explained and connected to visual elements, as demonstrated in the lesson plans aimed to fostering a better understanding of the terminology in practice.
- **Reflection:**  
The focus on practical, real-life examples was a strength of the intervention, reinforcing both content and language learning in an applied context.

### 3. Continuous Feedback and Adaptation:

- **T4 (TGD):** T4 suggested providing continuous feedback during project development, mentioning the value of student discussions and reflection, stating, *"I would like to participate in the discussion."*
- **T1 (ESP):** T1 agreed that ongoing discussions were key to ensuring students' understanding of technical terms. T1 suggested offering additional examples and facilitating conversations to address any language-related challenges.
- **Reflection:** Continuous feedback and reflection were integral parts of the intervention, with both teachers committed to adapting their approaches based on student needs.

Table 19 below provides generalised information about classes and focuses on the logistical aspects of organising class sessions.

**Table 19***Analysis of comments 5: T1 and T4*

<b>Aspect</b>	<b>T1 (ENG)</b>	<b>T4 (TGD)</b>	<b>Common points</b>
Terminology and concept understanding	- Emphasises the importance of addressing student doubts through class discussions.	- Concerned about students' understanding of terminology and concepts.  - Stresses the need for a language specialist to explain differences.	- Both stress the importance of students understanding terminology in their field and its practical applications.
Visual learning and language importance	- Discusses the use of examples to ensure comprehension of language terms.	- Highlights the importance of visual understanding of terms.  - Supports integrating visual aids with language explanations.	- Both discuss the integration of visual aids (such as logos) with language explanations to enhance understanding.
Scheduling and timing	- Confirms the suitability of dates and times for classes.	- Confirms the suitability of dates and times for classes.  - Proposes a class session to cover specific curricular areas.	- Both confirm the suitability of dates and times for the classes.
Evaluation methods	- Suggests starting class discussions to address student doubts.  - Provides additional examples to ensure comprehension.	- Interested in participating in discussions.  - Supports using different examples to encourage technical language use.	- Both discuss evaluation methods involving class discussions and examples to address doubts and reinforce learning.

The table shows a summary of the key aspects of the collaboration between T1 (ESP) and T4 (TGD), focusing on terminology understanding, visual learning, scheduling, and evaluation methods in their joint classes

**Terminology and concept understanding:** Both teachers emphasise the importance of students understanding the correct terminology used in their respective fields. T1 focuses on addressing student doubts through class discussions, while T4 ensures that students grasp the terminology and concepts specific to graphic design. T4 also highlights the necessity of a language specialist to help explain the differences in terminology, especially when it comes to nuances in technical language. This collaboration underscores the critical role that accurate terminology plays in students' ability to engage with design concepts, reinforcing the importance of integrating language and content in the learning process.

**Visual learning and language importance:** T1 and T4 agree on the significance of using visual aids to support language comprehension. T1 mentions using examples to ensure students understand the language terms, while T4 emphasises the importance of visual learning, specifically logos, to help students understand how terminology connects to real-world design applications. Both teachers highlight that visual aids, such as logos and branding, are essential tools in making technical terms more comprehensible and meaningful for students. This integration of visual learning with language instruction reflects a holistic approach to teaching, where students are encouraged to understand terms not just through definitions but in the context of practical applications.

**Scheduling and timing:** Both T1 and T4 confirm the suitability of the dates and times for their joint classes, ensuring that the scheduling aligns with the needs of the curriculum. T1 proposes a class session to cover specific curricular areas, while T4 concurs with the overall schedule. Their collaborative scheduling ensures that students have sufficient time to engage with theoretical concepts and practical applications, allowing for a balanced approach to learning. This attention to timing ensures that key concepts are thoroughly covered, and that the class pace supports the integration of language and content.

Assessment methods: Both teachers place a strong emphasis on using class discussions as a method for assessing student understanding. T1 suggests starting discussions to address student doubts and reinforce comprehension, while T4 supports the use of different examples to help students practice using technical language. Both teachers recognise the value of interactive, example-based evaluations, which clarify terminology and foster a deeper understanding of the material. This collaborative approach to evaluation reflects the importance of ongoing feedback, ensuring that students receive timely guidance to strengthen their language skills and content knowledge.

Figure 7 below illustrates the sequence of decision-making in the collaboration between T1 (ESP) and T4 (TGD), highlighting the key stages and decisions made throughout their joint classes. The figure provides a visual representation of the decision-making process, which is central to understanding how the teachers coordinated their teaching strategies, integrated language and content, and ensured that the students engaged with both theoretical and practical aspects of the curriculum. The decisions outlined in this figure reflect the teachers' approach to aligning their teaching objectives, structuring class activities, and assessing student progress in a way that aimed to integrate both language and technical knowledge.

**Figure 7**

*Sequence of decision-making T1 and T4*

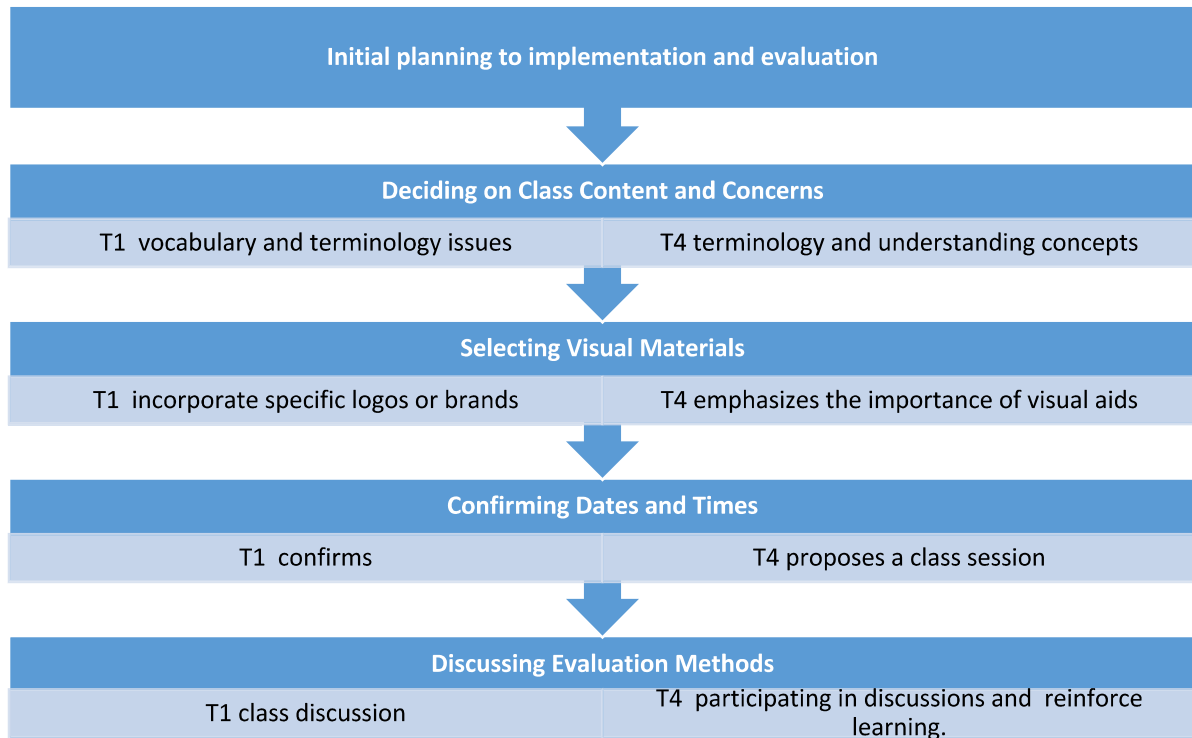


Table 20 summarises the specific roles and responsibilities of T1 (ENG) and T4 (TGD) in the context of class organisation and their joint responsibilities. The table highlights key aspects of their collaborative teaching approach, focusing on vocabulary and reinforcement, the use of visual aids, scheduling and timing, and teaching methods.

**Table 20 Specific roles and responsibilities T1 and T4***Specific roles and responsibilities T1 and T4*

<b>Aspect</b>	<b>T1 (ENG)</b>	<b>T4 (TGD)</b>	<b>Joint Responsibilities</b>
Vocabulary and reinforcement	<ul style="list-style-type: none"> <li>- Takes responsibility for addressing specific vocabulary issues.</li> <li>- Suggests class discussions and providing examples to reinforce understanding.</li> </ul>	<ul style="list-style-type: none"> <li>- Focuses on the importance of visual aids.</li> <li>- Suggests selecting logos for use in class.</li> <li>- Participates in discussions and provides examples to reinforce learning.</li> </ul>	<ul style="list-style-type: none"> <li>- Both emphasise providing examples to reinforce understanding.</li> <li>- Both support class discussions.</li> </ul>
Visual aids	<ul style="list-style-type: none"> <li>- Not specifically mentioned.</li> </ul>	<ul style="list-style-type: none"> <li>- Focuses on selecting logos for use in class to enhance visual learning.</li> </ul>	<ul style="list-style-type: none"> <li>- Both see the value in reinforcing learning through various means, though T4 specifically focuses on visual aids.</li> </ul>
Scheduling and timing	<ul style="list-style-type: none"> <li>- Agrees on the dates and times for classes.</li> </ul>	<ul style="list-style-type: none"> <li>- Agrees on the dates and times for classes.</li> </ul>	<ul style="list-style-type: none"> <li>- Both agree on the dates and times for classes, indicating collaborative scheduling.</li> </ul>
Teaching methods	<ul style="list-style-type: none"> <li>- Uses class discussions and examples to reinforce understanding.</li> </ul>	<ul style="list-style-type: none"> <li>- Participates in discussions and uses examples to encourage learning.</li> </ul>	<ul style="list-style-type: none"> <li>- Both use class discussions and examples as teaching methods.</li> </ul>

Table 20 above highlights the complementary roles and shared responsibilities of T1 and T4 in their collaborative teaching efforts. Their partnership is characterised by mutual agreement on key aspects such as vocabulary reinforcement, the use of visual aids, class scheduling, and teaching methods, all aimed at enhancing student learning through an integrated approach to language and content.

**Vocabulary and reinforcement:** T1 takes the lead in addressing specific vocabulary issues by initiating class discussions and providing examples to reinforce students' understanding. T4, while not focusing on vocabulary specifically, emphasizes the importance of using real-world examples, such as logos, to help students grasp terminology in the context of graphic design. Both teachers agree on the value of using examples and discussions to support students' comprehension and reinforce learning. Their collaborative efforts in this area ensure that students not only understand the language but also connect it with practical applications in design.

**Visual aids:** T4 emphasizes the use of visual aids, particularly logos, to enhance students' understanding of technical terms in graphic design. While T1 does not mention visual aids directly, both teachers agree on the importance of reinforcing learning through various means. T4's focus on visual learning supports the integration of language with practical design concepts, which is essential in helping students connect theoretical knowledge with real-world design tasks.

**Scheduling and timing:** Both T1 and T4 work together to ensure that the scheduling of their classes aligns with the curriculum's needs. They confirm the suitability of dates and times for their joint classes, reflecting their collaborative approach to class planning. This attention to scheduling allows for a balanced pace in covering both theoretical content and practical design projects, ensuring that students have sufficient time for engagement and learning.

**Teaching methods:** Both T1 and T4 employ class discussions and examples as their primary teaching methods. T1 uses discussions and examples to reinforce students' understanding of terminology, while T4 also participates in these discussions and uses

examples to encourage learning. Their shared teaching methods ensure that students are not only exposed to theoretical concepts but are also given the opportunity to practice and apply what they've learned in real-world contexts. These roles indicate a division of responsibilities between language instruction and visual design, with T1 primarily responsible for language-related aspects and T4 focusing on visual concepts and materials.

The collaborative approach between T4 (TGD) and T1 (ESP) effectively integrated content and language learning in a graphic design context, embodying the principles of Integrating Content and Language in Higher Education (ICLHE) evidenced by the post-class questionnaires from teachers and students discussed 6.3 Stage 3: Post collaboration stage. Both teachers emphasised the importance of using correct terminology and practical applications of theoretical concepts. Despite challenges, such as language barriers and complexities in project development, they aimed to provide clear explanations and foster.

The analysis of T1 and T4's comments underscores several key insights into the integration of language and content learning. Both teachers recognised that the synergy between these two areas was critical to improving student comprehension, especially for complex concepts. The use of practical examples, visual aids, and real-life scenarios is particularly instrumental in making abstract and technical ideas more accessible, reflecting effective strategies found in CLIL and ICLHE settings (Meyer, 2015; Marsh, 2012) and evidenced by the post-class questionnaires from teachers and students discussed 6.3 Stage 3: Post collaboration stage and in the final questionnaires. This highlights how multimodal resources can aid in demystifying subject-specific language.

Additionally, the clear objectives set for class organisation—improving student proficiency in terminology and conceptual understanding—were essential for achieving the intended educational goals. This structured approach to lesson planning ensured that students received a balanced education that strengthened content knowledge and language skills. Such organisation aligns well with best practices in interdisciplinary and language-integrated teaching (Coyle, 2006; Ellison et al., 2022; Morgado, Arau Ribeiro, et al., 2015).

The well-defined roles and responsibilities of each teacher also contributed to the intervention's success. T1 (ESP) primarily focused on integrating language learning objectives, helping students navigate technical terminology, while T4 (TGD) concentrated on visual and conceptual aspects, guiding students in applying their knowledge to graphic design. This division of labor enabled both teachers to address the dual challenges of teaching content and language, demonstrating effective team teaching and division of expertise (Meyer, 2015; Marsh, 2012). The complementary nature of their roles ensured that both content and language learning were fully covered, offering a more holistic educational experience.

Moreover, the planning and implementation process illustrated how collaborative teaching can overcome the inherent challenges of interdisciplinary education. T1 and T4 organised their collaboration strategically, using joint discussions, co-planning, and reflection to adapt their teaching approaches to students' evolving needs. This cooperation was crucial for tackling interdisciplinary barriers, particularly those related to language proficiency and project complexity. As Lyster (2017) and Pérez-Cañado (2016) emphasise, teacher collaboration is a vital asset in overcoming such barriers, as it allows for shared expertise and continuous adjustment to classroom dynamics.

The ESP and the content teachers collectively emphasised the importance of integrating language with technical content through practical applications and real-life examples. T2 focused on Fashion and Textile Design, encouraging students to engage with technology, new materials, and design concepts through English texts. T3 applied classic literature to clarify technical concepts in Communication and Audio Visual Design, making complex ideas more relatable. T4 emphasised using visual aids to support understanding in graphic design, highlighting the importance of multimodal approaches. T1 supported these efforts by reinforcing language through gap-fill exercises and visual lectures, ensuring students effectively utilised both content and language.

Despite the successes, several challenges emerged. The teachers identified issues with terminology comprehension, emphasising the need for specialised language support to

address these barriers. T1 highlighted difficulties in students' understanding of technical terms, while T3 and T4 noted challenges in translating terminology between English and Portuguese. Additionally, time and resource constraints affected the depth of understanding and practical application, suggesting a need for better resource allocation and support.

The collaborative approach involved setting clear objectives, defining roles, and designing curricula that integrated both content and language learning. T1 was responsible for language objectives and evaluations, T2 focused on integrating language with Fashion and Textile Design, T3 applied theoretical concepts in Communication and Audio Visual Design, and T4 utilized visual aids and practical applications. This clear division of responsibilities facilitated a comprehensive approach to teaching, ensuring that both language and content were addressed effectively.

The intervention plan successfully integrated language and technical content, with all teachers reporting enhanced student engagement and improved learning outcomes. The use of practical activities and interactive methods effectively bridges disciplinary boundaries and fosters a more cohesive learning experience. However, balancing content and language objectives and addressing language barriers remain ongoing challenges.

In response to these challenges, the teachers demonstrated remarkable adaptability. For instance, T1 adjusted the pace of instruction based on student feedback, while T3 incorporated additional resources to clarify complex terminology. This is evidenced by the e-mail exchanges and the post-class questionnaires and final questionnaires. This adaptability is crucial for responding to the dynamic needs of students and highlights the importance of ongoing professional development, such as workshops on effective strategies for integrating technical language in diverse contexts.

The collaborative efforts of the teachers illustrate the value of integrating content and language learning in higher education. The intervention plan not only addressed key challenges but also leveraged practical applications to support student learning. As evidenced by the transcripts, teacher meetings served as crucial platforms for

collaborative planning and reflection, reinforcing the notion that effective interdisciplinary teaching requires clear objectives, coordinated strategies, and a commitment to continuous improvement.

The lesson plans and student assessments further emphasised the deliberate integration of language objectives with subject-specific content. Significant language proficiency and content knowledge improvements were observed over time.

Stage 2 of the research highlights the importance of interdisciplinary collaboration in addressing educational challenges and promoting student learning outcomes within the CLIL framework.

The analysis of Stage 2 sheds light on the importance of addressing the multifaceted challenges within the CLIL framework. The integration of language and content, as observed in the collaborative efforts of T1, T2, T3, and T4, highlights how practical applications and real-life examples can bridge gaps in understanding, making complex technical content more accessible to students. This approach aligns with the broader challenges identified in research, such as the difficulty students face with specialised terminology, complex sentence structures, and the cognitive demands of higher education.

### **6.3. Stage 3: Post collaboration phase**

The key activities that characterise this stage are teacher reflections and student feedback and assessments. By synthesising these elements, Stage 3 aimed to provide a comprehensive reflection on the efficacy of interdisciplinary collaboration in enhancing teaching practices and student learning outcomes.

#### **6.3.1. Teacher insights from post-class and final questionnaires:**

For the analysis of Stage 3, the focus is specifically on teacher reflections regarding their experiences, challenges, and successes in implementing interdisciplinary collaboration. In the post-class questionnaires, the content teachers rated their experience with interdisciplinary collaboration highly, indicating successful integration of language and

content objectives. This reflects strong outcome expectations from SCT, where the teachers believed that their collaboration with the ESP teacher would yield positive results in student learning, and this expectation was fulfilled. The teachers' high ratings for successful collaboration underscore their confidence in the process, which is a key aspect of self-efficacy. The teachers completed a questionnaire after each content topic, which provided valuable insights into their experiences and perspectives. This feedback helped to capture their reflections on the effectiveness of the interdisciplinary collaboration, as well as the challenges and successes encountered in integrating language and content through-out the interdisciplinary collaboration. The following insights can be extracted from the responses to the post-class and final questionnaires:

## **1 Content teacher post-class questionnaire analysis**

### **Integration of language and content objectives**

#### **1. Overall success and achievement of objectives:**

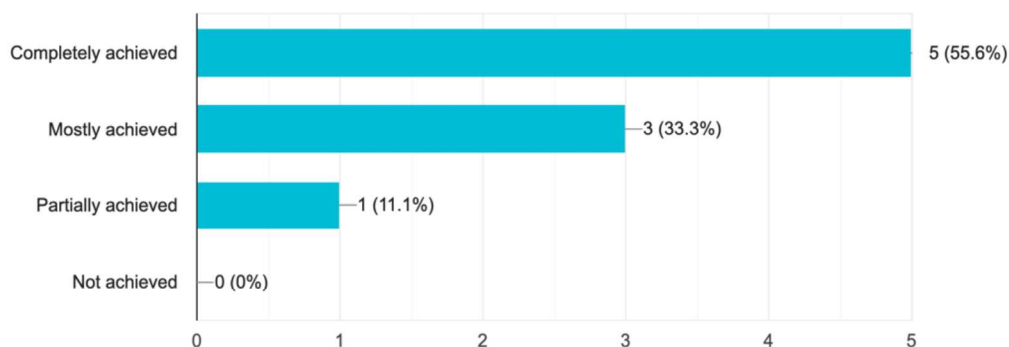
Teachers rated the interdisciplinary collaboration highly, with most indicating it was entirely or mostly successful in integrating language learning with content. This positive sentiment is further illustrated in Figure 8, which summarizes responses to the question: "To what extent do you believe the language learning objectives were achieved through the collaboration?". The teachers reported that lesson planning and the implementation of interdisciplinary approaches effectively achieved the learning objectives for both language and content. Their emphasis on clear, structured co-planning and alignment of objectives demonstrates strong expectancies for success (EVT)—they anticipated that setting clear goals for both content and language would lead to better student outcomes, and the success of their strategies confirmed this belief.

**Figure 8**

*Perceived achievement of language learning objectives through collaboration*

To what extent do you believe the language learning objectives were achieved through the collaboration?

9 responses



For instance, one teacher noted, "It was excellent to have the two teachers for a project that is extensive and requires the expertise of both."

2. Effective teaching strategies:

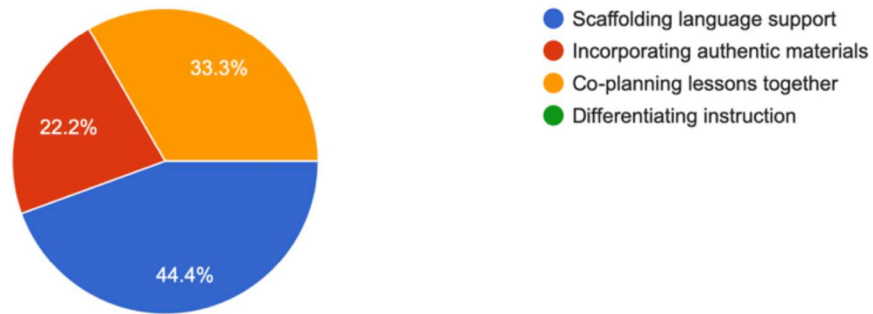
Effective teaching methods, such as scaffolding language support and integrating project-based learning, reflect a high level of self-efficacy (SCT) among the teachers. They demonstrated confidence in delivering complex interdisciplinary content using techniques that engage students in language learning and subject-matter expertise. As shown in Figure 9, the most effective teaching strategies identified by the teachers include scaffolding language support (44.4%), co-planning lessons together (33.3%), incorporating authentic materials (22.2%), and differentiated instruction. Moreover, the reliance on authentic materials and student-centred activities shows that the teachers valued these strategies as highly effective, aligning with task value (EVT).

**Figure 9**

*Most effective teaching strategies and approaches*

Which teaching strategies or approaches proved most effective during the collaboration in the CLIL context?

9 responses



**3. Challenges and limitations:**

Common challenges included terminology complexity and difficulties translating technical terms from English to Portuguese. While these challenges could hinder student progress, the teachers' proactive problem-solving and reliance on collaboration with the ESP teacher demonstrated strong self-efficacy and resilience. This willingness to tackle obstacles further highlights the positive influence of outcome expectations in motivating them to persist with interdisciplinary collaboration. The teachers found that students required significant guidance and support to develop autonomous learning skills. Scheduling and coordination were also logistical challenges, although email communication and mini-meetings helped mitigate these issues.

**Material development**

In developing teaching materials, the teachers' recognition of the need for constantly updated resources reflects task value (EVT)—they understood the importance of using relevant and current materials to maximise the effectiveness of interdisciplinary teaching. The use of digital resources and authentic materials like scientific articles and technical texts illustrated the teachers' awareness of the real-world applicability of language and

content learning, enhancing students' engagement. One teacher commented, "Recursos digitais serão de privilegiar, textos e vídeos e materiais didáticos para consulta dos estudantes" (Digital resources will be prioritised, texts and videos, and teaching materials for student consultation).

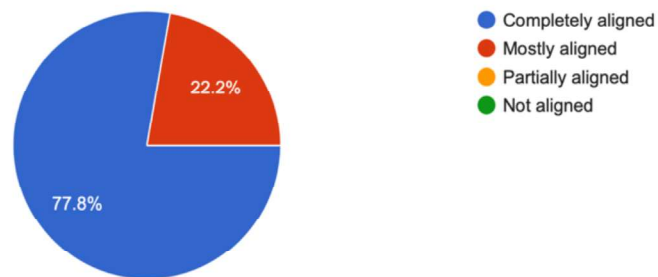
### Assessment methods

Teachers' reflections on the alignment of assessments with interdisciplinary learning objectives suggest strong expectancies for success (EVT) in accurately evaluating students' progress. As illustrated in Figure 10, teachers perceive their assessment methods as aligned with language and content objectives, with 77.8% indicating that their assessments were completely aligned and 22.2% noting they were mostly aligned. Their use of diverse assessment methods demonstrated a commitment to assessing both language and content proficiency. This approach aligns with their self-efficacy in managing complex assessment strategies.

**Figure 10**

*Perceived alignment of assessment methods with language and content objectives*

To what extent did the assessment methods align with the language and content learning objectives?  
9 responses



Teachers noted that "completely aligned" assessments were crucial for accurately measuring student progress.

### **Impact on student learning**

The teachers reported positive impacts on student engagement and learning outcomes, particularly noting language proficiency and content understanding improvements. These observations are consistent with outcome expectations from SCT, as the teachers had anticipated that their collaborative approach would enhance student performance, and the outcomes validated this expectation. Their ability to engage students with lower English proficiency also demonstrates their belief in their capacity to support a diverse range of learners, further reinforcing their self-efficacy.

There was a noticeable improvement in students' language skills and content understanding, particularly when teachers integrated language support into content instruction. One teacher remarked, "As the classes progress, students appear to be doing better with the classes in English and understand the concepts better."

### **Collaboration dynamics**

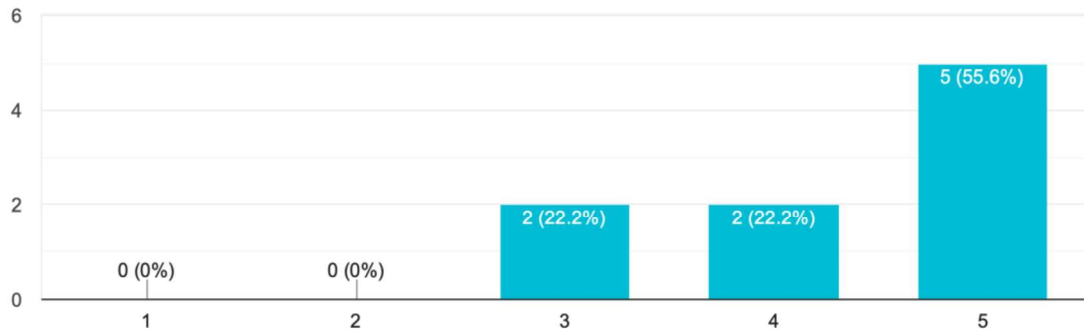
The collaboration between ESP and content teachers was generally effective, with positive feedback on the joint planning and teaching efforts. As shown in Figure 11, teachers rated the overall success of the collaboration in integrating language and content highly. The reflections also emphasise the importance of collaboration between ESP and content teachers, with positive feedback on joint planning and teaching efforts. This reflects both SCT and EVT, as teachers' collaboration enhanced their self-efficacy—they believed in their ability to manage interdisciplinary teaching—and their perception of the task value of collaboration. Teachers saw interdisciplinary work as professionally enriching, contributing to their own development while fostering a deeper connection between content and language instruction.

**Figure 11**

*Rating of the overall success of the collaboration*

On a scale of 1 to 5, how would you rate the overall success of the interdisciplinary collaboration in integrating language learning with content?

9 responses



They recommended expanding interdisciplinary collaborations to other curricular units and incorporating ongoing student language support. It becomes clear that the teachers' high levels of self-efficacy, outcome expectations, and the task value they assign to interdisciplinary collaboration significantly contributed to their positive experience. The teachers' confidence in their teaching abilities, their belief in the positive outcomes of collaboration, and their recognition of the value of integrating language and content have all played a role in enhancing student engagement and learning outcomes. This highlights the critical role that SCT and EVT play in understanding teachers' receptiveness to and success in interdisciplinary collaboration.

## **2 Content teacher's final questionnaire**

The analysis is organised with the data referring to the criteria used for developing the questionnaire for this specific phase, as explained in Section 4.8.2 (Table 7). It highlights the successful implementation of interdisciplinary collaboration between ESP and content teachers. Teachers reported high levels of satisfaction, significant benefits to student learning and engagement, and professional growth. While challenges such as time constraints and workload management were noted, practical strategies and strong

teamwork helped mitigate these issues. The insights gathered underscore the value of ongoing collaboration and suggest areas for further support and resource allocation to enhance the sustainability and impact of CLIL instruction.

The following is a detailed analysis of the responses:

**Overall success of interdisciplinary collaboration Q3-7:** Teachers rated their experience collaborating with an ESP teacher in the CLIL context very highly, scoring 5 out of 5. This strong positive reception towards interdisciplinary collaboration is consistent with findings by Coyle, Hood, and Marsh (2010) and Dalton-Puffer (2011), who highlight the effectiveness of CLIL in promoting positive collaborative experiences.

### **Benefits and advantages of collaboration**

Significant benefits noted by teachers, such as improved student language proficiency and enhanced cross-curricular connections, reflect the observations made by Meyer (2015) and Marsh (2012). For instance, one teacher's example of students discussing lexicon and translation issues underscores the depth of language engagement emphasized in these studies. Meyer (2015) and Marsh (2012) support the notion that integrating language and content can significantly enhance student engagement and understanding.

### **Examples of successful collaboration**

Successful examples of collaboration included joint planning of lessons across different subject areas (design and English), sharing methodologies and content, and co-creating specific content. One response mentioned, "Planeamento de aulas conjuntas em área distintas (design / Inglês), partilha de metodologias e conteúdos, co-criação de conteúdos específicos," (*Planning joint classes in different areas (design / English), sharing methodologies and content, co-creation of specific content*) highlighting the collaborative efforts in lesson planning and delivery. Another example was the introduction of ESP-specific content into design communication classes, which ensured that language learning was embedded within the technical content. Successful collaboration examples, including joint lesson planning and content co-creation, align with Pérez-Cañado's (2016) findings on effective interdisciplinary practices. The integration of ESP-specific content into design

communication classes, as noted by one teacher, reflects Lorenzo's et, al.(2011) emphasis on embedding language learning within technical content areas.

### **Addressing content and language objectives**

Teachers' evaluations of practical exercises and projects to address both content and language objectives mirror Dalton-Puffer's (2011) and Meyer's (2015) recommendations for aligning assessments with integrated objectives. One teacher stated, "Através da avaliação dos exercícios e projetos práticos desenvolvidos, em articulação com os objetivos definidos e resultados alcançados,"(*Through the assessment of exercises and practical projects developed, in conjunction with the objectives set and results achieved*) emphasising the importance of continuous assessment and alignment with defined objectives.

### **Effective strategies and approaches**

Co-planning lessons together was frequently mentioned as a highly effective strategy. This approach allowed for a seamless integration of language and content instruction, ensuring that both aspects were adequately addressed. Coyle et al. (2010) also underscore the value of collaborative planning in integrating language and content. Teachers' use of question-and-answer sessions and language research activities in class, as observed, enhances both language and content learning, reinforcing the approach advocated by Lyster (2017). One teacher noted, "We planned the classes together and decided on the materials and activities to do. We managed to have some meetings and make changes to the classes," underscoring their collaboration's dynamic and adaptive nature. During the classes, activities such as question and answer sessions were used to engage students and reinforce both language and content learning. Teachers observed that students needed to perform language research and develop technical language skills to support their work, further enhancing their learning experience.

### **Addressing potential challenges in teaching styles Q8-12**

Teachers viewed their teaching styles as similar but complementary in building student competencies and preparing them for integration into a global market. This perspective aligns with Richards and Rodgers (2015), who highlight that “effective teaching requires leveraging diverse approaches to enhance educational outcomes” (p. 145). The importance of leveraging diverse teaching styles to enhance the educational experience, which is an inherent factor to interdisciplinary collaboration, is also underscored by Coyle, Hood, and Marsh (2010), who note that “interdisciplinary teaching fosters a deeper understanding of both content and language” (p. 78).

Effective lesson planning between ESP and content teachers ensured smooth operation and minimised potential challenges. The shared responsibility for content, concepts, and language facilitated coordination in the classroom, making collaboration more efficient. According to the teachers, this collaborative approach was crucial in creating a cohesive learning environment. Lyster (2008) supports this by stating that “collaborative planning between teachers is essential for addressing interdisciplinary challenges” (p. 212).

### **Enhancing the learning experience for students**

Collaboration enhanced the learning experience, as reported by the audio-visual communications content teacher, by requiring students to apply ISO standards and English concepts to solve design problems. This practical application of interdisciplinary knowledge helped students see the real-world relevance of their studies. All of the teachers noted that employing visual aids and manipulatives to illustrate concepts has proven effective (Collins & Muñoz, 2016; Stoller, 2004). Specifically, tools like diagrams, charts, tables, and concept maps have been utilised to enhance learners' comprehension of subject matter in EFL settings by presenting information visually (Li et al., 2019; Stoller, 2004). Integrating language and content provides students with valuable skills applicable to real-world scenarios, as emphasised by the teachers (Dalton-Puffer, 2011), while the application of theoretical concepts to practical tasks enriched the learning experience (Marsh, 1984).

Teachers noted that cooperation allowed for deeper discussions and exploration of concepts. The collaborative environment enabled the identification and addressing of additional questions, enriching the learning experience. Collaborative learning environments foster deeper engagement with content, an effective collaboration enhances students' ability to grasp complex concepts (Mestre-Segarra & Ruiz-Garrido, 2022a).

### **Professional growth and development**

The collaborative relationship provided valuable insights into different methodological approaches, positively influencing project-based teaching methodologies, as indicated by the teachers. They appreciated how this collaboration helped consolidate concepts and highlighted the benefits of teacher cooperation. Coyle (2008) supports this view, noting that teacher collaboration significantly enhances pedagogical strategies, while Crandall and Kaufman (2002) emphasise that shared teaching experiences contribute to professional growth.

In the final questionnaire teachers expressed a desire for more collaboration, recognising its importance for their professional growth and teaching practice. They suggested investing in technical glossaries and ongoing teacher collaboration could enhance future projects. This aligns with Pawan and Ortloff (2009), who recommend ongoing collaborative efforts as essential for continuous professional development, and Crandall and Kaufman (2002), who argue that sustained collaboration supports ongoing improvement in teaching practices. It is worth noting that the teachers felt more confident in integrating language objectives into their content teaching. This increase in confidence reflects increased self-efficacy (SCT), as the teachers demonstrated confidence in their ability to apply new interdisciplinary strategies effectively. Their experiences throughout the project reinforced their belief that they could succeed in teaching both language and content, and this belief is crucial for sustained engagement in interdisciplinary collaboration (Bandura, 1997).

### **Incorporating ESP input in planning and instruction**

Content teachers expressed that they are actively seeking input from ESP teachers involved in co-creating briefings, projects, and content, particularly in areas like communication design, where understanding technical language in English is crucial for the future job market. Integrating ESP input into planning ensures that content-specific language is effectively taught and input of technical language in to ensure students grasped the material (Klaassen, 2018; Miles & Rainbird, 2015; Perry & Stewart, 2005). It was essential to regularly check students' understanding of English and the exercises they performed in class. Teachers used strategies, such as gap-fill activities with vocabulary and reading assignments with technical language, to ensure students grasped the material. From the final questionnaire, this process also allowed teachers to develop their English language skills and generate new research ideas.

### **Measuring the effectiveness of collaboration Q13-19**

The effectiveness of collaboration with the English teacher was measured through the results of exercises and the proposed project in the design area, as noted by the teachers. These assessments required understanding ISO standards, crucial for information design, wayfinding, and wayshowing projects. According to the teacher, the students' comprehension of these standards, which are not available in Portuguese, was essential for their success. This is a factor also observed by students who appreciate the attention to their needs and the focus on real-life examples and explanations of specific complex technical language (De las Heras et al., 2014; Mestre-Segarra & Ruiz-Garrido, 2022; Walker, 1973). Teachers received positive feedback and observed better learning outcomes. The assessments during the academic year involved significant use of English for research and projects. The difference in the quality of work between students who attended the classes and those who did not was evident, indicating the impact of the collaboration on student performance. This aligns with outcome expectations (SCT), where the teachers believed that interdisciplinary collaboration would enhance student performance, and their expectations were met by observing tangible improvements in learning outcomes.

## Frequency and impact of collaborative lesson planning

Teachers reported that while lesson plans were developed collaboratively with the ESP teacher, this collaboration often occurred through informal means such as email exchanges and brief conversations, rather than through formal, structured meetings. Each teacher contributed to the development of the lesson plans by focusing on the aspects they perceived as their responsibility—T1 (ESP) typically addressing language-related tasks, and the content teachers focusing on technical or subject-specific components. Although collaboration was consistent in this informal format, the lack of dedicated time for formal joint planning sessions limited opportunities for more in-depth collaboration. Time constraints significantly impacted collaborative lesson planning, with teachers rating the impact as 4 or 5 on a scale of 1 to 5. Time constraints often hinder the frequency and effectiveness of collaborative planning, and effective collaboration requires dedicated time and effort (Pawan & Ortloff, 2011; Zappa-Hollman, 2018). This highlights the challenge of finding adequate time for effective collaboration in a busy teaching schedule.

Despite these challenges, when collaboration occurred—whether through informal exchanges or brief conversations—lesson plans were consistently developed based on key criteria that ensured their effectiveness in integrating both content and language learning:

- **Learning objectives:** Each lesson clearly defined content knowledge and interdisciplinary skills, ensuring that students acquired both technical knowledge and the language needed to articulate their learning. This alignment was particularly important for tasks requiring students to use English for presentations and technical reports.
- **Subject integration:** The collaboration between content and language teachers ensured that lessons reflected the connections between subject areas. For instance, T1 (ESP) supported content-focused teachers like T2 (FTD) and T4 (TGD) by reinforcing key vocabulary through gap-fill exercises, project-based tasks, and presentations. This integration of subject matter and language helped students better understand complex concepts while improving their language proficiency.

- **Assessment and evaluation:** Assessment strategies combined language and content, employing rubrics, peer and self-assessments, and project-based evaluations. These methods were crucial in capturing students' progress in mastering both technical content and language, making interdisciplinary collaboration more effective and providing well-rounded feedback.
- **Differentiation:** Lesson plans accounted for the diverse needs and abilities of students, offering multiple entry points for those with varying levels of language proficiency and prior knowledge. Differentiation strategies included scaffolded learning activities, which allowed students to progress at their own pace while receiving the support they needed to succeed in both content and language areas.
- **Collaboration:** Regular teacher meetings ensured that objectives, materials, and assessments were aligned across disciplines, creating a cohesive learning experience for the students. This collaboration was particularly evident in Stage 3 of the research, where post-collaboration reflections helped refine the lessons and improve teaching strategies based on feedback from both teachers and students.

Incorporating these key criteria into the lesson planning process helped to mitigate some of the challenges posed by limited time for collaboration. It ensured that, even when collaborative planning was not structured or formal, the lessons still met interdisciplinary goals, provided clear learning objectives, and supported student development in both content and language areas.

### **Managing workload and seeking support**

Teachers managed their workload by seeking additional support, prioritising tasks, delegating responsibilities, and adjusting time allocation. According to the teachers, effective collaboration required balancing various tasks and meeting content and language objectives. This approach is in line with best practices for effective interdisciplinary collaboration and ICLHE (Gil & Dueñas, 2023; Havnes, 2009; Morgado, Coelho, et al., 2015; Perry & Stewart, 2005). Effective collaboration requires balancing various tasks and

meeting both content and language objectives, as supported by research on best practises in collaborative teaching (Chaovanapricha & Chaturongakul, 2020; Tionson, 2019).

### **Ensuring alignment and coordinating objectives**

Consistent communication with the ESP teacher was essential for ensuring that lesson plans were aligned with the curriculum content objectives. This involved coordinating both content and language goals in collaborative teaching, modifying instructional methods as needed, and tracking student progress. According to the teachers, aligning lessons with the students' ongoing activities was vital to enhance their acceptance and comprehension of the material's relevance. This strategy facilitated the integration of language learning into content instruction, making the lessons more pertinent and engaging for the students. Additionally, the teachers emphasised that, maintaining regular dialogue with students was important to help them understand the value of the integrated approach and effectively apply their learning in both content and language areas.

### **Assessing student learning and progress in CLIL Q20-26**

Teachers used various assessment methods to gauge student learning and progress. These included:

- Performance-based assessments, such as projects and presentations, allow students to demonstrate their understanding of content and language through practical application.
- Formative assessments, such as observations and check-ins, monitor ongoing progress and provide immediate feedback.

Their confidence in aligning assessments with interdisciplinary goals reflects their strong expectancies for success (EVT). By using a variety of assessment methods, including group projects, presentations, and individual tasks, the teachers were able to measure both language proficiency and content understanding, further validating their belief in the positive outcomes of interdisciplinary collaboration.

### **Addressing challenges in student assessment**

Teachers adapted their assessment methods to address challenges and discrepancies between content and language aspects, as reported by the teachers. This included providing additional language support during assessments to ensure that language barriers did not hinder the demonstration of content understanding. According to the teachers, providing clear assessment criteria for both content and language aspects was essential. This clarity students understand the expectations and enabled fair and comprehensive evaluation of their skills. Dove et al. (2017) note that these assessment strategies are crucial for accurately reflecting students' proficiency and supporting their learning needs.

### **Ensuring effective measurement of content understanding and language proficiency**

Aligning assessment tasks with both content and language objectives, as emphasised by the teachers ensured that evaluations accurately reflected student proficiency in both areas. This approach facilitated integrated learning and comprehensive assessment. According to the teachers, additional language support during assessments was crucial for helping students articulate their content knowledge effectively. This support included scaffolding language use and ensuring that students could comprehend and respond appropriately to assessment tasks. The importance to providing support is underscored by research in best practises for effecting student learning and motivating student participation (Jensen & Thompson, 2020; Klaassen, 2018; Zhou et al., 2020).

### **Time management and workload balancing**

Teachers managed their workload by seeking support or assistance when needed. This collaborative approach helped distribute the workload and effectively address content teaching and collaborative planning. Prioritising tasks and allocating time accordingly allowed teachers to balance content teaching with the demands of collaborative CLIL planning. This included using materials and approaches that had been successful in the past to streamline preparation and implementation processes. Balancing the workload between content teaching and collaborative planning was a common strategy. Teachers worked together to discuss content and concepts, draw up lesson plans, and ensure that

both aspects of CLIL instruction were adequately covered. This reflects high self-efficacy (SCT) in problem-solving and adaptability. The teachers' belief in their ability to handle these challenges is crucial for maintaining their commitment to interdisciplinary teaching.

### **Overall collaborative teaching experience in CLIL Q27-33**

Teachers generally rated their collaborative teaching experience highly, indicating a positive perception of the interdisciplinary approach:

- Ratings of 5 (on a scale of 1 to 5) were standard, reflecting intense satisfaction.
- The high ratings were attributed to effective cross-curricular connections, improved language proficiency, deeper content understanding, and increased cultural awareness.

### **Specific benefits and advantages of CLIL through collaborative teaching**

Teachers observed significant benefits in integrating language and content, fostering cross-curricular connections that enriched the learning experience. They reported that the collaboration enhanced students' language skills, particularly in the technical vocabulary necessary for specific subjects. According to the teachers, through collaborative teaching, students gained a more profound understanding of the content, as language instruction was directly tied to the subject matter. Additionally, the teachers highlighted that collaborative teaching promoted cultural awareness, helping students appreciate diverse perspectives and contexts.

### **Challenges and difficulties encountered**

One of the primary challenges, as noted by the teachers, was assessing student learning in both content and language. They found that balancing these two aspects to provide a fair and comprehensive evaluation was difficult. Time constraints were frequently mentioned as a significant challenge. Teachers had to manage limited time effectively to plan, execute, and assess interdisciplinary lessons. Additionally, they reported that managing the workload associated with collaborative teaching posed difficulties,

particularly when balancing content teaching responsibilities with the demands of integrated CLIL instruction.

### **Addressing and overcoming challenges**

Teachers emphasised the importance of effective communication and collaboration with the ESP (English for Specific Purposes) teacher to address these challenges. They reported that regular meetings, co-planning sessions, and ongoing dialogue helped streamline the collaborative process. Teachers shared the responsibility for content and language instruction, ensuring a coordinated approach that balanced both areas effectively. They identified strategies for managing workload and time constraints, including prioritising tasks and seeking additional support.

The responses from content teachers in the post-class questionnaires reflect the principles of SCT and EVT. Their high ratings for collaboration success (4-5 out of 5) indicate a strong belief in the effectiveness of the integrated approach. This belief, grounded in their experiences of improved student engagement and performance, suggests that their self-efficacy regarding interdisciplinary teaching has grown (Pajares, 1996).

Furthermore, the teachers observed tangible improvements in student language proficiency and engagement, they were more likely to perceive the collaboration as valuable, which increased their motivation to continue integrating language and content in their teaching (Ryan & Deci, 2000). The teachers' comments on the importance of student preparedness also suggest that they value the task and perceive its relevance to students' academic success, which is a central tenet of EVT (Meyer & Turner, 2006).

### **3 ESP teacher post-class questionnaire analysis**

The ESP teacher filled out a questionnaire after each content topic, offering valuable insights into their experience and viewpoints. This feedback served to capture reflections on the effectiveness of the interdisciplinary collaboration, along with the challenges and successes faced in integrating language and content throughout the process

### **Integration of language and content objectives**

The interdisciplinary collaboration was largely successful, achieving language and content goals, with most responses rated at 4 (mainly achieved) and 5 (completely achieved). Students demonstrated high participation, successfully completed projects, and engaged actively in class, indicating that language and content objectives were met. This reflects the teacher's high self-efficacy (SCT), as their confidence in their ability to deliver successful interdisciplinary lessons was confirmed by the positive student outcomes. Additionally, their outcome expectations—the belief that combining content and language would improve student learning—were validated through student engagement and successful completion of projects.

### **Effective teaching strategies and material development**

The ESP and content teachers employed several strategies to engage students. Real-life examples, scaffolding techniques, and interactive activities like group work and mind maps were essential in supporting both content learning and language development. Additionally, the use of multimedia (videos and images) kept students engaged, while supplementary resources helped clarify complex concepts. This aligns with the teacher's expectancies for success (EVT), as these strategies were chosen because the teacher believed they would enhance student learning by making the content more relatable and accessible. This shows a high task value (EVT) attached to these methods, with the teacher understanding that the integration of content and language learning would yield significant benefits for students' future professional contexts. These strategies also reflect the teacher's confidence in their ability to support students' learning, indicating high self-efficacy (SCT). The teacher believed that by engaging students in collaborative learning, they would enhance both content understanding and language development, reinforcing their positive outcome expectations.

## **Challenges and collaboration dynamics**

Despite these successes, challenges like time constraints and managing large class sizes posed difficulties, especially when balancing language and content teaching. These challenges, however, did not undermine the teacher's self-efficacy but highlighted their resilience and adaptability, as they continually sought to improve through collaboration and problem-solving. The teacher's belief that they could successfully manage these challenges reflects their strong outcome expectations. Teachers emphasised the importance of collaboration through regular planning sessions and sharing resources. While collaboration helped manage the workload, more effective scheduling and communication were needed to address these issues fully. Joint planning ensured that both content and language objectives were aligned across lessons.

## **Assessment methods**

The use of project work, participation in discussions, and formal assessments aligned with learning objectives, but teachers suggested the need for differentiated assessment strategies to meet varied student needs. These methods helped in evaluating both language proficiency and content understanding, though some ongoing adjustments were needed to fully balance these goals.

## **Impact on student learning**

Overall, students showed high engagement, actively participating in discussions and project work, which resulted in successful learning outcomes. The integration of language and content teaching, supported by real-life examples and interactive activities, was effective in enhancing both language skills and content understanding. Despite some challenges, the interdisciplinary approach had a positive impact on students' learning experiences.

#### **4 ESP teacher's final questionnaire analysis**

The ESP teacher rated the overall success of the collaborative teaching project with a 5, reflecting high levels of self-efficacy and positive outcome expectations. The teacher demonstrated confidence in their ability to integrate language and content learning, evidenced by their effective use of real-life examples, scaffolding, and inquiry-based learning. These strategies were seen as valuable, aligning with task value (EVT), where the teacher recognised their importance for both language development and content understanding.

##### **Integration of language and content objectives**

##### **Impact on student learning**

1. Student Engagement and Learning Outcomes: Students became progressively active in class discussions and engaged in Q&A sessions. Project work was particularly effective for older students (3rd-year and master's), who were better prepared for interdisciplinary learning.

2. Language Development and Content Understanding: Students' language development was observed through increased participation and engagement in content discussions.

The teacher reported that students became progressively more active and engaged in class discussions, showing improvement in language development and content understanding. This reflects outcome expectations (SCT), where the teacher expected these strategies to positively affect student performance, and these expectations were confirmed. The teacher's belief in their ability to facilitate these outcomes demonstrates high self-efficacy.

##### **Collaboration dynamics**

The collaboration with content teachers was key to the success of the project. The teacher's willingness to engage in joint planning, co-teaching, and the sharing of resources highlights the task value they attributed to collaborative efforts. The successful outcomes

of the interdisciplinary collaboration reflect the teacher's positive expectancies for success (EVT), as they anticipated that co-teaching would enhance both their teaching practices and student outcomes.

### **Insights and recommendations**

The collaborative experience enhanced the teacher's pedagogical innovation, content knowledge, and communication skills. Future initiatives emphasise the importance of interdisciplinary projects, co-teaching models, and ongoing professional development to support CLIL principles and collaborative teaching practices.

The ESP teacher's reflections indicate that the interdisciplinary collaboration was successful, with significant achievements in integrating language and content objectives. Effective teaching strategies included real-life examples, scaffolding, and inquiry-based learning. However, challenges such as time constraints, student preparation, and the need for differentiated instruction were noted. The collaboration enhanced professional development and provided valuable insights for future teaching practices, emphasising the importance of continuous professional development and interdisciplinary projects.

### **6.3.2. Student Feedback**

Findings from the students' post- and final questionnaires contribute to understanding students' perceptions and effectiveness of the whole teaching/learning process during the study. The findings, which integrate qualitative and quantitative results, are presented by the different academic levels, with the first-year students and then with the third-year and master's students. They take into consideration all the classes, and they are identified by the different content topics in the classes. The analysis is divided into clarity of learning objectives, perceived benefits, perceived challenges, and suggestions for improvement, or additional comments.

## First Year Students (Fashion and Textile Design)

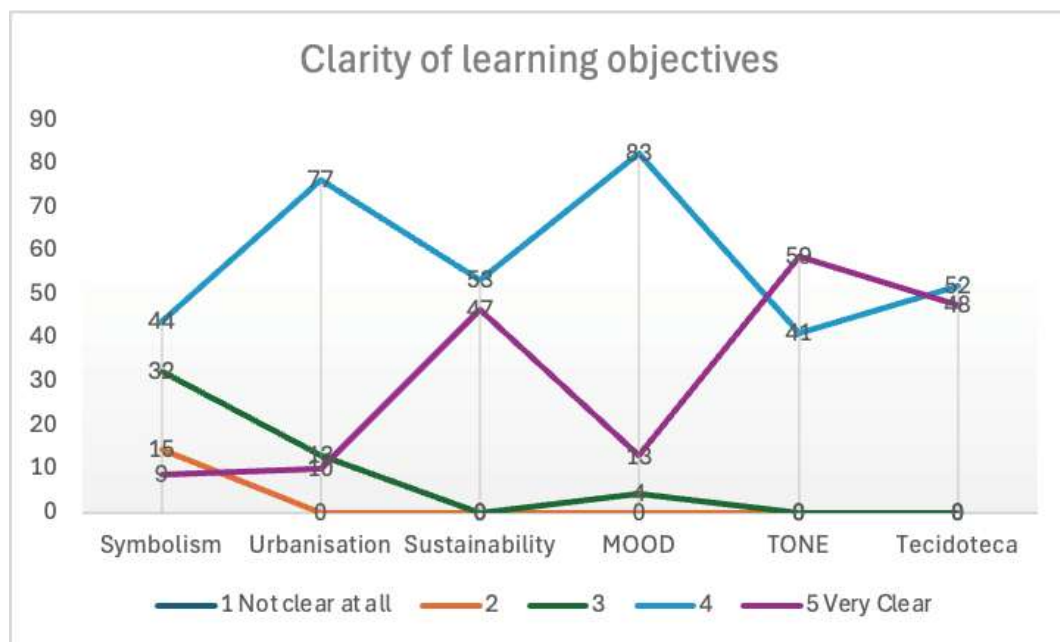
### Perceived clarity of learning objectives:

The first-year students in the fashion and textile design course had a total of thirteen 90-minute classes. These classes were divided into content topics (symbolism, urbanisation, sustainability, mood, tone and tecidoteca) as outlined in Table 12. The students filled in the post-class questionnaire at the end of a series of lessons referring to the content topic.

The figure below demonstrates how students perceived the clarity of objectives across different topics. The variability in clarity ratings suggests areas where objectives could be made more explicit to enhance comprehension.

**Figure 12**

*Clarity of learning objectives in percentages*



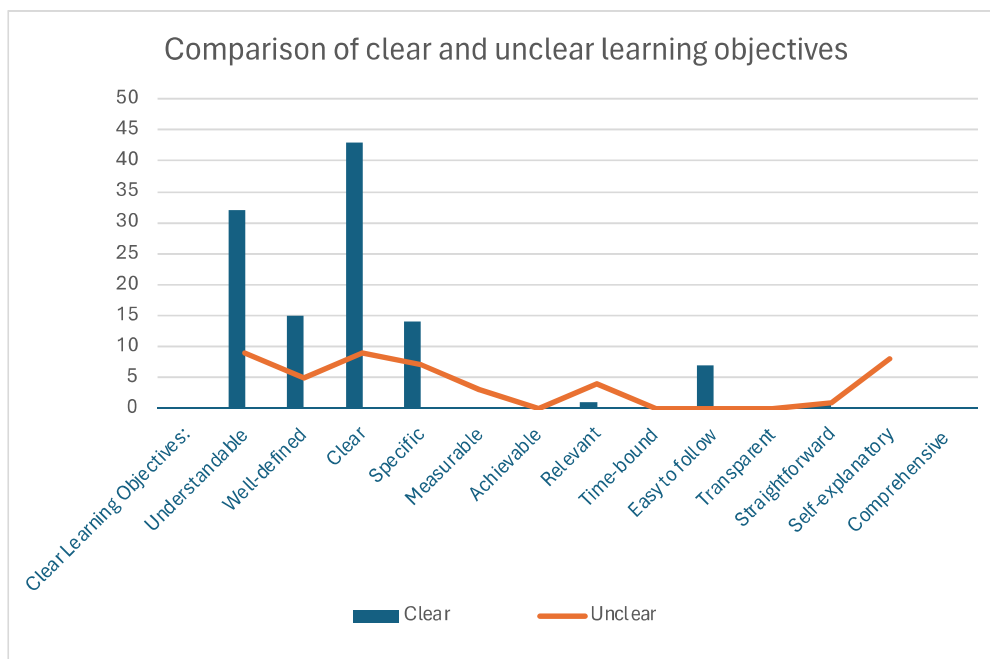
The symbolism classes received a mixed evaluation, with 44% of responses indicating "Not clear at all" and 32% rating them as "Very clear." Clear objectives were appreciated for being understandable, specific, and easy to follow, whereas unclear objectives were

described as confusing, vague, complex, and overwhelming. Feedback on the urbanisation topic was mostly positive, with 77% marking the objectives as "Not clear at all," 15% rating them as moderately clear, and 10% as "Very clear." Some students noted the complexity of certain objectives. The sustainability topic received 58% of responses marking the objectives as "Not clear at all" and 47% as "Very clear," with no mentions of unclear objectives, indicating high satisfaction with clarity. For mood, 83% rated the objectives as "Not clear at all," while 13% found them "Very clear." While there were positive responses, feedback suggested ambiguity and inadequacy in certain areas. The tone classes showed a 58% rating for "Not clear at all" and 52% for "Very clear." Despite overall positive feedback, minor improvements in clarity were suggested. Tecidoteca received 52% "Very clear" and 48% "Not clear at all" ratings. Feedback called for improvements in relevance and adequacy.

Figure 13 provides insight into the qualities that students associate with clarity or lack thereof in learning objectives. It underscores the importance of specificity and simplicity in crafting objectives that are accessible to learners.

**Figure 13**

*Comparison of clear and unclear learning objectives*



The clear objectives were commonly described as *understandable*, *well-defined*, *specific*, and *easy to follow*. The highest number of responses indicated clarity when objectives were *specific* and *well-defined*, suggesting these aspects are crucial in helping students grasp the learning goals.

In contrast, unclear objectives were often labelled as *vague*, *complex*, *ambiguous*, and *overwhelming*. Students highlighted difficulties with objectives they felt were *confusing* and lacking specificity, aligning with common issues in complex interdisciplinary topics.

The clarity of learning objectives is directly related to students' self-efficacy. When learning objectives are clear and achievable, students develop stronger beliefs in their ability to succeed in the tasks. On the contrary, unclear objectives might diminish their confidence, making them feel less capable of mastering the content. When students feel confident about what is expected of them, their self-efficacy increases, which enhances their participation and motivation.

Clear learning objectives also boost the perceived task value (EVT) of the activity. When students understand the relevance and purpose of the objectives, they are more likely to see the task as important and worthwhile. This aligns with feedback from classes such as sustainability, where clear objectives contributed to positive perceptions and engagement.

#### **Perceived benefits:**

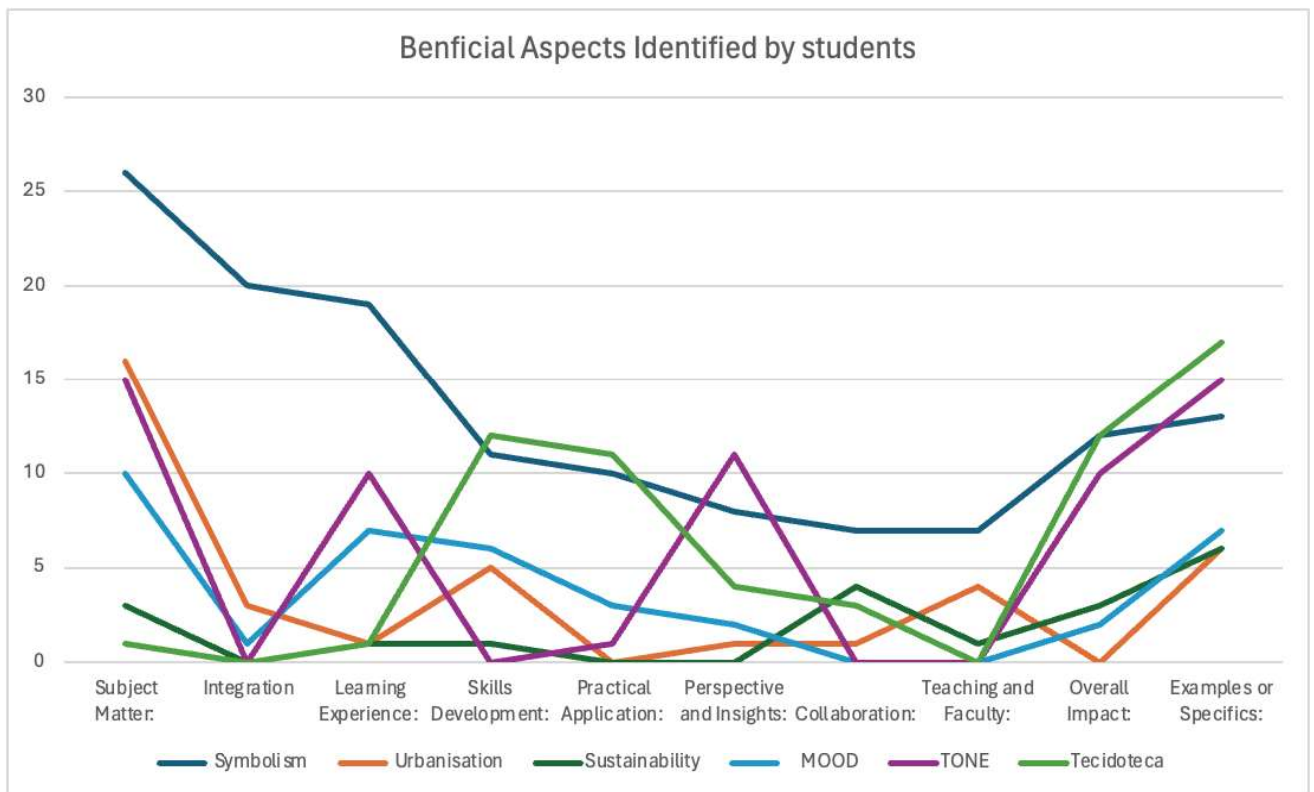
The symbolism classes notably emphasise the integration of concepts, evident through a high frequency of recognition that showcases a deep engagement with the subject matter. The urbanisation classes stand out for their strong positive perception of the content, marked by robust subject matter appreciation, indicating a keen interest among students. Additionally, collaboration recognition distinguishes the sustainability classes, with explicit mention showcasing a unique focus on teamwork and shared learning experiences. The mood classes are characterised by a positive learning experience, contributing to an engaging class environment and overall student satisfaction.

Moreover, Figure 13 captures the prevalent themes and patterns across these classes. The distinctive emphasis of the tone classes on perspectives and insights highlight a rich exploration of varied viewpoints beyond the core subject matter. The tecidoteca classes are recognised for their strong commitment to skills development, featuring a notable emphasis on practical skill acquisition, setting them apart by providing hands-on learning experiences.

Figure 14 illustrates the various beneficial aspects identified by students across the different subject areas. Each line represents a content topic and each point on the X axis represents a benefit identified—such as subject matter, skills development, or practical application—and tracks its frequency of mention by students for each subject area. This visual representation underscores which aspects of the learning experience students found most valuable and offers insights into where additional emphasis could enhance interdisciplinary and practical outcomes.

**Figure 14**

*Benefits identified by students*



From the chart, subject matter and examples or specifics show consistently high frequencies across multiple subjects, indicating a strong emphasis on understanding core content and specific examples. Skills development and practical application are particularly prominent in the tecidoteca subject area, highlighting its hands-on, skill-building nature. Conversely, integration and collaboration appear less frequently, suggesting potential areas for growth in interdisciplinary connections and cooperative learning.

Students recognised various benefits from the interdisciplinary collaboration. For example, in the urbanisation and sustainability classes, students appreciated subject matter integration and collaboration. They noted that real-world applications and teamwork were key contributors to their learning.

Students highlighted practical applications and subject matter integration as the most beneficial aspects, demonstrating high task value. The practical relevance of the interdisciplinary collaboration made students more motivated to engage, as they believed these skills would be useful in their future academic and professional careers. Additionally, their expectancies for success were confirmed when they successfully completed tasks that integrated technical and language skills.

Students' recognition of learning benefits like subject matter integration and collaborative learning suggests that their outcome expectations were met. The ESP and content teachers' joint efforts enabled students to achieve meaningful learning outcomes, reinforcing their belief that interdisciplinary approaches enhance both content understanding and language skills.

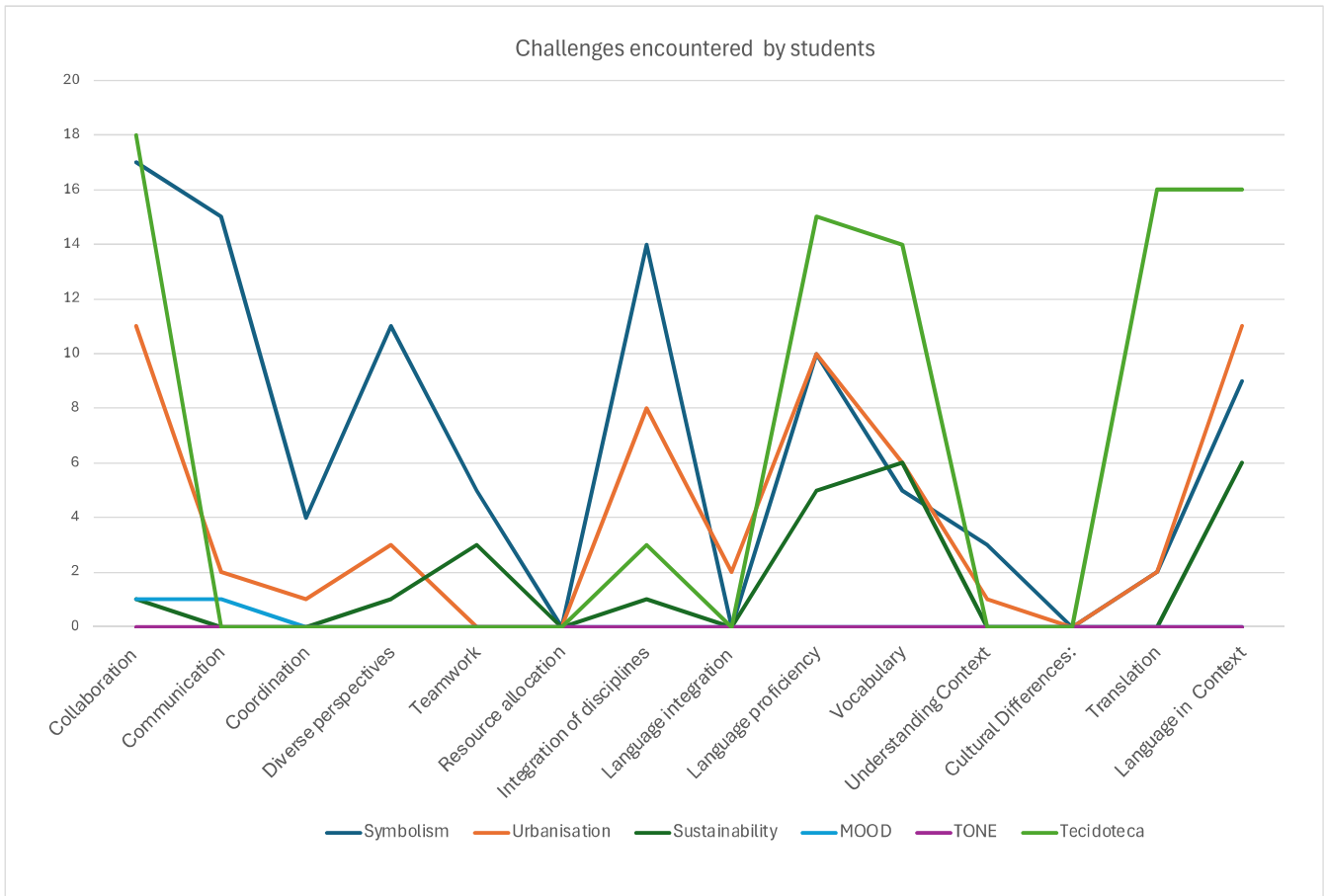
#### **Perceived challenges:**

Figure 15 presents a line graph that illustrates the specific challenges students encounter during interdisciplinary collaboration. The data categorises various issues that impact collaboration across the five content topics.

Interdisciplinary collaboration challenges stands out with the highest frequency, particularly in the symbolism and urbanisation classes, highlighting the significant hurdles students face in effectively communicating and collaborating across disciplines. Both communication and language proficiency exhibit notable frequencies, particularly in urbanization and sustainability. This suggests that effective communication and language skills are crucial in overcoming barriers during collaborative efforts. While teamwork and diverse perspectives show some frequency, they indicate a lesser emphasis compared to communication challenges, suggesting that while teamwork is acknowledged, it may be overshadowed by more pressing issues like communication and resource allocation.

**Figure 15**

*Challenges encountered by students*



Categories such as resource allocation and cultural differences show little to no recorded challenges, suggesting these issues may not be prevalent in the student experience of interdisciplinary collaboration.

Language-related challenges likely affected students' self-efficacy, particularly for those struggling with technical vocabulary or interdisciplinary communication. These students may have experienced lower confidence in their ability to succeed, especially if they believed that language barriers hindered their learning process. These language challenges might also lower the task value and expectancies for success for students who found the language aspect difficult. If students struggle with basic language skills, they

might not perceive the task of interdisciplinary collaboration as valuable or feasible, which could impact their overall engagement.

The challenges students identify offer insights into the institution's receptiveness to collaboration, which informs targeted interventions. These challenges also provide a comprehensive understanding of building collaborative teaching plans, enabling teachers to reflect on teaching practices and assess their impact. By addressing specific hurdles students face, the study aims to enhance the effectiveness of interdisciplinary collaboration within the higher education institution.

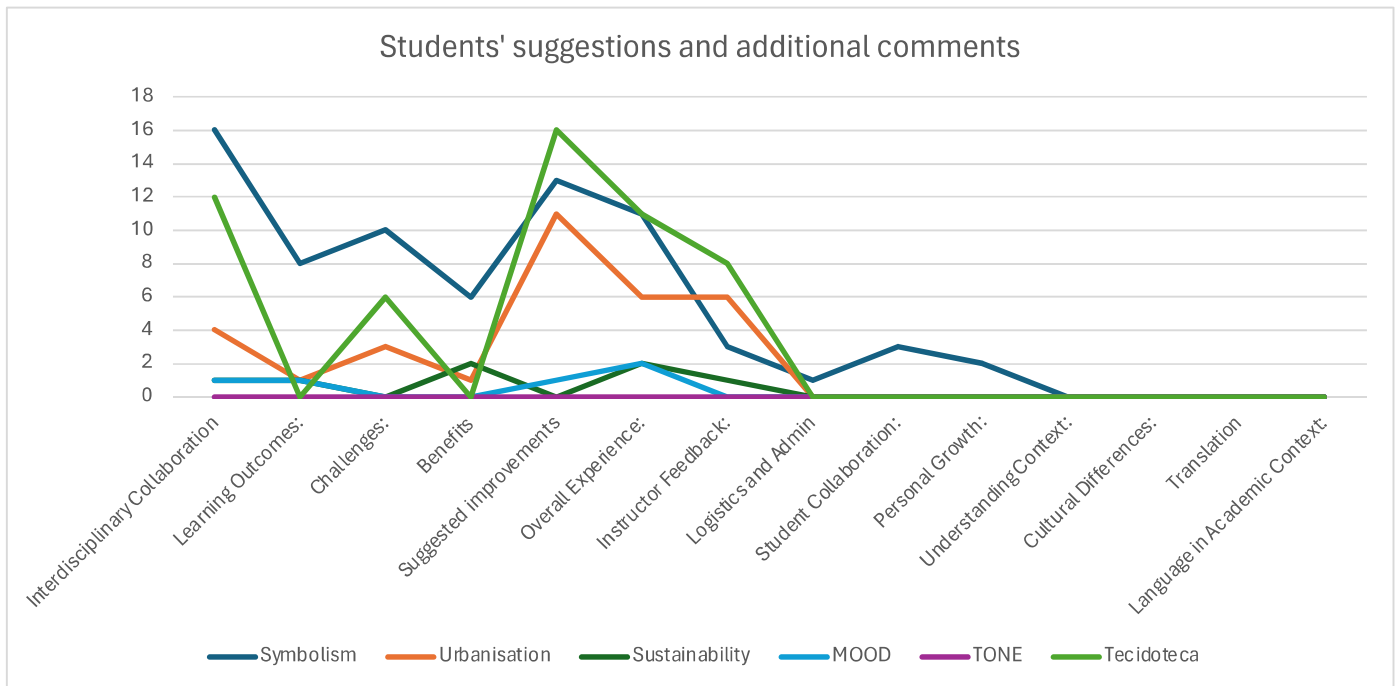
**Suggestions for improvement or additional comments:**

Figure 16 displays a line graph that captures students' suggestions and feedback. The data show various aspects, such as collaboration challenges, learning outcomes, and suggested improvements. The interdisciplinary collaboration category has the highest frequency, particularly in symbolism and tecidoteca, indicating that students perceive collaboration as a multifaceted challenge requiring attention to various symbolic and contextual factors. Suggested improvements show significant engagement, especially in symbolism, urbanisation, and tecidoteca classes, suggesting that students have clear ideas for enhancing their collaborative experiences and believe improvements are necessary.

Both learning outcomes and overall experience categories reflect notable frequencies, indicating that students feel their learning outcomes and overall experiences are closely tied to the collaborative process. While teacher feedback shows some engagement, it is overshadowed by the challenges identified, pointing to a need for more supportive feedback mechanisms. Categories such as understanding context, cultural differences, translation, and language in an academic context indicate a lack of student feedback, suggesting that these may not be perceived as significant challenges or areas of focus during their collaboration.

**Figure 16**

*Students' suggestions and additional comments*



While responses were in specific categories, others received limited or no feedback, requiring additional exploration and discussion to comprehensively understand students' perspectives. This multifaceted analysis provides a nuanced view of students' experiences, guiding future refinements in interdisciplinary teaching practices. Accompanying this textual analysis, Figure 8 visually encapsulates critical themes from various classes, offering a quick overview of topics identified by students regarding their experiences.

By suggesting improvements, students demonstrated an awareness that better integration of language and content would lead to better outcomes, reinforcing their outcome expectations. They expect that interdisciplinary collaboration will help them improve both content knowledge and language proficiency if the teaching approach is enhanced.

Students who suggested more opportunities for language practice and collaborative learning highlight their expectancies for success: they believe that additional support in

these areas will improve their chances of succeeding in both content and language. Moreover, the feedback shows that students attach high task value to interdisciplinary approaches, particularly when the activities are perceived as relevant to their academic and professional goals.

### **Third year and Master's students**

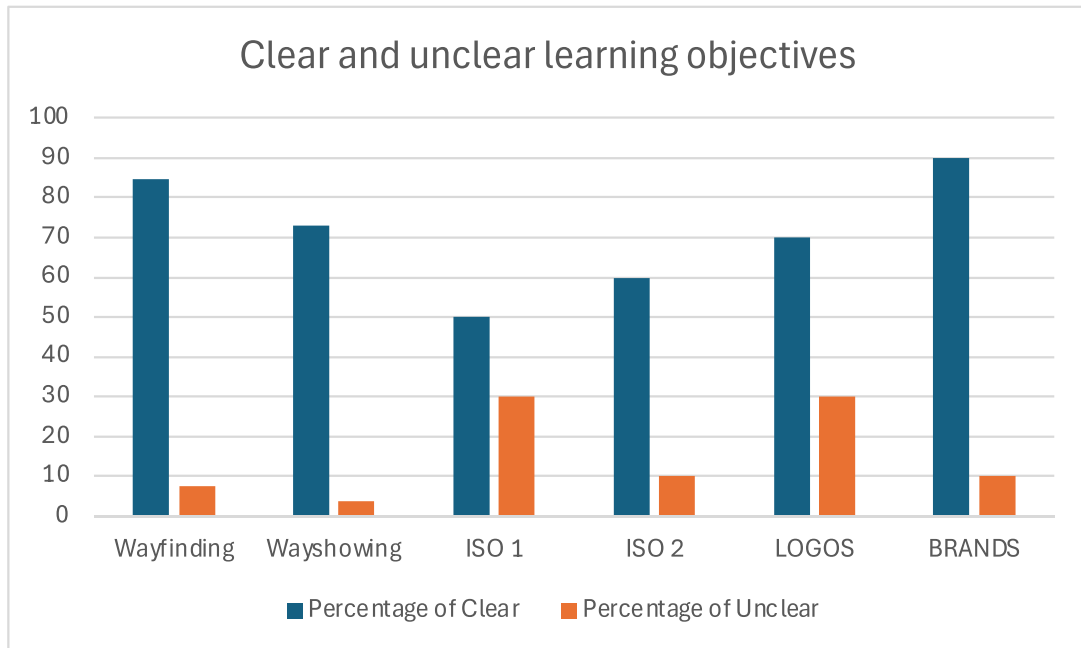
The third-year students in the communication and audio-visual design course had two 90-minute classes. These classes were divided into content topics (wayfinding and wayshowing), as outlined in Table 12. The master's students in the communication and audio-visual design course had a total of two 90-minute classes. These classes were divided into content topics (ISO Part 1 and ISO Part 2), as outlined in Table 11. The master's students in the technological and graphic design course had a total of three 90-minute classes. These classes were divided into content topics (Brands and Logos), as outlined in Table 12. The students filled in the post-class questionnaire once the content topic had been addressed.

### **Perceived clarity of learning objectives:**

Figure 17 illustrates the percentage of students identifying clear versus unclear learning objectives across various topics in their classes. The data represents the responses of third-year students in the topics of Wayfinding and Wayshowing, as well as master's students in the ISO parts (ISO Part 1 and ISO Part 2), Logos, and Brands.

**Figure 17**

*Clear and unclear learning objectives*



The data revealed various levels of clarity in learning objectives across the classes. This suggests that these classes were perceived as having well-defined and understandable objectives. On the other hand, ISO 2 and logos show moderate clarity, with 60% and 70% of students finding the objectives clear, respectively.

Analysing students' perceptions of learning objectives revealed significant disparities across different topics. ISO Part 1 stands out with a clarity percentage of only 50%, indicating a considerable need for improvement in how these learning objectives are communicated. This gap suggests that students may be struggling to grasp essential concepts, which could hinder their overall learning experience.

In contrast, the topics of wayfinding and brands are particularly noteworthy for their high clarity percentages of 85% and 90%, respectively. The very low percentages of students identifying the objectives as unclear—8% for wayfinding and 10% for brands—highlight these classes as highly effective in communicating their learning objectives. Such

clarity likely fosters a conducive learning environment, encouraging student engagement and understanding.

The wayshowing classes also perform well, with 73% of students reporting clear objectives. However, it has a slightly higher percentage of unclear objectives at 4%, suggesting that while the majority of students understand the goals, a small subset may benefit from additional clarification. This indicates an opportunity for teachers to refine their communication strategies to ensure all students have a solid grasp of the objectives.

Similarly, ISO Part 2 classes demonstrate a reasonably good level of clarity at 60%, yet 10% of students still find the objectives unclear. Although this performance was an improvement over ISO Part 1, it reveals that further efforts are necessary to enhance clarity in communication.

The logos classes, with a clarity percentage of 70%, presents another area of concern, as 30% of students perceive the objectives as unclear. This significant proportion of uncertainty signals the need for focused efforts to improve the clarity of these learning objectives.

The comparison between 1st-year and 3rd-year/master's students shows that clarity of learning objectives and integration of disciplines was positively perceived, with a high percentage of students expressing satisfaction in both groups.

The clear learning objectives and integration of disciplines likely contributed to positive outcome expectations among students. Students who understood the objectives and saw how the content and language were integrated would have been more likely to believe that their efforts would lead to successful learning outcomes, further enhancing their engagement.

When students perceived that the learning objectives were clear and the disciplines were well-integrated, their expectancies for success increased. Students who believed they could successfully meet the course requirements would have been more motivated to engage, particularly when the content was seen as valuable and relevant to their academic and professional goals. This aligns with the task value concept in EVT, as students

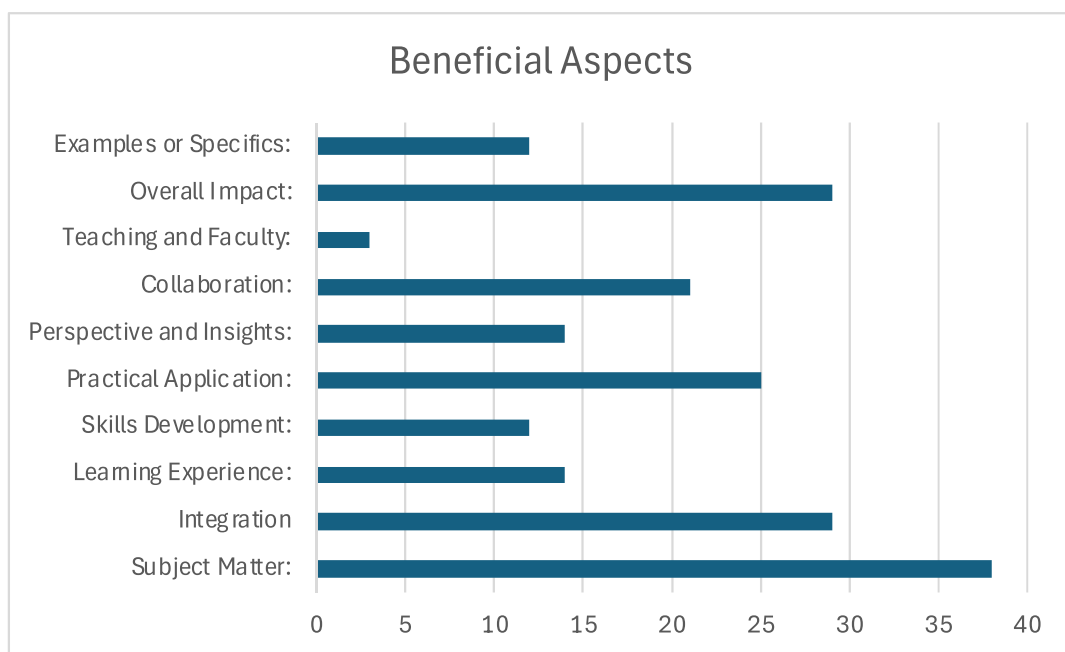
saw the importance of mastering both language and content in the interdisciplinary setting.

**Perceived benefits:**

The bar graph, Figure 18 illustrates the beneficial aspects that students identified as valuable in their classes, highlighting areas that enhanced their learning experience. Each aspect has been evaluated based on the frequency with which students cited it as beneficial.

**Figure 18**

*Beneficial aspects identified by students*



Subject matter emerges as the most valued aspect, with 71 mentions. This high score indicates that the relevance and content of the material resonate strongly with students, forming a solid foundation for their academic experience. Examples or specifics also scored notably high, with 64 students recognising this aspect as beneficial. This suggests that tangible, real-world examples or detailed specifics make the content more comprehensible and applicable for students. Both learning experience and overall impact were highlighted by 39 students each, pointing to the significance of a positive, impactful environment that

shapes students' growth and development. Skills development was another important area, with 35 mentions. This aspect underscores the value students place on acquiring practical skills that can be applied in various contexts beyond the classroom. Other aspects such as perspective and insights (26 mentions), practical application (25), and integration (24) were noted as beneficial, reflecting students' appreciation for the interconnectedness of topics and the practical relevance of what they are learning. Finally, collaboration and teaching and faculty were valued by 15 and 12 students, respectively. While these aspects had fewer mentions, they still contribute positively to the overall learning environment. The overall impact of the class was positively noted by 29 students, indicating that despite variability in specific benefits, the general effect of the collaboration was favourable.

Students' positive feedback on the practical applications of interdisciplinary collaboration underscores the importance of meeting their expectations for real-world applicability. They valued the technical language skills and subject matter knowledge gained, perceiving these as beneficial for their academic and professional futures. This practical relevance heightened their engagement, as they saw clear, tangible outcomes from their learning.

Active learning opportunities, such as discussions and projects, contributed to nearly universal participation, reflecting strong engagement with the interdisciplinary format. Through these activities, students not only practiced collaboration but also developed confidence in their abilities. This self-efficacy grew as they applied their skills in realistic contexts, which reinforced their motivation and commitment.

Overall, students assigned high task value to the interdisciplinary approach, recognizing the practical applications of language skills within their fields. This sense of progress, confirmed through continuous assessments and activities, strengthened their belief in the value of their efforts and increased their expectations for success.

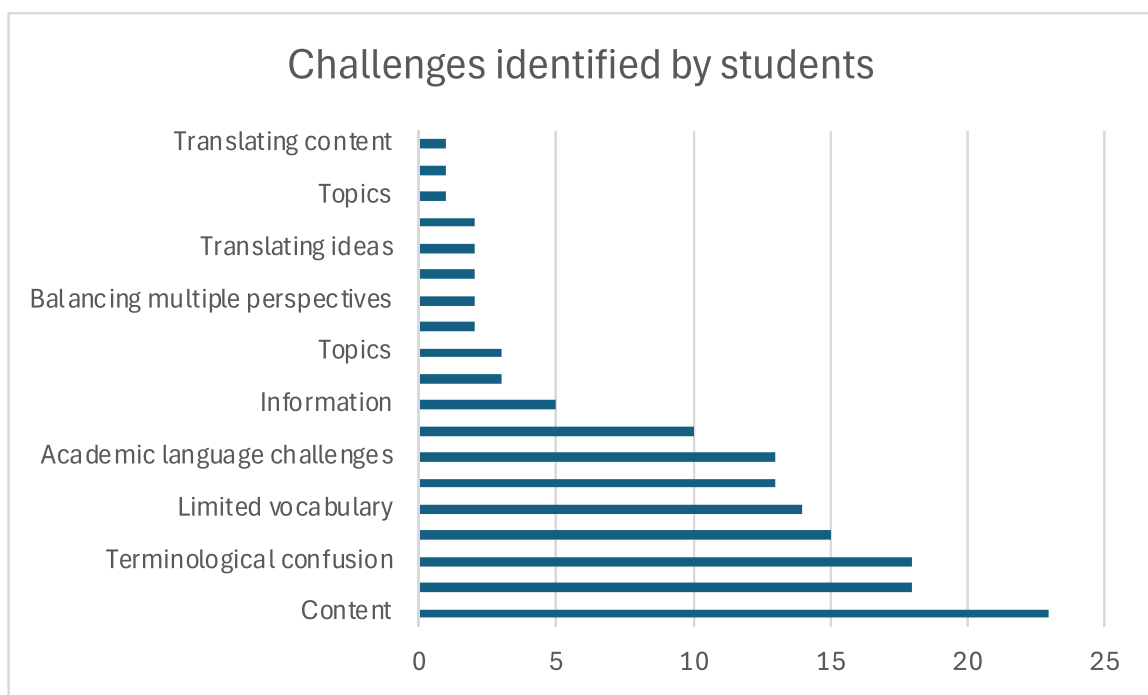
Finally, examples or specifics provided were mentioned by 12 students. While these can be useful, they were not the primary factor in determining the overall benefit of the collaboration.

**Perceived challenges:**

Figure 19 illustrates the various challenges students face in their classes, as identified through their feedback. This data highlights the specific areas where students experience difficulty, potentially impacting their learning outcomes and engagement.

**Figure 19**

*Challenges identified by students*



The most frequently cited challenge was content-related issues, with 23 students expressing concerns about the material's complexity, relevance, or presentation. This was closely followed by difficulties with specialised terms and terminological confusion, reported by 18 students each, indicating that technical vocabulary posed a significant barrier to fully engaging with the interdisciplinary content. Conceptual challenges were noted by 15 students, suggesting struggles with understanding or applying key ideas,

while limited vocabulary (14 students) added to these difficulties, indicating that some students felt constrained by their language skills. Language proficiency gaps and academic language challenges were each cited by 13 students, reflecting broader language issues that may have hindered comprehension and participation.

Less frequently mentioned challenges included knowledge depth (10 students) and information overload (5 students), suggesting these were less impactful overall. Additionally, integrating content and topics was a challenge for 3 students each, hinting at some difficulty in unifying various elements of the interdisciplinary approach. More specific challenges, such as balancing perspectives, translating ideas, and integrating diverse ideas, were each mentioned by only a few students, indicating they were less prominent but still present.

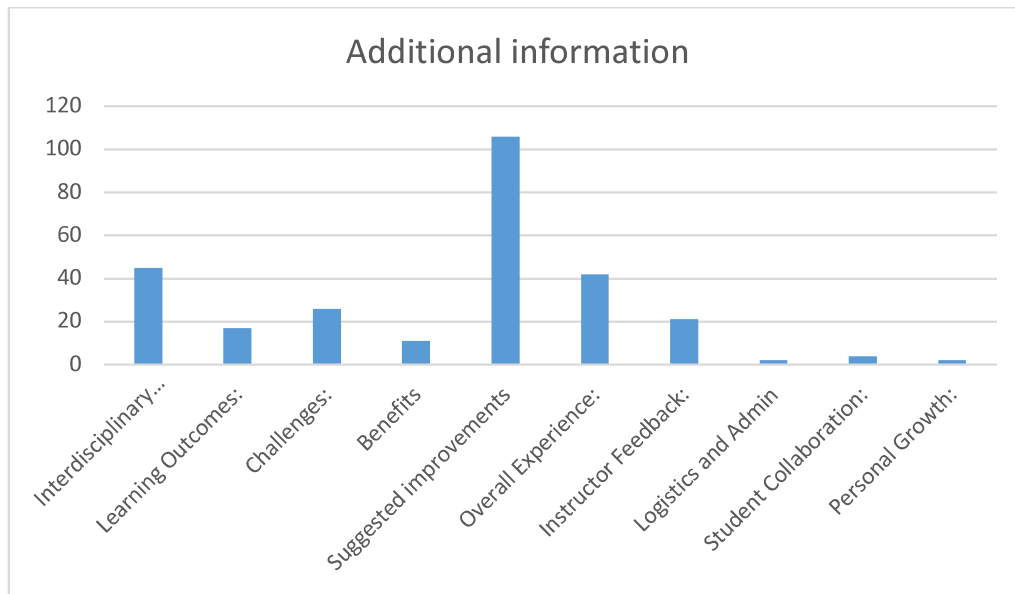
These language-related and content-specific challenges likely lowered students' self-efficacy, as difficulties with technical vocabulary and comprehension could diminish confidence in engaging with complex content. Students who struggled with terminology might have assigned a lower task value to the interdisciplinary collaboration, especially if they felt the language skills were not immediately relevant to their academic or career goals. This perception may have impacted their overall engagement and appreciation of the interdisciplinary approach.

**Additional comments and suggestions for improvements:**

In response to an open-ended question in the survey, students were encouraged to share any additional comments and suggestions. These contributions provide valuable insights into their experiences and perspectives on the course. Figure 20 below details the additional information provided by students.

**Figure 20**

*Additional Information given by students*

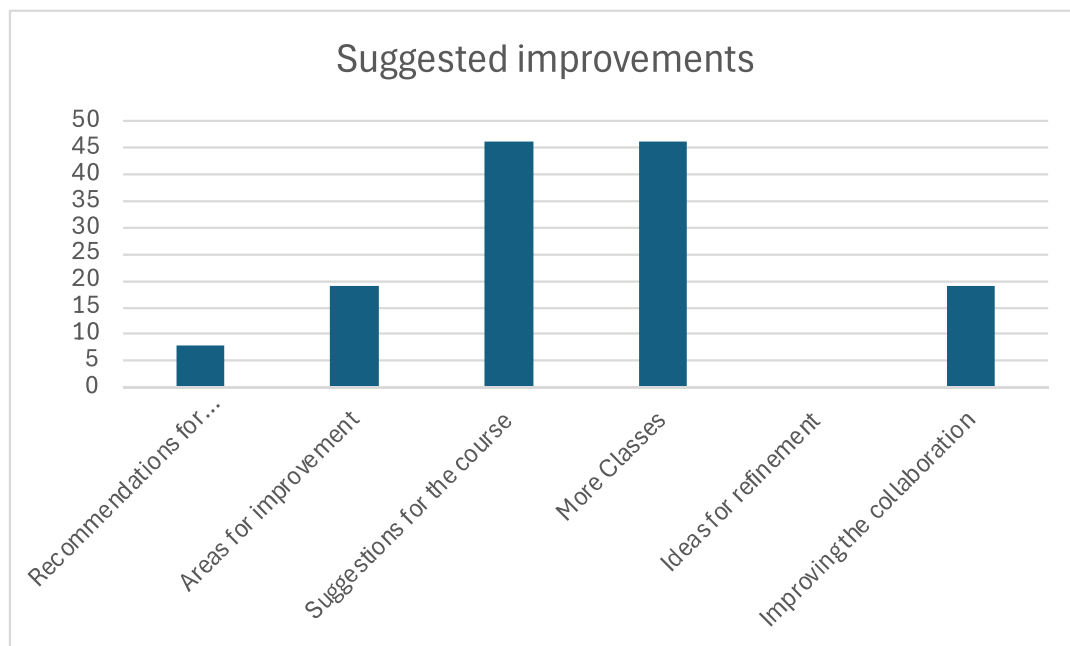


The most frequently mentioned areas were interdisciplinary collaboration (45 mentions), learning outcomes (17), challenges (26), overall experience (42), and suggested improvements (106). This high level of feedback on suggested improvements highlights students' active engagement in reflecting on their learning experience and their desire for continued course enhancement.

Building on these comments, Figure 21 breaks down the specific suggestions students made for improving the course. The key themes include recommendations for enhancement (5), areas for improvement (17), suggestions specific to the course (39), and a desire for more classes (20). Additional suggestions focus on refining the course structure (8) and improving collaboration (17). These insights underline the students' investment in the course's success and their thoughtful input for making it more effective.

**Figure 21**

*Suggested improvements*



Students' feedback on necessary improvements points to gaps in outcome expectations and self-efficacy for some participants. For students who struggled with language, low self-efficacy likely led them to recommend additional language support. They may not have felt confident in their ability to achieve success without this extra assistance.

For students who did not perceive the current level of support as sufficient, the task value of the interdisciplinary collaboration may have been reduced. If students felt that language barriers were too significant, they may not have seen the collaboration as valuable, resulting in suggestions for increased support and clearer guidance to help them succeed.

**6.3.3. Assessments**

The analysis of student performance assesses performance in various assessment types. The figures illustrate the distribution of scores in the assessment types. These visual aids

reveal performance trends across levels (levels 1-4 see 5.7.4), showcasing improvements, stabilisations, and areas needing focus.

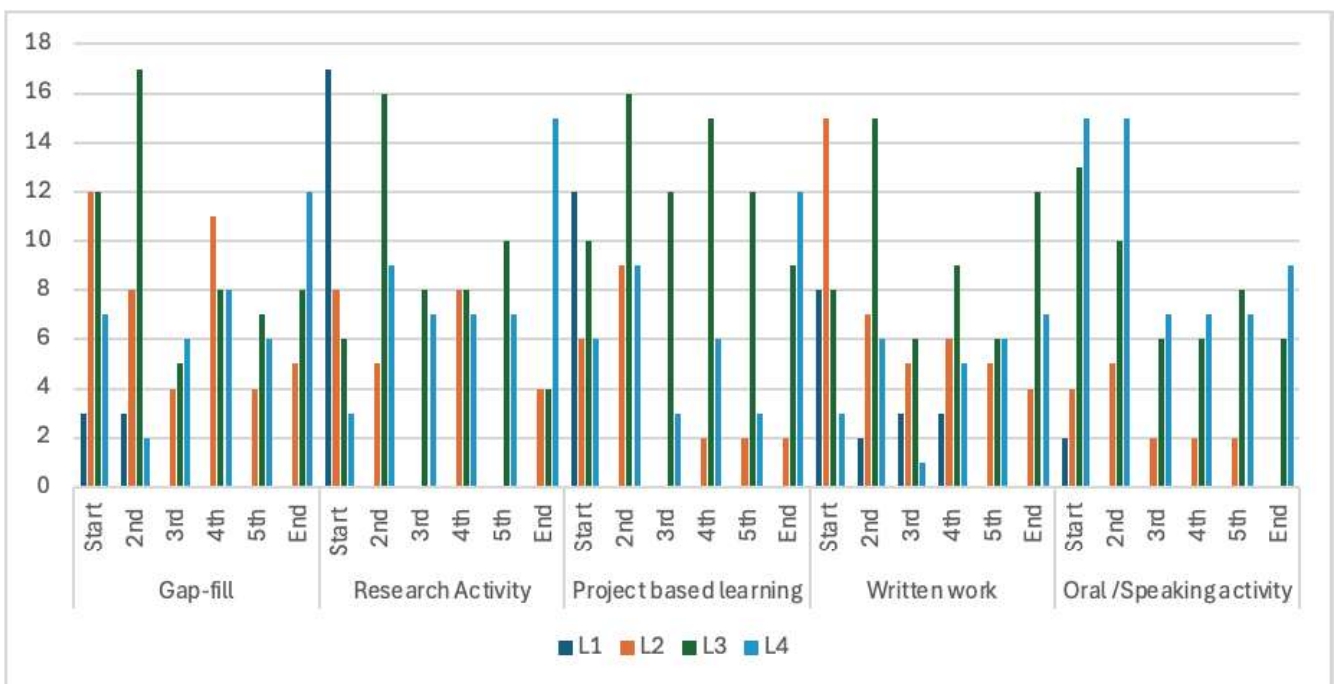
The findings are structured to begin with first-year undergraduates, followed by third-year students, and conclude with master’s students. Performance is examined at the start, middle, and end of their courses, emphasising their learning journeys and evolving competencies.

### First-year student assessments

Figure 22 visually represents how student performance varied across different assessment types and proficiency levels. The assessment data provides a detailed view of student progress from the start to the end of the intervention (six evaluation periods), across multiple activities, starting with the gap-fill assessment. In the initial stage, students were distributed across various proficiency levels, with the majority in Levels 2 and 3 and a smaller number reaching Level 4.

**Figure 22**

*First-year students' progression by assessment type and level*



At the start, most students scored in Level 2 (12 students), indicating they had basic language skills and a foundational understanding of the subject. However, by the end of the course, a clear improvement is visible: 12 students achieved Level 4, and 8 were in Level 3. This shift indicates that through ongoing practice, students progressed to higher levels of language proficiency and content knowledge, with more students demonstrating advanced skills by the course's conclusion.

The research activity data reveals similar patterns of improvement. Students began with a large proportion in Level 1 (17), highlighting limited language proficiency and comprehension. Over time, the scores shifted dramatically, with 15 students reaching Level 4 by the end. This indicates a significant enhancement in their understanding and the ability to integrate language with content knowledge.

In project-based learning, the starting scores also show a considerable number of students in Level 1, yet by the end, there were none at that level. Instead, more students reached Levels 3 and 4, demonstrating that the project-based approach fostered deeper engagement and skill development.

For written work, students initially showed moderate proficiency, with most in Level 2. By the final stage, an upward trend is visible, with increased numbers in Levels 3 and 4, reflecting students' growing ability to integrate language skills effectively with content knowledge.

Lastly, in oral/speaking activities, students performed relatively well from the beginning, with many initially achieving higher levels. However, there was a slight decrease in Level 4 scores by the end, indicating that while some maintained high proficiency, others may need additional support to sustain advanced language and communication skills. This drop may warrant further investigation to understand the factors contributing to decreased performance in this area towards the end of the assessments.

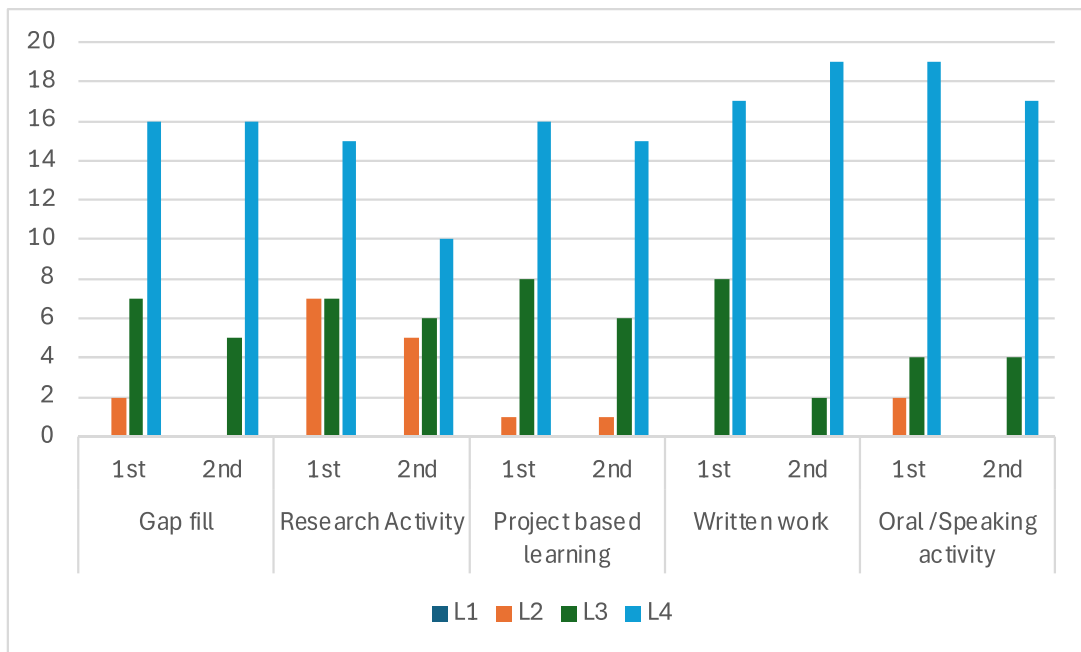
### **Third-year student assessments**

The assessment data for third-year students, who only participated in two topics, is presented in the Figure 23. In gap-fill assessments, students began with a strong

proficiency, as evidenced by the high number achieving Levels 3 and 4 in the first topic, with 7 students in Level 3 and 16 in Level 4. By the second topic, there was a slight decrease in Level 3 scores, but 16 students remained at Level 4, demonstrating consistent advanced language proficiency and comprehension.

**Figure 23**

*Third year students' progression by assessment type and level*



The research activity scores reflect a similar trend. At the first topic, students showed a high level of understanding, with a significant distribution between Levels 3 and 4 (7 and 15 students, respectively). In the second topic, there was a slight drop in the number of students at Level 4, though most remained in Levels 3 and 4, indicating a maintained, though slightly reduced, level of proficiency.

Project-based learning data highlights sustained high achievement. In the first topic, the majority of students were in Levels 3 and 4, with only one in Level 2. In the second topic, the trend continued, with 15 students achieving Level 4 and a slight decrease in Level 3. This reflects effective engagement with project-based tasks and solid integration of language and content skills.

In written work, students performed exceptionally well, with all students scoring in the higher levels from the start. At the first topic, 17 students reached Level 4, with the rest in Level 3. By the second topic, the number in Level 4 increased further to 19, showing clear progress in written language skills and subject-specific knowledge.

Oral/speaking activity also demonstrated high levels of proficiency. At the first topic, 19 students achieved Level 4, while only a few were in lower levels. By the second topic, although two students moved to Level 3, the majority (17 students) remained in Level 4, indicating a strong and sustained command over oral communication and subject matter.

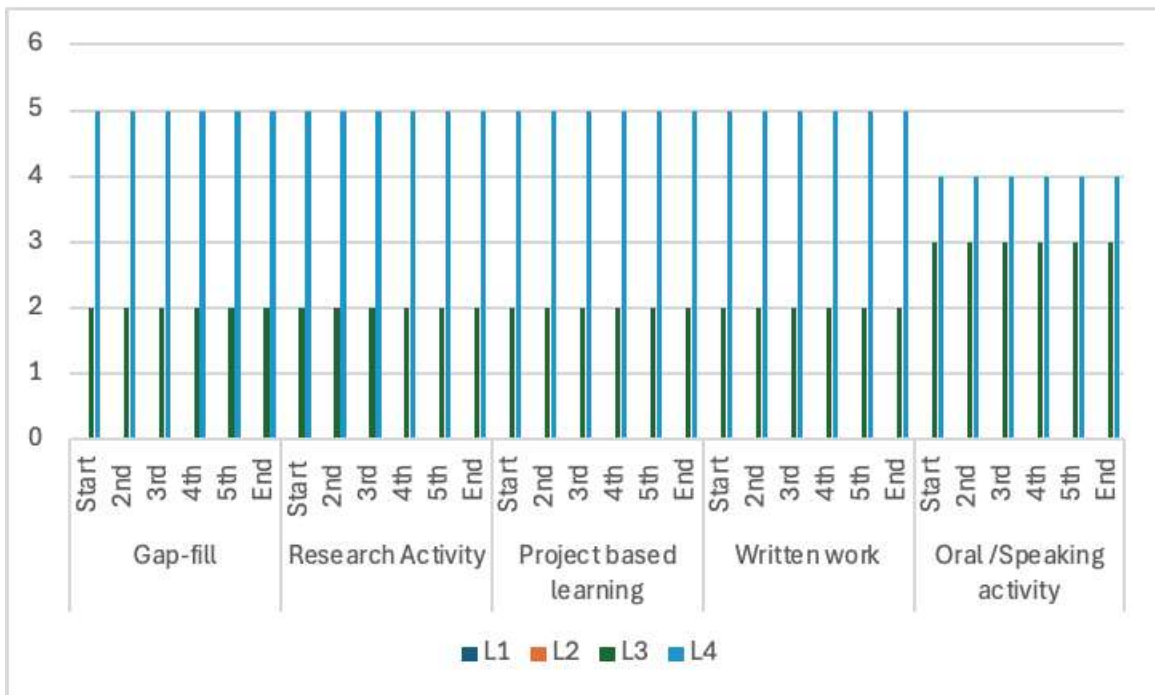
The third-year students' data shows a high level of proficiency across all assessment types, with most students achieving Levels 3 and 4 from the outset and maintaining or improving these scores through the second stage. This suggests that these students already possessed advanced skills in language and content integration, and the course assessments reinforced these competencies. The figure accompanying this analysis effectively visualises these high proficiency levels and the slight shifts in scores between stages, illustrating the third-year students' strong overall performance.

#### Master's student assessments

The data on master's students' assessment scores, displayed in the Figure 24, presents a unique and consistent pattern across all assessment types. Unlike other student groups, the scores for master's students remained identical throughout the various topics of each assessment, with all students consistently performing at either Level 3 or Level 4 across gap-fill, research activity, project-based learning, written work, and oral/speaking activity. In each of these assessments, there is a steady distribution of scores from the start to the end topics. Similarly, in oral/speaking activity, three students are at Level 3, and four are at Level 4 throughout all stages. This stability suggests that master's students entered the course with a high level of proficiency, maintaining this advanced understanding and skill integration without significant variation over time.

**Figure 24**

*Master's students' progression by assessment type and level*



This data allows to explore possible reasons for the higher and more consistent performance among master's students. One explanation could be the level of academic and professional experience typical of master's program entrants. These students likely possess a foundational knowledge base and well-developed language and critical thinking skills prior to beginning the course, enabling them to perform at an advanced level from the outset. Furthermore, master's students may have had previous exposure to rigorous academic environments, fostering their ability to integrate language and content knowledge.

The figure underscores the advanced proficiency of master's students, showing a consistency that highlights the difference in baseline abilities between master's students and those at earlier academic stages, suggesting that entry-level skills may play a significant role in their strong and stable performance.

### **Enhancement of students' learning of specific technical language**

The analysis of student assessments indicates a significant enhancement in students' learning of the specific technical language of their content area through interdisciplinary collaboration.

#### **Evidence from assessments:**

- **Improved language proficiency:** Students' consistent improvement across assessments suggests increased self-efficacy (SCT) as they grew more confident in their ability to use technical language effectively. Their progress also aligns with EVT's expectancies for success, as students likely started believing that mastering the technical language would directly impact their academic and professional futures. The perceived value of language proficiency in their field motivated them to engage more actively in interdisciplinary projects.
- **Effective integration of language and content:** Students were able to apply technical language within practical scenarios, highlighting both high task value (EVT) and positive outcome expectations (SCT). Their ability to connect language learning with real-world content application provided immediate and visible results, reinforcing the importance of the task and strengthening their confidence in success.
- **Enhanced oral communication skills:** The growth in students' oral communication skills reflects increased self-efficacy in communicating technical concepts, a critical skill for their future professional environments. This improvement further solidified outcome expectations (SCT) as students saw the real-world benefits of interdisciplinary learning and their growing ability to succeed.

The findings indicate that interdisciplinary collaboration improved students' acquisition of technical language relevant to their content areas. This enhancement aligns with SCT, which emphasises the importance of self-efficacy in learning. As students successfully used

technical language in practical contexts, such as class discussions and project-based tasks, their confidence in using this language likely increased. This self-efficacy not only motivates students to engage more actively in learning but also encourages them to tackle complex vocabulary and concepts, as supported by research showing that higher self-efficacy correlates with better student engagement and performance (Alalwan et al., 2019; Guo et al., 2017).

Moreover, EVT helps to explain students' motivation throughout this process. As students recognized the value of mastering technical language for their future careers, their engagement in interdisciplinary activities increased. The positive feedback loop between their perceived task value and their performance illustrates how the benefits of learning technical vocabulary can reinforce their motivation to engage in further interdisciplinary collaboration (Gaspard et al., 2018).

The data from student assessments underscores the positive impact of interdisciplinary collaboration on students' learning outcomes. Through careful curricular choices and effective teaching practices, students significantly improved their language proficiency and content understanding. These findings support the value of interdisciplinary education in higher education institutions, particularly in enhancing students' language skills and ability to apply technical language in real-world contexts.

#### **6.4. Receptiveness from post class and final questionnaires**

Responses from the content teachers in the post-class questionnaire demonstrated a strong receptiveness to interdisciplinary collaboration, with most rating the experience highly. Initially uncertain teachers gained confidence as they observed the benefits for students, indicating a positive shift in their self-efficacy. This improvement, influenced by successful outcomes, aligns with Social Cognitive Theory (SCT), where increased confidence emerged as teachers observed student progress. Teachers also reported that both language and content objectives were met, and they acknowledged the value of

interdisciplinary collaboration, reinforcing the relevance of the task (as described in Expectancy-Value Theory, or EVT) and motivating them to continue with this approach.

Effective teaching strategies noted by teachers included the use of authentic materials, collaborative lesson planning, and scaffolding, all of which enhanced interdisciplinary efforts. Challenges, such as time constraints and varied comprehension levels among students, were managed through ongoing adjustments, reflecting resilience and a commitment to improving the teaching process. Teachers also reported that assessment methods aligned well with the learning objectives, contributing to student engagement and active participation in both language and content areas. Their collaboration with the ESP teacher was marked by effective communication and coordination, which further facilitated the interdisciplinary approach.

The ESP teacher's responses varied by class, with successful integration of language and content positively influencing their receptiveness to collaboration. Teaching strategies, such as real-life examples, scaffolding, and visual aids, proved effective in engaging students and highlighted the teacher's self-efficacy in applying diverse methods. Despite challenges, the ESP teacher's resilience and adaptive approach supported the collaborative framework. Reflecting on the project, they acknowledged both successes and areas for improvement, particularly in lesson planning and student engagement.

Overall, the receptiveness to interdisciplinary collaboration at Castelo Branco Polytechnic University was high, supported by school leadership and evidenced by positive responses from both content teachers and the ESP teacher. Student feedback also reflected enthusiasm for interdisciplinary approaches, showing readiness for classes integrating language with content. Although some students may benefit from further support, both students and teachers showed openness to collaborative learning.

This analysis highlights the value of SCT and EVT in understanding the growth of self-efficacy and motivation among participants. Teachers and students became more engaged as they recognized the practical benefits of interdisciplinary collaboration, creating a

foundation for successful, sustained integration of language and content in higher education.

#### **6.4.1. The role of SCT and EVT in understanding receptiveness**

While not a direct focus of the research questions, Social Cognitive Theory (SCT) and Expectancy-Value Theory (EVT) were pivotal in providing a structured framework for analysing participants' receptiveness, motivation, and engagement in interdisciplinary collaboration. These frameworks offered critical insights into how cognitive and motivational factors shaped teachers' and students' willingness to participate in and sustain collaborative efforts.

Through the lens of SCT, the study revealed how self-efficacy—the belief in one's ability to succeed—evolved among participants. Both teachers and students entered the collaboration with varying confidence levels, which grew as they observed positive outcomes. For teachers, witnessing improved student performance reinforced their belief in the effectiveness of integrating language and content. Similarly, students experienced increased self-efficacy as they successfully applied technical language in practical contexts, fostering a reciprocal relationship between achievement and confidence. This progression aligns with research by Alalwan et al. (2019) and Guo et al. (2017), highlighting the connection between self-efficacy, engagement, and persistence.

EVT further elucidated the motivational dynamics underpinning participants' engagement. Teachers recognised the task value of interdisciplinary collaboration as it enhanced their teaching practices and student outcomes. Likewise, students appreciated the relevance of mastering technical language for their future careers, motivating them to engage more deeply in collaborative tasks. Improvements in their communication skills and vocabulary proficiency reinforced their expectancies for success, consistent with findings by Gaspard et al. (2018) and Meyer et al. (2019).

Together, SCT and EVT provided a nuanced understanding of how participants' beliefs, attitudes, and perceptions of task value influenced their receptiveness and engagement.

These insights highlight the cognitive and motivational underpinnings of interdisciplinary collaboration, emphasizing the importance of fostering confidence and demonstrating value to sustain participation. This theoretical grounding not only enriched the analysis of this case study but also offers a framework for future research and practical applications aimed at enhancing collaboration in educational settings.

## **7. Conclusions**

This chapter synthesises the conclusions derived from the investigation into interdisciplinary collaboration at Castelo Branco Polytechnic University. The study focused on integrating English language instruction with technical content to assess the effectiveness and challenges of implementing interdisciplinary collaboration between an ESP teacher and content teachers. Through a multi-stage analysis that assessed institutional readiness, implementation, and post-class phases, the study evaluated insights from school directors, teaching staff, students, and the ESP teacher. This chapter summarises the overall effectiveness of the interdisciplinary model, examines its impact on teaching practices and student outcomes, and provides recommendations for future improvements.

The conclusions address the research questions posed at the outset, exploring the implications for interdisciplinary collaboration, ICLHE and ESP. The discussion also considers language policies, internationalisation, teacher training, and strategies for enhancing student learning. Furthermore, the chapter acknowledges the study's limitations and suggests areas for future research.

Finally, based on the experiences and findings of the study, an intervention plan and guide have been developed. This guide includes recommendations for content selection and a decision-making tool to assist in implementing interdisciplinary collaboration within the ICLHE context.

### **7.1. Answers to the research questions**

The research questions guiding this study were:

1. How receptive is the higher education institution to implementing interdisciplinary collaboration between ESP teachers and teachers from other subject areas?
2. What key elements should be included in the intervention plan for interdisciplinary collaboration?

3. What are the benefits and challenges experienced by teachers in interdisciplinary collaboration, and how do these influence their teaching practices and curricular choices?
4. To what extent does the interdisciplinary collaboration enhance students' learning of the specific technical language of their content area?

In answering these questions, this highlights the alignment of collaborative efforts with educational objectives, evaluates the effectiveness of pedagogical strategies, and reflects on how the approach has influenced academic literacy and student engagement. The conclusions drawn aim to provide insights into interdisciplinary collaboration and offer recommendations for future practice and research. By synthesising the study's outcomes, this chapter aims to provide a clear and actionable understanding of the benefits and limitations of interdisciplinary teaching practices, guiding future efforts to enhance educational practices and support student learning in higher education.

**RQ1. How receptive is the higher education institution to implementing interdisciplinary collaboration between ESP teachers and teachers from other subject areas?**

The analysis of receptiveness reveals a generally positive and supportive stance. The examination, encompassing insights from school directors, deputies, and teaching staff, provides a nuanced understanding of the institution's readiness to implement and utilise interdisciplinary collaboration, particularly with ESP teachers.

The feedback from school directors and deputies highlights a significant commitment to integrating foreign language education and interdisciplinary collaboration. The directors' positive perceptions and willingness to support interdisciplinary approaches indicate a conducive environment, although further clarification and formalisation of language policies may enhance institutional alignment.

Among the teaching staff, the analysis revealed a moderate to high level of receptiveness towards interdisciplinary collaboration with ESP teachers. The majority of teachers perceive higher language proficiency as beneficial for their pedagogical

effectiveness and are relatively comfortable teaching in English. This comfort level, combined with a moderate need for linguistic support, suggests a readiness to engage in interdisciplinary efforts. The teachers' ability to integrate language instruction with their disciplinary content, especially for Erasmus students, points to promising opportunities for enriching educational experiences and promoting internationalisation within the institution. Their receptiveness is further supported by their willingness to adapt pedagogical strategies to align with interdisciplinary collaboration goals, fostering enhanced learning outcomes and cultural exchange.

The overall receptiveness of the institution is characterised by a shared commitment from school directors and teaching staff. While there are areas for improvement, such as formalising language policies and providing additional linguistic support, the general attitude towards collaboration is positive. The supportive culture within the institution, as evidenced by the alignment between directors and staff, provides a strong foundation for the successful implementation of interdisciplinary initiatives.

Students' pre-class perspectives reveal a high level of comfort in using English as the medium of instruction, attributed to their substantial prior exposure and interest in integrating English into their curriculum. They largely feel confident in their technical English vocabulary, indicating a readiness for interdisciplinary collaboration. While experiences with interdisciplinary teaching varied, there was a strong interest in collaborative formats that merge English with other disciplines.

Post-class feedback showed that both first-year and advanced students valued the integration of content and language. Advanced students, in particular, reported higher satisfaction with the interdisciplinary approach. They expressed encouragement to engage in interdisciplinary discussions, highlighting clear learning objectives and active learning opportunities as significant factors in their positive experience. However, some master's students noted that their communication skills did not improve as expected, suggesting a need for more advanced language support. Recommendations from students included

additional language assistance for those with lower proficiency levels and an increase in the number of interdisciplinary classes.

Before the case study, the ESP and content teachers held diverse perspectives on interdisciplinary collaboration, with some expressing scepticism about its effectiveness and others recognising its potential benefits. Concerns were raised regarding integrating language and content instruction, workload management, and the practical implementation of collaborative teaching methods. However, after the case study, their perspectives shifted significantly.

Content teachers' responses reflect a high receptivity to implementing interdisciplinary collaboration with an ESP teacher in a CLIL context. While most responses from the content teachers were positive, there were some indications of challenges and areas for improvement. This highlights the importance of addressing varying student needs and ensuring clarity in instructional delivery.

The teachers emphasised the need for ongoing collaboration and communication to improve teaching practices and student outcomes. Suggested strategies included regular exchange of ideas, materials, and planning to enhance the coherence and effectiveness of interdisciplinary projects. Throughout the project, their receptiveness translated into positive experiences, with teachers rating the overall success of the collaboration highly and recognising the achievement of language learning objectives.

Despite encountering challenges such as differences in teaching styles and time constraints, the teachers demonstrated adaptability and implemented strategies to address these issues, highlighting their commitment to effective interdisciplinary teaching. Ultimately, the teachers expressed high satisfaction and strongly endorsed continuing and expanding such collaborations. These findings underscore the potential of interdisciplinary approaches to enhance language and content learning outcomes in higher education.

The receptiveness of Castelo Branco Polytechnic University to interdisciplinary collaboration involving ESP teachers is promising. Key stakeholders—including school directors, teaching staff, and students—show significant support and readiness to

integrate language instruction with technical content. Addressing areas for improvement, such as formalising language policies and providing enhanced linguistic support, can further bolster the institution's capacity to implement effective interdisciplinary initiatives. Overall, the supportive culture within the institution lays a strong foundation for successful interdisciplinary collaboration aimed at enriching educational outcomes and fostering cultural exchange.

SCT and EVT were critical in measuring this receptiveness, demonstrating how increasing self-efficacy and a growing perception of task value motivated teachers and students to participate actively in interdisciplinary collaboration. As teachers and students experienced success, particularly in terms of language acquisition and student engagement, their confidence in this collaborative method grew. This alignment of institutional support, teacher commitment, and student engagement highlights the potential for successful interdisciplinary teaching at the institution.

**RQ2. What key elements should be included in the intervention plan for interdisciplinary collaboration ?**

The interdisciplinary collaboration between the ESP and content teachers was characterised by a flexible approach to teaching models. Rather than adhering to a single model, the teachers adapted their methods based on the specific content, objectives, and materials required for each lesson. This flexibility is a hallmark of effective interdisciplinary collaboration, as it allows both the ESP and content teachers to co-decide on the most appropriate teaching strategy for each class. Depending on the goals—whether focusing on language reinforcement, technical content mastery, or both—the teachers employed various co-teaching models, such as complementary co-teaching, team teaching, and integrated approaches from CLIL and ICLHE frameworks.

This dynamic, adaptable approach enabled the teachers to tailor each lesson to meet both language and content objectives more effectively. Over time, through joint planning and reflection, the teachers were able to select and refine strategies that aimed to

maximise student engagement and learning outcomes, demonstrating the value of interdisciplinary collaboration in higher education

Based on the findings of this study, several key elements should be included in the intervention plan. First and foremost, a structured communication framework is essential. Effective communication has been identified as crucial for aligning teaching objectives and strategies. Currently, teachers engage in structured email exchanges for day-to-day communication, which ensures focused and relevant discussions. By incorporating a formalized communication framework into the intervention plan, coordination can be enhanced, facilitating more effective decision-making processes. Regular informal meetings following these email exchanges should also be scheduled to allow for in-depth discussions, collaborative planning, and problem-solving.

Another critical element is a resource and material management strategy. The study highlights the importance of analysing existing teaching materials to identify gaps and determine the need for new resources. The intervention plan should therefore include a systematic approach for reviewing and updating teaching resources. This process will guide discussions on whether materials align with interdisciplinary goals and will determine the necessity for new resources, ultimately enhancing the relevance and effectiveness of teaching materials.

A lesson and assessment refinement process is vital for meeting content and language learning objectives. The intervention plan should incorporate a framework for continuous evaluation of lesson plans and assessments based on student feedback and performance. This iterative refinement process will help address any gaps and ensure assessments are aligned with diverse learning styles and objectives, leading to improved student outcomes.

Strategic coordination of class schedules is also a key element. Aligning class schedules to integrate theoretical content with practical exercises has proven essential for successful interdisciplinary teaching. The intervention plan should encourage teachers to collaborate on confirming class dates and ensuring cohesive curriculum integration. Establishing clear, shared objectives for interdisciplinary projects will guide the development of lessons that

effectively merge language and content, thereby enhancing students' understanding of technical terminology.

Incorporating engaging pedagogical strategies is another important aspect of the intervention plan. The study indicates that the use of interactive activities, class discussions, and visual aids supports learning across disciplines. The intervention plan should recommend specific pedagogical strategies that promote student engagement and facilitate comprehension of complex concepts, such as gap-fill exercises, visual lectures, and practical exercises that reinforce understanding and facilitate interdisciplinary learning.

Furthermore, the intervention plan should include provisions for ongoing professional development and support. Teachers expressed a need for specialised language support and strategies to overcome challenges related to terminology complexity and resource limitations. By including professional development opportunities, the intervention plan can enhance teachers' understanding of interdisciplinary approaches and bilingual education practices, equipping them with the necessary tools to address challenges and improve collaboration effectiveness.

Finally, establishing feedback mechanisms for continuous improvement is crucial. The study emphasises the importance of collecting feedback from both students and teachers to inform the iterative improvement of the interdisciplinary collaboration process. Regular assessments and reflections on the collaborative teaching experience can help identify successful strategies and areas for improvement, fostering a culture of continuous growth and adaptability.

Notably, this aligns with Coelho's (2022) observation that, despite gaps in theoretical understanding of CLIL methodologies, many lecturers still demonstrated strong interactive and student-oriented teaching strategies. This insight parallels how ESP and content teachers in the present study navigated their responsibilities and made collaborative decisions, even in the face of training gaps or limited understanding of bilingual education practices (Coelho, 2022).

**RQ3. What are the benefits and challenges experienced by teachers in interdisciplinary collaboration, and how do these influence their teaching practices and curricular choices?**

Content teachers encountered both drawbacks and benefits in their experience with interdisciplinary collaboration. One of the main drawbacks was the challenge of managing time constraints and workload, as collaborative planning requires substantial time and effort, which can strain teachers' schedules and affect their other teaching responsibilities. Additionally, the complexity of balancing both language and content objectives in interdisciplinary teaching presented difficulties, requiring extra support. The need to address diverse student needs and manage varied assessment requirements also added to the workload, making the process more demanding.

Despite these challenges, the content teachers identified several benefits from interdisciplinary collaboration. Among the most significant advantages was the improvement in pedagogical innovation, as the collaborative process encouraged teachers to explore new methods of instruction and integrate content in more dynamic ways. Furthermore, teachers experienced enhanced professional development opportunities, as working alongside ESP teachers allowed for an exchange of expertise that deepened their understanding of language instruction alongside content teaching. This, in turn, contributed to enriched teaching resources and improved instructional effectiveness. The collaboration ultimately fostered a more holistic approach to teaching, benefiting both teachers and students by improving the quality and depth of education delivered.

Curricular choices in the interdisciplinary collaboration between ESP and content teachers were shaped by both the challenges and benefits experienced throughout the collaboration process. One of the primary challenges faced by teachers was the need to balance language and content objectives within the limited class time. This difficulty influenced curricular decisions, leading teachers to prioritize essential content and focus on areas where language instruction could naturally integrate with subject matter. This

often required modifying lesson plans to accommodate both the technical content and language learning goals without overwhelming students or sacrificing depth.

The challenge of managing diverse student needs also impacted curricular choices. Teachers were required to differentiate instruction to cater to varying levels of language proficiency and content understanding. As a result, curricular adjustments included scaffolding strategies and the use of real-life examples to make content more accessible, particularly for students who struggled with language-related aspects. This need for differentiation highlights the significant role that formative assessments played in the curriculum, allowing teachers to continuously adapt their teaching based on student performance and feedback.

Despite these challenges, the collaboration brought several pedagogical benefits that were reflected in curricular choices. For example, the curriculum was enriched by incorporating interactive and student-centered learning approaches, such as inquiry-based learning and project-based tasks. These strategies were designed to engage students actively, helping them to apply both language and content knowledge in real-world scenarios. The emphasis on active learning not only improved student engagement but also supported deeper understanding of both language and disciplinary content.

Furthermore, the interdisciplinary collaboration fostered professional development and pedagogical innovation among the teachers, which influenced how the curriculum was structured. Teachers developed a deeper understanding of how to integrate language and content teaching, which was reflected in their lesson planning. The shared expertise between ESP and content teachers led to the introduction of more comprehensive and integrated curricular units, ensuring that both language and content objectives were aligned and mutually supportive.

In conclusion, curricular choices during interdisciplinary collaboration were largely shaped by the need to address time constraints, student diversity, and the integration of language and content objectives. Teachers' experiences with these challenges led to innovative solutions, such as differentiated instruction and inquiry-based learning, which

enhanced the overall effectiveness of the curriculum. The benefits of this collaboration, including enriched teaching strategies and professional growth, further influenced the curricular design, making it more interactive and aligned with both language and content learning goals

**RQ4. To what extent does the interdisciplinary collaboration enhance students' learning of the specific technical language of their content area?**

There is clear evidence that interdisciplinary collaboration significantly enhances students' acquisition of specific technical language within their content areas, regardless of when they are introduced to this method or their initial level of English proficiency. The study shows that whether students encounter interdisciplinary collaboration in their first year, third year, or at the master's level, the impact on their technical language acquisition is consistently positive.

For first-year students, the evidence shows a foundational understanding of technical language, with varying proficiency levels at the start. Despite some students needing additional language support, assessments demonstrate that those introduced to interdisciplinary collaboration early in their studies exhibit a solid grasp of basic technical vocabulary and language structures. This early exposure helps them build a strong foundation for future learning, setting the stage for further language development.

In the case of third-year students, it is important to note that they did not have interdisciplinary collaboration during their first two years. Despite this, once they engaged in the collaborative method, their assessments—both written and oral—indicated significant improvement in their ability to integrate technical language with content knowledge. The evidence shows that even students who encounter interdisciplinary collaboration later in their studies benefit from the approach. Their performance in various assessments suggests that the integration of content and language instruction in their third year enables them to apply technical language more effectively in both theoretical and practical contexts, even if they had no prior experience with interdisciplinary collaboration during the earlier years of their undergraduate program.

The performance of master's students in assessments involving research projects, presentations, and written tasks indicates that interdisciplinary collaboration did not hinder their ability to use technical language fluently and accurately in advanced academic and professional contexts. Although students already had a baseline level of English proficiency, they adapted well to the collaborative approach, applying technical language effectively across complex tasks. While this study cannot definitively conclude that interdisciplinary collaboration alone drives these outcomes, the positive results suggest that it may serve as a valuable component in supporting language and content integration. Further research is needed to explore the specific impacts of interdisciplinary collaboration on advanced language acquisition and its potential to enhance learning outcomes at the master's level.

Additionally, the study reveals that students benefit from interdisciplinary collaboration regardless of their initial English proficiency. Whether students begin with high, moderate, or lower levels of English, the collaborative approach improves their language skills. For those with a stronger foundation, the collaboration helps refine and expand their technical vocabulary, while those with lower proficiency receive the support needed to develop essential language skills. This suggests that interdisciplinary collaboration is an effective teaching strategy for students with diverse language backgrounds, providing them with the opportunity to improve and apply technical language in real-world contexts.

The impact of SCT and EVT is evident in students' growing self-efficacy as they successfully applied technical language in various contexts. Their awareness of the task value—the practical benefits of mastering subject-specific language—further motivated them to engage in interdisciplinary learning activities. The study confirms that interdisciplinary collaboration is a highly effective strategy for enhancing both language and content learning, contributing to students' academic and professional development across all levels of study.

In conclusion, the evidence supporting the enhancement of students' acquisition of specific technical language through interdisciplinary collaboration is found across all

academic levels—first year, third year, and master’s—irrespective of when they are introduced to this method. From early exposure to later academic stages, the collaborative approach consistently fosters technical language acquisition. The improvements observed in assessments across the first two groups demonstrate that interdisciplinary collaboration is a powerful tool for enhancing language and content learning, regardless of the students' prior experience with the method or their starting level of English proficiency.

## **7.2. Implications of the study**

### **7.2.1. Interdisciplinary collaboration, ICLHE and ESP**

The findings from this study have significant implications for interdisciplinary teaching and collaboration. Enhanced learning outcomes were observed, with notable improvements in students' language proficiency and content understanding, suggesting that interdisciplinary approaches should be more widely adopted to maximise educational outcomes. The study underscores the importance of integrated curriculum design that aligns language and content objectives, leading to more comprehensive educational frameworks supporting interdisciplinary teaching across various subjects. Recent studies on interdisciplinary collaboration (Chaovanapricha & Chaturongakul, 2020; Merino & Lasagabaster, 2018; Tionson, 2018) highlight various projects between English language and content teachers to enhance student outcomes and foster teacher collaboration skills. Examples include research on CLIL in English as a Foreign Language (EFL) contexts, technology-mediated collaboration (Arnó-Macià, 2014), policy development for ICLHE practices (D’Alessio & Hardie, 2019b), collaboration in EMI contexts (Kletzenbauer et al., 2022), and the use of online forums and videoconferencing in the INCOLLAB Project (2018).

INCOLLAB suggested ways of overcoming the challenges faced in ICLHE, such as the shortage of suitable teaching materials and the significant time investment required to create and adapt resources. By creating, promoting, and implementing innovative interdisciplinary and collaborative approaches to language teaching and learning, INCOLLAB aimed to address key issues in the field (Piquer-Píriz et al., 2021). Its primary

contribution lies in the development of specialised Open Educational Resources (OERs), which are innovative modules integrating both content and language. The significance of these efforts is highlighted by findings from the study conducted by Piquer-Píriz & Castellano-Risco as part of the regionally funded research project ICLUEx1 at the University of Extremadura in Spain. The study revealed that while most EMI lecturers used online resources and considered information and communication technology (ICT) crucial to their teaching, they often had to create and adapt their own materials due to a lack of suitable resources—a process further complicated by the need to balance content and language effectively (Piquer-Píriz & Castellano-Risco, 2021). Through its focus on interdisciplinary collaboration and high-quality resource development, INCOLLAB provided a meaningful response to these challenges, offering practical solutions for enhancing CLIL in higher education (Piquer-Píriz et al., 2021).

This case study also identified similar challenges, such as shortages in materials and reliance on the internet for research. It further highlighted the significant amount of time teachers invested in preparing lessons and adapting materials, emphasising the critical role of interdisciplinary collaboration in addressing these issues. Notably, the teachers expressed a strong desire to continue such collaboration, recognising the value of the efforts made and the successes achieved. They demonstrated a willingness to refine and improve their classes where necessary, appreciating the time and energy already committed. However, short-term projects alone are insufficient. For sustained progress, there must be a commitment to implementing interdisciplinary collaboration as a long-term practice. This appears to be the most viable way forward, ensuring that the benefits of such collaboration are fully realised and embedded within educational systems.

This study corroborates previous research on interdisciplinary collaboration (Chaovanapricha & Chaturongakul, 2020; Lasagabaster, 2018; Tionson, 2018) and adds a unique perspective by focusing on a higher education institution and examining the receptiveness of its entire teaching staff. Unlike earlier investigations, this case study provides an in-depth exploration spanning an entire semester of first-year undergraduate classes and classes in third-year undergraduate and master's programmes. This

comprehensive approach offers a holistic understanding of interdisciplinary collaboration dynamics across various academic levels.

Additionally, the study looks at ICLHE and highlights the proactive involvement of teachers in a semester-long exploration. Previous research has shown that students respond positively to collaborative teaching in ICLHE contexts, enjoying the simultaneous acquisition of subject matter and language skills (Arnó-Macià et al., 2020; Mestre-Segarra & Ruiz-Garrido, 2022; Milcu, 2012). They appreciate the support from English language teachers in understanding complex concepts and using subject-specific vocabulary. Moreover, students value the collaboration between content and English language teachers for better comprehension of subject matter and language proficiency development (Ronfeldt et al., 2015; Swales, 1971; Zappa-Hollman, 2018).

In this collaborative teaching setting, students reported increased confidence in communicating in English and understanding subject-specific concepts, expressing optimism about the approach's interactive and engaging nature. Studies by Dugan and Letterman (2008) and Merino and Lasagabaster (2018) underscore the positive impact of collaborative teaching on students' learning experiences, fostering increased engagement, motivation, and confidence.

Despite the benefits of interdisciplinary collaboration, researchers have noted several challenges in higher education, including difficulties in coordination, unequal participation, time constraints (Jortveit & Kovač, 2022), and resistance to change within disciplines (Marouli et al., 2017). This case study acknowledges these challenges and demonstrates how the teachers involved found ways to overcome them, often by employing strategies outlined in the literature. For example, Marouli et al. (2017) emphasise the importance of rapport building, establishing a teaching plan, and maintaining flexibility and respect among teachers. They highlight that a well-defined action plan with clear activities and learning objectives from the outset is crucial for successful collaborative teaching. By addressing these challenges through careful planning and communication, the benefits of interdisciplinary collaboration were fully realised.

Effective communication and collaboration between ESP and content teachers are crucial, and institutions should facilitate regular co-planning sessions and professional development workshops to build strong collaborative relationships. Additionally, schools and universities need to allocate adequate time and resources to support interdisciplinary teaching, including providing additional planning time, professional development, and materials catering to integrated learning objectives.

Integrating ESP with content teaching significantly boosts students' English proficiency, preparing them for global academic and professional environments. Focusing on technical language within the context of specific content areas helps students apply English practically, enhancing their ability to use the language in real-world scenarios. Implementing CLIL in higher education involves equipping subject-matter experts with language learning awareness and scaffolding techniques (Merino & Lasagabaster, 2018). Enhancing teachers' English competence is crucial, with multidisciplinary collaboration recommended for developing CLIL courses (Strotmann et al., 2014; Graham et al., 2018; Vilkancienė & Rozgienė, 2017; Zayas & Romero, 2017). Continuous support from a Foreign Language (FL) teacher specialising in CLIL aids content teachers in planning sessions, selecting materials, deciding tasks, and aligning assessments with students' language proficiency (Gonçalves et al., 2022). Ongoing cooperation among teachers is indispensable for effective ICLHE, emphasising the value of collaborative approaches within the context of foreign language instruction and the broader ICLHE framework (Lyster, 2017). The interdisciplinary approach makes language learning more engaging and relevant, increasing student motivation and participation.

While this study focused on the receptiveness of teachers and students toward interdisciplinary collaboration, it is important to acknowledge the parallel research conducted at the same HEI (Régio, 2024). Their thesis explored the perceptions of IPCB lecturers regarding their experiences in collaborating for CLIL, highlighting key variables such as teachers' autonomy, collegial relationships, and the need for professional development in bilingual education.

Together, these two studies provide a foundational understanding of the potential for interdisciplinary collaboration at this HEI. While this research addresses the specific areas of student engagement and learning outcomes resulting from interdisciplinary methods, Régio's findings emphasise the necessity of fostering an environment conducive to collaboration, thus reinforcing the broader context of interdisciplinary teaching.

The findings from this study respond to several future research proposals outlined by Régio. Expanding the sample size to include a broader range of departments and disciplines within the institution has enhanced the understanding of interdisciplinary collaboration across diverse academic contexts. By incorporating varied perspectives, this study offers a comprehensive overview of how collaborative efforts are perceived and how they can be implemented in this institution. Furthermore, it lays the groundwork for a longitudinal investigation to assess the evolution of teachers' autonomy, collegiality, and collaborative behaviours over time. This approach has the potential to yield valuable insights into the sustainability and long-term effects of interdisciplinary collaboration on both teaching practices and student outcomes.

In addition, this study emphasises the importance of student learning outcomes, underscoring the necessity of incorporating students' perceptions into future research. Understanding their views on learning experiences in interdisciplinary settings can complement teachers' insights, offering a more holistic perspective on the effectiveness of such approaches. The findings also carry implications for policymakers by demonstrating the receptiveness of faculty and administration to interdisciplinary collaboration. These results could inform strategic initiatives that enhance institutional policies supporting broader implementation of collaborative methods.

The research contributes to the development of tailored questionnaires for collecting student feedback and assessing teacher autonomy and collaboration in higher education. These instruments are essential for enabling researchers to gather comparable data across institutions and contexts. Thus, the study not only complements Régio's findings but also establishes a foundation for further exploration into interdisciplinary collaboration,

academic discourse, and practical applications aimed at improving educational practices in diverse settings. The alignment of findings underscores the significance of collaborative efforts, as reflected in the evolving self-efficacy and outcome expectations of participants. This is consistent with principles from social cognitive theory and expectancy-value theory, creating a synergy between the current study and related research that supports interdisciplinary collaboration as a strategy for academic and professional success.

The study exhibits notable strengths, particularly in its depth of analysis. Detailed reflections and feedback from teachers and students provide rich qualitative data, yielding insights into interdisciplinary collaboration processes. This qualitative data is complemented by a longitudinal perspective that allows continuous refinement and validation of findings, offering an understanding of interdisciplinary teaching. Additionally, the study provides practical implications for implementing interdisciplinary collaboration, offering actionable strategies that other educators and institutions can directly apply.

Positive outcomes were evident in the study's ability to create a supportive and engaging research environment. High response rates to the questionnaires reflected strong participant engagement, while follow-up feedback indicated that participants felt comfortable sharing their perspectives, contributing to the richness and quality of the data. The findings highlight the impact of interdisciplinary collaboration on student outcomes, particularly in improving technical language and engagement. Project-based learning and oral assessments demonstrated advanced proficiency levels among higher-year students, while teacher reflections revealed a commitment to continuous improvement and adaptability in instructional practices.

The study's recognition of areas for improvement is equally significant. Challenges such as variability in written task performance and the alignment of language and content mastery point to opportunities for targeted interventions. Recommendations include refining assessment rubrics, integrating technology to enhance collaboration practices, and establishing systematic feedback mechanisms to improve interdisciplinary

collaboration. Addressing these challenges will not only enrich education but also ensure the sustained success of similar initiatives.

Contributing to the existing literature, the study fills a gap in research on interdisciplinary collaboration in ESP and content teaching, particularly in technical fields. It advances the development of a framework or model for effective interdisciplinary collaboration that can be tested and refined in future studies. Furthermore, the study highlights the positive effects of interdisciplinary approaches on student outcomes, including improved engagement, enhanced language development, and the fostering of critical thinking, research skills, and autonomy. These findings underscore the broader applicability of interdisciplinary collaboration as a means of enriching education and promoting academic success across various contexts.

### **7.2.2. Language policies and internationalisation**

The findings from this study also underscore the necessity of developing clear and objective language policies that promote interdisciplinary collaboration with ESP teachers. The receptiveness of both students and teachers in the study reveals a strong willingness to engage in and acknowledge the benefits of such collaborations. Participants highlighted the importance of integrating more classes and ensuring continuous collaboration throughout the course, emphasising the critical role of English in content integration. The value teachers perceive, evidenced by their disappointment at the project's conclusion, reinforces the importance of sustaining these collaborative efforts. They have created lesson plans, resources, and assessments for reuse, aligning with standard higher education practices and underscoring the need for ongoing implementation.

Additionally, students expressed an apparent demand for further language support and guidance. These insights advocate for establishing language policies to facilitate sustained and effective interdisciplinary collaboration, benefiting teachers and learners in higher education. In light of internationalisation, developing such language policies could help institutions meet the global demands for multilingual proficiency, cross-cultural

communication, and the ability to engage effectively in diverse academic and professional settings.

Interdisciplinary collaboration with ESP teachers can contribute to the internationalisation of HEIs. Many HEIs may need more resources to offer EMI programmes. EMI brings challenges in academic literacy and language proficiency, necessitating curriculum development and faculty training (Coelho & Arau Ribeiro, 2018). Nevertheless, interdisciplinary collaboration with ESP teachers offers an alternative pathway, providing both students and teachers with crucial skills and language proficiency.

The interviews conducted at a Spanish HEI (Arnó-Macià et al., 2020) revealed that while lecturers may consider their own English proficiency adequate for teaching using EMI, they perceive CLIL as more suitable for less proficient students, since the interviews suggested that lecturers attach no importance to language integration. This perspective suggests a selective approach where only students with higher English proficiency are able to participate in EMI classes, raising concerns about the inclusivity of such programmes. The reliance on this selection process potentially undermines the broader goal of enhancing English language skills across all student levels. The significance of English in higher education and its role in preparing students for global careers should not depend solely on selective practices. A more inclusive strategy is essential to ensure that all students have the opportunity to improve their English proficiency.

This case study proposes an alternative to EMI by demonstrating that interdisciplinary collaboration with ESP teachers can effectively develop students' language skills and competencies. By integrating content and language instruction, this approach allows teachers to address both subject matter and language learning needs, which is essential for the internationalization efforts of Portuguese HEIs and others following EU directives.

It is important to clarify that this alternative should be viewed by HEIs as a viable strategy for equipping students with adequate English language skills, particularly in contexts where EMI may not be feasible due to various institutional limitations. Many HEIs face challenges—such as limited resources, lack of qualified teachers, or insufficient

student preparedness—that hinder their ability to implement EMI effectively. In such cases, adopting interdisciplinary collaboration with ESP teachers offers a practical solution for enhancing students' language proficiency without solely relying on EMI. This approach aligns with recommendations for ongoing cooperation among teachers to support effective ICLHE (Lyster, 2017). By fostering partnerships between content and language teachers, HEIs can create enriching learning environments that empower students to navigate academic and professional contexts effectively, thereby advancing their internationalisation goals.

Programmes offering integrated language and content instruction can attract international students seeking comprehensive educational experiences. Institutions that implement interdisciplinary teaching practices not only enhance their reputation as innovative and globally oriented but also appeal to a broader range of students and faculty.

It is crucial, however, that these programmes do not rely on distinguishing or selecting students based solely on their English proficiency levels. Instead, institutions should adopt an inclusive approach that focuses on developing language skills in conjunction with content knowledge. This means providing support and resources that address varying levels of English proficiency rather than reserving advanced language instruction for students who are already proficient. By focusing on the content and language integration rather than the proficiency of incoming students, institutions can create more equitable opportunities for all students to improve their English skills while engaging in their chosen disciplines. This approach ensures that all students benefit from high-quality education and support, contributing to a more inclusive and effective learning environment. Interdisciplinary collaboration with ESP teachers exemplifies this model by integrating language and content instruction, thereby enhancing students' overall learning experiences and improving their readiness for the global job market. Institutions that implement such collaborative practices can strengthen their global appeal, attract a wider array of students, and contribute to a more effective and inclusive educational environment. Fostering interdisciplinary collaboration can also lead to developing

international partnerships and collaborative research opportunities, furthering the institution's global reach.

### **7.2.3. Teacher training**

The findings further highlight the importance of targeted training programs, particularly for ESP teachers, in integrating interdisciplinary teaching strategies that combine language and content objectives. Belcher (2006) discusses the need for ESP teachers to continuously adapt to the linguistic and professional requirements of specific fields, highlighting the importance of interdisciplinary collaboration and content integration in ESP teaching. Basturkmen (2010) emphasises the importance of curriculum design that aligns language learning with subject-specific content. This approach is particularly relevant for training ESP teachers in interdisciplinary collaboration, as it highlights how effectively integrating content and language objectives can enhance both teaching practices and student outcomes. Ongoing professional development opportunities focusing on collaborative teaching methods can enhance teachers' effectiveness in implementing these strategies. ESP teachers, with their ability to teach both general and subject-specific language, play a vital role in higher education. Their capacity to adapt language instruction to meet the needs of different disciplines allows for a deeper engagement with academic content. As noted by Morgado and Coelho (2013), ESP teachers are central to the successful implementation of ICLHE programs, emphasising interdisciplinary teaching strategies and the integration of content and language

Similarly, content teachers also play a critical role in interdisciplinary collaboration. Their deep knowledge of subject matter helps ensure that language instruction remains aligned with key content goals, which enhances students' understanding of both language and technical concepts. By collaborating closely with ESP teachers, content teachers can ensure that the language used in instruction is relevant and accessible to students, making it easier to grasp complex disciplinary concepts. Integrating the expertise of both content and ESP teachers creates a more cohesive and supportive learning environment where students can fully engage with both language and content. This collaborative approach is

emphasized in Zappa-Hollman's (2018) research, which highlights the need for structured, pedagogy-driven collaboration between language and content teachers to maximize the benefits of interdisciplinary teaching.

In addition to ESP teachers, content teachers also require focused training to fully engage in interdisciplinary collaboration, particularly within the ICLHE framework. Unlike language specialists, content teachers are often less experienced in integrating language learning into their teaching. Therefore, professional development programs should include modules on interdisciplinary collaboration that emphasise the importance of aligning language instruction with subject-specific content. Coyle, Hood, and Marsh (2010) provide a valuable framework in their work on CLIL, outlining the pedagogical principles necessary for content teachers to effectively integrate language and content learning in their instructional practices. Training that focuses on co-teaching strategies, collaborative curriculum planning, and the use of scaffolding techniques would equip content teachers with the skills necessary to effectively contribute to a dual-focused teaching approach.

Moreover, content teachers can benefit from workshops on how to make technical or disciplinary language more accessible to students. By enhancing their understanding of second-language acquisition principles and linguistic awareness, content teachers will be better equipped to support ESP teachers in integrating subject knowledge with language development. Tschannen-Moran and Woolfolk Hoy (2001) emphasise the importance of teacher efficacy in professional collaboration, underscoring the need for content teachers to feel confident in incorporating language learning into their teaching. This partnership between ESP and content teachers can greatly enhance students' ability to grasp complex academic concepts while improving their language proficiency. In the context of internationalisation efforts at higher education institutions, such training will empower content teachers to take a more active role in promoting both language and content learning, creating a richer, more inclusive educational environment.

Successful CLIL programmes in higher education require investment in teacher training and language support from English language specialists (Strotmann et al., 2014; Graham et al., 2018; Vilkancienė & Rozgienė, 2017; Zayas & Romero, 2017). Continuous support from a Foreign Language (FL) teacher specialising in CLIL is crucial for content teachers in planning sessions, selecting materials, and aligning assessments with students' language proficiency (Gonçalves et al., 2022)..

#### **7.2.4. Enhancing student learning**

The findings of this study underscore the significance of technical language, particularly for students learning in a second language. Challenges such as navigating technical language, complex sentence structures, and disciplinary conventions are heightened for these students. Addressing these issues requires comprehensive support systems, including language classes and writing workshops, to better prepare students for academic demands (Lillis & Scott, 2015; Wollscheid et al., 2021).

Interdisciplinary collaboration proved effective in improving students' academic literacy by integrating language and content learning. This approach enhanced their understanding of subject-specific vocabulary and fostered deeper content comprehension. Student feedback and assessment results demonstrated that interdisciplinary teaching led to marked improvements in language proficiency and content mastery, particularly through project-based learning.

The study's alignment with SCT and EVT explains these positive outcomes. As students developed confidence in using technical language (self-efficacy) and recognised its value for their future success, their motivation to engage in interdisciplinary projects grew, leading to better academic performance. These insights advocate for the continued use of interdisciplinary approaches to address academic literacy challenges and equip students with the skills needed for academic and professional success.

### **7.3. Limitations of the study**

The limitation of the study evaluates the weaknesses of the study, providing a view of its limitations, such as a small sample size, time constraints, and potential biases must be acknowledged. These factors influence the study's generalizability and the consistency of its findings, highlighting areas for further research and refinement.

The focus on a single higher education institution limits the generalisability of its findings, as different institutional cultures, resources, and student demographics could produce varying results. Additionally, the variability in self-efficacy levels among both teachers and students may have influenced their receptiveness to interdisciplinary collaboration. As outlined by Bandura (1997) and Pajares (1996), self-efficacy beliefs significantly influence participants' engagement and outcomes. This suggests that participants with lower self-efficacy might have been less likely to fully embrace the interdisciplinary teaching methods.

Furthermore, the perceived task value, as discussed in research by Gaspard et al. (2018) and Guo et al. (2017), may vary among participants, affecting their motivation to engage fully in collaborative activities. Differences in assessment styles could complicate the alignment of evaluations with both language and content objectives, potentially leading to inconsistent expectations for student performance.

The small sample size and specific focus areas as well as the limited number of participating teachers and study areas could mean the results only apply to some contexts or disciplines. Additionally, there might be a selection bias, as the participants who volunteered for the study may have been more motivated or interested in interdisciplinary collaboration, potentially skewing the results.

Time constraints also posed a challenge. The restricted number of lessons taught in collaboration due to time limitations may not fully capture the approach's potential benefits and challenges. Scheduling difficulties for meetings and lessons could have affected the consistency and quality of the collaboration.

Student availability is another potential weakness. Variations in student availability and engagement levels could have impacted the consistency of data and the overall outcomes of the study. External factors affecting student participation, such as workload from other courses, might influence the results, making it harder to isolate the effects of the collaborative teaching approach.

One notable limitation lies in the design of the questionnaires, which, while generally effective, did not fully account for the diverse language proficiency levels among students. This gap may have impacted the ability of some participants to accurately convey their perceptions and experiences. Although the questionnaires provided valuable data, there is still room for improvement in enhancing their sensitivity to participants' linguistic and contextual needs. Another limitation is evident in the assessment criteria, particularly in written tasks, where mixed results among first-year students revealed a need for clearer rubrics and additional support mechanisms. Furthermore, there was a mismatch between students' language proficiency and content mastery, as some students who excelled in content-related tasks struggled with language-focused assessments and vice versa. This suggests that the assessment criteria could be refined to better capture the integration of language and content learning.

Challenges in managing interdisciplinary collaboration also emerged as a limitation. Teachers faced significant workload demands, particularly in balancing their interdisciplinary responsibilities alongside other professional obligations. The study's procedures for collaboration, such as regular meetings and structured communication, were effective overall but required greater flexibility to accommodate teachers' time constraints. In addition, the rubrics used in the study occasionally lacked nuance, as some students fell between predefined proficiency levels. This indicates the need for more granular scoring guides to ensure fair and accurate assessments of student progress. Another area that warrants attention is the integration of technology, which was not extensively explored in this study but could offer valuable insights into improving communication and content delivery. Moreover, the study's short-term analysis limited its ability to evaluate the sustained effectiveness of interdisciplinary collaboration, suggesting

that a longitudinal approach would provide a deeper understanding of its long-term impact on student outcomes.

Finally, there are challenges related to assessment and feedback. Aligning assessments with both language and content objectives can be difficult, potentially affecting the accuracy of measuring student progress. Moreover, a reliance on specific types of assessments, such as formative assessments, might not provide a comprehensive picture of student learning outcomes. This could limit the ability to fully understand and measure the effectiveness of the interdisciplinary teaching approach.

Despite these limitations, the study offers valuable insights and practical strategies for interdisciplinary collaboration in educational settings, highlighting areas for future research and improvement. This balanced evaluation underscores the significance of the findings while acknowledging the constraints and areas for further investigation.

#### **7.4. Future studies**

Future research should explore interdisciplinary collaboration and its profound impact on academic literacy and student learning across diverse educational contexts and institutions, considering the outcomes of this study conducted at a single polytechnic in Portugal.

Building on existing research, future studies should continue to explore the impact of interdisciplinary collaboration between English language and content teachers. Recent investigations into content CLIL in EFL contexts, technology-mediated collaboration, and EMI settings highlight various approaches and benefits. Future research could further examine specific aspects such as:

1. Longitudinal Effects: Investigate the long-term impact of interdisciplinary collaboration on student learning outcomes and retention of technical language skills.

2. **Technology Integration:** Explore how emerging technologies can enhance collaboration between language and content teachers and their influence on student engagement and achievement.
3. **Policy and Practice:** Examine the effectiveness of different policies and support structures for fostering interdisciplinary collaboration, and their impact on both teaching practices and student outcomes.
4. **Student Perspectives:** Conduct in-depth studies on student experiences and perceptions of collaborative teaching to identify factors that enhance engagement and confidence in their learning.
5. **Integration of SCT and EVT:** Future studies should assess how varying levels of self-efficacy among teachers and students influence their receptiveness to interdisciplinary collaboration. Additionally, understanding the relationship between perceived task value and engagement levels can provide insights into optimising collaborative practices.
6. **Tailored Teacher Development Programs:** Emphasize the need for ongoing teacher training and professional development programs to enhance teachers' self-efficacy in interdisciplinary teaching. Such programs should focus on equipping teachers with strategies that foster collaboration and increase the perceived value of interdisciplinary approaches.
7. **Exploring Discipline-Specific Collaborations:** Investigate how the integration of language instruction varies across different academic disciplines and how this influences students' technical language acquisition.
8. **Coordination between ESP and Content Teachers:** Future studies should also explore the current state of coordination between ESP and content teachers within HEIs, examining the effectiveness of this collaboration on student learning.

These areas of focus could provide valuable insights into optimising interdisciplinary collaboration and improving educational practices in various learning contexts.

Recognising that interdisciplinary collaboration is a flexible approach will allow institutions to adapt strategies to fit their specific contexts and needs.

It is essential to reevaluate language policies at HEIs to include interdisciplinary collaboration in an ICLHE context. This re-evaluation should consider the challenges and requirements for successful implementation, ensuring language policies adequately support and promote interdisciplinary collaboration initiatives. By aligning language policies with the principles of interdisciplinary collaboration, HEIs can enhance their educational practices and better prepare students for academic and professional success in a globalised world. By addressing these areas, researchers can contribute to advancing interdisciplinary collaboration initiatives in higher education and enhancing student learning experiences.

Exploring the effectiveness of interdisciplinary collaboration across diverse disciplinary contexts presents an opportunity to comprehend how specific technical language acquisition varies across fields such as STEM (science, technology, engineering and mathematics), humanities, and social sciences. Investigating this aspect can examine the unique challenges and opportunities associated with interdisciplinary collaboration in different academic domains. However, it is essential to note that while this study focused on the School of Applied Arts and specific areas of design, other areas of study, such as medicine, agriculture, business, and computing, also demonstrate an interest in collaborative efforts. Currently, ongoing research in academic literacy (Carlino, 2003; Castillo-Martínez & Ramírez-Montoya, 2020; Dima & Raluca Ştefan, 2021; Pinheiro et al., 2016; Roald et al., 2021; Zhou et al., 2020) explores methods for enhancing students' literacy skills and the epistemic role of writing across various fields of study, encompassing disciplines such as Medicine, Biology, Engineering, and History. Research in these diverse fields has explored interdisciplinary collaboration; however, a critical need remains for further investigation into students' learning strategies for language acquisition and adaptation of materials, resources, assessments, and tasks. Understanding how students in various academic disciplines approach language learning within interdisciplinary

contexts can inform the development of tailored pedagogical approaches and support mechanisms to optimise learning outcomes across diverse fields of study.

Research focusing on students' perceptions and experiences of interdisciplinary collaboration can offer invaluable insights into the challenges and benefits from their viewpoint. Through an in-depth exploration of students' lived experiences, researchers can acquire a nuanced understanding of the factors that shape their engagement and learning within interdisciplinary settings. This approach aligns with broader research examining academic literacy across diverse areas of study, facilitating a comprehensive understanding of how students navigate interdisciplinary contexts and adapt their learning strategies accordingly.

Understanding the specific benefits and challenges associated with various teaching tools and activities can help teachers tailor their approaches to meet the diverse needs of students in interdisciplinary courses. For instance, gap-fill activities might be beneficial for reinforcing vocabulary in technical subjects, while research tasks could enhance critical thinking and content integration in humanities courses. Presentations and speaking activities might be especially beneficial in developing students' communication skills across all disciplines.

Examining how students in different fields receive these teaching strategies can provide insights into the most effective ways to implement interdisciplinary collaboration. For example, while a particular activity might be highly effective in a business course, it might require adaptation to be equally beneficial in a medical or engineering context. This type of research can guide teachers in designing interdisciplinary courses that are both engaging and effective, ensuring that students receive the support they need to succeed academically and professionally.

By researching into these areas, researchers can comprehensively understand how to best support students' learning and academic literacy through interdisciplinary collaboration. This knowledge can inform the development of targeted training

programmes for teachers, promote the adoption of effective teaching practices, and ultimately enhance the quality of education in higher education institutions.

Expanding upon the existing initiatives, it is crucial to recognise that teacher training and professional development programmes should not be limited to specific projects but rather be ongoing endeavours within higher education institutions. These programmes are pivotal in supporting content teachers, particularly in Portuguese HEIs, where studies have underscored the need for increased support (Ellison et al., 2017).

To address this need, ongoing teacher training and professional development programmes should be implemented to provide continuous support for content teachers in enhancing their language proficiency in English and fostering interdisciplinary collaboration. These programmes should encompass targeted initiatives for ESP and content teachers, focusing on equipping them with the necessary skills and strategies to collaborate effectively in interdisciplinary settings.

Future research should explore the current state of coordination between ESP teachers and content teachers within HEIs to advance interdisciplinary education further. Examining existing ESP classes and their alignment with content courses can shed light on the level of collaboration and its impact on student learning. Investigating whether ESP and content teachers coordinate to ensure that language instruction aligns with subject matter can address common student complaints about the lack of integration between language and content learning. For instance, students often report that ESP topics need to be more varied or timely aligned with their content classes. Better coordination could help ESP classes support teaching technical language and relevant topics when students need them most.

Future studies should also explore students' perceptions of this coordination, particularly their views on the relevance and timing of ESP classes about their content courses. Understanding these dynamics can lead to developing strategies that promote better communication and collaboration between ESP and content teachers, ultimately enhancing the educational experience for students. Such research can provide valuable

insights into how HEIs can foster an integrated and cohesive approach to teaching that benefits both language acquisition and content mastery.

It is important to note that interdisciplinary collaboration does not need to be as in-depth as the approach taken in this study. Research into different types of coordination and co-teaching can identify various levels of collaboration that best fit the course and the HEI. Some collaborations may involve occasional joint planning sessions or shared teaching resources, while others entail more comprehensive co-teaching models. This flexibility allows institutions to adopt interdisciplinary strategies that align with their unique needs and constraints.

These conclusions emphasise the transformative potential of interdisciplinary education in higher education settings. They call for ongoing initiatives and support structures to sustain and expand these collaborative efforts. Future research should continue exploring and refining these interdisciplinary strategies, focusing on teacher training and professional development programmes to enhance co-teaching methods and collaborative instructional practices. This ongoing commitment will ensure that interdisciplinary collaboration remains a cornerstone of educational excellence and innovation, preparing students for academic and professional success.

### **7.5. Tools extracted from the case study**

Finally, an intervention plan (Appendix F1, p.422) and guide have been developed based on the experiences from the study. This guide includes recommendations for content selection and a tool to assist in decision-making for interdisciplinary collaboration within an ICLHE context. Designed to support future teachers in HEIs engaging in interdisciplinary collaboration, the guide offers a structured approach to enhance student learning outcomes, promote language proficiency, and address challenges in collaborative teaching. The decision-making tool (Appendix F2, p.427) is designed to assist ESP and content teachers in HEIs engaged in interdisciplinary collaboration within an ICLHE framework. It provides a structured approach to document and guide decision-making,

ensuring effective planning, implementation, and evaluation of collaborative teaching practices. These tools are included in the Appendices.

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# Appendices

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# Appendices A: Questionnaires

## Appendix A1: School Directors

### Diretores e Vice-Diretores Escolares

Este questionário destina-se a pedir a sua opinião como **Diretor/a e Vice-Diretor/a Escolares** do ensino superior sobre colaboração interdisciplinar com uma língua estrangeira. Faz parte integrante de um projeto de Investigação para um Doutoramento em Ciências da Linguagem da Faculdade de Letras da Universidade do Porto.

\*Required

1. **CONSENTIMENTO INFORMADO:** Por favor, leia a seguinte informação antes de continuar e assinale se concorda em participar neste estudo. Toda a informação que será recolhida é estritamente confidencial e em momento algum serão guardados quaisquer dados que permitam ligar as respostas ao respondente.

Mark only one oval.

Concordo

2. **A que escola está vinculado? \***

Mark only one oval.

- Escola Superior Agraria  
 Escola Superior de Artes Aplicadas  
 Escola Superior de Educação  
 Escola Superior de Gestão  
 Escola Superior de Saúde Dr. Lopes Dias  
 Escola Superior de Tecnologia

6. **Está familiarizado com a colaboração interdisciplinar em educação / ensino**

Mark only one oval.

- Sim  
 Não

7. Se já fez parte de colaboração interdisciplinar indique a que nível

Mark only one oval.

- A nível de administrativo  
 A nível de publicações  
 A nível de investigação (publicações conjuntas)  
 A nível de aulas partilhadas  
 A nível de Materiais/Recursos Conjuntos  
 A nível pedagógico  
 Other: \_\_\_\_\_

#### Implementação de colaboração interdisciplinar

De seguida serão apresentadas algumas afirmações para as quais pedimos a sua opinião de acordo com estas opções:

1 – Discordo completamente; 2 – Discordo; 3 – Não discordo nem concordo; 4 – Concordo; 5 – Concordo completamente

3. **Existe uma preocupação de integrar a formação em línguas estrangeiras nos planos curriculares na sua instituição de ensino superior?**

Mark only one oval.

- Sim  
 Não

4. **Na sua instituição existe algum programa específico para fins técnico-científicos de ensino de inglês?**

Mark only one oval.

- Sim  
 Não

5. **Considera que os programas de ensino de inglês são importantes?**

Mark only one oval.

- Sim  
 Não

A colaboração interdisciplinar no ensino integra duas ou mais disciplinas académicas em conjunto. Os professores concentram-se em estabelecer ligações entre as áreas temáticas. Esta colaboração implicará o planeamento e ensino conjunto de aulas bem como a avaliação

8. **A colaboração interdisciplinar deveria ser implementado nesta instituição**

Mark only one oval per row.

	1	2	3	4	5
A colaboração interdisciplinar deveria ser implementado nesta instituição	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A colaboração interdisciplinar é adequado a todos os cursos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A colaboração interdisciplinar será benéfica para o corpo docente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O corpo docente está receptivo a este tipo de ensino	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A colaboração interdisciplinar será útil para os estudantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
É fácil encorajar este método de Ensino	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
É fácil de implementar em todos os cursos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Este método de ensino pode ser implementado em todos os cursos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Gostava de deixar um comentário sobre a colaboração interdisciplinar?

## IPCB Deans and Deputy-Deans

This questionnaire is designed to ask your opinion as an IPCB dean or vice-dean in higher education about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts and Humanities of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Concordo

2. Which school are you affiliated with? Optional

Mark only one oval.

- School of Agriculture  
 School of Applied Art  
 School of Education  
 School of Management  
 School of Health Dr. Lopes Dias  
 School of Technology

7. Are you familiar with interdisciplinary collaboration in education/teaching? \*

Mark only one oval.

- Yes  
 No

8. If you have been part of an interdisciplinary collaboration, please indicate at what level.

Mark only one oval.

- Administrative level  
 In terms of publications  
 At the research level (joint publications)  
 In terms of shared classes  
 At the level of Joint Materials/Resources  
 On a pedagogical level  
 Other: \_\_\_\_\_

### Implementation of interdisciplinary collaboration

Below are some statements for which we ask your opinion according to these options:

1 - Completely disagree; 2 - Disagree; 3 - Neither disagree nor agree; 4 - Agree; 5 - Completely agree

3. Are you aware of a language policy at your higher education establishment?

Mark only one oval.

- Yes  
 No

4. Is there a concern about integrating foreign language training into the curriculum at your higher education institution?

Mark only one oval.

- Yes  
 No

5. Is there a specific technical-scientific English teaching programme at your school?

Mark only one oval.

- Yes  
 No

6. Do you think English teaching programmes are important? \*

Mark only one oval.

- Yes  
 No

Interdisciplinary collaboration in teaching integrates two or more academic disciplines. Teachers focus on establishing links between subject areas. This collaboration will involve joint lesson planning and teaching as well as assessment

9. These statements are specific to interdisciplinary collaboration with an English language teacher

Mark only one oval per row.

	1	2	3	4	5
Interdisciplinary collaboration should be implemented at this institution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interdisciplinary collaboration is suitable for all courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interdisciplinary collaboration will be beneficial for the teaching staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The teaching staff are receptive to this type of teaching	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interdisciplinary collaboration will be useful for students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This teaching method is easy to encourage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to implement in all courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This teaching method can be implemented in all courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Would you like to leave a comment about interdisciplinary collaboration with an English language teacher?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# Appendix A2: All Teaching Staff

neps.mnma.georgius@unipr.pt

## Docentes

Este questionário destina-se a pedir a sua opinião como **Docente** do ensino superior sobre colaboração interdisciplinar com uma língua estrangeira. Faz parte integrante de um projeto de Investigação para um Doutoramento em Ciências da Linguagem da Faculdade de Letras da Universidade do Porto.

1. **CONSENTIMENTO INFORMADO:** Por favor, leia a seguinte informação antes de continuar e assinale se concorda em participar neste estudo. Toda a informação que será recolhida é estritamente confidencial e em momento algum serão guardados quaisquer dados que permitam ligar as respostas ao respondente.

Mark only one oval.

Concordo

Assegura-se o anonimato das respostas.

2. Tick all that apply.

Feminino

Masculino

3. Há quantos anos leciona no ensino superior?

\_\_\_\_\_

6. Tick all that apply.

	1	2	3	4	5
Na minha vida académica a nível pedagógico	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para escrever artigos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para ler documentação técnica	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Para lecionar aulas a estudantes do Programa Erasmus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quando assisto a eventos científicos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quando apresento trabalhos em eventos científicos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quando participo em projetos internacionais	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Em projetos de investigação	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Colaboração interdisciplinar

A colaboração interdisciplinar integra duas ou mais disciplinas académicas em conjunto. Os professores concentram-se em fazer ligações entre as áreas temáticas. Esta colaboração implicará o planeamento e ensino conjunto de aulas, bem como a avaliação.

4. Qual é a sua categoria académica na sua instituição de ensino superior?

Mark only one oval.

- Professor Coordenador Principal  
 Professor Coordenador Agregado  
 Professor Coordenador  
 Professor Adjunto  
 Assistente 2º Triénio  
 Assistente 1º Termo

5. Em que área de estudo leciona?

\_\_\_\_\_

De seguida serão apresentadas algumas afirmações para as quais pedimos a sua resposta sobre o uso da língua inglesa de acordo com estas opções:

1 – Nunca; 2 – Raramente;  
3 – Por vezes; 4 – Frequentemente; 5 – Sempre

7. Conhece a colaboração interdisciplinar ?

Mark only one oval.

- Nunca ouvi falar  
 Já ouvi falar  
 Tenho uma ideia do que é  
 Conheço bem  
 Conheço-o bem e utilizo-o

8. Alguma vez se envolveu em projetos interdisciplinares?

Mark only one oval.

- Sim  
 Não

9. Em caso afirmativo, qual

\_\_\_\_\_

10. Alguma vez participou na colaboração interdisciplinar ?

Mark only one oval.

- Sim  
 Não

11. Em caso afirmativo, indique qual

\_\_\_\_\_

**Colaboração Interdisciplinar com inglês**

A Colaboração Interdisciplinar entre si e um professor de inglês significa escolher áreas de conteúdo que podem ser ensinadas em inglês pelo professor de inglês e pelo professor de conteúdo. Isto implica uma escolha de matéria e avaliação conjunta.

12. Tendo em conta a oportunidade de participar numa experiência de ensino colaborativo com um professor de inglês, qual será a probabilidade de o fazer?

Mark only one oval.

	1	2	3	4	5
Nada Provável	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extremamente Provável					

13. Gostaria de participar numa experiência de ensino colaborativo com inglês

Mark only one oval.

- Sim  
 Não

14. De seguida serão apresentadas algumas afirmações para as quais pedimos a sua resposta de acordo com estas opções: 1 - Discordo completamente; 2 - Discordo; 3 - Não discordo nem concordo; 4 - Concordo; 5 - Concordo completamente

Mark only one oval per row.

	1	2	3	4	5
Os níveis mais elevados de conhecimento de línguas implicam competências pedagógicas mais eficazes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estou à vontade para lecionar toda a minha área disciplinar em inglês	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estou à vontade para lecionar apenas parte da minha área disciplinar em inglês	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Precisaria de apoio linguístico para lecionar a minha área disciplinar em inglês	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Comentário opcional
- \_\_\_\_\_
- \_\_\_\_\_

## IPCB Teaching Staff

This questionnaire is designed to ask your opinion as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts and Humanities of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

- Agree

Anonymity of responses is guaranteed.

2. \*

Tick all that apply.

- Female  
 Male

3. How many years have you been teaching in higher education? \*
- \_\_\_\_\_

4. What is your academic rank at your higher education institution?

Mark only one oval.

- Principal Coordinating Professor  
 Aggregate Coordinating Professor  
 Coordinating Professor  
 Adjunct Professor  
 Assistant 2nd Triennium  
 Assistant 1st Triennium  
 Other

5. What subject area do you teach? \*
- \_\_\_\_\_

Below are some statements that we asked you to answer about your use of the English language according to these options:

1 - Never; 2 - Rarely; 3 - Sometimes; 4 - Often; 5 - Always

6. \*

*Tick all that apply.*

	1	2	3	4	5
In my academic life on a pedagogical level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To write articles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To read technical documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To teach Erasmus Programme students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I attend academic events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I present papers at academic events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I take part in international projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In research projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Interdisciplinary collaboration

Interdisciplinary collaboration integrates two or more academic disciplines. Teachers focus on making connections between subject areas. This collaboration will involve joint lesson planning and teaching, as well as assessment.

7. **Are you familiar with interdisciplinary collaboration? \***

*Mark only one oval.*

- Never heard of it  
 I have heard of it  
 I have an idea of what it is  
 I am very familiar with it  
 I am familiar with it and I use it

8. **Have you ever been involved in interdisciplinary projects? \***

*Mark only one oval.*

- Yes  
 No

9. If so, which

\_\_\_\_\_

10. **Have you ever taken part in interdisciplinary collaboration? \***

*Mark only one oval.*

- Yes  
 No

11. If yes, please indicate which

\_\_\_\_\_

### Interdisciplinary collaboration with English

Interdisciplinary Collaboration between you and an English language teacher means choosing content areas that can be taught in English by the English language teacher and the content teacher. This implies a choice of subject matter and joint assessment.

12. **Given the opportunity to take part in a collaborative teaching experience with an English teacher, how likely are you to do so?**

*Mark only one oval.*

- 1   2   3   4   5  
 Not      Extremely Likely

13. **I would like to take part in a collaborative teaching experience with an English language teacher**

*Mark only one oval.*

- Yes  
 No

14. **Below are some statements to which we ask you to respond according to these options: 1 - Completely disagree; 2 - Disagree; 3 - Neither disagree nor agree; 4 - Agree; 5 Completely agree**

*Mark only one oval per row.*

	1	2	3	4	5
Higher levels of language knowledge imply more effective teaching skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am happy to teach my entire subject area in English	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am comfortable teaching only part of my subject area in English	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I need language support to teach my subject area in English	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. **Optional comment**

\_\_\_\_\_

\_\_\_\_\_

# Appendix A3: Students (Pre-Class)

## Estudantes nos cursos

Este questionário destina-se a pedir a sua opinião como estudante do ensino superior sobre o ensino colaborativo interdisciplinar com uma língua estrangeira outra língua. Faz parte integrante de um projeto de Investigação para um Doutoramento em Ciências da Linguagem da Faculdade de Letras da Universidade do Porto.

\* Indicates required question

1. **CONSENTIMENTO INFORMADO:** Por favor, leia a seguinte informação antes de continuar e assinale se concorda em participar neste estudo. Toda a informação que será recolhida é estritamente confidencial e em momento algum serão guardados quaisquer dados que permitam ligar as respostas ao respondente.

Mark only one oval.

Concordo

2. Selecione uma opção

Tick all that apply.

Feminino  
 Masculino

3. Data de nascimento

Example: 7 January 2019

4. Qual a sua área de estudo?

10. Se não, gostaria de ter?

Mark only one oval.

Sim  
 Não

A linguagem académica refere-se à proficiência oral, escrita, auditiva e visual da linguagem necessária para aprender eficazmente em programas académicos.

De seguida serão apresentadas algumas afirmações a respeito da língua inglesa para as quais pedimos a sua opinião de acordo com estas opções

11. 1 – Discordo completamente; 2 – Discordo; 3 – Não discordo nem concordo; 4 – Concordo; 5 – Concordo completamente

Mark only one oval per row.

	1	2	3	4	5
Antes de entrar no curso já conhecia algum vocabulário técnico na minha área de estudo em inglês	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O vocabulário dos termos técnicos em inglês na minha área de estudo é fácil de aprender	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sou capaz de utilizar termos técnicos em inglês na minha área de estudo para comunicar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A colaboração interdisciplinar no ensino integra duas ou mais disciplinas académicas em conjunto. Os professores concentram-se em estabelecer ligações entre as áreas temáticas. Esta colaboração implicará o planeamento e ensino conjunto de aulas assim como a avaliação.

5. Considera que a aprendizagem de uma língua estrangeira é importante para o futuro?

Tick all that apply.

Sim  
 Não  
 Talvez

6. Teve inglês na escola ou num centro de línguas?

Mark only one oval.

Sim  
 Não

7. Sabe indicar o nível que atingiu ?

Mark only one oval.

Sim  
 Não  
 Não se aplica

8. Como opção pode indicar o nível de inglês ou a nota final

9. Tem uma disciplina curricular de inglês língua estrangeira no seu curso?

Mark only one oval.

Sim  
 Não

12. Está familiarizado com o ensino interdisciplinar?

Tick all that apply.

Sim  
 Não

13. Alguma vez participou?

Tick all that apply.

Sim  
 Não

14. Estaria interessado, como estudante, em participar num formato de ensino colaborativo entre inglês e outra disciplina ?

Tick all that apply.

Sim  
 Não  
 Talvez

15. Qual considera ser o seu nível de inglês?

Mark only one oval.

1 2 3 4 5  
Muito      Excelente

De seguida serão apresentadas algumas afirmações para as quais pedimos a sua opinião sobre o uso da língua inglesa de acordo com estas opções:

16. 1 – Nunca; 2-Raramente; 3 – Por vezes; 4 – Frequentemente; 5 – Sempre

Mark only one oval per row.

	1	2	3	4	5
Nos meus estudos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Para ler documentação técnica	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Para frequentar aulas no âmbito do Programa Erasmus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quando assisto a eventos científicos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quando apresento trabalhos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quando participo em projetos internacionais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Para contactar instituições de ensino superior estrangeiros	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Em situações relacionadas com futuro emprego	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## IPCB students on courses

This questionnaire is designed to ask your opinion as a higher education student about interdisciplinary collaborative teaching with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts and Humanities of the University of Porto.

\* Indicates required question

1. **INFORMED CONSENT:** Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. Select an option

Tick all that apply.

Female  
 Male

3. Date of Birth

Example: 7 January 2019

4. What is your area of study?

5. Do you think learning a foreign language is important for your future?

Tick all that apply.

Yes  
 No  
 Possibly

6. Did you have English at school or in a language centre?

Mark only one oval.

Yes  
 No

7. Can you indicate the level you reached?

Mark only one oval.

Yes  
 No  
 Does not apply

8. As an option, you can indicate the level of English or the final grade

9. Do you have a foreign language subject in your course?

Mark only one oval.

Yes  
 No

10. If not, would you like to have one?

Mark only one oval.

- Yes  
 No

Academic language refers to the oral, written, auditory and visual language proficiency needed to learn effectively in academic programmes.

Below are some statements about the English language which we ask you to agree with.

11. 1 - Completely disagree; 2 - Disagree; 3 - Neither disagree nor agree; 4 - Agree; 5 - Completely agree

Mark only one oval per row.

	1	2	3	4	5
Before joining the course I already knew some technical vocabulary in my field of study in English	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The vocabulary of technical terms in English in my field of study is easy to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sou capaz de utilizar termos técnicos em inglês na minha area de estudo para comunicar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Interdisciplinary collaboration in teaching integrates two or more academic disciplines. Teachers focus on establishing links between subject areas. This collaboration will involve joint planning and teaching of lessons as well as assessment.

12. Are you familiar with interdisciplinary teaching?

Tick all that apply.

- Yes  
 No

13. Have you ever taken part?

Tick all that apply.

- Yes  
 No

14. Would you be interested, as a student, in participating in a collaborative teaching format between English and another subject?

Tick all that apply.

- Yes  
 No  
 Possibly

15. What do you think your level of English is?

Mark only one oval.

	1	2	3	4	5
Ver	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Excellent

Below are some statements for which we asked your opinion on the use of the English language according to these options:

16. 1 - Never; 2 - Rarely; 3 - Sometimes; 4 - Often; 5 - Always

Mark only one oval per row.

	1	2	3	4	5
In my studies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To read technical documents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To attend classes as part of the Erasmus Programme	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I attend academic events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I present work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I take part in international projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To contact foreign higher education institutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In situations related to future employment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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# Appendix A4: Students (Post-Class)

## Students' post-class

This questionnaire is designed to ask your opinion as a higher education student about interdisciplinary collaborative teaching with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts and Humanities of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential and at no time will any data be stored that would make it possible to link the answers to the respondent

Mark only one oval.

Agree

2. Select

Tick all that apply.

Male

Female

3. Date of birth

Example: 7 January 2019

4. What is your course name

\_\_\_\_\_

9. Did you feel encouraged to participate in interdisciplinary discussions and share your perspectives?

Mark only one oval.

Yes

No

10. Were the assessment methods used in this course aligned with the learning objectives?

Tick all that apply.

Yes

No

11. Could you please provide an example of an assessment method that you felt well-aligned or misaligned with the learning objectives?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5. On a scale of 1 to 5, how clear were the learning objectives of this interdisciplinary course?

Mark only one oval.

1 2 3 4 5

Not      Very clear

6. Could you please briefly explain why you found the learning objectives clear or unclear in this lesson

\_\_\_\_\_

7. Did you feel that the content and language aspects were well integrated in this course?

Mark only one oval.

Yes

No

8. How often did you have opportunities to actively engage with course content through activities such as discussions, group work, or projects?

Tick all that apply.

Rarely

Occasionally

Sometimes

Often

Very often

12. How satisfied were you with the support and guidance provided by the instructors in this course?

Mark only one oval per row.

	1	2	3	4	5
<b>Very dissatisfied</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Dissatisfied</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Neutral</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Satisfied</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Very satisfied</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Row 6</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Were the resources and materials used in this lesson adequate for your learning needs?

Tick all that apply.

Yes

No

14. What aspects of this interdisciplinary course did you find most beneficial for your learning?

\_\_\_\_\_

15. Were there any specific challenges you encountered during this course related to interdisciplinary collaboration or language integration? Please describe.

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16. On a scale of 1 to 5, how satisfied were you with your overall experience in this interdisciplinary lesson?

*Mark only one oval.*

1 2 3 4 5

Very      Very satisfied

17. Is there anything else you would like to share about your experience in this lesson, any suggestions for improvement, or additional comments?

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# Appendix A5: Students (Final)

## Student's final questionnaire

This questionnaire is designed to ask you for some answers as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential, and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. Date of Birth

Example: 7 January 2019

3. What is your course title?

\_\_\_\_\_

7. To what extent do you believe you achieved the learning outcomes of this interdisciplinary course?

(1 - Not at All, 2 - Slightly, 3 - Somewhat, 4 - Mostly, 5 - Completely)

Mark only one oval.

1 2 3 4 5

### Teaching collaboration

Please rate the effectiveness of the teaching methods employed by the ESP and content teachers in this course.

8. ESP Teacher:

(1 - Ineffective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Effective, 5 - Highly Effective)

Mark only one oval.

1 2 3 4 5

4. Before starting the interdisciplinary course, how excited were you about this learning experience?

(1 - Not Excited at All, 2 - Slightly Excited, 3 - Neutral, 4 - Somewhat Excited, 5 - Very Excited)

Mark only one oval.

1 2 3 4 5

5. Have you participated in any interdisciplinary courses before this one?

Mark only one oval.

Yes

No

6. How well did you understand the learning objectives of this interdisciplinary course?

(1 - Poorly, 2 - Fairly, 3 - Moderately, 4 - Well, 5 - Extremely Well)

Mark only one oval.

1 2 3 4 5 6

9. Content Teacher:

(1 - Ineffective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Effective, 5 - Highly Effective)

Mark only one oval.

1 2 3 4 5

10. How would you describe the overall atmosphere of collaboration between ESP and content teachers in this course?

Mark only one oval.

1 2 3 4 5

Very      Very Cooperative

11. Describe your experiences with this course's collaborative activities between the ESP and content teachers.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Which interdisciplinary activities did you find most valuable in this course? (Select all that apply)

*Tick all that apply.*

- ESP CLIL class presentations
- Joint lessons by ESP and content teachers
- Collaborative research
- Pair and group work
- Other: \_\_\_\_\_

13. Other please specify:

\_\_\_\_\_

14. Please rank the following interdisciplinary activities in order of importance, with 1 being the most important and 6 being the least important

*Mark only one oval per row.*

	1	2	3	4	5	6
Joint lessons by ESP and content teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group / pair projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individual research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Class language and vocabulary exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Please evaluate the level of difficulty of the interdisciplinary assessments using the following scale:

*Mark only one oval.*

1 2 3 4 5  
 Very      Very Difficult

19. Overall, how satisfied are you with your experience in this interdisciplinary course?

(1 - Very Dissatisfied, 2 - Dissatisfied, 3 - Neutral, 4 - Satisfied, 5 - Very Satisfied)

*Mark only one oval.*

1 2 3 4 5

20. Were there any specific challenges or difficulties you encountered during the interdisciplinary collaboration in this course?

\_\_\_\_\_  
 \_\_\_\_\_

15. How did the interdisciplinary collaboration impact your overall learning and comprehension of course materials?

(1 - Negatively, 2 - Slightly Negatively, 3 - No Impact, 4 - Positively, 5 - Very Positively)

*Mark only one oval.*

1 2 3 4 5

16. Did the interdisciplinary collaboration contribute to the development of your communication skills, particularly in English?

*Mark only one oval.*

Yes  
 No

17. How satisfied were you with this course's assessments and evaluation methods?

(1 - Very Dissatisfied, 2 - Dissatisfied, 3 - Neutral, 4 - Satisfied, 5 - Very Satisfied)

*Mark only one oval.*

1 2 3 4 5

21. Please provide any suggestions or ideas for improving the interdisciplinary teaching approach in future courses.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

22. Is there anything else you would like to share about your experience with interdisciplinary collaboration or this course in general?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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# Appendix A6: Content Teachers (Pre-Class)

## Docentes no Estudo de Caso

Este questionário destina-se a pedir algumas respostas como **Docente** do ensino superior sobre a colaboração interdisciplinar com uma língua estrangeira. Faz parte integrante de um projeto de Investigação para um Doutoramento em Ciências da Linguagem da Faculdade de Letras da Universidade do Porto.

\* Indicates required question

1. **CONSENTIMENTO INFORMADO:** Por favor, leia a seguinte informação antes de continuar e assinale se concorda em participar neste estudo. Toda a informação que será recolhida é estritamente confidencial e em momento algum serão guardados quaisquer dados que permitam ligar as respostas ao respondente.

Mark only one oval.

Concordo

2. **Há quantos anos leciona no ensino superior? \***

\_\_\_\_\_

3. **Qual é a sua categoria académica na sua instituição de ensino superior?**

Mark only one oval.

- Professor Coordenador Principal  
 Professor Coordenador Agregado  
 Professor Coordenador  
 Professor Adjunto  
 Assistente 2º Triénio  
 Assistente 1º Termo  
 Outro

8. Como docente pensa que os benefícios da colaboração podem ser

Mark only one oval.

1 2 3 4 5  
Pou      Muitos

9. Como investigador na sua área académica pensa que esta colaboração pode trazer mais valias?

Tick all that apply.

- Sim  
 Não

### Áreas de conteúdo e a língua inglesa

A Colaboração Interdisciplinar entre si e um professor de inglês significa escolher áreas de conteúdo que podem ser ensinadas em inglês pelo professor de inglês e por si.

10. Tendo em conta a oportunidade de participar numa experiência de ensino colaborativo com um professor de inglês, qual é a sua expectativa inicial?

Mark only one oval.

1 2 3 4 5  
Pou      Extremamente Positiva

4. **Em que área de estudo leciona? \***

\_\_\_\_\_

**A colaboração interdisciplinar integra duas ou mais disciplinas académicas em conjunto. Os professores concentram-se em fazer ligação entre as áreas temáticas. Esta colaboração implicará o planeamento e ensino conjunto de aulas, bem como a avaliação.**

De seguida serão apresentadas algumas perguntas anteriores ao Estudo de Caso no qual concordou em participar

5. Como é que teve conhecimento de colaboração interdisciplinar? \*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Já participou nalguma colaboração interdisciplinar antes desta sua intervenção?

Mark only one oval.

- Sim  
 Não

7. Se sim, explique resumidamente a extensão do seu envolvimento.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. Quando foi proposto a colaboração interdisciplinar teve a ideia imediata de qual o conteúdo que queria partilhar?

Mark only one oval.

- Sim  
 Não

12. Se teve a ideia imediata de alguma estratégia de qual o conteúdo ou conteúdo que queria partilhar pode explicar resumidamente o porque dessa escolha

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. Quando foi proposto a colaboração interdisciplinar teve a ideia imediata de alguma estratégia de ensino que quer usar ou experimentar?

Mark only one oval.

- Sim  
 Não

14. Se teve a ideia imediata de alguma estratégia de ensino que quer usar ou experimentar pode explicar resumidamente

15. Quais são as expectativas que tem para a experiência de ensino colaborativo com inglês ?

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16. Como é que se sente a implementar a colaboração nas suas aulas? \*

*Mark only one oval.*

1 2 3 4 5  
Mui      Pouco Confiante

17. A que nível é que pensa que vai haver colaboração? \*

*Mark only one oval.*

1 2 3 4 5  
Par      Total

18. Têm algumas preocupações na implementação da colaboração interdisciplinar?

*Mark only one oval.*

Sim  
 Não

23. Na questão de tempo, pensa que esta colaboração vai aumentar o seu tempo de **avaliação dos alunos**?

*Mark only one oval.*

Sim  
 Não  
 Ainda não pensei sobre isso

24. Pode deixar aqui um comentário a respeito da colaboração interdisciplinar onde irá participar

---

---

19. Se existem algumas preocupações pode fazer um comentário opcional

---

20. Qual é a sua percepção da receptividade destas aulas para os estudantes? \*

*Mark only one oval.*

1 2 3 4 5  
Pou      Muito boa

21. Pensa desde já os benefícios de aprendizagem para os alunos será

*Mark only one oval.*

1 2 3 4 5  
Pou      Muitos

22. Na questão de tempo, pensa que esta colaboração vai aumentar o seu tempo de **preparação de aulas**?

*Mark only one oval.*

Sim  
 Não  
 Ainda não pensei sobre isso

## IPCB Content teachers

This questionnaire is designed to ask for some answers as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts and Humanities of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. How many years have you been teaching in higher education? \*

\_\_\_\_\_

3. What is your academic rank at your higher education institution? \*

Mark only one oval.

- Principal Coordinating Professor  
 Aggregate Coordinating Professor  
 Coordinating Teacher  
 Adjunct Professor  
 Assistant 2nd Triennium  
 Assistant 1st Triennium  
 Outro

7. If yes, briefly explain the extent of your involvement.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. As a teacher, you think that the benefits of collaboration can be

Mark only one oval.

1 2 3 4 5  
Few      Many

9. As a researcher in your academic field, do you think this collaboration can bring added value?

Tick all that apply.

- Yes  
 No

### Content areas and the English language

Interdisciplinary Collaboration between you and an English teacher means choosing content areas that can be taught in English by the English teacher and by you.

4. What subject area do you teach? \*

\_\_\_\_\_

**Interdisciplinary collaboration integrates two or more academic disciplines together. Teachers focus on making connections between subject areas. This collaboration will involve joint lesson planning and teaching, as well as assessment.**

The following are some questions from before the case study in which you agreed to take part

5. How did you find out about interdisciplinary collaboration? \*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Have you participated in any interdisciplinary collaboration before this intervention?

Mark only one oval.

- Yes  
 No

10. Given the opportunity to take part in a collaborative teaching experience with an English teacher, what are your initial expectations?

Mark only one oval.

1 2 3 4 5  
Not      Extremely positive

11. When interdisciplinary collaboration was proposed, did you have an immediate idea of what content you wanted to share?

Mark only one oval.

- Yes  
 No

12. If you had an immediate idea of a strategy for which content or center you wanted to share, can you briefly explain why you chose it?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. When interdisciplinary collaboration was proposed, did you immediately have an idea of a teaching strategy that you wanted to use or try out?

Mark only one oval.

- Yes  
 No

14. If you immediately have an idea for a teaching strategy that you want to use or try out, you can explain it briefly.

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15. What expectations do you have for the collaborative teaching experience with English?

---

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16. How do you feel about implementing collaboration in your classes? \*

Mark only one oval.

1 2 3 4 5  
Ver:      Not very confident

17. At what level do you think there will be collaboration? \*

Mark only one oval.

1 2 3 4 5  
Part      Total

18. Do you have any concerns about implementing interdisciplinary collaboration?

Mark only one oval.

Yes  
 No

19. If you have any concerns, you can make an optional comment

---

20. What is your perception of the receptiveness of these classes to the students?

Mark only one oval.

1 2 3 4 5  
Low      Very good

21. For now, what do you think about the learning benefits for the students

Mark only one oval.

1 2 3 4 5  
Few      Many

22. In terms of time, do you think this collaboration will increase your lesson preparation time?

Mark only one oval.

Yes  
 No  
 I have not thought about it

23. In terms of time, do you think this collaboration will increase your time spent assessing students?

Mark only one oval.

Yes  
 No  
 I have not thought about it

24. You can leave a comment here about the interdisciplinary collaboration in which you will be participating

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# Appendix A7: Content Teachers (Post-Class)

## Teachers' post-class questionnaire

This questionnaire is designed to ask you for some answers as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential, and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. What subject area do you teach? \*

\_\_\_\_\_

3. Which lesson does this refer to?

\_\_\_\_\_

4. On a scale of 1 to 5, how would you rate the overall success of the interdisciplinary collaboration in integrating language learning with content?

Mark only one oval.

1 2 3 4 5  
Not      Highly successful

9. Other (please specify):

\_\_\_\_\_

10. Did you encounter any challenges or limitations when implementing specific pedagogical approaches?

Mark only one oval.

Yes  
 No

11. If yes, please elaborate on the challenges or limitations and suggest possible solutions or improvements.

\_\_\_\_\_

12. To what extent did the assessment methods align with the language and content learning objectives?

Mark only one oval.

Completely aligned  
 Mostly aligned  
 Partially aligned  
 Not aligned

5. To what extent do you believe the language learning objectives were achieved through the collaboration?

Tick all that apply

Completely achieved  
 Mostly achieved  
 Partially achieved  
 Not achieved

6. Were the content-related learning objectives effectively addressed during the collaboration?

Mark only one oval.

yes  
 No

7. Please provide additional comments or insights regarding the achievement of learning objectives.

\_\_\_\_\_

8. Which teaching strategies or approaches proved most effective during the collaboration in the CLIL context?

Mark only one oval.

Scaffolding language support  
 Incorporating authentic materials  
 Co-planning lessons together  
 Differentiating instruction  
 Other: \_\_\_\_\_

13. Did the assessment strategies accurately measure students' language proficiency and content knowledge?

Mark only one oval.

Yes  
 No

14. Please provide additional comments or insights regarding the alignment between assessments and learning objectives.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

15. How did the interdisciplinary collaboration impact students' language and content learning engagement?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16. What evidence or observations did you notice regarding students' language development and content understanding?

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17. Which resources and materials particularly effectively support language learning in the CLIL context?

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18. Were there any additional resources or materials that you believe would have further enhanced the collaboration? Please specify.

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19. How well did the ESP and content teachers collaborate during the interdisciplinary project?

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20. Did you encounter any communication, coordination, or shared decision-making challenges during the collaboration?

*Mark only one oval.*

- Yes  
 No

21. If yes, please describe the collaborative dynamics and provide any suggestions for improving collaboration in future projects.

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22. What valuable insights or lessons did you gain from this interdisciplinary collaboration?

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23. Based on your experience, what recommendations would you provide for improving future interdisciplinary collaborations in a CLIL context?

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# Appendix A8: Content Teachers (Final)

## Teachers in the Case Study Final Questionnaire

This questionnaire is designed to ask you for some answers as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential, and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. What subject area do you teach? \*

\_\_\_\_\_

3. On a scale of 1 to 5, how would you rate your experience collaborating with an ESP teacher in the context of CLIL ?

Mark only one oval.

1 2 3 4 5

Ver      Very positive

7. Which strategies or approaches have you found most effective in integrating content and language instruction with the ESP teacher?

Mark only one oval.

Scaffolding language support

Incorporating authentic materials

Co-planning lessons together

Differentiating instruction

Other: \_\_\_\_\_

8. Other (please specify):

\_\_\_\_\_

9. How do you address potential challenges or differences in teaching styles when collaborating with the ESP teacher?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. How do you ensure that the collaboration with the ESP teacher enhances the overall learning experience for students?

\_\_\_\_\_

4. Select the benefits or advantages of collaborating with an ESP teacher to integrate content and language instruction. (Select all that apply)

Tick all that apply.

Enhanced student engagement

Improved language proficiency

Deeper content understanding

Cross-curricular connections

Increased cultural awareness

Other: \_\_\_\_\_

5. Can you share examples of successful collaboration between you and the ESP teacher in planning and delivering CLIL lessons?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. How do you ensure that your collaborative efforts effectively address content or language objectives?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. How has the collaborative relationship with the ESP teacher influenced your professional growth and development?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. How do you actively seek input and incorporate ideas from the ESP in your collaborative planning and instructional practices?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. How do you measure and assess the effectiveness of collaboration with the English teacher in terms of student outcomes, both in content understanding and language proficiency?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. How often do you collaboratively develop lesson plans with the ESP teacher in the context of CLIL?

Mark only one oval.

- Rarely
- Occasionally
- Sometimes
- Often
- Very often

15. On a scale of 1 to 5, how would you rate the impact of time constraints on you collaborative lesson planning with the English teacher in implementing CLIL.

Mark only one oval.

1 2 3 4 5

Ver      Very significant impact

16. How do you manage your workload when engaging in collaborative CLIL instruction lesson planning?

Tick all that apply.

- Prioritise tasks
- Delegate responsibilities
- Seek additional support
- Adjust time allocation
- Other: \_\_\_\_\_

17. Other (please specify): \_\_\_\_\_ \*

\_\_\_\_\_

22. How do you address any challenges or discrepancies in student assessment between the content and language aspects of CLIL instruction?

Mark only one oval.

- Collaboratively develop assessment criteria
- Modify assessment methods
- Provide additional language support during assessments
- Differentiate assessments for language proficiency levels
- Other

23. How do you ensure that CLIL instruction student assessments effectively measure content understanding and language proficiency?

Mark only one oval.

- Align assessment tasks with content and language objectives
- Provide clear assessment criteria for both aspects
- Use rubrics or scoring guides that encompass content and language expectations
- Incorporate feedback from the ESP teacher in the assessment process
- Other

24. Other (please specify):

\_\_\_\_\_

18. How do you ensure alignment between the CLIL lesson plans and the content objectives of your curriculum?

Tick all that apply.

- Regular communication with the ESP teacher
- Coordinating content and language objectives
- Adjusting instructional strategies
- Monitoring student progress
- Other: \_\_\_\_\_

19. Other (please specify): \*

\_\_\_\_\_

20. How do you assess student learning and progress in the context of CLIL instruction?

Tick all that apply.

- Formative assessments (e.g., observations, check-ins)
- Summative assessments (e.g., quizzes, exams)
- Performance-based assessments (e.g., projects, presentations)
- Language proficiency assessments
- Other: \_\_\_\_\_

21. Other (please specify):

\_\_\_\_\_

25. How do you manage your time to adequately address content teaching and collaborative CLIL planning?

Tick all that apply.

- Establishing a structured schedule
- Prioritising tasks and allocating time accordingly
- Seeking support or assistance when needed
- Balancing workload between content teaching and collaborative planning
- Other: \_\_\_\_\_

26. Other (please specify): \*

\_\_\_\_\_

27. How would you describe your overall collaborative teaching experience in a CL context?

Mark only one oval.

1 2 3 4 5  
Ext      Extremely negative

28. What were the specific benefits or advantages you observed in implementing CLIL through collaborative teaching?

Tick all that apply.

- Enhanced student engagement
- Improved language proficiency
- Deeper content understanding
- Cross-curricular connections
- Increased cultural awareness
- Other: \_\_\_\_\_

29. Other (please specify):

\_\_\_\_\_

30. What challenges or difficulties did you encounter during the collaborative teaching experience in a CLIL context?

*Tick all that apply.*

- Time constraints
- Workload management
- Differences in teaching styles or approaches
- Integrating content and language effectively
- Assessing student learning in both content and language
- Other: \_\_\_\_\_

31. Other (please specify):

\_\_\_\_\_

32. How did you address or overcome the challenges faced during the collaborative teaching experience in a CLIL context?

*Tick all that apply.*

- Effective communication and collaboration with the ESP teacher
- Seeking professional development or support
- Adapting instructional strategies
- Modifying lesson plans or assessments
- Other: \_\_\_\_\_

33. Other (please specify):

\_\_\_\_\_

34. To what extent do you feel the collaborative teaching experience in a CLIL context has enhanced your professional growth and development?

*Mark only one oval.*

1 2 3 4 5

Greatly      Greatly hindered

35. How did the collaborative teaching experience in a CLIL context influence your understanding of the relationship between content and language instruction?

*Tick all that apply.*

- Deepened understanding
- Strengthened awareness
- No significant change
- Some confusion or uncertainty
- Decreased understanding

36. Would you recommend collaborative teaching in a CLIL context to other content teachers? Why or why not?

\_\_\_\_\_

37. Based on your experience, what strategies or approaches do you consider most effective for successful collaborative teaching in a CLIL context?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

38. What suggestions or recommendations do you have for improving the implementation of collaborative teaching in a CLIL context in the future?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Appendix A9: ESP Teachers (Pre-Class)

## ESP teacher's pre-class questionnaire

This questionnaire is designed to ask you for some answers as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential, and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. Please rate your experience with CLIL methodology on a scale of 1 to 5

Mark only one oval.

1 2 3 4 5  
No      Extensive experience

3. Have you collaborated with teachers from other disciplines? If yes, please provide details.

Mark only one oval.

Yes

No

4. If yes, please provide details.

\_\_\_\_\_

5. How do you envision integrating language learning with content in this interdisciplinary collaboration? Please elaborate.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Are there any specific topics or themes you believe would be well-suited for interdisciplinary collaboration?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. How can we address content and language objectives effectively? Please provide your insights.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. What language learning goals do you aim to achieve in this collaboration?

\_\_\_\_\_

9. How can we align the objectives to create meaningful student learning opportunities? Please explain

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. How do you propose assessing students' language proficiency?

Tick all that apply.

Oral exams

Written exams

Portfolio assessment

Other: \_\_\_\_\_

11. Other (please specify)

\_\_\_\_\_

12. How do you propose assessing students' content knowledge?

Tick all that apply.

Exams/quizzes specific to the content area

Projects/presentations integrating language and content

Performance assessments

Other: \_\_\_\_\_

13. Other (please specify)

\_\_\_\_\_

14. How can we ensure fair and valid assessment of language and content learning outcomes  
Please share your thoughts.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. What resources and materials do you currently use to support language learning in your classroom?

*Tick all that apply.*

- Textbooks or course materials specifically designed for language learning
- Online platforms or language learning apps
- Authentic materials such as articles, videos, or podcasts
- Language learning exercises or worksheets
- Language learning games or interactive activities
- Other: \_\_\_\_\_

16. Other (please specify)

\_\_\_\_\_

21. How can the teachers collaborate on developing or adapting materials to meet the joint goals? Please provide suggestions

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

22. What teaching strategies or approaches have you found effective for language acquisition CLIL classrooms?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

23. How can we incorporate cooperative or project-based learning into our interdisciplinary collaboration?

*Mark only one oval.*

Option 1

24. What support or professional development might be beneficial for the teachers to enhance their pedagogical skills?

\_\_\_\_\_

17. Do you recommend any specific resources or materials for this interdisciplinary collaboration?

*Mark only one oval.*

yes

No

18. Select from the list below any specific resources or materials for this interdisciplinary collaboration

*Tick all that apply.*

- Content-specific textbooks or resources that integrate language learning
- Authentic materials related to the content area (e.g., scientific articles, historical documents)
- Online platforms or resources that combine language and content learning
- Multimodal resources (e.g., videos, simulations)
- Other: \_\_\_\_\_

19. *Mark only one oval.*

Option 1

20. Other (please specify):

\_\_\_\_\_

25. How can the teachers coordinate their schedules and ensure sufficient time for collaboration?

\_\_\_\_\_

26. Are there any challenges or constraints the teachers should consider regarding time allocation or scheduling?

\_\_\_\_\_

27. What strategies can the teachers employ to optimize time use in our collaborative efforts? Please share your suggestions.

\_\_\_\_\_

28. What potential challenges do you anticipate in implementing interdisciplinary collaboration in a CLIL context?

\_\_\_\_\_

29. How can teachers address language proficiency gaps among students?

\_\_\_\_\_

30. Are there any specific challenges the teachers may face regarding assessment, curriculum alignment, or student engagement? Please elaborate.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Appendix A10: ESP Teachers (Post-Class)

## ESP teacher's post-class questionnaire

This questionnaire is designed to ask you for some answers as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts of the University of Porto.

\* Indicates required question

1. INFORMED CONSENT: Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential, and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. What class does this form refer to?

\_\_\_\_\_

3. On a scale of 1 to 5, how would you rate the overall success of the interdisciplinary collaboration in integrating language learning with content?

Mark only one oval.

1 2 3 4 5  
Not      Highly successful

4. Please provide specific examples or evidence to support your rating

\_\_\_\_\_

9. Did you encounter any challenges or limitations when implementing specific pedagogical approaches?

Mark only one oval.

Yes  
 No

10. If yes, please elaborate on the challenges or limitations and suggest possible solutions or improvements.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. To what extent did the assessment methods align with the language and content learning objectives?

Mark only one oval.

Completely aligned  
 Mostly aligned  
 Partially aligned  
 Not aligned

5. To what extent do you believe the language learning objectives were achieved through the collaboration?

Mark only one oval.

Completely achieved  
 Mostly achieved  
 Partially achieved  
 Not achieved

6. Were the content-related learning objectives effectively addressed during the collaboration?

Mark only one oval.

Yes  
 No

7. Please provide additional comments or insights regarding the achievement of learning objectives

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Which teaching strategies or approaches proved most effective during the collaboration in CLIL context?

\_\_\_\_\_

12. Did the assessment strategies accurately measure students' language proficiency and content knowledge?

Mark only one oval.

Yes  
 No

13. Please provide additional comments or insights regarding the alignment between assessments and learning objectives.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. How did the interdisciplinary collaboration impact students' language and content learning engagement?

\_\_\_\_\_

15. What evidence or observations did you notice regarding students' language development and content understanding?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

16. Please provide specific examples or anecdotes to support your observations.

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17. Which resources and materials particularly effectively support language learning in the CL context?

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18. Were there any additional resources or materials that you believe would have further enhanced the collaboration? Please specify.

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19. How well did the ESP and content teachers collaborate during the interdisciplinary project?

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20. Did you encounter any communication, coordination, or shared decision-making challenge during the collaboration?

*Mark only one oval.*

- Yes  
 No

21. If yes, please describe the collaborative dynamics and provide any suggestions for improv collaboration in future projects.

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22. What valuable insights or lessons did you gain from this interdisciplinary collaboration?

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23. Based on your experience, what recommendations would you provide for improving future interdisciplinary collaborations in a CLIL context?

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Google Forms

# Appendix A11: ESP Teachers (Final)

## ESP Teacher in the Case Study Final Questionnaire

This questionnaire is designed to ask you for some answers as a higher education teacher about interdisciplinary collaboration with a foreign language. It is part of a research project for a PhD in Language Sciences at the Faculty of Arts of the University of Porto.

\* Indicates required question

1. **INFORMED CONSENT:** Please read the following information before continuing and tick if you agree to take part in this study. All the information that will be collected is strictly confidential, and at no time will any data be stored that would make it possible to link the answers to the respondent.

Mark only one oval.

Agree

2. On a scale of 1 to 5, how would you describe your overall experience in the collaborative teaching project?

Mark only one oval.

1 2 3 4 5  
Ver      Very positive

3. What were the highlights of the collaboration for you?

\_\_\_\_\_

8. If yes, please elaborate.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. How did the collaborative teaching experience impact students' engagement in both language learning and content understanding?

Mark only one oval.

1 2 3 4 5  
Sign      Decreased engagement

10. Did you observe any notable improvements in students' language development due to the collaboration?

Mark only one oval.

yes  
 No

11. If yes, please provide examples.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. To what extent do you believe the language learning objectives were successful integrated with the content in the CLIL context?

Mark only one oval.

1 2 3 4 5  
Con      Not integrated at all

5. How effectively were the content-related learning objectives addressed during collaboration?

Mark only one oval.

1 2 3 4 5  
Con      Not addressed at all

6. Which teaching strategies or approaches were most effective in supporting language learning and content understanding in the CLIL context?

\_\_\_\_\_

7. Did you encounter any challenges or limitations when implementing specific pedagogical strategies?

Mark only one oval.

No  
 Yes

12. How well did the assessment methods align with the objectives of both language learning and content understanding?

Mark only one oval.

1 2 3 4  
Con     Not aligned at all

13. Were the assessment strategies used effectively in measuring students' language proficiency and content knowledge??

Mark only one oval.

yes  
 No

14. How would you evaluate the collaborative dynamics between yourself and the content teachers during the project?

Mark only one oval.

Excellent  
 Good  
 Fair  
 Poor

# Appendices B: Consent Forms and Information

## Appendix B1: Students



### CONSENTIMENTO INFORMADO, LIVRE E ESCLARECIDO PARA PARTICIPAÇÃO EM PROJETO DE INVESTIGAÇÃO

*Por favor, leia com atenção a seguinte informação. Se achar que algo está incorreto ou que não está claro, não hesite em solicitar mais informações. Se concorda com a proposta que lhe foi feita, queira assinar este documento.*

#### **Ensino Colaborativo no Ensino Superior: Um Estudo de Caso Examinando o Processo de Tomada de Decisão de Professores Envolvidos no Ensino Colaborativo**

Esta participação enquadra-se num projeto de investigação para um Doutoramento em Ciências da Linguagem da Faculdade de Letras da Universidade do Porto.

**Descrição do Estudo:** O estudo tem como objetivo explorar e compreender o processo de tomada de decisão de professores envolvidos no ensino colaborativo no ensino superior. Esta pesquisa concentra-se na abordagem inovadora do Ensino Colaborativo, combinando a experiência de professores de Inglês para Fins Específicos (ESP) e professores de conteúdo de disciplinas específicas para criar um ambiente de aprendizagem holístico.

**Participação:** Como participante deste estudo, irá participar ativamente em sessões de Ensino Colaborativo, preencher questionários e fornecer insights sobre a colaboração interdisciplinar vivenciada durante estas sessões.

**Confidencialidade e Anonimato:** A participação garante a confidencialidade e o uso exclusivo dos dados recolhidos apenas para fins de investigação. A identidade dos participantes será mantida anónima em quaisquer relatórios ou publicações resultantes deste estudo.

**Benefícios e Riscos:** A participação neste estudo pode contribuir para uma compreensão mais profunda das práticas de ensino colaborativo no ensino superior. Não existem riscos antecipados associados à participação.

**Participação Voluntária:** A participação é totalmente voluntária. Reserve o direito de se retirar do estudo a qualquer momento sem enfrentar quaisquer consequências.

**Confidencialidade e anonimato:** Fica garantida a confidencialidade e uso exclusivo dos dados recolhidos para o presente estudo. Agradecemos a vossa disponibilidade para participar neste estudo sobre a colaboração interdisciplinar no ensino superior.

#### **Assinatura**

Isabele Lavado, Estudante de Doutoramento da Faculdade de Letras da Universidade do Porto

Li, compreendi e concordo em participar no projeto de investigação intitulado "Ensino Colaborativo no Ensino Superior: Um Estudo de Caso Examinando o Processo de Tomada de Decisão de Professores Envolvidos no Ensino Colaborativo".

**Assinatura do Estudante:** \_\_\_\_\_

**Data:** \_\_\_\_\_

## Appendix B2: Content Teachers



### CONSENTIMENTO INFORMADO, LIVRE E ESCLARECIDO PARA PARTICIPAÇÃO EM PROJETO DE INVESTIGAÇÃO

*Por favor, leia com atenção a seguinte informação. Se achar que algo está incorreto ou que não está claro, não hesite em solicitar mais informações. Se concorda com a proposta que lhe foi feita, queira assinar este documento.*

#### **Collaborative Teaching in Higher Education: A Case Study Examining the Decision-Making Process of Teachers Involved in Collaborative Teaching**

#### **O Ensino Colaborativo no Ensino Superior: Um Estudo de Caso Examinando o Processo de Tomada de Decisão de Professores Envolvidos no Ensino Colaborativo**

Esta participação enquadra-se num projeto de investigação para um Doutoramento em Ciências da Linguagem da Faculdade de Letras da Universidade do Porto.

O estudo de caso examinará o processo de tomada de decisão dos 'professores de conteúdo' e do professor de língua inglesa durante a colaboração para preparar aulas em conjunto. Isso envolverá o preenchimento de questionários e a gravação de reuniões e entrevistas a realizar nas instalações do Instituto Politécnico de Castelo Branco. As reuniões dos professores tal com as entrevistas terão lugar na Escola Superior de Artes Aplicadas, a não ser que seja feito um pedido específico por parte dos participantes para alterar o local.

- As reuniões dos professores assim como as entrevistas serão gravadas (áudio) e serão produzidas transcrições
- As transcrições das reuniões dos professores e das entrevistas serão acedidas e analisadas exclusivamente pela investigadora e suas orientadoras
- Assegura-se o anonimato de qualquer conteúdo das reuniões dos professores, das entrevistas, ou citações diretas das mesmas, transcrito em publicação académica.

**Confidencialidade e anonimato:** Fica garantida a confidencialidade e uso exclusivo dos dados recolhidos para o presente estudo. Agradecemos a vossa disponibilidade para participar neste estudo sobre a colaboração interdisciplinar no ensino superior. Isabele Lavado, Estudante de Doutoramento da Faculdade de Letras da Universidade do Porto

**Assinatura(s):** ...

~~~~~  
*Declaro ter lido e compreendido este documento, bem como as informações verbais que me foram fornecidas pela pessoa que acima assina e que considero suficientes. Foi-me garantida a possibilidade de, em qualquer altura, recusar participar neste estudo sem qualquer tipo de consequências. Desta forma, aceito participar neste estudo e permito a utilização dos dados que de forma voluntária forneço, confiando nas garantias de confidencialidade e anonimato que me são dadas pelo/a investigador/a. e que apenas serão utilizados para esta investigação*

Nome: \_\_\_\_\_

Assinatura:

Data: \_\_ / \_\_ / \_\_\_\_

**ESTE DOCUMENTO É FEITO EM DUPLICADO: UMA VIA PARA A INVESTIGADORA, OUTRA PARA A PESSOA QUE CONSENTE**

## Appendix C: Lesson Plan

### Textile and Fashion Design : Symbolism

CLIL Lesson Plan

2022-2023

Textile and Fashion Design

Curricular Unit: Materials

Date: 22/11/2022

Time:14:00

|                |                                    |                          |
|----------------|------------------------------------|--------------------------|
| Lessons: 1 & 2 | Level: 1 <sup>st</sup> year degree | Duration:90 + 90 mins X2 |
|----------------|------------------------------------|--------------------------|

| Aims / Learning Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"><li>1. Integrate Language and Content: Develop students' language proficiency while teaching them about the concepts, issues, and impacts relating to embroidery.</li><li>2. The huge cultural impact on embroidery</li><li>3. Explore Topics relating to embroidery both with regards to Castelo Branco embroidery but also relating to symbolism in embroidery.</li><li>4. Facilitate Group Discussions: Encourage collaborative learning through group discussions where students can exchange ideas, share findings, and explore different perspectives on symbolism in embroidery.</li><li>5. Promote Critical Thinking: Encourage students to think about the influence of symbolism in embroidery.</li><li>6. Develop Presentation Skills: Provide opportunities for students to present their research and ideas in a clear and organised manner, improving their presentation and public speaking skills.</li><li>7. Apply Language Patterns: Practice using language patterns for describing, informing, contrasting, adding, and explaining various aspects of symbolism including images, patterns, and materials.</li><li>8. Provide students with a comprehensive understanding of symbolism as a complex phenomenon, while simultaneously developing their language skills in the context of meaningful content.</li></ol> |

## Assessments

Teacher, peer- and self-assessment processes will be used

Participating the class activities and the group activity

Doing the group activity and writing down the keywords and vocabulary

Hands-on Activity: Creating a Symbolic Embroidery Piece:

Students engage in a practical activity where they design and create their own small embroidery piece.

Students incorporate symbols that hold personal or cultural significance.

Discussion on the process and meaning behind their chosen symbols.

Development of a pattern and print for a scarf relating to Castelo Branco embroidery and symbolism with an explanation of their research.

Final work of a printed scarf incorporating symbolism

| Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Cognition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p>1. Symbolism in embroidery with a specific focus on Castelo Branco embroidery.</p> <p><b>Understanding Symbolism in Embroidery:</b></p> <ul style="list-style-type: none"> <li>• Definition of symbolism in the context of art and embroidery.</li> <li>• The role of symbolism in conveying cultural, emotional, and historical meanings.</li> <li>• Examples of common symbols used in embroidery across different cultures (e.g., flowers, animals, geometric shapes).</li> </ul> <p>2. The cultural element is one of the most significant aspects of this class.</p> | <p><b>1. Knowledge Acquisition:</b></p> <ul style="list-style-type: none"> <li>• Introduce historical and cultural contexts that gave rise to various embroidery traditions.</li> <li>• Present examples of embroidery techniques and styles from different regions to broaden students' understanding.</li> </ul> <p><b>2. Comprehension:</b></p> <ul style="list-style-type: none"> <li>• Encourage students to analyse and interpret the symbolism in different embroidery designs.</li> <li>• Discuss how specific materials, techniques, and motifs contribute to the overall message of an embroidery piece.</li> </ul> <p><b>3. Application:</b></p> <ul style="list-style-type: none"> <li>• Have students compare and contrast different embroidery styles and techniques to understand how they relate to their cultural contexts.</li> </ul> <p><b>4. Analysis:</b></p> <ul style="list-style-type: none"> <li>• Encourage critical thinking by having students analyse the reasons behind the choice of specific symbols in different embroidery pieces.</li> </ul> <p><b>5. Evaluation:</b></p> <ul style="list-style-type: none"> <li>• Foster evaluative skills by discussing the ethical considerations of borrowing and adapting embroidery designs from different cultures.</li> <li>• Have students assess the effectiveness of museums and educational initiatives in preserving cultural embroidery heritage.</li> </ul> <p><b>6. Reflection:</b></p> <ul style="list-style-type: none"> <li>• Encourage students to reflect on their own cultural backgrounds and the ways embroidery might be used to communicate their own heritage and values.</li> </ul> <p><b>7. Collaborative Learning:</b></p> <ul style="list-style-type: none"> <li>• Organise group activities where students research and present on different embroidery</li> </ul> |

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|  | <p>traditions, fostering collaboration and shared learning.</p> <p><b>8. Future Considerations:</b></p> <ul style="list-style-type: none"><li>• Encourage students to consider the future of embroidery in a globalised world and how it might evolve while retaining cultural significance.</li></ul> |
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**1. Castelo Branco Embroidery: A Cultural Gem:**

- Introduction to Castelo Branco embroidery, its origin, and history.
- Geographical and cultural context of Castelo Branco, Portugal.
- Importance of Castelo Branco embroidery as a cultural heritage and economic activity.

**2. Preserving and Promoting Cultural Heritage:**

Importance of preserving traditional embroidery techniques and styles.

Role of education and awareness in keeping cultural practices alive.

How Castelo Branco embroidery contributes to the local economy and tourism.

Explore the cultural significance of embroidery in an international context, highlighting how different societies use this craft to convey their heritage, beliefs, and stories.

**1. Cultural Diversity in Embroidery:**

- Embroidery's universal presence in various cultures and civilizations.
- How cultural values, aesthetics, and histories influence embroidery designs.

**2. Symbolism and Meaning:**

- The use of embroidery to symbolise cultural identity, religious beliefs, and societal roles.
- Examples of symbols commonly found in different cultures' embroidery.

**3. Regional Styles and Techniques:**

- Exploration of distinctive embroidery techniques and styles from different regions (e.g., Japanese sashiko, Mexican Otomi, Indian kantha).
- How local materials, climate, and daily life shape embroidery methods.

**4. Connection to Rituals and Traditions:**

- Embroidery's role in rituals, ceremonies, and milestones (e.g., wedding dresses, religious garments, ceremonial textiles).
- How embroidery often encapsulates cultural stories and narratives.

**5. Social and Economic Significance:**

- Embroidery as a means of livelihood and economic empowerment, especially for women in many societies.
- Preservation of traditional embroidery contributing to sustainable cultural practices.

**6. Globalization and Adaptation:**

- The impact of globalisation on embroidery, including the exchange of techniques and designs across cultures.
- How embroidery adapts to modern trends while retaining cultural authenticity.

**7. Case Study: Castelo Branco Embroidery:**

- Exploring Castelo Branco embroidery as a microcosm of cultural embroidery practices.

- Understanding how the designs, motifs, and techniques reflect the local heritage.

#### **8. Cross-Cultural Exchange and Inspiration:**

- How different cultures borrow from each other's embroidery traditions, leading to fusion styles.
- Positive aspects of cross-cultural exchange in preserving and revitalizing embroidery traditions

#### **9. Embroidery as a Cultural Bridge:**

- Discussing how embroidery can bridge gaps between generations and facilitate intercultural understanding.
- Sharing personal stories or experiences related to cultural embroidery.

#### **10. Future of Embroidery in a Globalised World:**

- Exploring the potential challenges and opportunities for preserving cultural embroidery in an interconnected world.
- Emphasising the role of education, museums, and cultural institutions.

| Communication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Language OF Learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Language FOR Learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Language THROUGH Learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>1. Vocabulary:</b></p> <ul style="list-style-type: none"> <li>Cultural terms: heritage, tradition, symbolism, rituals, ceremonies, aesthetics, authenticity, fusion, globalisation.</li> <li>Embroidery-related terms: stitches, motifs, designs, techniques, threads, materials, textiles, patterns, colors.</li> </ul> <p><b>2. Academic Language:</b></p> <ul style="list-style-type: none"> <li>Analyse, interpret, compare, contrast, evaluate, synthesise, adapt, assess, comprehend, conceptualise.</li> </ul> <p><b>1. Embroidery Techniques and Stitches:</b></p> <ul style="list-style-type: none"> <li>Satin stitch: A smooth, glossy surface stitch used for filling in shapes or creating solid areas.</li> <li>Running stitch: A simple, continuous stitch used for outlining and creating dashed lines.</li> <li>Chain stitch: A looped stitch forming a chain-like pattern, often used for outlines and curves.</li> <li>Cross-stitch: Formed by intersecting diagonal stitches to create X-shaped patterns.</li> </ul> <p><b>2. Embroidery Materials:</b></p> <ul style="list-style-type: none"> <li>Silk threads: Threads made from natural silk fibers, valued for their luster and fine quality.</li> </ul> | <p><b>1. Descriptive Language:</b></p> <p>Adjectives to describe embroidery styles: intricate, ornate, traditional, contemporary, elaborate, subtle.</p> <p>Adjectives to describe cultural aspects: religious, historical, symbolic, regional, ethnic, indigenous.</p> <p><b>2. Connecting Ideas:</b></p> <p>Phrases for making connections: "In relation to," "Likewise," "Similarly," "On the other hand," "Consequently," "Furthermore," "In contrast."</p> <p><b>3. Questioning Language:</b></p> <p>Wh-questions: Who, what, where, when, why, how.</p> <p>Open-ended questions: "What are the cultural implications of this embroidery style?"</p> <p>Critical thinking questions: "How might globalisation impact the preservation of embroidery traditions?"</p> <p><b>4. Expressing Opinions:</b></p> <p>Phrases for expressing opinions: "In my opinion," "I believe that,"</p> | <p><b>1. Language for Introducing the Topic:</b></p> <ul style="list-style-type: none"> <li>"Today, we're examining the intricate world of embroidery, a craft that weaves cultural stories and traditions through threads and stitches."</li> </ul> <p><b>2. Vocabulary Introduction and Building:</b></p> <p>"Let's start by learning some key terms. Embroidery is the art of embellishing fabric with decorative stitches, while motifs are recurring design elements that hold cultural meanings."</p> <p><b>3. Reading and Listening Activities:</b></p> <ul style="list-style-type: none"> <li>"Read this passage about Kantha embroidery from India and answer the following questions to check your comprehension."</li> </ul> <p><b>4. Speaking and Discussion:</b></p> <ul style="list-style-type: none"> <li>"Discuss with your partner how symbolism in embroidery connects to the cultural identity of a community. Share your thoughts with the class."</li> </ul> |

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| <ul style="list-style-type: none"> <li>• Linen fabric: A woven textile made from flax fibers, commonly used as a base for embroidery.</li> <li>• Goldwork: The use of metallic threads, often made of gold or silver, to create intricate designs.</li> </ul> <p><b>3. Pattern and Motif</b></p> <p><b>Terminology:</b></p> <ul style="list-style-type: none"> <li>• Repetition: Repeating a design element to create a sense of rhythm and visual interest.</li> <li>• Border motif: A decorative pattern that frames the edge of an embroidery piece.</li> <li>• Focal point: The central motif that draws the viewer's attention and anchors the design.</li> </ul> <p><b>4. Embroidery Styles and Traditions:</b></p> <ul style="list-style-type: none"> <li>• Whitework embroidery: Techniques that use white threads on white fabric, often associated with intricate cutwork.</li> <li>• Crewel embroidery: A style using wool threads on a fabric like linen, featuring bold and textured designs.</li> <li>• Blackwork: A monochromatic style using black threads, characterised by geometric patterns and intricate fillings.</li> </ul> <p><b>5. Embroidery Tools:</b></p> <ul style="list-style-type: none"> <li>• Embroidery hoop: A circular frame used to stretch and hold the fabric taut while stitching.</li> <li>• Embroidery scissors: Small, sharp scissors designed for precise cutting of threads.</li> <li>• Embroidery needle: A specialized needle with a sharp point and large eye for threading embroidery floss.</li> </ul> | <p>"From my perspective," "It seems to me that."</p> <p>5. <b>Giving Examples:</b></p> <p>Phrases for giving examples: "For instance," "To illustrate this," "A case in point is," "As an example."</p> <p>6. <b>Sequencing and Organizing Ideas:</b></p> <p>Transition words: First, next, then, finally, meanwhile, afterward, subsequently.</p> <p>7. <b>Description and Analysis:</b></p> <p>Language for describing: "This embroidery piece features..."</p> <p>Language for analysing: "The choice of colors in this design symbolises..."</p> <p>8. <b>Hypothetical Language:</b></p> <p>"Imagine if," "What if," "Suppose that."</p> <p>9. <b>Engaging Language:</b></p> <p>Inviting participation: "Let's discuss," "What do you think about?"</p> <p>Encouraging interaction: "Can you share your thoughts on this?"</p> <p>10. <b>Cultural References:</b></p> <p>Names of specific embroidery styles from different cultures (e.g., kantha, sashiko, Otomi).</p> <p>Mention of well-known cultural symbols or practices related to embroidery.</p> <p>11. <b>Reflection and Connection:</b></p> | <p><b>5. Descriptive Language Practice:</b></p> <ul style="list-style-type: none"> <li>• "Describe the visual differences between crewel embroidery and blackwork embroidery, focusing on their unique techniques and aesthetics."</li> </ul> <p><b>6. Guided Reflection:</b></p> <ul style="list-style-type: none"> <li>• "Take a moment to reflect on the embroidery traditions in your own culture. How do they reflect your heritage and identity?"</li> </ul> <p><b>7. Visual Aids and Multimedia:</b></p> <ul style="list-style-type: none"> <li>• "Observe this image of Otomi embroidery. What cultural elements do you notice? How do the vibrant colors and animal motifs contribute to the overall design?"</li> </ul> <p><b>8. Technical Language and Vocabulary Reinforcement:</b></p> <ul style="list-style-type: none"> <li>• "In your own words, explain the difference between cross-stitch and running stitch. Use the correct technical terms to describe each technique."</li> </ul> <p><b>9. Language for Analysis and Interpretation:</b></p> <ul style="list-style-type: none"> <li>• "Analyse the use of repeated motifs in this sashiko design. How does the repetition contribute to the overall aesthetic and cultural symbolism?"</li> </ul> |
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| <p><b>6. Cultural References and Terminology:</b></p> <ul style="list-style-type: none"> <li>• Kantha embroidery: A traditional style from Bengal, India, characterized by simple running stitches and reused fabric layers.</li> <li>• Otomi embroidery: A Mexican style featuring bold, colorful designs of animals, plants, and symbols.</li> <li>• Sashiko: A Japanese style of visible mending or decorative stitching, often using white thread on indigo-dyed fabric.</li> </ul> <p><b>7. Color Theory in Embroidery:</b></p> <ul style="list-style-type: none"> <li>• Color harmony: The use of complementary or analogous colors to create a pleasing color scheme.</li> <li>• Color contrast: The juxtaposition of colors to create visual interest and distinction.</li> </ul> <p><b>8. Embroidery Anatomy:</b></p> <ul style="list-style-type: none"> <li>• Warp and weft: The vertical and horizontal threads that make up the fabric, forming a grid for stitching.</li> <li>• Embroidery ground: The fabric area that is embroidered, distinct from the surrounding background.</li> </ul> <p><b>9. Thread Blending and Shading:</b></p> <ul style="list-style-type: none"> <li>• Thread blending: Mixing threads of different colors to create smooth transitions and color gradients.</li> <li>• Shading: Using varying thread colors or densities to create the illusion of depth and three-dimensionality.</li> </ul> | <p>Language for reflection: "In hindsight," "Looking back," "Upon reflection."</p> <p>Connecting with personal experiences: "In my culture, we have a similar tradition..."</p> | <p><b>10. Language for Collaboration:</b></p> <p>"Work in pairs to create a list of technical terms related to embroidery. Then, share your lists with another pair and compare your findings."</p> <p><b>11. Summarisation and Conclusion:</b></p> <ul style="list-style-type: none"> <li>• "In conclusion, embroidery serves as a universal language that bridges cultures and tells stories through needlework."</li> </ul> <p><b>12. Homework and Extension Activities:</b></p> <ul style="list-style-type: none"> <li>• "Research Castelo Branco embroidery and read the text detailing its history, motifs, and cultural significance in Portuguese heritage."</li> </ul> <p><b>13. Assessment Language:</b></p> <ul style="list-style-type: none"> <li>• "For your presentation, remember to include a clear explanation of the embroidery techniques used and their cultural meanings. You will be evaluated based on content, language, and engagement."</li> </ul> |
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| Procedures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Scaffolding Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <p><b>Class 1: Understanding Cultural Significance of Embroidery</b></p> <p><b>Objective:</b> To introduce students to the cultural importance of embroidery and explore how it reflects diverse heritage and traditions.</p> <p><b>Class Duration:</b> 90 minutes</p> <p><b>Class Structure:</b></p> <p><b>Introduction (15 minutes):</b></p> <ul style="list-style-type: none"> <li>• Welcome students and explain the lesson's objectives.</li> <li>• Share a captivating embroidery image from a different culture as a conversation starter.</li> <li>• Pose the question: "How do you think embroidery can represent cultural identities?"</li> </ul> <p><b>Vocabulary Building (10 minutes):</b></p> <ul style="list-style-type: none"> <li>• Present key terms related to embroidery, such as motifs, symbolism, heritage, techniques, and tradition.</li> <li>• Provide definitions and pronunciation for technical terms.</li> </ul> <p><b>Reading Activity: Cultural Embroidery Traditions (20 minutes):</b></p> <ul style="list-style-type: none"> <li>• Distribute short passages about Kantha embroidery from India and Otomi embroidery from Mexico.</li> <li>• In pairs, have students read and discuss the passages, highlighting cultural elements and symbolism.</li> <li>• Facilitate a class discussion on the commonalities and differences between the two traditions.</li> </ul> <p><b>Discussion: Cultural Interpretation (15 minutes):</b></p> <ul style="list-style-type: none"> <li>• Engage students in a discussion on how embroidery can convey cultural stories and beliefs.</li> <li>• Encourage students to share insights from the reading activity and their own cultural perspectives.</li> </ul> <p><b>Creating a Cultural Motif (20 minutes):</b></p> | <p><b>Class 1: Understanding Cultural Significance of Embroidery</b></p> <ol style="list-style-type: none"> <li><b>Vocabulary Pre-teaching:</b> <p>"Before we start the lesson, let's quickly review some key terms. Can anyone give me an example of what 'symbolism' means in the context of art?"</p> </li> <li><b>Guided Reading:</b> <p>"As you read the passage about Kantha embroidery, focus on finding examples of cultural elements. Write down at least two examples that stand out to you."</p> </li> <li><b>Think-Pair-Share:</b> <p>"Now, turn to your partner and discuss the cultural elements you found in the Kantha embroidery passage. What stood out to your partner that you might have missed?"</p> </li> </ol> |

- Ask students to create a simple motif inspired by their own cultural background or the ones discussed in class.
- Emphasize the importance of using colors and patterns that hold cultural significance.

**Wrap-up and Homework (10 minutes):**

- Summarize the main points discussed in class.
- Assign reading homework: Research Castelo Branco embroidery and prepare to discuss its cultural symbolism in the next class.

**Class 2: Exploring Castelo Branco Embroidery and Globalization**

**Objective:** To delve deeper into Castelo Branco embroidery as a case study and explore the impact of globalization on cultural embroidery traditions.

**Class Duration:** 90 minutes

**Class Structure:**

**Recap and Introduction (10 minutes):**

- Recap the previous class by asking students to briefly share their experiences with the hands-on activity and any reflections on cultural motifs.

**Presentation: Castelo Branco Embroidery (20 minutes):**

- Introduce Castelo Branco embroidery: its origin, techniques, and cultural significance.
- Display images of Castelo Branco embroidery pieces, highlighting motifs and techniques.
- Discuss the local and historical context that shaped this embroidery style.

**Discussion: Globalization and Embroidery (15 minutes):**

- Lead a discussion on the influence of globalization on traditional embroidery practices.
- Explore the pros and cons of globalization for cultural heritage, considering factors like exposure, adaptation, and preservation.

**Case Study Analysis: Castelo Branco Embroidery (20 minutes):**

**Class 2: Exploring Castelo Branco Embroidery and Globalisation**

1. **Recap and Graphic Organizer:**

"Let's quickly recall what we learned last class. Take a moment to fill in the graphic organiser with the key terms we discussed."

2. **Guided Presentation:**

"As we go through the presentation on Castelo Branco embroidery, feel free

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| <ul style="list-style-type: none"> <li>• Distribute images of Castelo Branco embroidery motifs to small groups.</li> <li>• Have groups analyze the symbolism and motifs, discussing what cultural elements they represent.</li> </ul> <p><b>Group Presentation: Global Impact (15 minutes):</b></p> <ul style="list-style-type: none"> <li>• Each group presents their analysis of Castelo Branco embroidery and its significance in a globalized world.</li> <li>• Discuss how globalization might influence the preservation and adaptation of this tradition.</li> </ul> <p><b>Reflection and Future Considerations (10 minutes):</b></p> <ul style="list-style-type: none"> <li>• Facilitate a class reflection on the cultural aspects learned in this lesson and the implications of globalization.</li> <li>• Encourage students to think about ways to balance preservation and innovation in cultural embroidery practices.</li> </ul> <p><b>Conclusion and Homework (10 minutes):</b></p> <ul style="list-style-type: none"> <li>• Summarize the key takeaways from the lesson, focusing on Castelo Branco embroidery providing the text.</li> </ul> | <p>to stop me at any point if you have questions or need further clarification."</p> <p>3. <b>Jigsaw Analysis for Case Study:</b></p> <p>"Each group will focus on analyzing one image of a Castelo Branco motif. Remember, your goal is to describe the motifs and explain what they might symbolise."</p> <p>4. <b>Structured Group Presentation:</b></p> <p>"Your presentation should start with a brief description of the motif, followed by its cultural significance. Remember to refer to the questions on the template to guide your analysis."</p> <p>5. <b>Reflection Template:</b></p> <p>"Use this reflection template to guide your thoughts on the impact of globalisation. Consider how it affects both the preservation and innovation of embroidery traditions."</p> <p>6. <b>Peer Feedback and Self-Assessment:</b></p> <p>"As you provide feedback to your peers, focus on their use of vocabulary and how effectively they explained the cultural significance. Remember, we're here to help each other improve."</p> |
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## Kantha Embroidery: Stitching Stories of Resilience and Tradition

**Introduction:** Kantha embroidery, originating from the Indian subcontinent, is an exquisite art form that weaves together history, culture, and craftsmanship. With its roots deeply embedded in the rural landscapes of West Bengal and Bangladesh, Kantha embroidery tells stories of creativity, resilience, and the interplay between art and daily life.

**Historical Origins:** The word "kantha" translates to "rags" in Sanskrit, reflecting the humble origins of this embroidery style. Kantha traces its roots back to ancient times when thrifty homemakers used discarded fabric to create blankets, coverings, and clothing. Over the years, this practical craft evolved into a vibrant art form that captures the essence of rural life.

**Techniques and Aesthetics:** Kantha embroidery employs simple stitches such as the running stitch, making it accessible to artisans of all skill levels. The magic, however, lies in the artistic arrangement of these stitches. Kantha artists skillfully layer multiple pieces of fabric, often worn-out saris or dhotis, and breathe new life into them through intricate patterns and motifs. The result is a tactile and visual masterpiece that exudes warmth and authenticity.

**Motifs and Symbolism:** Kantha embroidery is a language of symbols, with each motif holding cultural, spiritual, or personal significance. Traditional motifs include flowers, birds, animals, and geometric shapes. The "Ratha," a stylised chariot, represents life's journey, while the "sankha," or conch shell, symbolises purity and spirituality. Such motifs convey stories of nature, folklore, and rituals passed down through generations.

**Cultural Significance:** Kantha holds a special place in Bengali culture and beyond. These embroidered creations often carry the spirit of the artisan and the wearer, reflecting personal narratives and broader social contexts. Kantha sarees, for instance, are usually gifted to brides as a representation of familial love and heritage. Through its threads, Kantha stitches together the past and the present, honouring tradition while embracing the present moment.

**Modern Revival and Global Recognition:** In recent years, Kantha embroidery has experienced a renaissance in its countries of origin and on the global stage. Artisans and designers have merged traditional techniques with contemporary aesthetics, creating fashion and home decor that resonates with diverse audiences. The allure of Kantha lies not just in its beauty but also in its story of sustainability and craftsmanship.

**Conclusion:** Kantha embroidery is a testament to art's transformative power and cultural traditions' resilience. It bridges generations, connects communities, and speaks a universal language, transcending

borders. As Kantha embroidery continues to evolve, it reminds us that creativity, heritage, and the human touch can give rise to masterpieces that weave together the threads of the past, present, and future.

1. What is the historical origin of Kantha embroidery?
2. Which basic stitch is commonly used in Kantha embroidery?
3. How did Kantha embroidery evolve from its humble beginnings?
4. What kind of fabrics are often used in Kantha embroidery?
5. What is the significance of traditional motifs in Kantha embroidery?
6. What cultural and personal aspects do Kantha sarees symbolise?
7. How has Kantha embroidery experienced a modern revival?
8. What does Kantha embroidery represent beyond its aesthetic beauty?
9. How does Kantha embroidery connect different generations and communities?
10. What message is conveyed by Kantha embroidery's transformation from discarded rags to a revered art form?

Answers:

1. **What is the historical origin of Kantha embroidery?**
  - Kantha embroidery originated from the Indian subcontinent.
2. **Which basic stitch is commonly used in Kantha embroidery?**
  - The running stitch is commonly used in Kantha embroidery.
3. **How did Kantha embroidery evolve from its humble beginnings?**
  - Kantha embroidery began as a practical craft using discarded fabric, which evolved into a vibrant art form.
4. **What kind of fabrics are often used in Kantha embroidery?**
  - Often, worn-out saris or dhotis are used in Kantha embroidery.
5. **What is the significance of traditional motifs in Kantha embroidery?**
  - Traditional motifs in Kantha embroidery hold cultural, spiritual, or personal meanings.
6. **What cultural and personal aspects do Kantha sarees symbolise?**
  - Kantha sarees symbolise familial love, heritage, and cultural significance and are often gifted to brides.
7. **How has Kantha embroidery experienced a modern revival?**
  - Kantha embroidery has experienced a revival by blending traditional techniques with contemporary aesthetics.

8. **What does Kantha embroidery represent beyond its aesthetic beauty?**

- Kantha embroidery represents resilience, heritage, sustainability, and the transformative power of art.

9. **How does Kantha embroidery connect different generations and communities?**

- Kantha embroidery bridges generations and communities by preserving traditions and telling stories.

10. **What message is conveyed by Kantha embroidery's transformation from discarded rags to a revered art form?**

- The transformation of Kantha embroidery from rags to an art form highlights the potential of creativity and craftsmanship to elevate humble materials into masterpieces.

Images:

<https://www.google.com/imgres?imgurl=https%3A%2F%2Fp1.pxfuel.com%2Fpreview%2F820%2F344%2F20%2Fkantha-embroidery-animals-textiles.jpg&tbnid=s-FFOa7maCUxGM&vet=12ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMygBegQIARBX..i&imgrefurl=https%3A%2F%2Fwww.pxfuel.com%2Fen%2Ffree-photo-jghfs&docid=q1S8NFypmR3T1M&w=910&h=683&q=kantha%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMygBegQIARBX>

[https://www.google.com/imgres?imgurl=https%3A%2F%2Fupload.wikimedia.org%2Fwikipedia%2Fcommons%2F8%2F85%2FModern\\_Naksi\\_kantha.jpg&tbnid=WPdHa\\_QCysmGOM&vet=12ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMyglegQIARBs..i&imgrefurl=https%3A%2F%2Fcommons.wikimedia.org%2Fwiki%2Ffile%3AModern\\_Naksi\\_kantha.jpg&docid=Pd0FM1z0V2sycM&w=1500&h=1056&q=kantha%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMyglegQIARBs](https://www.google.com/imgres?imgurl=https%3A%2F%2Fupload.wikimedia.org%2Fwikipedia%2Fcommons%2F8%2F85%2FModern_Naksi_kantha.jpg&tbnid=WPdHa_QCysmGOM&vet=12ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMyglegQIARBs..i&imgrefurl=https%3A%2F%2Fcommons.wikimedia.org%2Fwiki%2Ffile%3AModern_Naksi_kantha.jpg&docid=Pd0FM1z0V2sycM&w=1500&h=1056&q=kantha%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMyglegQIARBs)

[https://www.google.com/imgres?imgurl=https%3A%2F%2Fwww.lookandlearn.com%2Fhistory-images%2Fpreview%2FYCM%2FYCM0%2FYCM0082%2FYCM0082074\\_Kantha.jpg&tbnid=Lc3A4Xm9cfDkYM&vet=12ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMygDegQIARBD..i&imgrefurl=https%3A%2F%2Fwww.lookandlearn.com%2Fhistory-images%2FYCM0082074%2FKantha&docid=72AE6meamVwUTM&w=512&h=320&itg=1&q=kantha%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMygDegQIARBD](https://www.google.com/imgres?imgurl=https%3A%2F%2Fwww.lookandlearn.com%2Fhistory-images%2Fpreview%2FYCM%2FYCM0%2FYCM0082%2FYCM0082074_Kantha.jpg&tbnid=Lc3A4Xm9cfDkYM&vet=12ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMygDegQIARBD..i&imgrefurl=https%3A%2F%2Fwww.lookandlearn.com%2Fhistory-images%2FYCM0082074%2FKantha&docid=72AE6meamVwUTM&w=512&h=320&itg=1&q=kantha%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjN7tyikeSAAxURnCcCHSXJCesQMygDegQIARBD)

<https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.justdial.com%2Findia%2FKantha-Embroidery-Fabric&psig=AOvVaw0rornjEZPzXRV8L3s4S84V&ust=1692376870328000&source=images&cd=vfe&opi=89978449&ved=0CBAQjRxxFwoTCMCAqQOR5IADFQAAAAAdAAAAABAJ>

OTOMI:

<https://www.google.com/url?sa=i&url=https%3A%2F%2Fcommons.wikimedia.org%2Fwiki%2FFile%3AAntiguaEasterCarpetMacaws.jpg&psig=AOvVaw17Eo-zSZY0kIWJ2dcyCzhw&ust=1692377196685000&source=images&cd=vfe&opi=89978449&ved=0CBAQjRxxFwoTCPCc6L6S5IADFQAAAAAdAAAAABAE>

<https://www.google.com/imgres?imgurl=https%3A%2F%2Fupload.wikimedia.org%2Fwikipedia%2Fcommons%2Fb%2Fba%2FOtomiRugs003.JPG&tbnid=IC84iO10B-FHMM&vet=12ahUKEwj9jKy-kuSAAxVBp0wKHVxUAPUQMygFegQIARBD..i&imgrefurl=https%3A%2F%2Fcommons.wikimedia.org%2Fwiki%2FFile%3AOtomiRugs003.JPG&docid=-ggY47fzR20tDM&w=3872&h=2592&itg=1&q=otomi%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwj9jKy-kuSAAxVBp0wKHVxUAPUQMygFegQIARBD>

<https://www.google.com/imgres?imgurl=https%3A%2F%2Fgarden.spoonflower.com%2Fc%2F13447793%2Fp%2Ff%2FI%2FahrPyBb7shDjdijH95avcEKNtKXHBtRnWBKnjncAHqZXA9fCVO81sEA%2FOtomi%2520Embroidery%2520Curtain%2520Panel%2520by%2520Queen%2520Bean%2520Productions.jpg&tbnid=dR7zeXI33C9oM&vet=10CAIQxiAoAGoXChMI8JzovpLkgAMVAAAAABOAAAAAEAw..i&imgrefurl=https%3A%2F%2Fwww.spoonflower.com%2Fen%2Fshop%2Fotomi-embroidery&docid=JGEOZEEUrWrHeM&w=400&h=400&itg=1&q=otomi%20embroidery&hl=pt-PT&client=safari&ved=0CAIQxiAoAGoXChMI8JzovpLkgAMVAAAAABOAAAAAEAw>

Sashiko:

[https://www.google.com/imgres?imgurl=https%3A%2F%2Flive.staticflickr.com%2F1457%2F24144967410\\_3a4448cd24\\_b.jpg&tbnid=iNZEh2AonTMwSM&vet=12ahUKEwjF2faUk-SAAxWmnyCCHQx1B6EQMygDegQIARBZ..i&imgrefurl=https%3A%2F%2Fwww.flickr.com%2Fphotos%2Fjacquedavis%2F24144967410&docid=jK6RsXbOcxAZwM&w=1024&h=1024&q=%09Sashiko%3A%20%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjF2faUk-SAAxWmnyCCHQx1B6EQMygDegQIARBZ](https://www.google.com/imgres?imgurl=https%3A%2F%2Flive.staticflickr.com%2F1457%2F24144967410_3a4448cd24_b.jpg&tbnid=iNZEh2AonTMwSM&vet=12ahUKEwjF2faUk-SAAxWmnyCCHQx1B6EQMygDegQIARBZ..i&imgrefurl=https%3A%2F%2Fwww.flickr.com%2Fphotos%2Fjacquedavis%2F24144967410&docid=jK6RsXbOcxAZwM&w=1024&h=1024&q=%09Sashiko%3A%20%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjF2faUk-SAAxWmnyCCHQx1B6EQMygDegQIARBZ)

[https://www.google.com/imgres?imgurl=https%3A%2F%2Ffive.staticflickr.com%2F498%2F19024226784\\_ee5756d307\\_b.jpg&tbnid=3gsEpvTmo\\_yMtM&vet=12ahUKEwjF2faUk-SAAxWmnycCHQx1B6EQMyglegQIARBo..i&imgrefurl=https%3A%2F%2Fwww.flickr.com%2Fphotos%2Fjacquedavis%2F19024226784&docid=rkurAo058z16TM&w=1024&h=768&q=%09Sashiko%3A%20%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjF2faUk-SAAxWmnycCHQx1B6EQMyglegQIARBo](https://www.google.com/imgres?imgurl=https%3A%2F%2Ffive.staticflickr.com%2F498%2F19024226784_ee5756d307_b.jpg&tbnid=3gsEpvTmo_yMtM&vet=12ahUKEwjF2faUk-SAAxWmnycCHQx1B6EQMyglegQIARBo..i&imgrefurl=https%3A%2F%2Fwww.flickr.com%2Fphotos%2Fjacquedavis%2F19024226784&docid=rkurAo058z16TM&w=1024&h=768&q=%09Sashiko%3A%20%20embroidery&hl=pt-PT&client=safari&ved=2ahUKEwjF2faUk-SAAxWmnycCHQx1B6EQMyglegQIARBo)

## **Reflection Template: Embroidery and Globalization – Impact on Cultural Symbolism**

### **Introduction:**

In this reflection, you'll explore the intricate relationship between embroidery, cultural symbolism, and the influence of globalisation. Take time to think deeply about the concepts we've discussed and their intersectionality. Your insights are valuable as we examine the dynamic world of cultural heritage and artistic expression.

### **Part 1: Understanding Cultural Symbolism (Briefly summarise your understanding of cultural symbolism in embroidery):**

- What is cultural symbolism in embroidery, and how does it contribute to conveying cultural stories and values?
- Please provide an example of an embroidery motif or design with strong cultural symbolism and explain its significance.

### **Part 2: The Impact of Globalization (Consider how globalisation affects cultural traditions):**

- How has globalisation led to increased exposure to different embroidery traditions worldwide?
- How has globalisation influenced how people perceive and appreciate cultural symbolism in embroidery?

### **Part 3: Balancing Preservation and Adaptation (Reflect on the delicate balance between tradition and change):**

- Reflect on the challenges that arise when cultural embroidery traditions encounter globalisation.
- How do you think communities can preserve their embroidery's authenticity while adapting to changing global trends?

**Part 4: Personal Insights and Observations (Share your thoughts on the broader implications of these discussions):**

- Do you believe that globalisation enhances or threatens the preservation of cultural embroidery traditions? Why?
- How might your own experiences and cultural background shape your perspective on the impact of globalisation on cultural symbolism?

**Conclusion:**

As you've explored the complex interplay between embroidery, cultural symbolism, and globalisation, take a moment to summarise your key takeaways and insights. Consider how this understanding might influence your appreciation of traditional and contemporary embroidery designs in a globalised world.

Remember, your reflections are a way to connect your learning with your insights, contributing to a richer understanding of the intricate connections between art, culture, and society.

## Castelo Branco Embroidery

Examples of the symbolism of motifs found in Castelo Branco Embroidery:

1. **Flowers and Leaves:**
  - **Symbolism:** Growth, beauty, connection to nature and the land.
  - **Influence:** Reflects the town's surroundings and agricultural heritage, showcasing the importance of nature in daily life.
2. **Crosses and Religious Symbols:**
  - **Symbolism:** Spiritual devotion, faith, religious heritage.
  - **Influence:** Portugal's strong Catholic history demonstrates the fusion of religious beliefs and artistic expression.
3. **Geometric Designs:**
  - **Symbolism:** Balance, harmony, unity.
  - **Influence:** Reflects Moorish influences from the Iberian Peninsula's history, showcasing the interplay of cultures over time.
4. **Ships and Anchors:**
  - **Symbolism:** Exploration, adventure, maritime heritage.
  - **Influence:** Pays homage to Portugal's maritime past and the country's significant role in global exploration.
5. **Exotic Animals and Plants:**
  - **Symbolism:** Discovery, new horizons, cultural exchange.
  - **Influence:** Reflects Portugal's exploration of distant lands and trade with other parts of the world, infusing the embroidery with global elements.
6. **Interlacing Designs:**
  - **Symbolism:** Interconnectedness, unity of cultures, harmony.
  - **Influence:** Represents the harmonious coexistence of diverse cultural influences and traditions, forming a unique and unified identity.
7. **Modern Elements:**
  - **Symbolism:** Innovation, adaptation, cultural exchange.
  - **Influence:** Modern embroiderers might incorporate contemporary symbols or motifs from other cultures, reflecting the ongoing global exchange of ideas and artistic expression.

These examples illustrate how the motifs in Castelo Branco Embroidery hold layers of meaning and reflect the fusion of local heritage with influences from other countries and cultures.

Examples of how the materials used in the construction of Castelo Branco Embroidery also have symbolism:

1. **Linen Fabric:**
  - **Symbolism:** Purity, simplicity, authenticity.
  - **Explanation:** Linen fabric, often used as the base for Castelo Branco Embroidery, symbolises purity and simplicity. This choice of material reflects the genuine and unadorned nature of the embroidery's cultural heritage.
2. **Silk Threads:**
  - **Symbolism:** Luxury, elegance, sophistication.
  - **Explanation:** The use of silk threads in Castelo Branco Embroidery adds an element of luxury and elegance to the artwork. It symbolises the appreciation for fine craftsmanship and the attention to detail that defines the embroidery's cultural identity.
3. **Cotton Threads:**
  - **Symbolism:** Strength, endurance, resilience.
  - **Explanation:** When used in Castelo Branco Embroidery, cotton threads can symbolise the strength and endurance of the local community. Just as cotton withstands the test of time, the embroidery tradition persists as a resilient expression of cultural heritage.
4. **Recycled Fabrics:**
  - **Symbolism:** Continuity, resourcefulness, sustainability.
  - **Explanation:** When recycled fabrics are incorporated into Castelo Branco Embroidery, they represent continuity and the passing down of traditions through generations. This resourceful approach also reflects a commitment to sustainability and minimising waste.
5. **Gold and Metallic Threads:**
  - **Symbolism:** Royalty, prosperity, cultural exchange.
  - **Explanation:** Using gold and metallic threads can symbolise prosperity and cultural exchange. Such threads may harken back to Portugal's history of maritime trade and interactions with distant lands, infusing the embroidery with a touch of global influence.
6. **Natural Dyes:**
  - **Symbolism:** Connection to nature, authenticity, tradition.
  - **Explanation:** When natural dyes are employed in embroidery, they symbolise a deep connection to the land and an appreciation for traditional craftsmanship. Using natural dyes adds an authentic touch to the embroidery's representation of cultural roots.
7. **Bright Colors:**
  - **Symbolism:** Vibrancy, celebration, cultural identity.
  - **Explanation:** Bright and vibrant colours used in Castelo Branco Embroidery symbolise the celebratory nature of the culture. These colours reflect the local community's joy, energy, and cultural identity, making the embroidery visually represent their spirit.
8. **Earth Tones:**
  - **Symbolism:** Earthiness, connection to the land, grounding.
  - **Explanation:** The earthy tones used in the embroidery evoke a sense of connection to the land and the environment. This symbolism reinforces deep-rooted cultural ties and the importance of maintaining a connection to one's origins.

By considering the symbolism of the materials used in Castelo Branco Embroidery, we understand how each element contributes to the rich tapestry of cultural storytelling and artistic expression.

## Castelo Branco Embroidery: A Thread of Historical Journeys and Far-Eastern Connections

**Introduction:** Castelo Branco Embroidery, a masterpiece of Portuguese heritage, is intricately linked to historical journeys that spanned continents. In particular, its ties to Asia, specifically China and Japan, intertwine with the maritime adventures that brought exotic ceramics to Europe through Portuguese exploration.

**Asian Influences on Motifs:** Castelo Branco Embroidery's motifs often reflect a subtle infusion of Asian aesthetics. Elements inspired by Chinese and Japanese art, such as delicate floral patterns and harmonious compositions, have found their way into the embroidery's designs. This intercontinental exchange added a touch of Far Eastern allure to the local embroidery tradition.

**Portuguese Maritime Explorations:** Portuguese explorers embarked on ambitious maritime journeys that connected Europe to Asia. Vasco da Gama's historic voyage to India opened trade routes that facilitated the exchange of goods, ideas, and artistic inspiration between continents. As Portuguese ships sailed the oceans, they carried back treasures from the East, including textiles, spices, and ceramics.

**Ceramics from China and Japan:** Chinese and Japanese ceramics, coveted for their exquisite craftsmanship and intricate designs, captivated the European imagination. Portuguese ships brought these ceramics to the European shores, introducing them to new audiences. The elegant motifs of these ceramics resonated with Portuguese artisans, influencing various art forms, including embroidery.

**Cultural Fusion and Embroidery:** Portugal's encounter with Asian ceramics and artistic traditions sparked a creative fusion. Embroiderers in Castelo Branco drew inspiration from the delicate motifs of Far Eastern ceramics, infusing their craft with elegance and refinement. This cross-cultural exchange enriched the embroidery's visual language, creating a unique blend of local and global aesthetics.

**Legacy of Global Connections:** The connections forged between Portugal and the Far East left an indelible mark on Castelo Branco Embroidery. Through intricate stitches and motifs, the embroidery silently narrates the stories of maritime adventures, cultural encounters, and the beauty of shared artistic expressions.

**Conclusion:** Castelo Branco Embroidery is a testament to the power of human connection across vast distances. Its motifs, influenced by the beauty of Asian art and the treasures of Portuguese exploration, carry the whispers of history's journeys. The embroidery continues to celebrate the crossroads of cultures, reminding us that threads of heritage, like the threads of a needle, have the power to weave together stories that transcend time and space.

## Appendices D: Tabulated Comments

### Appendix D1: Fashion and Textile Design

| FTD: Fashion and Textile Design              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Researching materials and technical language |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Participants                                 | Content Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| T1 (ENG)                                     | <ul style="list-style-type: none"> <li>• Is there a preference for which of the classes you want to do the materials and research with?</li> <li>• Specifically, what is the class on materials related with?</li> <li>• Do you think that it is the project development area that would be appropriate to teach in English.</li> <li>• It is possible to take the steps and apply these to the work that they must do.</li> <li>• The vocabulary and language is an area that we need to decide on.</li> <li>• When you talk about technology, new materials and textile and fashion design the different areas converge in the product design but what exactly is the language are that you want them to understand in English?</li> <li>• What work do you usually do with students in Portuguese?</li> <li>• So we need to present the students with the areas as research into innovative and state-of-the-art research that they need to summarize and use as evidence for their product development.</li> <li>• I am looking at report writing and language for presentations.</li> </ul> |
| T2 (FTD)                                     | <ul style="list-style-type: none"> <li>• I have two areas that I want to look at. The first one is materials and technical language that students need to research in this area. The next one goes back to the symbolism in embroidery.</li> <li>• Materials and technical language are what I am doing with the master's students</li> <li>• When students are focused on just the creative part of the work, they forget that the project development of the product has to be followed and that there are steps that they need to follow.</li> <li>• When I teach the project steps, I find that students often do not spend enough time on this part of the project work and concentrate a lot of their effort on the creative part.</li> </ul>                                                                                                                                                                                                                                                                                                                                              |

|              | <ul style="list-style-type: none"> <li>• Since it is essential that these students have practical, real-life examples, the project development steps are important.</li> <li>• Companies expect students to have the know-how in creativity and creation, but companies really want the know-how in the presentation of projects and project development. Students need to know how to do these in English.</li> <li>• The class is centered around three focal points, technology, new materials, and textile and fashion design.</li> <li>• The class is to have students research these areas as a whole and transfer that research into product development.</li> <li>• The classes in Portuguese look at innovation in these areas and research in these areas but the texts are all in English. It would be a benefit for students to look at these areas in English as a technical language and examine the texts and recent developments in English. Summarizing and consolidating the work in English will be much more productive for the work in the long run.</li> </ul> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Participants | Material Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• The texts I have are abstracts and results for quick search that we can go over in class identifying the innovative aspect of the materials and how these can be integrated into design.</li> <li>• There are also some simulations of search engine results that can demonstrate to students how we can use synonyms to reduce our search</li> <li>• The language is based around useful expressions that you can use to signpost the various parts of their work but also identify the language in original texts.</li> <li>• We can look at reports which are concise and have a formal structure and how they break down the report into sections, which each have their own headings and sub-headings.</li> </ul>                                                                                                                                                                                                                                                                                                                      |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• It is very important at these stage that the students understand the importance of writing the product development report because it also helps them organize the whole work as a brief.</li> <li>• Students already have problems with these in Portuguese and the fact that most of the work even needs to be in English is another challenge. Doing it immediately in English is an excellent learning opportunity.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Participants | Dates                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• The dates are fine with me</li> </ul>                                                                                                                                                                                                                                                                                                          |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• I want to launch a final project with the students for the end of the semester</li> </ul>                                                                                                                                                                                                                                                      |
|              |                                                                                                                                                                                                                                                                                                                                                                                         |
| Participants | Evaluation                                                                                                                                                                                                                                                                                                                                                                              |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• The evaluation for the students will be based around texts and language relating to the 3 areas.</li> <li>• The product development phase can be done through steps and language to use in the different stages</li> </ul>                                                                                                                     |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• I need students to have followed the product development stages and done the appropriate research with the key words</li> </ul>                                                                                                                                                                                                                |
|              |                                                                                                                                                                                                                                                                                                                                                                                         |
| Participants | Reflection                                                                                                                                                                                                                                                                                                                                                                              |
| T1 (ENG)     | <p>I think that went really well. I was surprised to with how engaged they were.</p> <p>I think that I need to do more practical activities because they all appeared to enjoy them.</p> <p>Students asked a lot of questions and participated a lot.</p> <p>I didn't expect students to make so many suggestions about other classes. The report writing was an interesting point.</p> |
| T2 (FTD)     | <p>Everyone really enjoyed this class. I was surprised that the students were so good at English. For a first class I didn't expect students to get as involved as they did.</p>                                                                                                                                                                                                        |

|  |                                                                                                                                                                                   |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>The practical parts of the lesson were really good and I was impressed with how they participated.</p> <p>Students had lots of suggestions for the work and that was good.</p> |
|  |                                                                                                                                                                                   |

| FTD: Fashion and Textile Design<br>Symbolism in Embroidery |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Participants                                               | Content Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| T1 (ENG)                                                   | <ul style="list-style-type: none"> <li>• We can look at the work we want to do on Symbolism</li> <li>• Do we want to include all the embroidery or just the Bordado de Castelo Branco?</li> <li>• There is a lot of history behind this embroidery and I think it would be a good idea to look at the origins of the embroidery.</li> <li>• If you want to look at the cultural and religious points this is important in the symbols and the material</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                       |
| T2 (FTD)                                                   | <ul style="list-style-type: none"> <li>• I really want students to take a close look at symbolism in embroidery.</li> <li>• When it comes to Materials students need to look at the materials that are used and what this mean. It's not just a piece of embroidery there is a lot more than just the physical piece of embroidery.</li> <li>• Again, students focus on the creative and visual part of the embroidery and they need to understand the cultural and religious weight that embroidery has.</li> <li>• I would like the class to center around three points, the images, materials, and use of the embroidery.</li> <li>• I'd like to centre it around Bordado de Castelo Branco</li> <li>• The background of the embroidery is important yes, it is a good point to have students research the images in classical embroidery</li> </ul> |

| Participants | Material Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• I have a collection of images from the embroidery and texts from several museums about the embroidery.</li> <li>• There is what we call a language in the images and specific symbolism attached to the different images such as the people, animals, vegetation and birds etc.</li> <li>• I understand that very often the students as an artist can sometimes concentrate on the images and forget what it is that creates these images and why they are used</li> </ul>                                                                                                                                                                                                                                                                                                                                      |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• It will be very important for students to see the different interpretations of the images as well as to see the similarities Worldwide.</li> <li>• Students really don't seem to understand the importance of the background they need for their projects and works.</li> <li>• When I ask students to research an area for their mood boards they really don't seem to understand the starting point or background to the work</li> <li>• I think that with the English in the class students will have to concentrate more and think harder about the importance of the embroidery as a starting point for their mood boards that will be the basis of their work.</li> <li>• Students really can't separate the meaning and interpretation of the symbolism in embroidery from the actual images.</li> </ul> |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants | Dates                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• The dates are fine with me I just need to know what the specific dates are</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• I want to have this class this month as they have another work to do next semester. launch a final project with the students for the end of the semester</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants | Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|              |                                                                                                                                                                                                                                                                                                                 |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• We can evaluate the students through their research, and I have a text that we can use that is very specific to Bordado de castelo Branco and the Asian connection.</li> </ul>                                                                                         |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• I need students to have a clear understanding of the symbolism behind the embroidery. Their mood boards should reflect the research that they do and the class.</li> <li>• They have to produce a scarf with their design ideas based on this area of study</li> </ul> |
|              |                                                                                                                                                                                                                                                                                                                 |
| Participants | Reflection                                                                                                                                                                                                                                                                                                      |
| T1 (ENG)     | The class appeared to go well but it was obvious that students had never thought about what embroidery actually meant.                                                                                                                                                                                          |
| T2 (FTD)     | It has been difficult to have students understand that in the area of Fashion and textiles it is not just about images and their creativity for drawing. In materials students do not always understand that it is not just about the fibres                                                                    |
|              |                                                                                                                                                                                                                                                                                                                 |

| FTD: Fashion and Textile Design<br>Sustainability and Urbanisation |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Participants                                                       | Content Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| T1 (ENG)                                                           | <ul style="list-style-type: none"> <li>• I received your brief on Sustainability and Urbanisation it is very different from the other work that students are doing</li> <li>• Would you like to do these separately?</li> <li>• What points of urbanization would you like to look at?</li> <li>• I can look at urbanization as a whole and use texts and images.</li> <li>• Patterns and colors are a point that we can examine and provide a deeper understanding of urbanization for their briefing.</li> <li>• I have the part of mood and tone which can be very useful to have students thinking about sensations.</li> </ul>                                                                                                                                                   |
| T2 (FTD)                                                           | <ul style="list-style-type: none"> <li>• This part of materials has a very practical side and will engage students in two areas that will join to form one briefing. I need students to understand that the creative moment needs to have an understanding of the area that they are looking at.</li> <li>• For urbanization I need students to look at the colours and the patterns that they find in urbanisation.</li> <li>• With materials students need to look at the use of the materials.</li> <li>• The students can focus on the visual patterns and images but I was thinking you could use more aspects to broaden their creativity.</li> <li>• I like the mood and tone idea as it forces students to think outside the normal interpretation of urbanisation</li> </ul> |
|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Participants                                                       | Material Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| T1 (ENG)                                                           | <ul style="list-style-type: none"> <li>• I think we should start with simple definitions and then use images to start a class discussion</li> <li>• Using the white board to write key words and illicit expressions and words they associate with urbanization.</li> <li>• Mood and tone can be an exercise that we do at the end to inspire students to think about all of their senses and concentrate on their interpretation of what they feel is urbanisation</li> </ul>                                                                                                                                                                                                                                                                                                        |

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• It will be very important for students to see the different interpretations of the images as well as to see the similarities Worldwide.</li> <li>• The students limit their searches to images and often fail as they use Pintrest as a source of images and ideas for their work. I want them to start and develop their own ideas and interpretations.</li> <li>• Of course, they can use these types of sources but I think they can be more creative and original</li> <li>• Let's use the patterns and colors as a starting point and the mood and tone can help them develop their imagination</li> </ul> |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants | Dates                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• The class needs to be divided into two dates and times I don't think we can do both together</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• I think it will be easier if we have a Part I and Part II for this class with Urbanisation first and then Sustainability</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants | Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• We can evaluate the students through the participation and I have some short paragaphs and sentences for students to fill in with key words.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| T2 (FTD)     | <ul style="list-style-type: none"> <li>• I would like students to record their progression to the briefing and how they interpret Urbanisation and Sustainability.</li> <li>• The mood boards need to reflect their understanding of the two concepts.</li> <li>• The students need to produce two different mood boards which they will later join together.</li> <li>• It will be good to check their understanding of the two concepts before I check the mood boards</li> <li>• They will have a final mood board to create by joining these two and they will have to produce a draft for a textile that is based on the briefing</li> </ul>        |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants | Reflection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|          |                    |
|----------|--------------------|
| T1 (ENG) | Notes not recorded |
| T2 (FTD) | Notes not recorded |
|          |                    |

## Appendix D2: Technological and Graphic Design

| TGD: Technological and graphic design |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Participants                          | Content Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| T1 (ENG)                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| T4 (TGD)                              | <ul style="list-style-type: none"> <li>• My main concern for students in this area of English is related to terminology and understanding the concepts with the correct terminology.</li> <li>• There is an incorrect use of terminology in our area of study, and it would be beneficial to have a specialist in language explain the difference in the terminology.</li> <li>• The fact that, as an expert, you realize the difficulties in translating from English into Portuguese, I believe, gives the students valuable insight into the uses of the terminology.</li> <li>• So the idea here is why do I need this theory and how do I apply it. At that moment I stop being the teacher and start being the Creative Director and they have a project to develop</li> </ul> |
|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Participants                          | Materials Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| T1 (ENG)                              | <ul style="list-style-type: none"> <li>• If you have any specific logos or brands you want me to look at you can let me know</li> <li>• The terms that are used can be set alongside the visual explanation of the logo brand etc.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| T4 (TGD)                              | <ul style="list-style-type: none"> <li>• I really want the students to have a visual idea and the importance of the language when they use the terms.</li> <li>• We can pick the logos and I can send you the ones I use.... They are all classics</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Participants | Dates                                                                                                                                                                                                                                                                                                                                     |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• The dates and times are fine with me at the moment</li> </ul>                                                                                                                                                                                                                                    |
| T4 (TGD)     | <ul style="list-style-type: none"> <li>• We have time available with the students because they are in the research mode now. I have a class with them to go over specific areas of the curricular unit and they would be the perfect opportunity</li> </ul>                                                                               |
|              |                                                                                                                                                                                                                                                                                                                                           |
| Participants | Evaluation                                                                                                                                                                                                                                                                                                                                |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• Since we are looking at specific vocabulary I think that for these students starting a class discussion is a good way to address student doubts</li> <li>• providing other examples can insure understanding of language that appears to be so similar but which in fact is different</li> </ul> |
| T4 (TGD)     | <ul style="list-style-type: none"> <li>• I would like to participate in the discussion. It is good to provide this type of forum for this level of students</li> <li>• Having different examples and asking students to use the technical language that they have learnt to address these images is excellent</li> </ul>                  |
|              |                                                                                                                                                                                                                                                                                                                                           |
| Participants | Reflection                                                                                                                                                                                                                                                                                                                                |
| T1 (ENG)     | Notes not recorded                                                                                                                                                                                                                                                                                                                        |
| T4 (TGD)     | Notes not recorded                                                                                                                                                                                                                                                                                                                        |

## Appendix D3: Communication and Audiovisual Design

| CAD: Communication and Audiovisual Design |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants                              | Content Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| T1 (ENG)                                  | <ul style="list-style-type: none"> <li>• In other classes there has been an there has been an option to use academic language in the development of a project which requires students to consolidate theory and do research in that specific area</li> <li>• The literature on the two concepts are interlinked</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| T3 (CAD)                                  | <ul style="list-style-type: none"> <li>• One of the things that interest me is what I usually do with my students in the third year is what I'm doing is a curricula unit which is information design and curiously, it has some of the reality they are concepts which are known as wayfinding and way showing these concepts are in a very technical context which really isn't Portuguese and frequently what happens is the nomenclature as well as the descriptions and the definition of concepts is very Anglo-Saxon rather than Portuguese</li> <li>• one of the things that I'm interested in is that normally information design projects are aligned with a component of promoting areas of tourism and valuing artisans etc. One of the issues that I have noticed is that there has been a move away from design</li> </ul> |
|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Participants                              | Materials Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| T1 (ENG)                                  | <ul style="list-style-type: none"> <li>• The concepts are all explained in images and signage.</li> <li>• I would like to present the students with the concepts and ask students to provide examples during the lesson. These are not</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <p>difficult to find if they have managed to understand the two different concepts.</p> <ul style="list-style-type: none"> <li>• I would like to give students a gap fill exercise that needs them to place specific language relating to the concepts in the correct gap and give them images that they can relate to the different ideas.</li> <li>• There is also a video of a lecturer that is very visual that students can have at the end of the lesson to consolidate they ideas</li> </ul>                                                                                                                                                                                                                                                                                                                    |
| T3 (CAD)     | <ul style="list-style-type: none"> <li>• I really want to concentrate on the concepts of Wayfinding and Wayshowing by explaining the concepts by presenting the students with the two different concepts using classic examples that you can find in the literature</li> <li>• Giving the students an exercise in the class is an excellent idea as it forces them to look closely at the concepts and the technical language that is used.</li> <li>• The gap fill is useful for students to have a summary at the end of the class that they can take way. They don't always read support documents that I send them.</li> <li>• The video is a good idea to have them listening to the concept. They need to be able to explain the decisions they make in the project so listening in English is ideal.</li> </ul> |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Participants | Dates                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• The dates are fine with me</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| T3 (CAD)     | <ul style="list-style-type: none"> <li>• What happens in this curricular unit of Information Design is that next week we end the theory in the curriculum unit as a learning concept and they have been doing a number of classes one or two or three followed by an exercise that will consolidate their learning.</li> <li>•</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Participants | Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| T1 (ENG)     | <ul style="list-style-type: none"> <li>• In class evaluation will be good for students as these concepts are very vocabulary and visually based.</li> <li>• An exercise that asks students to provide their examples as well as place the ones given in class into the appropriate categories will tests students understanding of the class</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|              |                                                                                                                                                                                                                                                                         |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <ul style="list-style-type: none"> <li>• Student participation is also good to check the receptiveness of the class</li> </ul>                                                                                                                                          |
| T3 (CAD)     | <ul style="list-style-type: none"> <li>• We can both check the students understanding with the examples and it's good to do this in class.</li> <li>• The students participate a lot in these classes so it would be good to see them participate in English</li> </ul> |
|              |                                                                                                                                                                                                                                                                         |
| Participants | Reflection                                                                                                                                                                                                                                                              |
| T1 (ENG)     | Notes not recorded                                                                                                                                                                                                                                                      |
| T3 (CAD)     | Notes not recorded                                                                                                                                                                                                                                                      |

## Appendix E: Emails

### Appendix Overview

This appendix contains the headings of email exchanges (59 in total) between the ESP and content teachers across the various design disciplines: Fashion and Textile Design and Communication and Audio-Visual Design. These exchanges highlight collaborative efforts for content delivery and language support, addressing topics such as technical terminology, lesson plans, and student assessments. There are summaries and general notes included to add context to the e-mails and clarity. Full email texts have been omitted for conciseness, as examples and their details are integrated into the main body of the thesis.

1. Email Exchanges between ESP and Content Teachers (Fashion and Textile Design) Subject: Language Support and Technical Vocabulary
2. Resource Analysis Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Supplementing Fashion Design Textbook with Additional Resources
3. Lesson Plan Evaluation Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Improving Language Support in Fabric Manipulation Lesson
4. Material Review Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Adding Visuals to Materials for Better Comprehension
5. Student Assessment Review Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Adjusting Assessments to Support Language and Design Skills
6. Email Exchanges between ESP and Content Teachers (Communication and Audio-Visual Design) Subject: Language Support for Sound Editing Terminology
7. Email Exchanges between ESP and Content Teachers (Technological and Graphic Design) Subject: Adding Language Support to UX Design Materials
8. Student Assessment Review Done by Both the ESP and Content Teachers (Technological and Graphic Design) Subject: Improving Design Portfolio Assessment for Language and Content

**Summary:** These email exchanges reflect a balanced collaboration between the ESP and content teachers, focusing on language and content objectives. Content teachers suggest ways to improve the technical language used by students (e.g., creating glossaries and incorporating practice exercises). In contrast, the ESP teacher suggests scaffolding and reinforcing this language in class and assessments. The exchanges also emphasise the use of additional resources (e.g., glossaries, visual aids, video tutorials) and

adjustments to lesson plans and assessments to ensure both language and content are effectively supported.

9. Email Exchanges between ESP and Content Teachers (Fashion and Textile Design) Subject: Language Support for Fabric Terminology

10. Resource Analysis Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Supplementing Fashion Design Textbook

11. Lesson Plan Evaluation Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Improving Fabric Manipulation Lesson

12. 4. Material Review Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Adding Visuals and Context to Materials

13. Student Assessment Review Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Adjusting Written Assessments for Language and Design Skills

14. Email Exchanges between ESP and Content Teachers (Communication and Audio-Visual Design) Subject: Editing Terminology and Language Support

15. Email Exchanges between ESP and Content Teachers (Technological and Graphic Design) Subject: Language Support for Design

16. Student Assessment Review Done by Both the ESP and Content Teachers (Technological and Graphic Design) Subject: Revising Portfolio Rubric to Include Language Proficiency

**Summary:** These additional reflections from the content teachers provide more depth regarding their thoughts on language development. Content teachers are considering ways to scaffold language learning, incorporate peer feedback, and enhance students' practical language use in real-world scenarios. They also explore resources such as video tutorials, interactive quizzes, and self-assessments, which aim to strengthen both content comprehension and language proficiency in their specific fields. These reflections demonstrate a proactive approach to integrating language support in technical and creative contexts.

17. Email Exchanges between ESP and Content Teachers (Fashion and Textile Design) Subject: Integrating Technical Language with Fabric Terminology

18. Resource Analysis Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Supplementing the Textbook with Online Resources

19. Lesson Plan Evaluation Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Improving Language Scaffolding in Fabric Manipulation Lesson

20. Material Review Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Adding Visuals and External Resources to Fabric Materials
21. Student Assessment Review Done by Both the ESP and Content Teachers (Fashion and Textile Design) Subject: Language and Design Assessment Alignment
22. Email Exchanges between ESP and Content Teachers (Communication and Audio-Visual Design) Subject: Language Support for Editing Terminology
23. Exchanges between ESP and Content Teachers (Technological and Graphic Design) Subject: Design Terminology and Visual Support
24. Student Assessment Review Done by Both the ESP and Content Teachers (Technological and Graphic Design) Subject: Portfolio and Language Proficiency Integration

**Summary:** These emails now reflect more balanced collaboration between the ESP and content teachers. The content teachers have provided additional ideas for both language and content development, such as interactive activities, real-world tasks, and practical assessments. They suggest strategies like creating glossaries, introducing real-world case studies, and integrating visual aids or online resources. These ideas show that content teachers are actively contributing to the development of both content and language learning, ensuring that students are prepared for real-world contexts and fluent in technical language.

25. 1st-Year Undergraduate Fashion and Textile Design Subject: Follow-Up on Glossary for Fabric Terminology
26. 3rd-Year Undergraduate Communication and Audio-Visual Design (Wayfinding) Subject: Feedback on Wayfinding Lesson Plan
27. Master's in Technological and Graphic Design (Logos and Brands) Subject: Brand Identity Terminology Clarification
28. 3rd-Year Undergraduate Communication and Audio-Visual Design (Wayshowing) Subject: Incorporating Critique Language into Wayshowing

**General Notes Observed in the Emails:**

**Variations in Email Response Times:** In each email, there is a recognition of busy schedules, with teachers apologising for delayed responses due to the workload and offering follow-ups when time permits.

**Increased Emphasis on Language Integration:** In later exchanges, the ESP teacher emphasises the importance of integrating language into content-specific lessons, such as terminology clarification, critical thinking vocabulary, and language use during presentations or critiques.

**Preference for Specific Teaching Approaches:** In each exchange, the content teacher seems open to integrating the ESP's suggestions, preference for simplifying complex terminology, incorporating

language support, and ensuring clearer student understanding through structured lesson plans. Sharing of Resources and Lesson Plan Ideas: Teachers share ideas and plans for integrating language resources such as glossaries, handouts, or terminology lists, as well as suggestions for teaching strategies and activities (like peer feedback or lesson revisions).

**Discussion of Materials and Concerns of Content and Language:** The email discussions often revolve around better matching content with language needs, addressing concerns like simplifying language for students or offering clearer explanations of key concepts.

29. Subject: Observations on Content and Lesson Plan Adjustments: 1st-Year Undergraduate Fashion and Textile Design

30. 3rd-Year Undergraduate Communication and Audio-Visual Design (Wayfinding) Subject: Updating Wayfinding Resources and Lesson Plan Adjustments

31. Master's in Technological and Graphic Design (Logos and Brands) Subject: Review of Materials for Brand Identity Lesson

#### **General Observations in the Emails:**

**Shortage of Up-to-date Content:** The ESP teacher identifies the need for more current materials in certain areas (e.g., interactive signage, digital branding, textile production techniques). The content teachers are receptive and agree to update resources or find more modern case studies and examples.

**Surplus of Underutilised Materials:** Both the ESP and content teachers discuss underutilised materials (e.g., pattern-making guides, and wayfinding analysis exercises). These are identified as resources that can be integrated into lessons for better engagement.

**Materials Supporting Language Learning:** There is a clear effort to incorporate language support into the lessons, whether through vocabulary-building exercises or by providing students with opportunities to use design terminology in context. Both teachers recognise the importance of language integration.

**Higher Student Engagement with Certain Lesson Plans:** The ESP teacher notes that some lessons, particularly those with real-world examples (e.g., branding case studies or signage analysis), tend to engage students more. Content teachers are encouraged to integrate these lessons to boost student interest and participation.

**Clarity in Lesson Plan Instructions:** Sometimes, the ESP teacher observes that lesson instructions need more clarity or structure to ensure students understand what is expected. The content teacher acknowledges this and agrees to revise lesson plans to improve clarity.

**Adaptability of Lesson Plans for Different Content Topics:** Both teachers are aware that lesson plans should be adaptable to different topics. This suggests a flexible approach to teaching that can be adjusted based on student needs or changing content areas.

**Assessment Method Diversity:** The ESP teacher suggests more varied assessment methods for diverse learning styles. Content teachers are open to reviewing their assessment techniques and making them more inclusive of different student needs.

32. Fashion and Textile Design: Scheduling a Class and Meeting Subject: Scheduling the Next Lesson and Meeting

33. Communication and Audio-Visual Design: Organizing Class Time and Meeting Subject: Class Schedule & Meeting

34. Technology and Graphic Design: Quick Class Scheduling Subject: Class and Coffee

35. Fashion and Textile Design: Confirming Schedule and Quick Coffee Subject: Next Class & Coffee

36. Communication and Audio-Visual Design: Meeting and Class Time Subject: Class Timing & Meeting

37. Technology and Graphic Design: Quick Check on Class and Coffee Subject: Scheduling for the Week

38. Fashion and Textile Design: Finalizing Class Time and Coffee Subject: Class Scheduling & Meeting

39. Communication and Audio-Visual Design: Class and Coffee Timing Subject: Class Schedule and Meet-up

40. Fashion and Textile Design: Exchange of Materials and Assessment Subject: Materials for Upcoming Class + Assessment Changes

41. Communication and Audio-Visual Design: Links and Resources for Class Subject: Updated PowerPoint and Links for Class

42. Technology and Graphic Design: PowerPoint and Materials for Design Subject: Design Material Update + Assessment Ideas

43. Fashion and Textile Design: Resources for Class + Assessment Ideas Subject: Resources for Next Class + Assessment Draft

44. Communication and Audio-Visual Design: Reviewing Materials and Changes Subject: Updated PowerPoint and Assessment Suggestions

45. Fashion and Textile Design: Handouts and Resources Subject: Handouts for Next Lesson + Moodle Resources

46. Communication and Audio-Visual Design: Online Resources Subject: Editing Handout + Online Links

47. Technology and Graphic Design: Handouts and Moodle Resources for Design Subject: Updated UX Design Handout + Moodle Upload

48. Fashion and Textile Design: Moodle Resources and Handout Review Subject: Fabric Manipulation Resources + Moodle Upload

49. Communication and Audio-Visual Design: Handouts and Moodle Updates Subject: PowerPoint and Links for Upcoming Class

50. Fashion and Textile Design: Content Teacher Initiating Exchange Subject: Handout on Fabric Types + Moodle Resources
51. Communication and Audio-Visual Design: Content Teacher Suggesting Resources Subject: Sound Editing Tools Handout + Online Resources
52. Technology and Graphic Design: Content Teacher Sharing Resources Subject: Design Case Studies + PowerPoint Updates
53. Fashion and Textile Design: Content Teacher Offering Extra Resources Subject: Additional Fabric Manipulation Resources for Students
54. Communication and Audio-Visual Design: Content Teacher Suggesting Language Support Subject: Video + Moodle Updates
55. Fashion and Textile Design: Content Teacher Requesting Feedback Subject: Request for Feedback on Fabric Manipulation Handout
56. Communication and Audio-Visual Design: Content Teacher Asking for Suggestions Subject: Request for Suggestions on Video Editing Vocabulary
57. Technology and Graphic Design: ESP Teacher Asking for Suggestions Subject: Suggestions for Language Support in Design Materials
58. Fashion and Textile Design: Content Teacher Asking for Language Support Subject: Seeking Suggestions for Fabric Sustainability Terms
59. Communication and Audio-Visual Design: Content Teacher Asking for Language Scaffolding Ideas Subject: Request for Suggestions on Language Scaffolding for Design Critiques

## Appendices F: Tools extracted from the case study

### Appendix F1: Intervention plan and guide

# Intervention Plan

This intervention plan serves as a guide for English for Specific Purposes (ESP) teachers and content teachers in Higher Education Institutions (HEIs) who aim to participate in interdisciplinary collaboration within the Integrating Content and Language in Higher Education (ICLHE) framework. The plan is based on analysing successful collaborative teaching practices and addresses key planning, implementation, and evaluation aspects.

#### Objectives:

This intervention plan aims to enhance student understanding by integrating language and content learning, address interdisciplinary challenges through collaborative teaching, develop practical skills that students can apply in real-world contexts, promote language proficiency within the content area, and foster a holistic learning environment through interdisciplinary approaches.

#### Steps for Implementation

1. **Objective Definition:** ESP Teacher (T1) focuses on integrating academic language objectives into the content curriculum, defining language learning outcomes related to vocabulary, terminology, and communication skills. Content Teacher (T2) identifies key content objectives and practical applications of the subject matter, defining content

learning outcomes related to technical skills and real-world applications. The joint task is to align language and content objectives to ensure they support each other, such as having T1 focus on correctly using terminology in the context of T2's projects.

**2. Curriculum and Material Design:** ESP Teacher (T1) develops language-focused materials such as gap-fill exercises, visual aids, and glossaries and selects videos and readings that reinforce language learning within the content context. Content Teacher (T2) creates content-specific materials that illustrate technical concepts using real-life examples and practical exercises and incorporates classic examples from literature or case studies relevant to the content area. The joint task is to collaborate on the design of integrated lessons that combine language and content learning, ensuring materials are complementary and reinforce both sets of objectives.

**3. Scheduling and Coordination:** ESP Teacher (T1) proposes class dates and times that fit the curriculum schedule, ensuring enough time is allocated for language-focused activities. Content Teacher (T2) coordinates the schedule to include theoretical and practical sessions, ensuring the timing allows for seamless language and content lesson integration. The joint task is to finalise a coordinated schedule that balances language and content teaching and plan regular meetings to review progress and make necessary adjustments.

**4. Implementation of Teaching Strategies:** ESP Teacher (T1) uses interactive teaching methods such as class discussions, role-plays, and group activities to reinforce language learning and focuses on the practical application of language skills in the context of content lessons. Content Teacher (T2) implements teaching strategies that involve hands-on activities, project-based learning, and practical exercises, ensuring students apply technical skills in real-world scenarios. The joint task facilitates integrated lessons where

language and content are taught concurrently, such as having T1 introduce relevant vocabulary before T2 conducts a practical exercise.

**5. Evaluation and Feedback:** ESP Teacher (T1) conducts formative assessments such as quizzes, vocabulary tests, and oral presentations to evaluate language proficiency and provides feedback on language use during content-related activities. Content Teacher (T2) evaluates technical skills through practical exams, project assessments, and case studies, providing feedback on applying technical knowledge in real-world contexts. The joint task is to design summative assessments that evaluate both language and content learning outcomes, using rubrics that address both sets of objectives and provide comprehensive feedback to students.

#### Roles and Responsibilities

ESP Teacher (T1) leads the integration of language objectives into the curriculum, develops language-focused materials and assessments, and monitors and evaluates student language proficiency. Content Teacher (T2) leads the integration of content objectives and practical applications, develops content-specific materials and assessments, and monitors and evaluates student technical skills. Joint responsibilities include collaborating on curriculum design and lesson planning, coordinating class schedules and ensuring alignment of teaching activities, conducting integrated assessments and providing joint feedback.

#### Recommendations for Future Interventions

Professional development should include training teachers on interdisciplinary teaching strategies, the ICLHE framework, and workshops on curriculum design, assessment methods, and collaborative teaching techniques. Resource allocation should provide resources for developing integrated teaching materials and access to relevant technology, ensuring teachers have the necessary support for professional development and collaborative planning. Ongoing evaluation should implement a system for regular evaluation of the interdisciplinary teaching process, gathering feedback from students and teachers to improve the intervention plan continuously.

## Content Selection for Interdisciplinary Collaboration in an ICLHE Context

### Factors Relating to Content Selection

*Relevance to Subject Matter:* Ensure the content is directly aligned with the learning objectives and outcomes of the curriculum, demonstrating practical applications of theoretical concepts and facilitating connections between the language being learned and the content area.

*Complexity and Depth:* Ensure the content is suitable for the student's academic level, allowing for scaffolding by starting with more straightforward concepts and gradually introducing more complex ideas.

*Cultural and Contextual Relevance:* Choose culturally relevant and respectful content, incorporating local and global perspectives, to broaden students' understanding and appreciation of the subject matter's worldwide relevance.

### Factors Relating to Language Acquisition

*Language Level Appropriateness:* Select content that matches the students' language proficiency level, introducing and reinforcing academic language and terminology relevant to the content area.

*Language Skills Integration:* Choose content that supports the development of all language skills (reading, writing, listening, and speaking) and encourages interaction and communication through discussions, debates, group projects, and presentations.

*Supportive Resources:* To support language acquisition, Use content that includes visual aids, videos, and other multimedia resources, and provide supplementary materials such as glossaries, vocabulary lists, and grammar guides.

#### Practical Considerations

*Accessibility:* Ensure the chosen content is readily available and accessible to all students, considering digital access and any potential cost barriers, and is easy to navigate and use.

*Flexibility and Adaptability:* Choose content adapted to different teaching contexts and learning styles. Be open to modifying and adjusting content based on student feedback and learning outcomes.

*Conclusion:* When selecting content for interdisciplinary collaboration classes in an ICLHE context, it is essential to consider factors related to both the subject matter and language acquisition. The content must be relevant, appropriately challenging, culturally sensitive, and supportive of comprehensive language development. By carefully considering these factors, teachers can create a cohesive and effective learning environment that addresses interdisciplinary challenges and promotes content understanding and language proficiency.

**Appendix F2: Decision-making for interdisciplinary collaboration within an ICLHE context**

# Tool for Decision-Making in Interdisciplinary Collaboration within an ICLHE Context

This tool is designed to assist ESP and content teachers in HEIs engaged in interdisciplinary collaboration within an ICLHE framework. It provides a structured approach to document and guide decision-making, ensuring effective planning, implementation, and evaluation of collaborative teaching practices.

| <b>Decision-Making in Interdisciplinary Collaboration within an ICLHE Context</b> |                                               |                                                                                     |                                            |                                           |
|-----------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------|
| <b>Topics</b>                                                                     | <b>Action</b>                                 | <b>Content/Details</b>                                                              | <b>Purpose</b>                             | <b>Distribution/Maintenance</b>           |
| <b>Meeting Minutes</b>                                                            | Assign a note-taker or rotate responsibility. | Record key discussion points, decisions, action items, responsibilities, deadlines. | Ensure accurate documentation of meetings. | Share minutes promptly after the meeting. |
| <b>Action Plans</b>                                                               | Create based on meeting decisions.            | Outline steps, responsibilities, timelines.                                         | Ensure clarity and organisation in         | Distribute to all involved teachers.      |

| <b>Decision-Making in Interdisciplinary Collaboration within an ICLHE Context</b> |                                                          |                                                                 |                                                             |                                                             |
|-----------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| <b>Topics</b>                                                                     | <b>Action</b>                                            | <b>Content/Details</b>                                          | <b>Purpose</b>                                              | <b>Distribution/Maintenance</b>                             |
|                                                                                   |                                                          |                                                                 | implementing decisions.                                     |                                                             |
| <b>Shared Online Documents</b>                                                    | Use shared repositories (e.g., Google Drive, Dropbox).   | Ensure all teachers can access and contribute to documents.     | Facilitate real-time collaboration and information sharing. | Include decision logs, resources, progress updates.         |
| <b>Decision Log</b>                                                               | Record major decisions, rationale, supporting documents. | Serve as a centralised reference for future discussions.        | Ensure continuity and clarity.                              | Regularly update to reflect new decisions and changes.      |
| <b>Digital Collaboration Tools</b>                                                | Use platforms like Trello, Asana, Microsoft Teams.       | Assign tasks, set due dates, track progress.                    | Enhance transparency, accountability, organisation.         |                                                             |
| <b>Visual Aids</b>                                                                | Use diagrams, charts, concept maps.                      | Represent the decision-making process and connections visually. | Facilitate understanding and communication.                 | Include in meeting minutes, action plans, shared documents. |
| <b>Reflection and Evaluation Reports</b>                                          | Encourage documenting reflections on outcomes.           | Gather reports on impact, effectiveness, challenges.            | Inform future decisions and enhance collaboration.          |                                                             |

| <b>Decision-Making in Interdisciplinary Collaboration within an ICLHE Context</b> |                                                     |                                                        |                                                    |                                       |
|-----------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|----------------------------------------------------|---------------------------------------|
| <b>Topics</b>                                                                     | <b>Action</b>                                       | <b>Content/Details</b>                                 | <b>Purpose</b>                                     | <b>Distribution/Maintenance</b>       |
| <b>Archiving and Organising</b>                                                   | Establish an organisation and archiving system.     | Sort documents by topics, dates, themes.               | Ensure easy retrieval and organisation.            | Regularly review and update archives. |
| <b>Clarity of Objectives</b>                                                      | Ensure clear objectives.                            | Verify alignment with ICLHE goals.                     | Ensure all decisions support overall goals.        |                                       |
| <b>Inclusivity and Participation</b>                                              | Ensure contribution from all relevant stakeholders. | Include diverse viewpoints.                            | Enrich the decision-making process.                |                                       |
| <b>Information and Data</b>                                                       | Use accurate and comprehensive information.         | Base decisions on data and research.                   | Ensure informed decision-making.                   |                                       |
| <b>Communication and Transparency</b>                                             | Clearly convey decisions and rationale.             | Maintain openness in sharing information and outcomes. | Foster trust and understanding among stakeholders. |                                       |
| <b>Timeliness and Efficiency</b>                                                  | Make timely decisions.                              | Utilise resources effectively, avoid delays.           | Address needs promptly and efficiently.            |                                       |
| <b>Consensus Building</b>                                                         | Aim for collaborative decisions.                    | Address conflicts appropriately.                       | Foster agreement and unity.                        |                                       |

| <b>Decision-Making in Interdisciplinary Collaboration within an ICLHE Context</b> |                                           |                                                  |                                              |                                 |
|-----------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------|----------------------------------------------|---------------------------------|
| <b>Topics</b>                                                                     | <b>Action</b>                             | <b>Content/Details</b>                           | <b>Purpose</b>                               | <b>Distribution/Maintenance</b> |
| <b>Implementation and Follow-up</b>                                               | Execute action plans as intended.         | Monitor progress and address challenges.         | Ensure effective implementation.             |                                 |
| <b>Reflection and Adaptation</b>                                                  | Incorporate opportunities for reflection. | Make adjustments based on feedback and outcomes. | Enhance future decision-making processes.    |                                 |
| <b>Stakeholder Satisfaction</b>                                                   | Gather feedback from participants.        | Ensure fair and valued input process.            | Foster positive engagement and satisfaction. |                                 |
| <b>Impact and Outcomes</b>                                                        | Assess impact and outcomes.               | Ensure alignment with intended goals.            | Verify decisions lead to positive changes.   |                                 |

By following this tool, teachers can document and navigate the decision-making process, assisting in having a structured and collaborative approach in interdisciplinary collaboration within an ICLHE context.

