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Exploring the Perceptions and Practices of Content and Language Teachers' Collaboration in CLIL Classes: The Case of Second-Year Computer Science Students and Teachers at the Faculty of Mathematics and Computer Science, M'sila Universitv.

Dissertation Submitted to the Department of Letters and English Language in Partial Fulfillment of the Requirements for the Master's Degree in Linguistics

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بـسم الله الـرحمن الـرحيم

إهداء

إلى أرواح شهداء غزة الأبرار والأسرى البواسل والجرحى الميامين إلى الرجال والنساء والأطفال الصامدين في غزة وفلسطين إنكم المضغة الحية في جسد هذه الأمة التي نهشتها قوافل الخيانة والتطبيع.

ثبتكم الله وأيدكم ونصركم نصرا عزيزا مؤزرا...

إلى أميرة قلبي أمي مريم الرؤوم أمد الله في عمرها وروح روحي أبي رابح العزيز الصديق الصادق

إلى إخوتي محمد وعلي وياسين سندي ومصدر فخري واعتزازي

إلى زوجي الغالي منبر سكني ومأمني ورفيق دربي

إلى من زرع فيّ حب اللغة الإنجليزية وعلّمني إياها بتفان الدكتور توفيق بن زهية

إلى أختي عزيزتي ورفيقتي في هذا العمل إكرام لولاها لما اكتمل بهذه الصورة

إلى من ربطني بهم عهد الصداقة وورد المحبة إلى إخوة جمعني بهم ميدان العلم والدعوة

إلى كل هؤلاء "نهدي هذه الدراسة، راجيين من المولى عز وجل أن تكون نافذة علم وبطاقة معرفة.. وأن ينفعنا وينفع بنا."

وآخر دعوانا أن الحمد لله رب العالمين

خديجة

Dedication

To the brave people of Gaza, whose unwavering strength and resilience since the 7th of October 2023 continue to inspire the world, this work is humbly dedicated to your courage, sacrifice, and unshakable hope.

To my warm and loving family, beginning with my dear parents, your support and prayers have been my guiding light, and to my lovely sisters, your kindness and encouragement have meant everything to me.

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Abstract

Teachers' collaboration is increasingly recognized as a key element in the successful implementation of Content and Language Integrated Learning (CLIL). This study explores the extent and impact of collaboration between English and computer science teachers on students' learning experiences within a CLIL context. It also aims to investigate the teaching strategies that arise from such interdisciplinary cooperation and to identify the challenges and benefits encountered by teachers. The research was conducted with second-year students and computer science teachers at M'sila University. To collect data, the study employed two research instruments: a semi-structured questionnaire for students and an interview for subject teachers. The findings reveal that while collaboration does occur, it is often informal and inconsistent. However, when collaboration is present, it contributes positively to student engagement, content comprehension, and the development of English language skills. Teachers reported that collaborative practices help align language and content goals, though they also highlighted barriers such as time constraints and lack of institutional support. The study recommends fostering structured collaboration opportunities and targeted training to strengthen CLIL practices and support student achievement more effectively**.**

Keywords: CLIL, Teachers' collaboration, Content teachers, Language teachers, Interdisciplinary collaboration

List of Abbreviations

CLIL: Content and Language Integrated Learning

EFL: English as a Foreign Language

ESL: English as a Second Language

4Cs : (Content, Communication, Cognition, Culture)

%: Percentage

ZPD: Zone of Proximal Development

LT: The Language Triptych

L2: The second language

UPNA: Public University in Pamplona, Spain

ANOVA: Analysis of variance

BICS: Basic Interpersonal Communication Skills

CALP: Cognitive Academic Language Proficiency

PLCs: Professional Learning Communities

STEM: (Science, Technology, Engineering, and Mathematics)

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Introduction

General Introduction

Background of the Study

Content and Language Integrated Learning (CLIL) has emerged as a widely recognized approach to teaching academic subjects through a foreign language, most commonly English. By combining content mastery with language development, CLIL aims to equip students with both disciplinary knowledge and the linguistic competence necessary to engage in global academic and professional communities (Coyle, Hood, & Marsh, 2010). This dual-focused approach is particularly relevant in disciplines such as Computer Science, where English dominates the fields of research, instruction, and industry communication.

The effectiveness of CLIL heavily relies on the collaboration between content and language teachers. Rather than working in isolation, subject matter experts and language instructors are encouraged to engage in coordinated efforts that include co-planning, co-teaching, and ongoing reflection. This collaboration ensures that both content and language objectives are achieved and that students are supported in understanding complex concepts while developing their academic language proficiency (Morton, 2018).

However, implementing such collaboration presents pedagogical and practical challenges. Content teachers may not be trained in language instruction, while language teachers may lack familiarity with technical subject matter. This mismatch can hinder the coherence and effectiveness of CLIL instruction if not addressed through structured collaboration. The situation becomes more complex in scientific fields like Computer Science, where technical terminology, abstract reasoning, and problem-solving skills demand high levels of cognitive and linguistic engagement from students.

Within this context, second-year students in the Computer Science Faculty represent a critical group for examining the outcomes of CLIL-based teaching supported by teachers' collaboration. At this stage in their academic journey, students are expected to engage deeply with core disciplinary knowledge while also enhancing their English proficiency. Understanding how collaborative teaching impacts their learning experience, comprehension, and academic confidence is essential for improving instructional practices and student outcomes.

This study investigates the effects of teachers' collaboration in CLIL classes on student perceptions, classroom effectiveness, and overall learning in the Computer Science Faculty. By focusing on the interaction between language and content instruction, the research aims to shed light on the practical benefits and challenges of collaborative teaching in a CLIL setting, contributing to the development of effective pedagogical strategies for language-integrated instruction in technical disciplines.

Statement of the Problem

As English increasingly becomes the medium of instruction in Algerian higher education, particularly within scientific and technical disciplines, approaches such as Content and Language Integrated Learning (CLIL) have gained significant attention. CLIL requires systematic collaboration between content-area teachers and language instructors to ensure both subject matter and language objectives are effectively addressed. However, in the Algerian university context, such collaboration is often underdeveloped, lacking clear institutional frameworks, structured planning, and sustainable practices. This gap has led to notable difficulties in lesson planning, pedagogical coherence, and student engagement with both content and language.

Despite the theoretical emphasis on teacher collaboration as a cornerstone of successful CLIL implementation, there remains a dearth of empirical research examining how such collaboration is enacted in practice, particularly in STEM-related faculties. Furthermore, little is known about how students experience and perceive this collaboration in terms of its impact on their content comprehension and language development. This study aims to fill this gap by exploring the perceptions and practices of CLIL-based teacher collaboration, focusing on second-year computer science students and their instructors at the Faculty of Mathematics and Computer Science, M'sila University.

Research Objectives

In light of the identified research problem and the need to investigate teacher collaboration within CLIL contexts, the study aims to achieve the following objectives:

- To explore the perceptions of both English language teachers and computer science content teachers regarding their collaboration in CLIL classrooms.
- To investigate the collaborative practices and instructional strategies employed by content and language teachers in the context of CLIL.
- To examine students' perceptions of the impact of teacher collaboration on their learning experience and comprehension in CLIL computer science courses.
- To identify the challenges and benefits experienced by teachers when engaging in interdisciplinary collaboration within CLIL settings.

Research Questions

To address the above objectives and guide the investigation, the study seeks to answer the following research questions:

- To what extent do content and language teachers collaborate in CLIL classrooms at the Faculty of Mathematics and Computer Science, M'sila University?
- How do English language and computer science teachers perceive the impact of their collaboration on students' learning outcomes in both content and language domains?
- What instructional strategies and teaching approaches emerge from the collaboration between English and computer science teachers in CLIL settings?
- What are the main challenges and perceived benefits experienced by teachers when collaborating in CLIL classrooms, particularly in the context of computer science education?

Research Hypotheses

1. Collaboration between English and computer science teachers improves students' understanding of both language and subject content.

N0: Collaboration has no significant effect on students' learning in English or computer science.

2. Teachers who collaborate in CLIL classes use more innovative and effective teaching strategies compared to those who work independently.

N0: Collaboration does not lead to noticeable changes in teaching strategies.

3. Teachers face challenges but also experience benefits from working together.

N0: Teachers do not report significant challenges or benefits from collaboration.

5. Research Methodology and Data Collection

To conduct this exploratory research, the study adopts a research methodology that outlines the participants, the data collection tools, and the type of data analysis used.

5.1. The Participants

The participants include second-year students from the Computer Science Department at M'sila University. This group was chosen because they have had two years of experience with the Content and Language Integrated Learning (CLIL) approach. Due to this ongoing exposure, they are expected to have developed a moderate level of English proficiency, making them suitable for examining the effects of teachers' collaboration in CLIL settings. In addition to the students, teachers from the same department are also included as participants in the study.

5.2. Research Instruments

This study employs two main research tools to explore teachers' collaboration in CLIL classes. First, a semi-structured online questionnaire is administered to second-year computer science students, combining closed-ended questions for quantitative data and open-ended questions for qualitative insights into their experiences and perceptions. Second, semi-structured interviews are conducted with seven content teachers from the same department, guided by a set of questions that address collaboration practices, challenges, and the effectiveness of joint teaching. By collecting both student and teacher perspectives through quantitative and qualitative methods**,** the study aims to gain a comprehensive understanding of collaboration in CLIL classrooms.

5.3. Data analysis

The data collected from the questionnaire and teachers' interview were analyzed using descriptive methods. The results were presented in tables and graphs, including bar charts, to illustrate how the integration of CLIL and teachers' collaboration impacts students' ability to engage in meaningful communication and effectively apply language skills.

6. Significance of the Study

This study is significant as it explores the role of teachers' collaboration in CLIL classrooms, an area that remains under-researched in Algerian higher education. By examining how English and computer science teachers work together and how this affects student learning, the study provides valuable insights for improving interdisciplinary teaching practices. It also highlights the challenges and benefits of CLIL implementation, which offers guidance for educators, curriculum planners, and institutions aiming to enhance learning outcomes in bilingual education settings.

7. Structure of the Dissertation

This dissertation is organized into three main sections. The first section provides a general introduction, offering an overview of the study, including the research problem, questions, hypotheses, and methodology. The second section, Chapter One, focuses on theoretical aspects and is divided into two parts. The first part explores the CLIL approach, its features, and its connections with other educational elements, while the second part examines teachers' collaboration, its different types, and how it relates to CLIL. Chapter Two, the third section, covers the practical part of the study. It describes the data collection tools, the analysis of the data, a discussion of the results, and concludes with a summary of the entire dissertation.

Chapter One: Theoretical Background

Section One: Content and Language Integrated Learning

Section Two: Teachers' Collaboration

Chapter One: Literature Review

Section One: Content and Language Integrated Learning

Introduction

This chapter provides the theoretical foundation for this investigation into the effects of Content and Language Teachers' Collaboration in CLIL classes in the English-Economics department at the University of M'sila. It first offers a comprehensive exploration of Content and Language Integrated Learning (CLIL) and the collaboration between teachers in educational settings. The chapter opens with an overview of CLIL, which traces its historical framework and outlines its core principles. The discussion then moves to the key features of CLIL, with a focus on the Four Cs framework—Content, Communication, Cognition, and Culture—alongside essential concepts such as the Language Triptych. This section also sheds light on the benefits of CLIL, as it enhances cognitive and metacognitive abilities, fosters cultural awareness, increases student motivation, and contributes to language proficiency development.

The chapter then shifts to the concept of teacher collaboration, as it defines its scope and significance within multidisciplinary educational contexts. It explores various models of collaboration, such as co-teaching, team planning, and interdisciplinary approaches. Following this, an overview of the stages involved in collaborative teaching is provided, which includes planning, classroom implementation, and reflection. Additionally, the discussion addresses challenges related to time constraints and scheduling difficulties before it concludes with an analysis of the benefits of collaborative teaching, particularly in terms of professional development and shared expertise. Finally, the chapter examines teacher collaboration in CLIL settings and presents strategies for the effective integration of content and language instruction.

1. Historical Framework

The integration of education in a non-native language has a long history, dating from Ancient Rome when Roman families educated their children in Greek for social and professional benefits. This pattern continues today with the extensive adoption of English due to globalization (Coyle et al, 2010). The increasing interest in CLIL (Content and Language Integrated Learning) arises from the need for effective language and content learning, driven by globalization and international education standards such as PISA. Additionally, advances in cognitive science, particularly since the cognitive revolution of the 1950s, have influenced learning theories. Furthermore, contributions from Bruner, Piaget, and Vygotsky have emphasized socio-cultural and constructivist perspectives, significantly impacting language learning and teaching methodologies. These developments have played a crucial role in shaping and expanding this approach (Doidge et al, 2007).

CLIL has emerged more prominently in the mid-1990s, evolving from the English as a Foreign Language (EFL) approach to English for Specific Purposes (ESP), then to Content and Language Integrated Learning (CLIL), and finally to English as a Medium of Instruction (EMI). These approaches fall under the umbrella of Content-Based Instruction (CBI), where students learn academic content in a non-native language (Makhlouf Kouider, 2023). As CLIL obtains international recognition more than ever before, it is increasingly seen as a response to English's role as a global lingua franca and is supported at various educational levels.

2. CLIL Definition

Content and language integrated learning (CLIL) represents an innovative educational approach that prepares students for a globalized world by fostering bilingualism while deepening their understanding of various subjects. According to Cambridge dictionary, "content and language integrated learning (in some countries) is a teaching method that involves teaching students about a subject in a foreign language". In the same vein, (Marsh et al, 2010, p. 1) states that "CLIL is a dual-focused educational approach in which an additional language is used for the learning and teaching of content and language with the objective of promoting both content and language" Marsh highlights an exact concept of the approach and addresses its functions and goals.

Additionally, CLIL definitions tend to depend on the emphasis that practitioners give to either content or language, or both. Content-driven CLIL contexts e.g. in Japan argue that CLIL is related to all forms of education in which subjects are learned through L2 or through two languages concurrently (Ball, 2015, p. 1). This statement points out that the main objective of CLIL is to deepen the subject matter understanding and to make learning more engaging and relevant. However, the Argentinian context where language-driven CLIL means that foreign language teachers lead the lessons while the emphasis is on language learning through school content (Banegas, 2020, p. 244). He signifies that the primary goal of CLIL is to promote second language acquisition through its application in classroom settings. In contrast, (Dalton-Puffer, 2016) is in the same mind as March. He emphasizes that CLIL needs to articulate substantial links between the teaching methods of different subjects, like physics or economics, and the pedagogy of language teaching. This way, it can achieve its promise of dual focus.

3. Key Features and Principles of CLIL

3.1. The Four Cs Framework (Content, Communication, Cognition, Culture)

The 4C Framework integrates four contextualized elements which are content (subject matter), communication (language learning and using), cognition (learning and thinking processes) and culture (developing intercultural understanding and global citizenship) (Coyle et al, 2010, p. 41). In Mehisto and others (2008) model, community is one of the four Cs, but in Coyle's theory, it is replaced by culture (Hemmi, C., & Banegas, D. L, 2021). Besides, Sakamoto (2021) suggests adding a fifth C, criticality, to address ideological incongruences in language learning. His contribution offers a valuable perspective in line with continuous updates in language education and evolving students' needs. In so doing, Coyle and others (2010) take into consideration the integrating content learning and language learning within specific contexts and recognize the symbiotic relationship that exists between these elements, they suggest that effective CLIL takes place as a result of this synergies about by the positioning of self and otherness as shown in

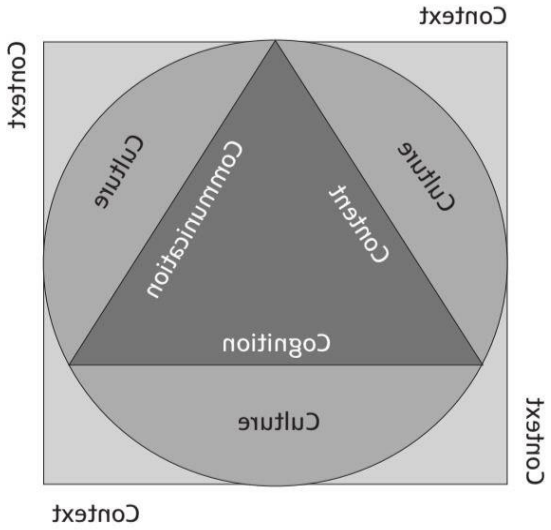


Figure 1: The 4Cs Framework

3.1.1. Content

Just as a human grows by learning new experiences and adapting to different situations, *CLIL content* evolves to fit different classrooms, subjects, and cultures. It is considered as a flexible and an adapted aspect to meet all students' needs. It can be taught through activities based on themes, projects, or cross-curricular studies that link different subjects. The content can be sorted from elements directly taken from a statutory national curriculum and depends on the context of the learning institution (e.g., the Olympic Games, global warming, ecosystems). This approach provides students with more opportunities to learn and develop new skills (Mehisto et al, 2008; Coyle et al, 2010).

Content is not only about acquiring knowledge and skills; it is also about learners creating their own knowledge, understanding, and developing skills through personalized learning (Oliver Meyer, 296). The idea here is that learning isn't just about absorbing information from teachers or books. It's about learners actively engaging with the content, building their own understanding, and forming their own knowledge based on their experiences and perspectives. In personalized learning, students take charge of their educational journey, exploring topics that interest them, asking questions, and developing skills at their own pace. This process helps learners not only grasp concepts but also apply and adapt them to real-world situations, making the learning more meaningful and relevant to their lives (Meyer, 2010; Coyle et al, 2010). Since CLIL learners are expected to improve both subject knowledge and language skills, Coyle and others (2010) suggest using the Language Triptych to organize and connect language and content objectives. It looks at language learning from three perspectives: language of learning, language for learning, and language through learning.

3.1.2. Cognition

Cognition refers to the mental processes we use to make sense of knowledge, experience, and the world around us, such as remembering, understanding, evaluating, critiquing, reflecting, and creating (Coyle et al, 2010). Accordingly, they aim through their definition is to align the mind processes with language learning procedures in the interest to CLIL development. In the context of CLIL, cognition focuses on the development of cognitive abilities through integrated learning, which enhances critical thinking, problem-solving skills, and a deeper understanding of content. This approach fosters a more comprehensive educational experience, equipping students with the skills needed to tackle real-world challenges (Emel Akay, 2024).

CLIL is built on social-constructivist principles, focusing on active student engagement rather than passive memorization (Cummins, 2005). In other words, CLIL is in harmony with modern learning theories that prioritize the learner's central role. Unlike the traditional "banking model," where teachers simply transfer information to students, CLIL promotes interactive, student-centered learning. Here, students collaborate with teachers, peers, and learning resources, making education a dynamic, shared process. Social interaction plays an essential role, especially when students encounter new or difficult concepts. Vygotsky's "zone of proximal development" (ZPD) highlights the importance of providing just the right amount of support—challenging students while guiding them toward deeper understanding (Coyle, 2010).

In CLIL, cognition is at the core of the approach, as it fosters cognitive development by blending language learning with meaningful content. This integration not only supports language acquisition but also deepens students' understanding of the subject matter and leading to improved learning outcomes (Arun George, 2023). The relationship between content and language is crucial for cognitive growth, as meaningful content strengthens communication and language skills. By

focusing on human cognitive architecture, educators can help achieve a higher level of understanding in the integration of content and language, leading to more effective learning experiences (M. Reit Bauer et al, 2018).

3.1.3. Communication

Language is a conduit for both communication and learning. From this perspective, language is acquired through its use in authentic, unrehearsed, yet 'scaffolded' situations, which complement the more structured approaches commonly found in foreign language lessons (Coyle et al., 2010). Additionally, it is argued that language is fundamentally a tool for communication within motivating and meaningful contexts, with the two concepts often used interchangeably—not just within the framework of the 4Cs. But, for responding to critics who reduce language to mere grammatical constructs, she emphasizes that true linguistic richness arises from its role in fostering meaningful interactions (Canale & Swain, 1980).

In CLIL, language learning goes beyond traditional grammar and text-based teaching. Instead of just learning grammar rules, CLIL integrates language and content, focusing on using language in real, meaningful ways. Over time, language teaching has evolved from grammar-focused methods to more communicative approaches that include socio-cultural theory, interactionism and connectionism and emphasize communication and understanding, not just form (de Graaff et al, 2007; Ellis, 1997; Lantolf, 2000; Mitchell & Myles, 2004; VanPatten & Williams, 2006). In other words, CLIL as a modern approach confirms the communication importance in the educational contexts unlike traditional ones.

The key idea in CLIL is that language learning should occur through authentic, interactive contexts where students use language to learn subject content. This approach encourages active student participation and communication, rather than passive learning. It also recognizes the

importance of balancing language form *grammar* with meaning. While grammar is important, learners need to be able to use language to understand and discuss content. For example, Lyster's (1987) study of French immersion programs in Canada found that while students could communicate well, they struggled to speak as fluently as native speakers and often made consistent grammatical mistakes. Because teachers were reluctant to discourage students by correcting them too much, a kind of "immersion interlanguage" developed, where students used a mix of language forms. Swain (2000) also noted this issue and suggested that while students can communicate, a greater focus on grammar and correcting mistakes is necessary for their language development. This creates a dynamic environment where language skills develop alongside content knowledge.

Effective CLIL teaching focuses on both the form and function of language, emphasizing the use of language to learn rather than just learning the language itself. It aligns with the Communication aspect of the 4Cs framework by promoting interaction and idea-sharing among students. By integrating language skills with subject knowledge, CLIL encourages students to become confident communicators. This approach creates an environment where language and content develop together, preparing students for real-world challenges (Coyle et al, 2010).

3.1.3.1. The Language Triptych (LT)

The language triptych (LT) is a conceptual representation to connect both content objectives and language objectives. This conceptual representation provides a framework for the analysis of the vehicular CLIL language from three interrelated perspectives which are the components of the LT: "Language of learning" refers to the specific vocabulary and language needed to understand and talk about a subject, like the language of science. This language focuses on using words and phrases for practical communication rather than just learning grammar. "Language for learning" enables the learner to be functional in a foreign language environment.

This includes classroom language as well as language for academic processes and speech acts, such as group work, discussions, or asking questions, which requires planning and support from both teachers and learners. "Language through learning" is the language generated in the process of learning. As a new meaning is learnt, new language is required and acquired. It emphasizes how language helps learners think and understand new concepts. It's about encouraging learners to talk and interact as they learn, which helps them build new meanings and language. Teachers need to be flexible in supporting language development as it emerges during the learning process, using strategies to help learners build on what they already know and continuously improve their language skills. LT is a conceptual representation to connect both content objectives and language objectives. This conceptual representation provides a framework for the analysis of the vehicular CLIL language from three interrelated perspectives which are the components of the LT (Figure 02) (Coyle et al, 2010; Martín Del Pozo, M. A. 2016

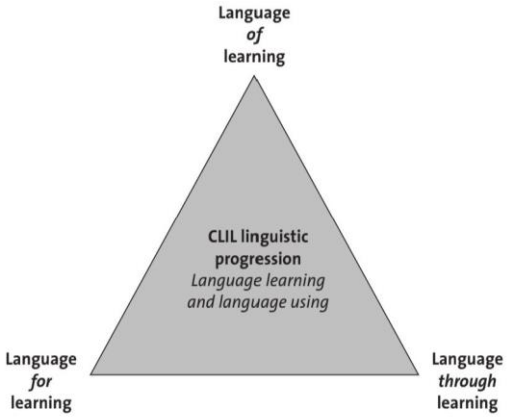


Figure 1: The Language Triptych

- The language of learning is the language needed to access concepts and skills of a field of knowledge. These language demands of the different disciplines comprehend much more than vocabulary.

- The language for learning is the language that enables the learner to be functional in a foreign language environment. This includes classroom language as well as language for academic processes and speech acts.
- The language through learning is the language generated in the process of learning, as a new meaning is learnt, new language is required and acquired.

A second notable and innovative aspect provided by the LT (Language Teaching) is the fact that it does not replace grammar progress but fosters it through continuous recycling for further development of language, based on an upward spiral for progression rather than step-by-step grammatical chronology (Coyle et al, 2010; Martín del Pozo, M. A. 2016). The upward spiral approach allows learners to revisit and refine previously learned language structures in increasingly complex contexts, facilitating deeper understanding and application over time. Unlike traditional linear methods, this model encourages learners to apply language in authentic situations, reinforcing their skills and promoting retention. As shown in (Figure 03).

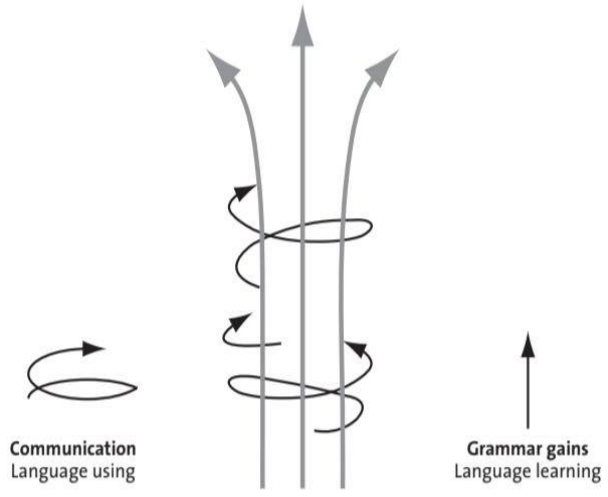


Figure 2: The spiral of language progression

3.1.4. Culture

The concept of culture in the context of Content and Language Integrated Learning (CLIL) is multifaceted, emphasizing the integration of cultural awareness alongside language and content learning, while also embracing pluri-culturally. CLIL aims not only to enhance language proficiency and subject knowledge but also improving cultural understanding and sensitivity, which is crucial in a globalized educational landscape, when students are exposed to diverse cultural perspectives, they are able to obtain a deeper awareness and appreciation of cultural differences. As Brown (1980) explains, language expresses cultural patterns and specific worldviews, and Halliday (1978) highlights that language development is a sociological event where meanings are exchanged. This cultural dimension is integral to the 4Cs framework of CLIL, underscoring the importance of cultural awareness in educational settings (Akay & Yılmaz, 2024).

The relationship between cultures and languages is complex, and intercultural awareness is fundamental to CLIL. It rightfully holds a central place in the CLIL framework (Coyle, 2006). Culture is perhaps the most challenging and ambiguous element in Coyle's model. Since language, thinking, and culture are inextricably linked. For instance, it is impossible to translate a discourse without taking into consideration the culture of the target language. CLIL provides an ideal opportunity for students to engage with alternative cultures through studies in a foreign language. Studying a subject through the language of a different culture opens the door to understanding and tolerating different perspectives (Ruiz de Zarobe, Y. & Jiménez Catalán, R. M., 2009).

In CLIL, language, culture, cognitive engagement, and thinking are all interconnected, providing opportunities for students to experience intercultural perspectives that they might not encounter in a monolingual setting. This fosters a deeper understanding of global citizenship. However, it also places responsibility on CLIL teachers to cultivate school-wide partnerships and

utilize technologies to bridge these connections. According to sociocultural theorists like Vygotsky and Bakhtin, language and culture are developed through interaction. In first-language contexts, meanings and cultural values are learned alongside language. Learning about culture in CLIL is not limited to facts such as celebrations or folk songs; it involves experiential learning that fosters true intercultural understanding (Coyle et al, 2010). Furthermore, cultural understanding requires meaningful interaction both within and beyond the classroom. At a micro level, students engage with peers, teachers, and resources in the target language, while at a macro level, extending social interaction outside the classroom is essential for collaborative, intercultural learning. Intercultural skills are developed through interactions in diverse contexts, enabling learners to adjust and expand their understanding (Coyle et al, 2010).

Coyle and others (2010) addressee that CLIL plays a significant role in promoting intercultural understanding by helping learners navigate the relationship between their own cultural beliefs and those of others, especially through the use of foreign languages, through meaningful communication, students can gain insights into different cultural perspectives, enhancing their ability to understand and respect diversity. To have a cultural impact, CLIL requires interactive and dialogic learning both inside and outside the classroom. The success of CLIL depends on the intercultural ethos established within the classroom environment and curiosity encourages students to explore various cultural viewpoints.

4. Benefits of CLIL in Educational Settings

Content and Language Integrated Learning (CLIL) is a dynamic educational approach that holds the potential to enhance language proficiency, content knowledge acquisition, and academic achievement among students. By integrating language learning with subject content, CLIL provides students with immersive and meaningful learning experiences that facilitate

communicative competence, critical thinking skills, and intercultural awareness. Discussions surrounding CLIL implementation have emphasized its potential to transform language education and promote multilingualism in diverse educational contexts of learners (Mohammad Iskandar Dzulkurnain ET e, 2024).

4.1. Cognitive Benefits

CLIL provides academic benefits for students beyond just language proficiency, including *cognitive* and brain development. The findings of Castilla-La Mancha study in Spain emphasize that CLIL significantly contributes to the development of cognitive and learning strategies. CLIL students tend to use cognitive and metacognitive strategies more effectively than their non-bilingual peers (Grisaleña et al., 2009). In this study, it is evident that CLIL encourages students to engage in a variety of cognitive processes. Additionally, bilingual projects, as noted by Reilly and Medrano (2009), bring cognitive and social benefits that go beyond purely linguistic gains. These benefits include the development of higher-order cognitive skills such as questioning, summarizing, predicting, hypothesizing, and fostering independent learning and study skills. Marsh (2002) also describes these extra benefits as the added value of CLIL, especially in terms of enhanced learning strategies and broader cognitive development.

4.2. Metacognitive Benefits

Metacognitive strategies are the actions that learners take to plan, arrange, and evaluate their own learning. They consist of directed attention and self-evaluation, organization, setting goals and objectives, seeking practice opportunities, and so forth. CLIL helps students build better metacognitive skills by getting them to work with both a subject and a language at the same time. In a CLIL classroom, students aren't just learning new content—they're also thinking about how they use the language to understand that content (Coyle, D., Hood,

P., & Marsh, D. 2010). This helps them become more aware of how they learn, track their understanding, and use different strategies to get better at it. A study at UPNA University shows that CLIL in subjects like math helps students improve their reading comprehension skills. CLIL students also develop a better understanding of how language works, which is linked to their higher skills in the target language. This makes it easier for them to keep track of how they're using language, a key skill for understanding what they read. Plus, CLIL students know more words and are better at figuring out the meaning of words based on the context. This skill is part of thinking about their learning and helps them adjust when they come across difficult words or ideas. The study shows that CLIL not only boosts vocabulary but also helps students think more strategically, making them better learners overall (Victoria Zenotz Iragi, 2013).

4.3. Cultural Awareness

CLIL has shown great potential in enhancing cultural awareness among higher education students (Marsh, D., 2002)**.** Studies have highlighted its effectiveness in improving cultural awareness, particularly among EFL student teachers**.** For instance, a study conducted at Benha University in 2018 used an experimental one-group design to assess the impact of CLIL on EFL cultural awareness. The results revealed a significant improvement in the participants' cultural awareness, with a t-value of 20.28, which is statistically significant at the 0.01 level. This indicates that the participants made notable progress in their cultural understanding. The findings confirmed that the CLIL approach was effective in developing EFL cultural awareness, especially in terms of its two key dimensions: knowledge and cultural situations (Abeer Ali Mahmud Diab et al., 2020). Overall, CLIL fosters a rich, immersive learning environment that enhances students' ability to navigate and appreciate global cultural contexts, making it an invaluable tool in teacher education and beyond (Abeer Ali Mahmoud Diab et al, 2018). This makes CLIL a valuable approach in

preparing educators who are more culturally aware and capable of teaching in diverse, global contexts.

4.4. Motivation

The implementation of Content and Language Integrated Learning (CLIL) has been shown to positively impact students' motivation when learning English, with both students and instructors viewing it as an engaging and effective teaching tool (Mede & Çinar, 2019). A study conducted at a Chinese higher education institution examined the effects of CLIL on English proficiency and learning motivation in the context of College English Teaching. Using a quasi-experimental pretest-posttest design, the study involved 60 undergraduate students, categorized into three groups based on their English proficiency: High-Group, Medium-Group, and Low-Group. Data were collected from standardized English language tests and a questionnaire on motivation. The analysis, including t-tests and ANOVA, revealed that:

- CLIL had a generally positive impact on both English proficiency and motivation.
- Participants across all proficiency groups made significant progress, with the low-achieving students showing considerable improvement.
- CLIL had a minimal effect on learners' positive attitudes toward language learning.
- Higher-achieving students demonstrated stronger motivation for learning English by the end of the study compared to their lower-achieving peers.

The study concluded that CLIL can benefit language learners at various proficiency levels in both effective and affective learning. However, the authors caution against viewing CLIL as a universal solution and call for more classroom-based research to further explore its impact on student performance and motivation (Hengzhi Hu et al, 2022). By integrating language learning with subject content, students see the practical application of the language in real-world contexts,

which increases their interest and enthusiasm. Both students and instructors appreciate CLIL as an effective tool because it enhances understanding of the subject matter and making learning more dynamic and enjoyable.

5. Language proficiency gains

Content and Language Integrated Learning approach has emerged as a promising educational approach that combines language learning with subject content, thereby fostering both linguistic and cognitive skills (Anna Várkuti, 2012). Research consistently demonstrates that CLIL programs significantly enhance language proficiency at various educational levels. It leads to development in both conversational and academic language skills and promotes deeper language acquisition. This review will focus on the positive effects of CLIL on language proficiency, drawing on studies conducted across different countries and educational settings, which highlight its effectiveness in improving learners' ability to use language fluently and accurately in diverse academic and real-world contexts.

One of the key findings from research on CLIL is that advantages are particularly evident in the development of productive language skills, such as speaking and fluency. A study from Hungary conducted by Várkuti (2012) found that CLIL students excelled not only in social language use (BICS—Basic Interpersonal Communication Skills) but also in academic language proficiency (CALP—Cognitive Academic Language Proficiency). CLIL students demonstrated higher levels of competency in both context-embedded and context-deprived language situations, applying their broader lexical knowledge effectively and adhering to grammar rules. This enhanced metalinguistic awareness enabled CLIL students to excel in cognitively demanding tasks and outperformed their non-CLIL peers in tests requiring more advanced language skills.

However, it is worth noting that the benefits of CLIL are most apparent when such programs are sustained over time. The research carried out by a team from Argentina University (Cendoya, A. M, & Di Bin, M. V, 2010) observed that non-bilingual students in charter schools eventually caught up to their bilingual peers in both private and public schools. This suggests that while CLIL provides clear advantages, these advantages may diminish if the programs are not maintained in the long term. Indeed, research suggests that CLIL programs require a sustained effort, with some studies arguing that it may take up to 20 years for CLIL to reach its full potential.

Additionally, CLIL has been found to be effective in higher education settings. A study conducted at a private university in Kazakhstan investigated the effect of a one-semester CLIL intervention combined with English language instruction on university students' language skills. The study revealed that CLIL, when integrated with English language instruction, had a large positive effect on students' language gains. Factors such as prior CLIL experience and being a non-first-year student were found to correlate with more positive attitudes toward CLIL and higher satisfaction with the program. This suggests that CLIL not only boosts students' general language proficiency but also strengthens a greater appreciation for integrating language with subject-specific knowledge in academic settings (Malik Satayev et al, 2022).

In conclusion, the growing body of research on CLIL consistently supports its positive impact on language proficiency across various educational levels, from secondary to higher education. CLIL students tend to outperform their non-CLIL counterparts in both conversational and academic language skills, especially when these programs are sustained over time. While CLIL programs show particular strengths in enhancing productive language skills such as speaking and fluency, they also contribute to improvements in reading, writing, and metalinguistic awareness. To fully maximize the benefits of CLIL, it is crucial to integrate language instruction with subject-

specific content in a sustained manner throughout students' educational journeys. Further research is needed to explore the long-term effects of CLIL on first language development and content mastery, ensuring that this approach continues to be a key tool in enhancing language competence worldwide.

Section Two: Teachers' Collaboration

Introduction

This chapter outlines the practical procedures followed during the fieldwork phase of the study. It aims to present the key methodological components that guided the research and to provide a comprehensive account of the data collection and analysis processes. The chapter begins by introducing the research design, the context in which the study was conducted, the sampling strategy, and the tools employed to gather relevant data. It then moves on to a detailed analysis and interpretation of the collected data, highlighting the findings in relation to the research objectives. The final part of the chapter summarizes the key outcomes and proposes suggestions for future research. Overall, this chapter serves to address the central research questions by presenting a clear picture of how the investigation was carried out and what results were obtained.

1. Definition and Scope of Teachers' Collaboration

1.1 What is Teachers' Collaboration?

Collaboration plays a fundamental role in professional settings, enabling individuals to work together toward shared goals and improved productivity. Broadly, collaboration is defined as a process where individuals or groups engage in cooperative efforts to achieve a common objective (Boswell & Cannon, 2005). It requires stakeholders to interact, share knowledge, and make joint decisions based on shared norms and structures (Bramwell & Lane, 2000; Wood & Gray, 1991). Schmalenberg et al. (2005) emphasize that collaboration is a dynamic and evolving process involving continuous interactions and relationships.

Building on this, teachers' collaboration refers to a structured and intentional process where educators work interdependently to enhance student learning outcomes (DuFour et al., 2006). Unlike informal cooperation, it involves systematic planning, shared decision-making, and joint

problem-solving to refine instructional strategies and improve student achievement (Geijsel et al., 2009). The OECD (2009) defines teachers' collaboration as a professional practice where teachers work collectively to enhance educational processes and student learning.

Research highlights the positive impact of teachers' collaboration on both professional development and student achievement. Schools where teachers engage in collaborative discussions on curriculum, instructional methods, and classroom practices tend to have higher student performance levels (Goddard & Goddard, 2007; Supovitz et al., 2010). Hattie (2012) supports this, noting that collaborative lesson planning allows teachers to align their beliefs about student progress and enhance learning outcomes. Moreover, collaboration between different professionals in schools—such as teachers, special educators, and administrators—improves teaching effectiveness and student performance (Cook & Friend, 2010; Easen et al., 2000). A study on Professional Learning Communities (PLCs) found that structured teachers' collaboration positively impacts professional development and student success (Khasawneh et al., 2023). PLCs provide a formal framework where educators work collectively, engage in reflective inquiry, and implement evidence-based instructional improvements.

Teachers' collaboration is supported by several educational and sociological theories:

Social Constructivism (Vygotsky, 1978): This theory emphasizes that learning is a social process. Collaborative teaching allows educators to construct knowledge together, scaffold each other’s understanding, and refine instructional techniques. Professional Learning Communities (PLCs) (DuFour et al., 1998): PLCs offer a structured model where educators engage in continuous cycles of reflection, shared inquiry, and action research to improve teaching effectiveness.

Teachers' collaboration takes various forms, including lesson studies, professional learning communities, and joint professional development activities (Hornyák, 2020; Glazier et al., 2017).

Effective collaboration is characterized by shared goals and responsibilities, mutual accountability, and regular interaction and communication (Hornyák, 2020). mutual accountability, and regular interaction and communication (Hornyák, 2020).

In essence, teachers' collaboration is a multifaceted and essential practice that enhances both educator professional growth and student learning outcomes. Schools that foster a culture of collaboration create supportive and innovative environments, ensuring sustained instructional improvement and academic success.

1.2. Multidisciplinary Collaboration in Educational Contexts

Multidisciplinary collaboration brings together professionals from different fields who work in parallel while they maintain communication (Orelove & Sopsey, 1991), as cited in Lacey & Lomas, 1993). It is an interactive process that leverages diverse expertise to develop effective programs and solutions (National Council for Special Education, 2006b). In educational contexts, such collaboration enhances learning experiences, fosters innovative ideas, and improves students' awareness of shared responsibility (Rodrigues Neves et al., 2021). However, simply creating a multidisciplinary environment does not automatically lead to effective collaboration or interdisciplinary work (Zuo et al., 2016).

Successful multidisciplinary collaboration requires structured and intentional engagement. In schools, teachers, special educators, counselors, and psychologists work together to provide a holistic approach to student learning and well-being. Research supports the effectiveness of this approach—continuous quality improvement strategies have been shown to enhance school mental health teams' performance over time (Norton et al., 2022). Similarly, interdisciplinary projects, such as collaborations between engineering and nursing students, not only strengthen teamwork skills but also create meaningful real-world applications (Mc Clelland & Kleinke, 2011).

Higher education institutions have also benefited from multidisciplinary collaboration. Faculty exchanges between universities in different countries have improved students' linguistic and cross-cultural competencies (Mathiesen & Lager, 2007). Additionally, the inclusion of diverse professional perspectives in course design has improved civically engaged education, which equips students for real-world problem resolution (Joseph-Mathews et al., 2022). Overall, multidisciplinary collaboration in education contributes to improved teaching practices, enriched learning experiences, and better preparation for future careers. However, to maximize its impact, collaboration must be structured, intentional, and sustained over time.

2. Models of Teachers' Collaboration

2.1. Co-Teaching

In historical terms, the concept of co-teaching in education was promoted in the 1980s due to a greater emphasis and attention on inclusion (Friend, Cook, Hurley-Chamberlain, & Shamberger, 2010). Specifically, collaboration between special educators and general educators is described as co-teaching and defined by Cramer (Cramer, 2010, p. 560) as situations that develop ‘when two or more professionals share instruction for a single group of pupils in the same class. In other words, co-teaching happens when two teachers work together in the same classroom to teach the same group of students. They share the planning, teaching, and assessment responsibilities to provide better support and learning opportunities for all students.

Villa et al. (2008) suggest that “co-teaching involves the distribution of responsibility among people for planning, instruction, and evaluation for a classroom of students.” It is a unique professional relationship in which “partners must establish trust, develop and work to communicate, share chores, celebrate, work together to overcome the inevitable challenges and problems, and anticipate conflict and handle it in a constructive way.” This idea connects directly

to a Model of Teachers' Collaboration because co-teaching is a type of collaboration where teachers work together closely to support student learning. In this model, teachers do not work alone; instead, they share tasks, solve problems together, and help each other improve. Just like in any good partnership, they need to communicate well, divide responsibilities fairly, and support each other when challenges arise.

To expand on this concept, Fluijt et al. (2016, p. 189) identify five essential elements of co-teaching: (1) pupils are generally taught by two or more teachers in a co-teaching team; (2) teachers are responsible for both students with and without disabilities; (3) these teams typically consist of a general educator and a special educator; (4) co-teaching is recognized as a form of collaboration; and (5) it most commonly takes place in a general education classroom." These elements provide a clear structure and further clarify the key characteristics of co-teaching.

Co-teaching is a teaching method deeply rooted in Vygotsky's (1978) sociocultural theory, which highlights the role of social interaction in learning. This theory suggests that students learn best through guided interaction with more knowledgeable individuals. In a co-teaching environment, students benefit from the combined expertise of two educators, who provide structured support and tailored guidance to meet individual needs. This teamwork creates an engaging and supportive learning environment where lessons can be adapted to meet different student needs.

2.2. Team Planning

Moore (2009) stated that "Team planning can have tremendous value. For example, if all the social studies teachers were to coordinate their course plans, then the possibility of duplicating efforts or of leaving out important lessons would be reduced." (p. 120). Similarly, he defined team planning as a 'group or team of teachers organizing instruction so that each supplements the other'

(p. 126). This means that when teachers plan together, they can ensure that lessons are well-organized, avoid repetition of the same topics, and make sure all important content is covered. It also helps create a more consistent and effective learning experience for students.

Team planning is helpful especially in the context of schools undergo reorganization or major policy changes. A study shows that team planning can help teachers adjust to changes in school structures (e.g., transition from a junior high to a middle school) (McQuaide, 1992). Similar to corporate planning teams, teacher teams also benefit from structured collaboration. Research by Kimura et al. (2022) found that forced team meetings can reduce motivation unless preceded by relationship-building activities. This suggests that in educational team planning, establishing trust and collaboration before formal planning meetings may enhance effectiveness.

2.3. Interdisciplinary Collaboration

Interdisciplinary has become a helpful way to improve teaching and make education more inclusive for all students. It refers to the integration of knowledge from multiple disciplines to generate new insights (Lattuca, 2001). Interdisciplinary collaboration in teaching brings educators from different fields together to integrate knowledge, enriching students' learning experiences. Research suggests that partnerships between language and content specialists can foster teacher development and improve content-based language teaching (Stewart & Perry, 2005). In high school settings, interdisciplinary STEM (Science, Technology, Engineering, and Mathematics) collaboration models, such as multi-classroom and extracurricular activities, can help students connect STEM subjects to real-world problems (Wang et al., 2020). Collaboration between mainstream English and ESL teachers has shown potential in developing curriculum that addresses both language and content needs of English language learners (Dellicarpini, 2009). Furthermore, interdisciplinary collaboration between mainstream and special education teachers can contribute

to creating inclusive learning environments by transforming specialized knowledge through co-teaching practices (Hedegaard-Soerensen et al., 2017). Interdisciplinary collaboration enriches learning, supports teacher development, and fosters inclusivity by integrating knowledge across subjects.

3. Stages of Collaborative Teaching

Collaborative teaching is a structured process where educators work together to plan, teach, and reflect on lessons to improve student learning outcomes. It consists of three key stages:

3.1. Collaborative Planning in Preparations

In this initial phase, collaborative lesson planning refers to the process where teachers work together to create lesson plans. Instead of working alone, they meet (in person or online) to discuss what to teach and the most effective ways to teach it. Their focus is on the explanation of concepts, the selection of the best teaching methods, and the preparation for possible student misunderstandings. These meetings allow teachers to plan lessons for the upcoming week, unit, or semester, which helps maintain a well-organized approach to both teaching and learning (Third Space Learning, 2024). Collaborative lesson planning offers opportunities for (1) continuous learning, (2) the improvement of professional practice, and (3) reflective, affective, and professional support (Gutierez, 2020). Furthermore, collaborative planning plays a key role in the promotion of inclusive education collaboration. It enables teachers to take different learning needs into account when developing lessons, whether they teach alone or with others. The goal is to combine teachers' expertise to incorporate inclusive practices and accommodations in lessons, ultimately enhancing learning for all students, especially those with special needs (Sandelius, 2024). However, disagreements emerged during the planning process, creating difficulties in reaching a consensus on key course elements (Herranen et al., 2020).

3.2. Collaborative Implementation in the Classroom

This stage involves delivering the lesson together, using different co-teaching models to engage students effectively. According to Beninghof (2012), there are six primary models of co-teaching, each with its unique structure and purpose. For instance, in the *One Teach, One Observe model*, one teacher leads the lesson while the other gathers data on student learning. Similarly, in *the One Teach, One Assist model*, one teacher provides instruction while the other offers individual student support. *Station Teaching* involves dividing students into groups that rotate between different learning stations, while *Parallel Teaching* allows educators to split the class and deliver the same lesson simultaneously. In *Alternative Teaching*, one teacher focuses on a small group needing additional support, while the other works with the rest of the class. Lastly, *Team Teaching* involves both teachers sharing instructional responsibilities equally. Moreover, factors such as student diversity, lesson complexity, and teaching styles should be taken into consideration when deciding which model to use.

3.3. Collaborative Reflection and Feedback

The Collaborative Reflection and Feedback stage is a critical component of teachers' professional growth, allowing educators to analyze their teaching effectiveness, share insights, and refine their instructional strategies. The Collaborative and Reflective Practices (CRP) Program at Villanova College in Brisbane exemplifies this stage by fostering a structured environment where teachers collaboratively reflect on their impact on students. Through discussions with peers, educators' trial and implement new strategies with collective support, reinforcing the idea that professional reflection is most effective when undertaken in a collaborative setting (Alexander, 2020). This aligns with research indicating that ongoing, sustained, and critical dialogue among teachers not only enhances individual teaching practice but also strengthens collective pedagogical

effectiveness (Tobin et al., 2024). Additionally, student responses and researchers' comments act as a catalyst for teachers' professional growth (Lin et al., 2012).

3.4. Time Constraints and Scheduling Issues in Teachers' Collaboration

Teacher collaboration is essential for school improvement, but time constraints and scheduling issues pose significant challenges. A lack of structured collaboration time, along with unfavorable working conditions, often hinders meaningful engagement among teachers (Forte & Flores, 2014; Datnow et al., 2013). Schools frequently fail to allocate common planning periods, forcing teachers to sacrifice personal time, which is unsustainable and inequitable (Bae, 2017; Cansoy & Turkoglu, 2022). Additionally, logistical factors such as school bus schedules, contractual obligations, and limited resources further restrict opportunities for collaboration (Johnston & Tsai, 2018).

Efforts to structure collaboration through formal meetings often fall short, as excessive regulation can weaken both formal and informal teacher relationships (Lockton, 2019). While some schools have experimented with alternative schedule models, these must be carefully designed to prevent an increase in teacher workload or a decrease in instructional time (Bae, 2017). Systemic changes, such as a revision of the school calendar or the provision of training in collaboration skills, are necessary to support sustainable teamwork (Forte & Flores, 2014). Ultimately, the establishment of a balance between structured collaboration time and organic professional relationships is key to the development of a collaborative school culture (Lockton, 2019).

4. The Benefits of Collaborative Teaching in Professional Growth and Shared Expertise

Collaborative teaching is essential for teacher professional development and student success. It enhances job satisfaction, reduces isolation, and helps educators stay informed about

research and innovations (Morel, 2014). Collaboration in lesson planning and problem-solving enables teachers to grow professionally through continuous learning (Sonsupap & Cojorn, 2024). Structured collaboration fosters shared responsibility and continuous improvement (Khasawneh et al., 2023), while co-teaching provides opportunities for critical reflection, pedagogical renewal, and real-time feedback (Karathanos-Aguilar & Ervin-Kassab, 2022). Participation in professional learning communities (PLCs) and collaborative teaching practices positively impact both teacher development and student achievement (Khasawneh et al., 2023). Furthermore, collaborative teaching promotes inquiry-based learning, encouraging teachers to reflect on their practice and refine their teaching strategies (Park & So, 2014).

Collaboration also fosters inclusive and holistic learning environments that support student engagement and development (Omodan et al., 2024). Drawing from Vygotsky's sociocultural theory, shared expertise among teachers enhances innovative learning outcomes and encourages peer learning (Salonen & Savander-Ranne, 2015). Effective communication and interaction are key to collaborative knowledge construction (Salonen & Savander-Ranne, 2015). In higher education, co-teaching raises considerations about power dynamics and expertise distribution (Ferguson & Wilson, 2011). Additionally, when combined with peer coaching, collaborative teaching supports continuous professional growth and allows educators to explore new instructional strategies (Little, 2005). When teachers collaborate, they improve their teaching skills, learn from each other, and create better learning experiences for students. This teamwork leads to continuous growth for teachers and better educational outcomes for students.

5. Teachers' Collaboration in CLIL Context

Teachers' collaboration is essential in Content and Language Integrated Learning (CLIL), as it requires coordinated efforts between subject and language teachers (Ivanova, 2016). The

coexistence of the mother tongue and a foreign language in CLIL classrooms presents unique opportunities, where language assistants and content teachers can work together to enhance both teaching processes and language acquisition (Méndez García & Pavón Vázquez, 2012).

5.1. Collaborative Strategies for Integrating Content and Language

Effective content and language integration is at the heart of CLIL, requiring teachers to have a strong grasp of subject-specific genres, linguistic resources, and interactive classroom strategies (Llinares, 2015). The success of CLIL depends on educators' linguistic competence, subject knowledge, and pedagogical adaptability (Vázquez & Ellison, 2013). An examination of teacher roles, competences, and instructional methods is key to achieving a seamless balance between content delivery and language development (Villabona & Cenoz, 2021).

Collaboration between language assistants and content specialists fosters effective instructional practices (Méndez García & Pavón Vázquez, 2012), particularly in areas like strategic reading instruction (Ruiz de Zarobe & Zenotz, 2014, 2015). Studies show that students who receive reading strategy training demonstrate greater metacognitive awareness and improved academic performance, even if the variety of strategies used remains similar between trained and untrained groups (Ruiz de Zarobe & Zenotz, 2015).

Collaborative approaches in CLIL classrooms extend beyond teacher partnerships. Web-based resources provide platforms for teachers to co-develop integrated learning materials (Pastor & Perry, 2010). The Knowledge Framework offers a structured method for the alignment of language and content instruction, which benefits ESL students by means of the improvement of academic English, computer literacy, and critical thinking (Tang, 1994). Furthermore, collaborative writing tasks encourage learners to focus on both linguistic accuracy and subject comprehension (Swain, 2001).

Despite challenges, research highlights the benefits of teachers' collaboration in CLIL, which include enhanced student self-esteem, deeper engagement, and improved intercultural competence (Pastor & Perry, 2010; Leibowitz, 2011). Through the promotion of dialogue, negotiation, and joint decision-making, collaboration in CLIL classrooms strengthens both educators' instructional effectiveness and students' academic success (Roselli, 2016).

Teachers' collaboration enhances instruction and student education, especially in CLIL contexts. Joint efforts between subject and language teachers improve both content and language acquisition. Effective strategies like co-planning and strategic instruction foster deeper understanding and student confidence. Despite challenges, collaboration strengthens teaching practices and creates more inclusive classrooms.

Conclusion

In conclusion, CLIL offers a valuable approach to the enhancement of both content mastery and language proficiency in educational settings. Through the combination of subject knowledge and language learning, CLIL promotes cognitive and metacognitive development, cultural awareness, and student motivation. However, its successful implementation depends on a thorough understanding of its key principles, such as the Four Cs framework and the Language Triptych, as well as the adoption of strategies that maximize its benefits.

Similarly, effective teachers' collaboration plays a crucial role in the success of CLIL and other interdisciplinary educational approaches. Various models of collaboration, such as co-teaching, team planning, and interdisciplinary teamwork, contribute to professional growth and shared expertise. However, challenges such as time constraints and scheduling conflicts must be addressed to ensure seamless cooperation. The creation of structured stages of collaborative

teaching—planning, implementation, and reflection—can assist educators in optimizing their efforts and improving student learning outcomes.

Looking ahead, this theoretical foundation serves as the basis for further exploration of practical strategies that enhance teachers' collaboration and the implementation of CLIL. The next chapter will provide an in-depth examination of real-world applications and solutions that address these challenges, ultimately leading to a more effective integration of content and language learning in diverse educational contexts.

Chapter Two: The Field Work

Chapter Two: The Field Work

Introduction

This chapter outlines the methodology adopted for the study, detailing the research design, data collection and analysis procedures. It also presents the findings and interprets them in the context of the research questions. Furthermore, the chapter discusses the limitations of the study, explores the pedagogical implications, and offers recommendations for future research.

1. Research Methodology

1.1. Research Design

This study adopts a descriptive research approach and employs a mixed methods research design to comprehensively investigate the effects of collaboration between content and language teachers in CLIL classes, using the case of second-year Computer Science students at the University of M'sila. A mixed methods approach is particularly appropriate for this research, as it enables the collection and interpretation of both quantitative and qualitative data, offering a more complete understanding of the phenomenon than either method alone.

Quantitative data: The online questionnaire distributed to second-year Computer Science students provides useful insights into their perceptions of how teacher's collaboration in CLIL classrooms affects their learning experience. The data helps identify general trends and attitudes among students regarding the clarity of instruction and content comprehension.

Qualitative data: The interviews conducted with content teachers offer detailed and context-rich information about their collaborative practices with language teachers. This data gives

a deeper understanding of how such collaboration is planned, implemented, and experienced within the CLIL framework.

By combining both data types, this study aims to present a more comprehensive view of teacher's collaboration in CLIL classes. The students' responses reveal broad perceptions and outcomes, while the teachers' perspectives offer deeper insight into the practices and challenges involved in collaboration.

1.2. Research Setting

This study was conducted during the 2024/2025 academic year at the Faculty of Mathematics and Computer Science, specifically within the Department of Computer Science at M'sila University -pole-. The participants were observed in their natural academic environment.

1.3. The Sample Population

The population of interest in this study includes second-year Computer Science students and content subject teachers from the same department. A total of 50 students were initially targeted from the full population of 426. However, data collection was concluded once 30 students responded voluntarily, the actual study sample was formed. Therefore, the sample was selected based on convenience sampling, as participation relied on the students' availability and willingness to take part in the study, as stated by Creswell (2012) and Cohen et al. (2018).

In addition, seven (7) content subject teachers involved in CLIL modules were selected using simple random sampling. This method ensured that each teacher had an equal chance of being chosen, supporting the objectivity of the teacher sample and enhancing the credibility of the findings.

The selection of second-year students as the sample for this study is based on their two-year experience with the Content and Language Integrated Learning (CLIL) approach. As a result of this sustained exposure, they are anticipated to have reached a moderate level of English proficiency, which makes them suitable for investigating the effects of teacher's collaboration within CLIL contexts.

1.4. Research Instruments

To gain a comprehensive understanding of teachers' collaboration in CLIL classes, this study uses two main research tools. The first tool is a semi-structured online questionnaire directed at second-year computer science students at the Faculty of Mathematics and Computer Science. The questionnaire includes a combination of closed-ended questions to gather quantitative data about students' perceptions of language and content teachers' collaboration, and open-ended questions to obtain qualitative insights into their personal experiences and opinions regarding this collaboration. This tool is chosen for its ability to reach a wider group of participants efficiently and encourage honest responses.

The second tool consists of semi-structured interviews conducted with seven content teachers from the same department. An interview guide is prepared to ensure consistency across interviews while giving space for teachers to elaborate on their individual experiences. The guide explores topics such as collaboration practices with language teachers, challenges in designing CLIL courses, and perceptions of the effectiveness of joint teaching efforts.

By combining data from both students and teachers, and using both quantitative and qualitative instruments, the study achieves a deeper, multi-perspective understanding of collaboration in CLIL classrooms. This study uses a semi-structured questionnaire that combines

closed-ended questions to obtain quantitative data and open-ended questions to gather qualitative insights into students' experiences and perceptions of teachers' collaboration in CLIL classes.

2. Data Analysis

The data collected from the questionnaire and teachers' interview were analyzed using descriptive methods. The findings were presented through tables and graphs, including bar charts, to show the extent to which the integration of CLIL and teachers' collaboration influences students' ability to engage in meaningful communication and apply language skills effectively.

2.1. Description and Procedure of the Research Instruments

This section outlines the two research instruments employed in the study: the students' questionnaire and the teachers' interview. Each instrument is designed with specific elements, aims, and procedures to collect relevant data. The following description provides a detailed account of these tools and their role in the research process

2.1.1. Students' Questionnaire

This research instrument aims to investigate students' experiences, perceptions, and attitudes toward CLIL (Content and Language Integrated Learning) instruction, particularly focusing on the collaboration between English and computer science teachers. The questionnaire is semi structured, it includes both open-ended and closed-ended questions. It consists of 15 items, organized into four sections. The first section gathers basic demographic information, while the second section explores students' awareness and experiences with teachers' collaboration. The third section addresses challenges, communication barriers, and observed changes in teaching styles, and the final section evaluates student satisfaction and overall reflections on the CLIL approach.

2.1.1.1. Description and Objectives of the Students' Questionnaire

The students' questionnaire is purposefully designed to investigate learners' experiences with the integration of content and language instruction within CLIL classrooms, particularly focusing on the collaboration between English and computer science teachers. It also aims to explore the challenges students face in learning through English and their overall satisfaction with this approach. This questionnaire is semi-structured, it consists of 15 questions, in which it includes both open-ended and closed-ended items. These questions are organized into four main sections.

The first section includes the students' Profile questions, which are the very first three questions. It gathers essential demographic information. The questions cover gender, age, and the duration of studying academic content in English. These details provide an overview of the participants' backgrounds and help the researchers interpret their familiarity with the CLIL approach.

The second section explores students' understanding of computer science concepts taught in English and their confidence using English in technical discussions. It encompasses the next six questions. This section also investigates their awareness of collaboration between English and computer science teachers, including how such collaboration may enhance their performance. Additionally, students reflect on effective teaching methods and the frequency of integrated activities. The aim is to assess how interdisciplinary collaboration is perceived and experienced in CLIL classrooms.

The third section has five questions. It looks into the operational and pedagogical challenges perceived by students regarding teachers' collaboration, as well as their own learning difficulties. It addresses issues such as barriers in communication between teachers, observed

changes in teaching methods, and specific language-related challenges students face when engaging with English-medium instruction. These questions aim to uncover both institutional and individual obstacles that might affect the success of CLIL implementation in their educational context.

The forth section evaluates the students' overall satisfaction with their learning experience under the CLIL model. It includes a Likert-scale rating of satisfaction, asks whether students would recommend this learning method to others, and provides space for any additional comments or reflections. This section is critical for collecting qualitative insights into students' general impressions, perceived benefits, and concerns regarding the integration of content and language teaching.

2.1.1.2. Data Analysis of the Students' Questionnaire

a- Section One: Students' Profile

The population of interest in this study includes second-year Computer Science students and content subject teachers from the same department. A total of 50 students were initially targeted from the full population of 426. However, data collection was concluded once 30 students responded voluntarily. According to the results gathered in the first section which is related to the students' profile, it is found that 55% students are female and 45% students are male. All of students have been studying English for more than a year. Their age is from 18 to 24. The majority of the students 57% have an Intermediate level in English language while few 34% states that they have pre- intermediate and beginner level, the rest 9% represent elite students whom have an advanced level.

In exploring the background of the students' profile, the findings reveal that 55% are female, while 45% are male. All students indicated that they have been studying English for more than one year. Their ages fall between 18 and 24 years old. As for their English proficiency levels, the majority (57%) reported having an intermediate level. In comparison, 34% described their level as either pre-intermediate or beginner, while only 9% identified themselves as having an advanced level. These results suggest that while most students are moderately proficient in English, a significant segment may still require linguistic support, as they may still face challenges, particularly in content and language integrated learning environments.

b- Section Two: Students' Awareness and Engagement with Teachers' Collaboration.

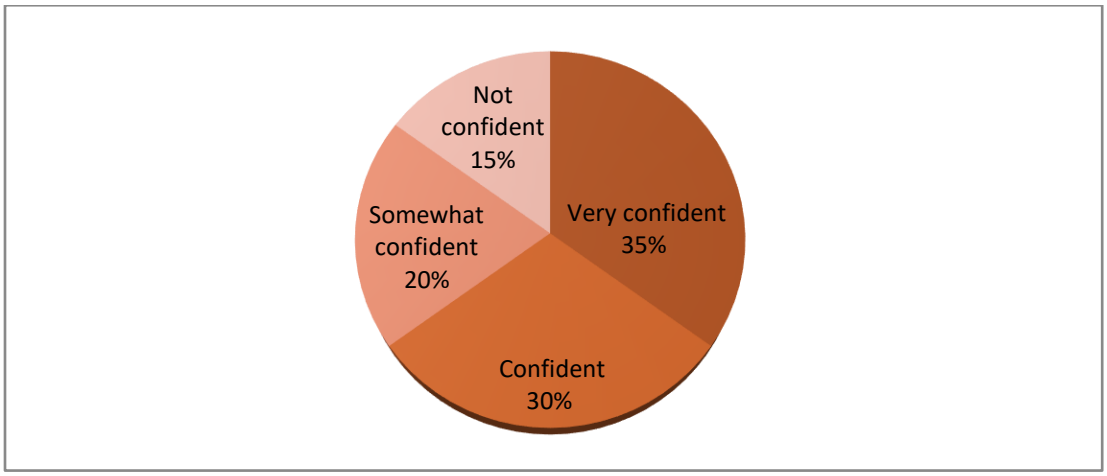
Q 1: How would you rate your understanding of science computer concepts taught in English?

Graph 01: Students' understanding of science computer concepts taught in English

This item seeks to explore students' self-perceived understanding of computer science concepts delivered in English. The responses indicate that a majority of students (55%) rate their

understanding as good, suggesting a general confidence in grasping the subject matter. A smaller portion (20%) consider their level to be very good, while 15% rate themselves as excellent. Only 10% of students report a poor understanding. This implies that while most students feel relatively comfortable with the concepts, a small group may still require additional support to ensure full comprehension.

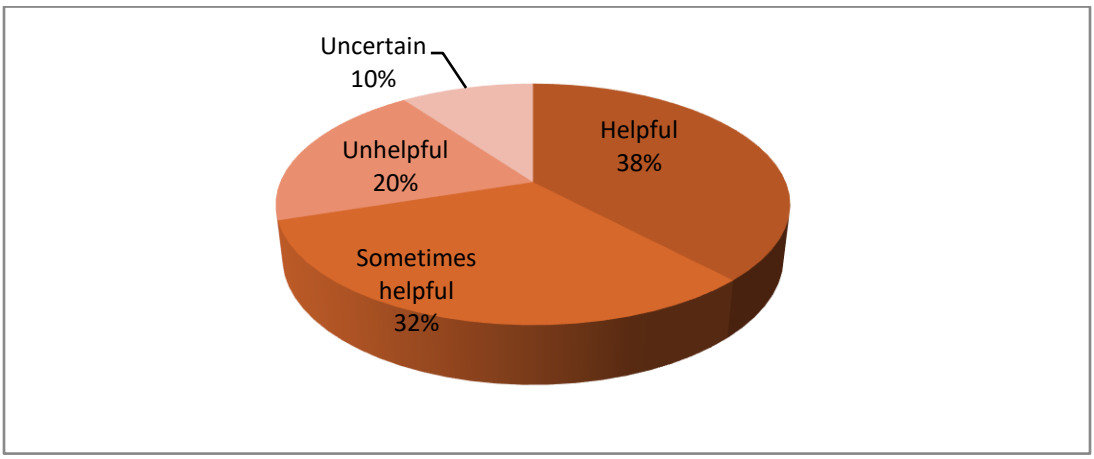
Q 2: How confident do you feel using English to discuss computer science topics?



Graph 02: Students' confident while discussion in English

This question aims to assess students' confidence levels when using English to discuss topics related to computer science. The data shows that a notable portion of students (35%) report feeling very confident, while 30% consider themselves confident. A smaller group (20%) state they are somewhat confident, and a minority (15%) indicate they are not confident at all. These results suggest that although a majority of students express a relatively high degree of confidence in using English for academic discussions, there remains a portion of them that may benefit from additional language support or practice opportunities.

Q 3: Do you feel that the English used in your computer science classes supports your understanding of the subject?



Graph 03: English support in students' understanding of the subject

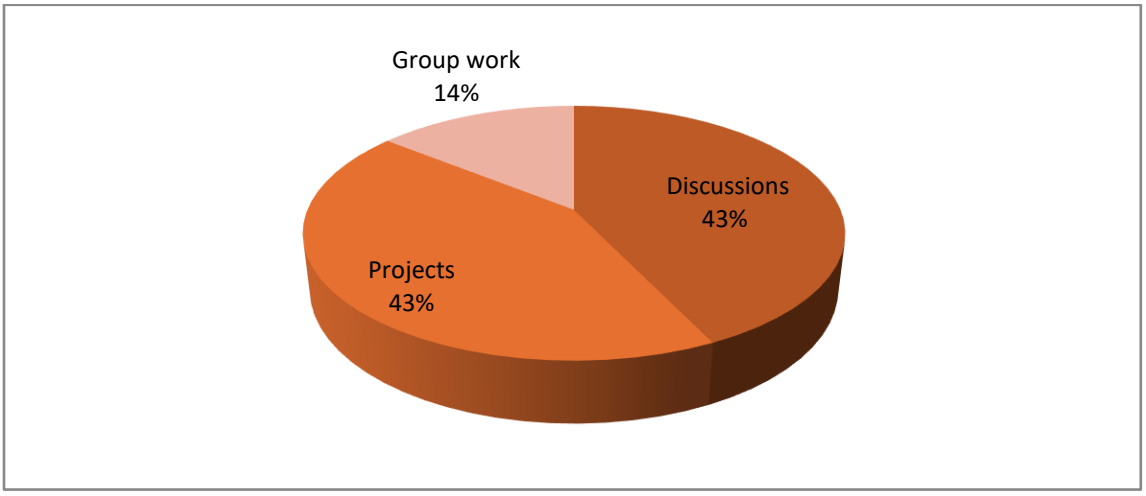
This item aims to explore students' perceptions of how the use of English in computer science classes impacts their understanding of course content. The results show that a notable portion of students (38%) believe that the use of English helps them understand the subject better. Meanwhile, 32% report mixed experiences, indicating that sometimes it helps and sometimes it does not. On the other hand, 20% state that English does not help much in their comprehension, and 10% are uncertain. This suggests that while a majority of students benefit from the use of English in their computer science education, there remains a significant group facing occasional or consistent language-related challenges.

Q 4: Can you give an example of a time where your English skills helped you understand a computer science topic more clearly?

The responses to this open-ended question are varied. They reveal different levels of engagement and experience with English in computer science contexts. A number of students

indicated that they could not recall any specific instance where English significantly helped them, with answers such as "there is none" or "Nothing." However, others provided specific examples of how English supported their learning, particularly through understanding technical terminology, writing project reports, and accessing external resources such as tutorials or videos online. Some students mentioned that while English was helpful for them personally, they recognized that other students with weaker language skills struggled due to the low English proficiency of some instructors. A few students also noted that using English helped them clarify their code logic and complete compiler-related tasks more effectively. Overall, the data suggests that while a portion of students do not actively associate their English skills with clearer understanding of computer science topics, others see tangible benefits, especially in self-learning, project work, and engaging with digital content in English.

Q 5: What teaching methods do you find most effective in your CLIL classes?

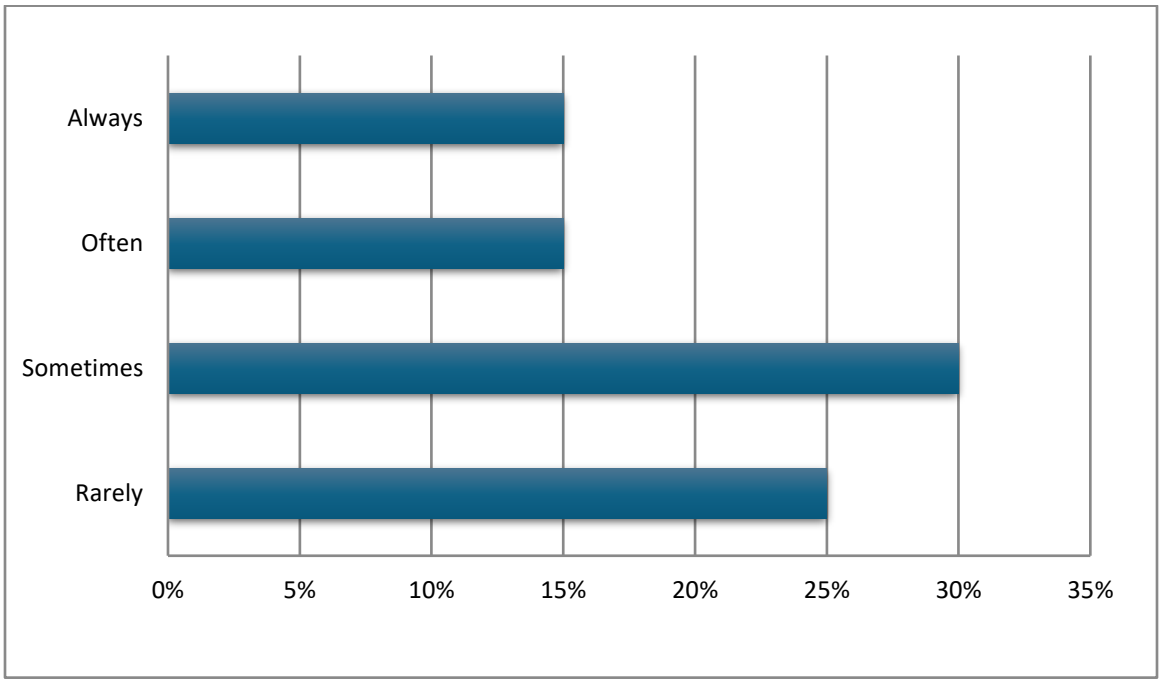


Graph 04: Students' effective methods in CLIL classes

When students were asked about the most effective teaching methods in their CLIL classes, discussions and projects were equally favored by the majority, with 43% of students selecting each. Group work was considered effective by 14% of the respondents. These results suggest that

interactive and task-based approaches such as class discussions and project-based learning are highly appreciated by students, likely because they support both content understanding and language development.

Q 6: How often do your teachers use integrated activities that combine both English language skills and computer science content?



Graph 05: The frequency of using combined activities

The responses to this item show varied experiences among students. A portion of the students (15%) reported that such integrated activities are always used, and an equal percentage (15%) noted they are used often. The highest percentage (30%) stated that these activities are used sometimes, indicating a moderate presence in the classroom. Meanwhile, 25% of the students indicated these activities are used rarely, and 15% said never. This distribution suggests that while integrated activities are present to some extent in CLIL classes, they are not consistently

implemented in all classes or by all teachers, which reflects a need for more structured integration to ensure all students benefit equally.

c- Third Section: Challenges and Observations of Teachers' Collaboration and Learning in CLIL

Q 1: Do you think your English and computer science teachers collaborate well when preparing lessons or assessments?

The responses to item reveal a variety of student perspectives as well. Some students believe that such collaboration is lacking or even nonexistent, often due to the absence of teachers who are familiar with both English and computer science. Others pointed out a disconnect caused by teachers' continued reliance on French, which leads to inconsistencies in the use of terminology and instructional language. A few responses suggest that even when collaboration exists, it may not be strong or visible enough to benefit students directly. However, some students acknowledged that collaboration, when it does happen, can improve clarity and help bridge the gap between language and content instruction.

Q 2: Have you noticed any challenges that your teachers face when collaborating? If so, please describe them.

For this item, Students' responses reveal mixed views. While some students reported no such issues, others pointed to challenges that appear linked to the absence of collaboration, especially when it comes to language use. Several responses indicated that students often have to rely on independent resources like online tutorials to fully grasp certain concepts, which suggests gaps in instructional clarity. Moreover, some students noted that certain teachers struggle with English proficiency, frequently switching to French or using incorrect terminology, which leads to confusion. These findings suggest that even though students may not always directly observe

collaboration, its absence, along with inconsistent language use, can negatively affect their understanding and classroom experience in CLIL environments.

Q 3: What do you think are the benefits of your English and computer science teachers working together?

The benefits	Frequency	Percentage of students
Improving communication skills	17	85%
Interdisciplinary learning	9	45%
Critical thinking development	5	25%
Engagement with real-world tasks	4	20%

Table 01: Students' benefits of English and computer science teachers co-working

The graph shows that the majority of students (85%) believe such collaboration improves their communication skills, suggesting that integrated instruction enhances their ability to express technical ideas more clearly. A significant portion (45%) also values interdisciplinary learning, which reflects an appreciation for the connection between language and content. Meanwhile, fewer students associate this collaboration with critical thinking development (25%) or engagement with real-world tasks (20%), which may which may indicate the extent to which these aspects are emphasized or made visible in their classes.

Q 4: Have you noticed any changes in how lessons are taught or how the class is organized when your English and computer science teachers collaborate?

This inquiry seeks to explore whether students have observed any changes in lesson delivery or classroom organization as a result of coordination between their English and computer science teachers. The responses reveal a spectrum of student perceptions. Some students reported

no noticeable changes, which may indicate that collaboration is either limited or not effectively communicated to learners. Others noted improvements such as clearer instruction, better integration of English in coding-related tasks, and enhanced understanding of terminology. A few students expressed uncertainty, which suggests that the collaboration, if present, is not consistent or sufficiently evident.

Q 5: What difficulties do you face when studying in English?

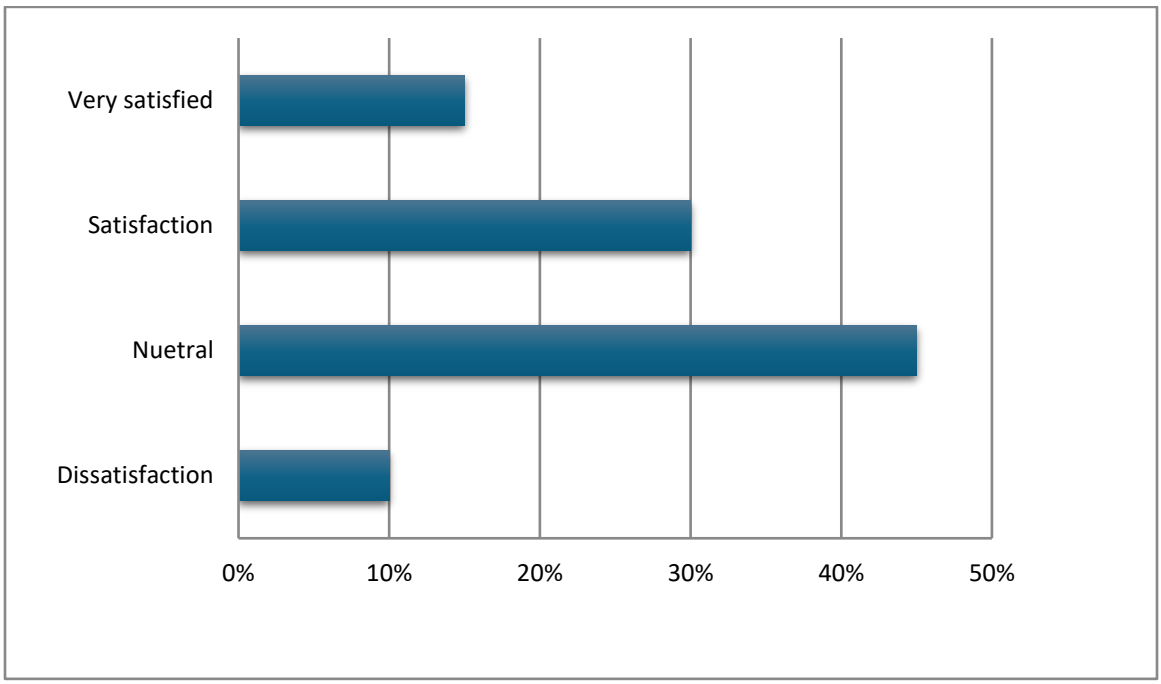
Difficulties	Frequency	Percentage of students
Difficulty following the teacher	3	15%
Embarrassed to speak English	6	30%
Trouble expressing ideas	10	50%
Limited vocabulary	12	60%
Complex subject content	4	20%
Lack of interest	5	25%
Others	2	10%

Table 02: Students' difficulties of studying in English

According to the data reported in the graph above the most reported issues were limited vocabulary (60%) and trouble expressing ideas (50%). Many also felt embarrassed to speak English (30%) or had difficulty following the teacher (15%). Some struggled with complex content (20%) or lacked interest (25%). A smaller group (10%) mentioned other challenges, such as not understanding certain vocabulary and relying on AI tools for help, or facing issues due to teachers' low English proficiency. Overall, the findings highlight the need for stronger language support for both students and teachers.

d- Fourth Section: Students' Satisfaction and Recommendations

Q 1: Overall, how satisfied are you with the learning experience in your CLIL classroom?



Graph 06: Students' satisfaction on CLIL classroom experience

The results in the graph above demonstrate that the largest group of respondents (45%) reported feeling neutral, which suggests uncertainty or mixed opinions about how effective their learning environment is. Meanwhile, 30% expressed satisfaction, and only 10% reported being very satisfied. This indicates that although some students have a positive view of the CLIL approach, it may not fully address the needs of most learners. On the other hand, 15% of students reported some level of dissatisfaction, which may point to problems related to instructional quality, coordination between teachers, or insufficient language support.

Q 2: Would you recommend this type of learning approach to other students? Why or why not?

This question seeks to explore students' willingness to recommend the CLIL approach to others, along with the reasons behind their opinions. Most respondents expressed a strong endorsement of this method, emphasizing its practical relevance, especially in scientific fields like computer science where English is essential for global communication, academic advancement, and professional development. Some students highlighted how the approach has increased their motivation to improve their English skills and engage more confidently with international content. However, a few students raised concerns. They noted that not all learners have a strong command of English, making the learning process more difficult. Others pointed out that when the method is not well-implemented or lacks professional depth, it may fall short of delivering meaningful improvement.

2.1.2. Teacher's Interview

In alignment with the development process of the students' questionnaire, the researchers followed similar procedures when designing the teachers' interview. They first identified the key aims of the interview, determined its format, and carefully selected the types of questions to be included. Attention was also paid to the sequencing of questions to ensure a logical flow that facilitates a smooth conversation with the participants. Before using the interview for data collection, a pilot version was tested with three experienced content teachers to ensure the clarity and relevance of the questions.

2.1.2.1. Description and Objectives of the Teachers' Interview

The teachers' interview used in this study is a semi-structured one. It consists of nine questions items and it is divided into three two section. This type of interview involves preparing a set of core questions in advance while allowing flexibility to ask follow-up questions depending on the interviewee's responses. This approach enables the researcher to explore deeper insights and gather more detailed information, especially when responses raise new relevant points. The main aim of the interview is to support and validate the data collected from the students' questionnaire, particularly regarding the implementation of the CLIL (Content and Language Integrated Learning) approach, and to understand the nature and impact of teacher collaboration in this context.

The interview is divided into three main sections. The first section concerns the teachers' profile and gathers basic background information about the participating teachers. It includes questions about their gender, academic degree, and level of English proficiency. The second section explores the teachers' knowledge and understanding of the CLIL approach, including their awareness of its principles and features. It also investigates the challenges they face in designing and delivering CLIL-based courses, especially in terms of language and content balance. The third section focuses on collaborative practices between content and language teachers. It seeks to identify how often such collaboration occurs, in what areas it takes place (e.g., course design, exams), and how it affects the effectiveness of CLIL implementation. This section is crucial for revealing how interdisciplinary teamwork contributes to—or hinders—the success of CLIL classes in the computer science department.

2.1.2.2. Data Analysis of the Teacher's Interview

a- Section One: Teachers' Profile

Q 1: Teacher's Gender

Gender	**Frequency**	**Percentage**
Male	5	71.4%
Female	2	28.6%
Total	**7**	**100%**

Table 03: Teacher's Gender

This table summarizes the distribution of participants by gender. 71.4%of the participants were male and 28.6% were female. This diversity allowed for a range of perspectives on CLIL collaboration.

Q 2: Degree of your study

Degree	**Frequency**	**Percentage**
Master	0	0%
Magister	3	42.9%
PhD	4	57.1%
Total	**7**	**100%**

Table 04: Teacher's Educational Qualification

The data tabulated above illustrates the distribution of teachers based on their academic degrees. Out of the total sample of six (07) teachers, 57.1% of the participating teachers hold a Ph.D., while 42.9% hold a Magister degree. Notably, none of the participants reported holding only a Master's degree. This indicates a highly qualified sample, which suggests that the participants possess strong subject-matter expertise. Such academic backgrounds may influence how these teachers engage in CLIL collaboration, as their depth of knowledge could support meaningful contributions in content-focused discussions. At the same time, their qualifications might shape their openness to interdisciplinary cooperation with language teachers, potentially affecting the overall dynamics of collaboration in CLIL settings.

Q 3: What is your level of English?

Level of English	**Frequency**	**Percentage of teachers**
Upper Intermediate (B2)	2	28.57%
Intermediate (B1)	4	57.14%
Pre-intermediate (A2)	1	14.29%
Total	**7**	**100%**

Table 05: Teachers' Level of English.

The data presented in the table above reveals that a majority (57.14%) identified their level as intermediate. This is followed by 28.57% who reported an upper-intermediate level, while 14.29% of the participants indicated a pre-intermediate level of proficiency. This distribution suggests that while most teachers possess a moderate command of English, fewer demonstrate higher levels of fluency. These proficiency levels are particularly relevant in the context of CLIL-

based collaboration, as they may influence teachers' confidence and effectiveness when engaging with language-focused colleagues or delivering content in English. Teachers with intermediate or lower proficiency may require additional support or training to fully take part in CLIL teaching and collaboration.

b. Section Two: Teachers' knowledge and understanding of CLIL

Q 1: Do you know CLIL (content and language integrated learning approach)?

This question explores teachers' familiarity with the CLIL approach. Most respondents demonstrated a general understanding of CLIL as a method of teaching subject content through English, where students learn both language and content simultaneously. While some teachers described applying the approach in practice, others admitted to limited familiarity or a need for more clarity regarding its specific features. Overall, the responses indicate varying levels of awareness, which suggests that while CLIL is being introduced into teaching practices, further guidance and support may be needed to ensure a more consistent and informed application.

Q 2: **Do you know its features?**

The aim of this question is to assess the extent of teachers' awareness regarding the key features of the CLIL approach. The responses show varying degrees of familiarity. Most teachers were able to mention general features such as the integration of language and content learning, the promotion of communication skills, and the use of real-world tasks or student-centered methods. However, several teachers admitted that their knowledge was limited, and they expressed a need for more formal training or clearer guidance. This indicates that while the overall concept of CLIL is somewhat understood, there is a lack of deep or structured knowledge among the participants,

likely due to the novelty of the approach and the limited exposure or training provided so far in the Algerian university context.

Q 3. What problems you face in designing CLIL courses?

This question aims to identify the main challenges teachers face when designing CLIL courses. The responses indicate a variety of ongoing difficulties. Most notably, teachers report a strong language barrier, with many still accustomed to using French, which makes the shift to English-based instruction more demanding. They also express concern over the lack of training and structured guidelines for CLIL, which leaves them unsure of how to effectively integrate language and content objectives. A common issue is the struggle to balance subject complexity with language simplicity— to ensure that students grasp technical content without oversimplifying it. Additionally, teachers note the absence of adapted teaching materials and report time constraints in preparing such lessons. These responses suggest that while teachers are making efforts to implement CLIL, they are doing so with limited institutional support and pedagogical resources, which hinders the development of fully effective CLIL courses.

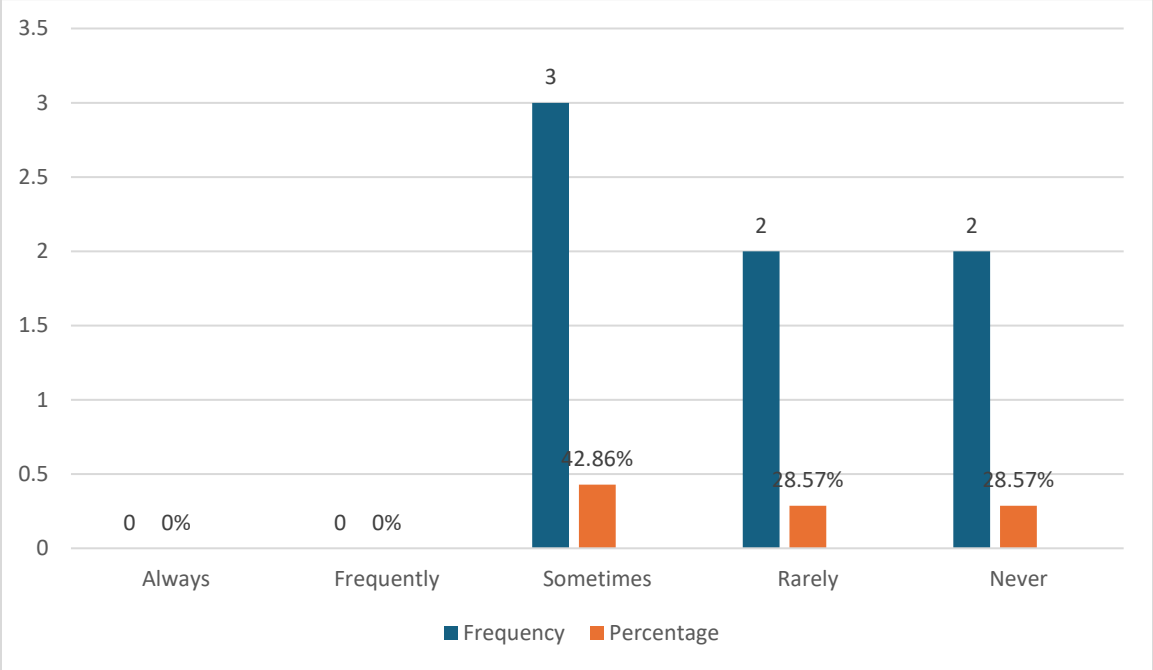
Q 4: What challenges do you face when teaching, and are they more related to language or content?

The question sought the primary challenges teachers face during instruction and whether these are more related to the subject matter or to language use. Most teachers indicated that their difficulties stem largely from language-related issues. They noted that students often lack the vocabulary needed to fully grasp lessons, which requires teachers to simplify terms, repeat explanations, or switch between languages to ensure understanding. While the content itself is generally manageable for the teachers, which makes it accessible in a way students can follow

remains a significant challenge. A few teachers pointed out that the degree of difficulty varies depending on the group, but overall, language-related concerns were more common than those linked to the complexity of the content. These findings highlight the importance of enhancing students' language proficiency and providing pedagogical support for more effective communication in subject teaching.

c- Section Three: collaborative practices between content and language teachers.

Q 1: How frequently do you collaborate with content teachers and language teachers?



Graph 07: Teachers' Reported Frequency of Collaboration with Language and Content Colleagues.

The data showed in the graph (graph 1) above illustrates how often the participating teachers engage in collaborative practices. The responses reveal that 42.8% of teachers stated they sometimes collaborate, while 28.6% reported rarely collaborating, and another 28.6% mentioned they never collaborate. The majority of teachers indicated that this collaboration, when it happens,

is with language teachers and tends to be occasional and somewhat formal, but not consistent or systematic. This suggests that while some efforts at collaboration exist, they are not regular or well-established, which notes a need for more structured and sustained coordination to support effective CLIL implementation.

Q 2: Do you collaborate with language teachers to:

Collaboration Area	**Frequency**	**Percentage of teachers**
A. Design CLIL courses	3	42.9%
B. Evaluate CLIL courses	1	14.3%
C. Design CLIL exams	0	0%
D. Evaluate CLIL exams	0	0%
E. None	3	42.9%
Total	**7**	**100%**

Table 06: Areas of Collaboration with language teachers.

When content teachers were asked to identify the areas in which they collaborate with language teachers in the context of CLIL implementation, the majority indicated limited involvement. Particularly, 42.9% reported collaborating on the design of CLIL courses, while only 14.3% mentioned collaboration in evaluating these courses. No collaboration was reported in designing or evaluating CLIL exams. Additionally, 42.9% of the teachers stated that they do not collaborate with language teachers in any of the mentioned areas. These findings highlight that

although some collaboration exists, it remains occasional and focused mainly on course design, which suggests the need for more structured and widespread cooperative practices.

Q 3: Do you think that this collaboration helps in the effectiveness of the implementation of CLIL classes?

In this item, the responses highlight the positive perception of collaboration with language teachers in enhancing the effectiveness of CLIL implementation. All teachers expressed that such cooperation would help bridge the gap between content and language, improve students' comprehension, especially of technical terms, and support more coherent lesson planning. They emphasized that collaboration could lead to better integration of subject matter and language instruction, benefiting both teaching and learning processes. However, they also noted that this collaboration remains limited due to time constraints, scheduling difficulties, and a lack of institutional frameworks to facilitate regular and structured interaction.

3. Discussion of the Results

This section presents and explains the main findings from the students' questionnaire and the teachers' interview. These results are discussed in light of the study's research questions and hypotheses. Overall, the data offer valuable insights into how content and language teachers' collaborate in CLIL settings, how this influences student learning, what teaching practices are affected, and what challenges emerge.

The first research question focused on the extent of collaboration between content and language teachers. The findings indicate that collaboration exists, but it tends to be irregular and mostly informal. Most teachers mentioned that when they work together, it happens occasionally rather than as part of a structured plan. This reflects the lack of formal systems that encourage

regular collaboration. These findings are in line with Ivanova (2016), who argued that successful CLIL depends on coordinated efforts between subject and language teachers. The limited nature of the collaboration found in this study also lends some support to the null hypothesis. Although collaboration does take place, it has not reached a level that significantly improves how CLIL is implemented.

The second research question explored how collaboration affects student learning. Both students and teachers expressed positive views. Teachers observed that cooperation with language colleagues helps students understand complex vocabulary and concepts more easily. Students, in turn, felt that integrated teaching made lessons clearer and helped them engage more effectively with the material. These views support the first hypothesis, which proposed that collaboration between teachers can enhance students' understanding of both content and language.

In relation to the third research question, the findings show that some collaborative teaching strategies are occasionally used. These include discussing important terms, simplifying subject content, and guiding students in writing projects. However, more formal types of cooperation, such as designing exams together or conducting joint assessments, are still rare. This indicates that although collaboration has begun to influence teaching approaches, it has not yet developed into a consistent part of classroom practice. These observations are consistent with previous studies (Llinares, 2015; Khasawneh et al., 2023), which emphasized that collaboration supports innovation in teaching when it is properly developed.

The fourth research question focused on the challenges of collaboration. Both teachers and students mentioned several obstacles, including time limitations, differences in teaching priorities, lack of administrative support, and the continued use of French in some content courses. Despite these difficulties, some teachers also pointed out positive outcomes such as clearer lesson delivery

and opportunities for professional development. These findings confirm the third hypothesis, which states that collaboration can offer both benefits and challenges. This is also supported by the work of Forte and Flores (2014) and Roselli (2016), who highlighted that meaningful collaboration requires structural support in order to succeed.

In conclusion, the study shows that interdisciplinary collaboration has the potential to improve CLIL by making content more understandable and lessons more coherent. However, collaboration is still not fully developed in many cases. For CLIL to become more effective in higher education, there is a need for more organized teamwork, shared planning time, and professional training for teachers.

3. Conclusion

This section discusses data collection and analysis using tools like students' questionnaire and teachers' interview. The findings show that teachers' collaboration can help improve CLIL by making content clearer and lessons more organized. While collaboration does happen, it is not yet at a level that significantly enhances CLIL implementation and remains underdeveloped in many cases. The study highlights the importance of fostering stronger collaboration among teachers. Further development is needed to fully realize the benefits of CLIL through collaboration.

5. Recommendations

This study highlights several ways to enhance the effectiveness of CLIL and teachers' collaboration in Algerian universities. First, institutions should encourage regular cooperation between subject and language teachers. It is also important to provide training in CLIL methods for all involved educators. Universities need to develop clear policies and support systems to guide CLIL implementation. Students would benefit from additional language support, such as glossaries

and writing assistance. All participants should clearly understand the goals and advantages of CLIL. Furthermore, more research is necessary across various regions and institutions. These steps can help improve both CLIL practices and overall teaching quality.

6. Limitations

- The study used convenience sampling due to time and access constraints, which may limit generalizability, but still offers valuable insights into CLIL implementation and teachers' collaboration in the given context.
- Although CLIL is gaining attention globally, there is a limited body of local research or published resources specifically addressing its implementation and interdisciplinary collaboration in Algerian universities.
- One of the challenges faced during the data collection process was the weak engagement of students with the questionnaire. Many students were unresponsive or showed little interest in completing it, which limited the amount of data collected.

General Conclusion

The present study aimed to investigate the effects of teachers' collaboration in CLIL (Content and Language Integrated Learning) classrooms, with a particular focus on second-year computer science students and their English and content subject teachers. This research sought to explore the extent and nature of collaboration between teachers, its impact on student learning, the teaching strategies developed through such collaboration, and the challenges and benefits experienced by educators. To address these aims, a mixed-methods research design was adopted, combining quantitative data from a student questionnaire with qualitative insights obtained from interviews with computer science teachers.

The analysis of the collected data led to several key findings. First, the results revealed that while some level of collaboration between English and content teachers does exist, it is often informal, occasional, and lacks systematic institutional support. Most teachers reported limited engagement in joint planning or assessment, citing constraints such as time, lack of training, and absence of coordinated structures. However, both teachers and students acknowledged the potential benefits of collaboration, especially in improving students' understanding of subject-specific content through clearer language and terminology.

Second, the study found that collaboration contributes positively to the learning environment when it does occur. Students expressed that coordination between teachers can enhance their comprehension of technical content, improve communication skills, and increase their confidence in using English in academic contexts. Nevertheless, challenges remain, particularly related to linguistic barriers, unbalanced roles between teachers, and a general need for CLIL-specific training and resources.

General Conclusion

In conclusion, the findings confirm the study's main hypotheses: teachers' collaboration in CLIL settings supports student learning and promotes more effective and innovative teaching strategies, while also presenting specific challenges. These conclusions highlight the importance of developing structured frameworks and professional development opportunities to support interdisciplinary collaboration in Algerian higher education. The study contributes valuable insights into the ongoing implementation of CLIL in non-European contexts and calls for greater institutional commitment to fostering collaboration between content and language educators.

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Appendices

Appendix One: Students' Questionnaire

Dear students, in order to fulfill the Master degree, we are required to conduct a research, which this questionnaire is part of. Our research investigates teachers' collaboration in applying CLIL approach (Content and language integrated learning) that you are studying by. It focuses on teaching content (Computer science) through English language to enhance content and language learning simultaneously.

Your responses will be kept confidential and used only for the purpose of this research...Thank you for your help!

أعزائي الطلاب، من أجل الحصول على درجة الماستر، نحن مطالبون بإجراء بحث، وهذا الاستبيان جزء منه. نحاول الاستقصاء حول تعاون أساتذة المحتوى وأساتذة اللغة لتطبيق منهج CLIL. يركز المنهج على تعليم المحتوى واللغة معا على سبيل المثال علم الحاسوب باللغة الإنجليزية وذلك لتعزيز تعلم المحتوى واللغة في آن واحد. سيتم الاحتفاظ بسرية إجاباتكم وسيتم استخدامها فقط لأغراض بحثية... شكراً لكم على مساعدتكم!

Section One: Students' Profile.

01- Gender الجنس

◯ Male ذكر ◯ Female أنثى

02- How old are you? كم عمرك؟

◯ 18-23 ◯ more than 23 أكثرمن

Section Two: Students' Awareness and Engagement with Teachers' Collaboration.

01- How would you rate your understanding of science computer concepts taught in English?

كيف تقيّم مدى فهمك لمفاهيم علوم الحاسب الآلي التي يتم تدريسها باللغة الإنجليزية

		1	2	3	4	5		
Excellent	ممتاز	○	○	○	○	○	Very poor	ضعيف جدا

02- How confident do you feel using English to discuss computer science topics?

ما مدى ثقتك في استخدام اللغة الإنجليزية لمناقشة موضوعات علوم الحاسب الآلي؟

		1	2	3	4	5		
Very confident	واثق جدا	○	○	○	○	○	not confident	غير واثق

03- Do you feel that the English used in your computer science classes supports your understanding of the subject?

هل تشعر أن اللغة الإنجليزية المستخدمة في دروس علوم الكمبيوتر تدعم فهمك للمادة؟

		1	2	3	4	5		
Always	دائما	○	○	○	○	○	Never	أبدا

04- Can you give an example of a time where your English skills helped you understand a computer science topic more clearly?

هل يمكنك إعطاء مثال على مرة ساعدتك فيها مهاراتك في اللغة الإنجليزية على فهم موضوع في علوم الحاسب الآلي بشكل أوضح؟

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……
……

05- What teaching methods do you find most effective in your CLIL classes?

ما هي طرق التدريس التي تجدها أكثر فاعلية في فصولك الدراسية في اللغة الإنجليزية كلغة أجنبية؟

☐ Group work فريق عمل

☐ Discussions مناقشات

☐ Projects مشاريع

☐ Other

06- How often do your teachers use integrated activities that combine both English language skills and computer science content?

كم مرة يستخدم معلموك أنشطة متكاملة تجمع بين مهارات اللغة الإنجليزية ومحتوى علوم الحاسب الآلي؟

	1	2	3	4	5	
Always دائما	◯	◯	◯	◯	◯	Never أبدا

Third Section: Challenges and Observations of Teachers' Collaboration and Learning in CLIL

01- Do you think your English and computer science teachers collaborate well when preparing lessons or assessments?

هل تعتقد أن معلمي اللغة الإنجليزية وعلوم الحاسب الآلي يتعاونون بشكل جيد عند إعداد الدروس أو التقييمات؟

……
……
……
……

02- Have you noticed any challenges that your teachers face when collaborating? If so, please describe them.

هل لاحظت أي تحديات تواجه معلميك عند التعاون؟ إذا كان الأمر كذلك، يرجى وصفها.

……
……
……
……

03- What do you think are the benefits of your English and computer science teachers working together?

ما هي برأيك فوائد عمل معلمي اللغة الإنجليزية وعلوم الحاسب الآلي معاً؟

- ☐ Interdisciplinary Learning تعلُّم متعدد التخصصات
- ☐ Improved Communication Skills تحسين مهارات التواصل
- ☐ Critical Thinking Development تطوير التفكير النقدي
- ☐ Engagement with Real-World Issues التفاعل مع قضايا العالم الحقيقي

04- Have you noticed any changes in how lessons are taught or how the class is organized when your English and computer science teachers collaborate?

هل لاحظت أي تغييرات في كيفية تدريس الدروس أو كيفية تنظيم الفصل عندما يتعاون مدرسو اللغة الإنجليزية وعلوم الحاسب الآلي؟

……
……
……
……

05- What difficulties do you face when studying in English?

ما الصعوبات التي تواجهها عند الدراسة باللغة الإنجليزية؟

☐ Difficulty following the teacher صعوبة في متابعة الأستاذ

☐ Embarrassed to speak English الإحراج من التحدث بالإنجليزية

☐ Trouble expressing ideas صعوبة في التعبير عن الأفكار

☐ Limited vocabulary محدودية المفردات

☐ Complex subject content محتوى الموضوع المعقد

☐ Lack of interest ضعف الحافز الدراسي

☐ Other

Fourth Section: Students' Satisfaction and Recommendations

01- Overall, how satisfied are you with the learning experience in your CLIL classroom?

إجمالاً، ما مدى رضاك عن تجربة التعلم في صفك الدراسي بمنهج CLIL؟

	1	2	3	4	5	
Very satisfied راض جدا	○	○	○	○	○	not satisfied راض غير

02- Would you recommend this type of learning approach to other students? Why or why not?

هل توصي بهذا النوع من نهج التعلم للطلاب الآخرين؟ لماذا أو لماذا لا؟

……
……
……
……

Thank you for your participation

Appendix Two: Teachers' Interview

Section One: Teachers' Profile

1- Degree of your study

☐ Master

☐ Magister

☐ PhD

2- What is your level of English?

☐ Upper Intermediate (B2)

☐ Intermediate (B1)

☐ Pre-intermediate (A2)

Section Two: Teachers' Knowledge and Understanding of CLIL

1- Do you know CLIL (content and language integrated learning approach)?

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……
……
……

2- Do you know its features?

……
……

……

……

3- What problems you face in designing CLIL courses?

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4- What challenges do you face when teaching, and are they more related to language or content?

……

……

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……

……

Section Three: Collaborative Practices Between Content and Language Teachers.

1- How frequently do you collaborate with content teachers and language teachers?

- ☐ Always
- ☐ Often
- ☐ Frequently
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

2- Do you collaborate with language teachers to:

A. Design CLIL courses

B. Evaluate CLIL courses

C. Design CLIL exams

D. Evaluate CLIL exams

E. None

3- Do you think that this collaboration helps in the effectiveness of the implementation of CLIL classes?

……
……
……
……
……
……

Thank you for your participation!

ملخّص

يُعدّ تعاون المعلّمين عاملاً أساسياً يزداد الاعتراف بأهميته في إنجاح تنفيذ نهج التعلّم المتكامل للمحتوى واللغة (CLIL). تهدف هذه الدراسة إلى استكشاف أثر التعاون بين أساتذة اللغة الإنجليزية وأساتذة علوم الحاسوب على تجربة تعلم الطلبة ضمن هذا السياق، كما تسعى إلى تحليل الاستراتيجيات التدريسية الناتجة عن التعاون البين تخصصي، مع تحديد أبرز الفوائد والتحديات التي يواجهها المعلمون. أُجريت الدراسة على طلبة السنة الثانية في تخصص علوم الحاسوب وأساتذتهم بجامعة المسيلة. ولجمع البيانات، استخدمت الدراسة أداتين: استبياناً شبه منظّم موجهاً للطلبة، ومقابلات مع الأساتذة المتخصصين. أظهرت النتائج أن التعاون بين المعلمين، وإن وُجد، غالباً ما يتم بصورة غير رسمية وغير منظمة. ومع ذلك، أظهر هذا التعاون أثراً إيجابياً في تعزيز تفاعل الطلبة، وفهمهم للمحتوى، وتنمية مهاراتهم في اللغة الإنجليزية. كما أشار المعلمون إلى أن التعاون يسهم في تحقيق تكامل بين أهداف المحتوى وأهداف اللغة، إلا أنهم عبّروا عن صعوبات تعيق هذا التعاون، مثل ضيق الوقت وغياب الدعم المؤسسي. وبناءً على هذه النتائج، توصي الدراسة بضرورة تعزيز فرص التعاون المنظم بين المعلمين، وتوفير التدريب المتخصص، بهدف دعم ممارسات (CLIL) وتحسين تحصيل الطلبة بشكل أكثر فاعلية..

Résumé

La collaboration entre enseignants est aujourd'hui largement reconnue comme un facteur déterminant dans la réussite de la mise en œuvre de l'approche d'apprentissage intégré du contenu et de la langue (CLIL). La présente étude examine l'ampleur et l'impact de la coopération entre les enseignants d'anglais et ceux d'informatique sur les expériences d'apprentissage des étudiants dans un contexte CLIL. Elle vise également à analyser les stratégies pédagogiques issues de cette collaboration interdisciplinaire, ainsi qu'à identifier les bénéfices et les défis rencontrés par les enseignants. L'enquête a été menée auprès d'étudiants de deuxième année en informatique et de leurs enseignants à l'Université de M'sila. Pour la collecte des données, deux instruments ont été mobilisés : un questionnaire semi-structuré destiné aux étudiants et des entretiens menés avec les enseignants de spécialité. Les résultats révèlent que, bien que la collaboration soit présente, elle demeure souvent informelle et irrégulière. Néanmoins, lorsqu'elle est mise en œuvre, elle favorise l'engagement des étudiants, améliore leur compréhension du contenu et renforce leurs compétences en langue anglaise. Les enseignants ont souligné que les pratiques collaboratives permettent d'harmoniser les objectifs linguistiques et disciplinaires, tout en évoquant certains obstacles tels que le manque de temps et l'insuffisance de soutien institutionnel. En conclusion, l'étude recommande de promouvoir des opportunités de collaboration structurée et de proposer des formations spécifiques afin de consolider les pratiques CLIL et d'améliorer les performances des étudiants.