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From Francophonie to Anglophonie: Investigating Code-Switching as a Mediating Pedagogical Strategy in the Shift from French to English in the Algerian University

A Case Study of English-Medium Instruction in the Faculty of Medicine at the University of Khenchela

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Dedication

In this special dedication, I wish to honor and express my gratitude to the people who have played an essential role in my life, and those who have supported me all these past years.

To my parents, pillars and guides, whose sacrifices and encouragement have allowed me to achieve my goals. Their unconditional love and support have been the strength that has carried me throughout my academic career.

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Abstract

The present study investigates the role of code-switching within the implementation of English-Medium Instruction (EMI) in the Faculty of Medicine at Abbes Laghrour University of Khenchela, Algeria. As Algerian higher education increasingly shifts toward English in scientific and medical disciplines, this research explores how multilingual classroom practices shape teaching and learning processes. Adopting a mixed-methods approach, the study combined classroom observation with three teachers over the course of three sessions and questionnaire administered to eighty-seven first-year and second-year medical students participated in the study. The findings reveal that code-switching between English, French, and Arabic constitutes a strategic pedagogical practice used to facilitate comprehension, clarify complex medical terminology, and enhance classroom interaction. The results further indicate that while participants generally hold positive attitudes toward EMI due to its academic and professional value, significant linguistic challenges persist, particularly regarding English proficiency and content accessibility. Moreover, the study demonstrates that EMI in the Faculty of Medicine at Khenchela remains transitional and hybrid, characterized by the coexistence of multiple linguistic resources rather than exclusive English use. Ultimately, the research highlights the importance of flexible multilingual practices, teacher training, and linguistic support in ensuring the effectiveness of EMI in Algerian medical education.

Keywords: English-Medium Instruction (EMI), Code-Switching, Medical, Education, Multilingualism; French; Higher Education

List of Abbreviations and Acronyms

N	ABBREVIATION	EXTENTION
01	CA	Code Alternation
02	CM	Code-Mixing
03	CLIL	Content and Language Integrated Learning
04	CS	Code-Switching
05	EME	English Medium Education
06	EMI	English-Medium Instruction
07	ETPs	English Taught Programs
08	IMC	International Medical Communication
09	LA	Language Alternation
10	LST	Language Switching Tasks
11	L1	Language 01
12	L2	Language 02
13	ME	Medical Education
14	NLP	Natural Language Processing

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General Introduction

1. Background of the study

The Ministry of Higher Education and Scientific Research transformative has recently shifted to endorse English in Higher Education, namely English-Medium Instruction in particular scientific sectors such as medicine, as a reform-oriented approach. This initiative requires time, effort, and high resources for actual execution because, among other constraints, medical studies were conducted purely in French language, from instruction to teaching materials. In this transitory phase, the application of both French and English simultaneously seems to be an unpreventable but practical pedagogical strategy transmitting and making transformation much easier for teachers and students. While the institutional goal of EMI is to integrate English as a scientific research language, the immediate linguistic shift requires a flexible approach. In this context Code-Switching appears to be a functional mechanism that bridges the gap between student's and teachers' existing linguistic repertoires and the strict demands of EMI. This fluid alternations serves as an important communicative mediator that supports medical content transmission and comprehension. The strategic use of CS withing EMI ultimately shapes student engagement and medical terminology acquisition as well as teaching practices.

Many recent studies have started to investigate the interplay between EMI and code switching in scientific disciplines. Researchers have documented that the strategy of code-switching allows the facilitation of complex academic concepts, fosters vocabulary understanding, and thereby increases student participation in English for Medical Purposes (EMP) courses (Laggoun et al., 2023). CS has also been argued to ensure a supportive learning environment by facilitating a gradual transition from French to English, especially in multilingual societies such as Algeria (Khelalfa et al., 2023). The pedagogical roles of CS

include explaining new terminology, reinforcing concepts, and bridging the linguistic gaps of learners while not hindering target language proficiency (Laggoun et al., 2023). Suryanti et al. (2025) discussed “Cognitive Load Management”, showing that integrating CS can alleviate cognitive overload for non-native English speakers, allowing them to focus on medical content rather than language proficiency.

The current study focuses on how Code-Switching (CS) influences Students' Academic Performance in terms of engagement, comprehension, and acquisition of medical English terminology, lesson explanation, and classroom interaction, all of which contribute to the gradual linguistic shift required for proficiency in English medical communication. In Algeria, medical education presents a particular linguistic context where students often study scientific content in English while remaining strongly influenced by French in academic communication. This linguistic reality makes code-switching an important classroom strategy that may affect students in different ways.

The present study investigates also the gradual shifting process from French to English within the medical faculty context at the University of Khenchela. It mainly focuses on Code-Switching between French and English as a mediating pedagogical strategy employed by instructors for several reasons, including the need for such an approach in the current period which is undeniably a critical and important transitional phase at many levels to establish a solid ground for EMI in Higher Education and Scientific Research.

Despite the numerous studies that have been conducted on Code-Switching within bilingual or multilingual education and health communication, there is still a severe lack of empirical research into the phenomenon, with even fewer studies touching upon the alternation between French and English specifically in terms of English Medium Instruction (EMI). In contrast,

Code-Switching involving French/Arabic or English/Arabic has been prevalent in Algerian universities for decades.

2. Statement of the problem

Currently, English is being widely used as an instructional language in medical education around the world, including the University of Khenchela. However, formal teaching in medicine is still oriented in the medium of French, which creates obstacles for most students to enhance their English proficiency, that is considered necessary for international medical communication (IMC). The main problem here is the lack of a functional transitional approach from French to English within the curriculum that may block students' understanding of medical English, engagement, and comprehension in general. Code-Switching became a necessary pedagogical strategy during the transition to EMI, considering that the majority of teacher were trained in French language and do not yet fully master English to explain clearly complex medical concepts and maintain effective classroom communication.

3. Research Questions

In accordance of with the problem statement, this study aims to answer one main research question followed by two secondary questions.

Main Research Question

How does Code-Switching between French and English influence academic performance and English development in English-Medium Instruction (EMI) at the University of Khenchela?

Secondary Research Questions

- What is the relationship between the occurrence of Code-Switching during medical lectures and students' assimilation of medical terminology?
- what are students' attitudes about the use of code-switching in relation to comprehension, participation, and classroom discussion?

4. Aim and Objectives of The Study

This study assists educators involved in medical English Instruction by providing evidence-based strategies, managing the transition from French to English by evaluating the influence of Code-Switching on medical students and their performances, engagement and comprehension. The research will spot lights on bilingual teaching practices in medical sciences at Khenchela university and analogous environments. The research findings will be useful for decision-makers in improving the trilingual teaching of medicine.

This research offers new insights and different perspectives, particularly considering that the integration of the English-Medium Instruction is expected to have a solid impact both in the short and long term across various fields. Consequently, It serves as a gateway to discovering the benefits that will be given to the Algerian University from the reforms suggested by The Ministry of Higher Education and Scientific Research. Furthermore, it is worthwhile mentioning that only two years ago, the University of Khenchela founded the faculty of medicine; it is an opportunity for studying the phenomenon of Code-Switching.

5. Research Methodology

To conduct this study, a blended approach (mixed methods) is adopted. This approach allows the collection of both qualitative and quantitative data. The Qualitative data collection methods include class observations that provides deeper insights and understanding on students' new experiences while the quantitative data were collected through a questionnaire and statistical analysis of data to quantify code-switching frequency, student attitudes, and perceived learning benefits.

This study adopts an Exploratory Sequential mixed Methods Design. Since the study is based on a certain pattern starting with phase one: Qualitative Approach, investigating Code-Switching phenomenon through a Classroom Observation with three teachers during three

sessions and an online questionnaire administered to 87 first-year and second-year medical students participated in the study with a total of 30 respondents completing the survey.

6. Structure of the Dissertation

The nature of this research necessitates to articulate it on two distinct parts, theoretical and practical, which are themselves subdivided into two chapters. The theoretical part or “*The Literature Review*” will be devoted to the previous studies related to Code-Switching or the alternation between English and French, while the second section will focus on English-Medium Instruction in the medical field.

As for the practical part, it will also be divided into two sections. The first section will focus on the research design, the adopted methodology to conduct the study and the data collection instruments (classroom observation followed by an online questionnaire). The second chapter will be dedicated to the research methodology, careful analysis and interpretation of the obtained findings. The results are followed by discussion where they are analyzed and interpreted in the light of the theoretical framework.

Chapter One: Code-Switching and English-Medium Instruction

Introduction

In education, particularly in language studies and specialized fields like medicine, a phenomenon known as code-switching (CS) occurs when instruction is delivered in multiple languages, especially with the accreditation of English-Medium Instruction (EMI) at the Algerian University. EMI has become progressively predominant in educational contexts, particularly in Higher Education, which is driven by a number of factors like technology, and the escalating role of English as a universal academic language. Despite its vogue, EMI remains recent in the Algerian University, which still adopts the French Language in education specifically in scientific fields such as Medicine. This chapter delves into the multifaceted relationship between Code-Switching as a communicative strategy and the burgeoning implementation of EMI. The first section is entirely devoted to providing a theoretical framework for the study. It first scopes general concepts including code switching, its types, and its models, then we delve into its pedagogical role, its linguistic and cognitive mechanism, finally the socio-linguistic dimensions of Code-Switching. The second section, aims to explore EMI as an educational practice. It first outlines key definitions and concepts, the linguistic situation in Algeria, moving to the rise of EMI in Algeria as well as in the scientific research, then its introduction to university of Khenchela and finally how it is connected to CS.

1.1. Code-Switching

1.1.1. Definitions and Concepts

Code-Switching encompasses multiple definitions that vary across fields and disciplines; it is associated with several related concepts such as Code-Mixing, Code Alternation, language Alternation, etc.

Romaine (1995) clarifies code-switching from a sociolinguistic perspective as "the use of more than one language or variety in the same interaction." (p.121). It explains that a speaker

uses at least two codes in one conversation, with someone else who understands him and shares the same interests.

Myers-Scotton (1993) describes code-switching as "the use of two or more linguistic varieties in the same conversation"(p. 48). This refers to the speaker's ability to employ more than one code or language while chatting in various situation, about different topics alternating from a language to another when needed.

Bullock and Toribio (2009) extend a more structural approach, defining code-switching as "the systematic alternation of languages within a single conversation or utterance" (p. 270). This shows that CS is a cognitive process that requires at least mastering two or more than one language because the switch is happening in a natural and fluent way.

Gardner-Chloros (2009) believes that code-switching is a key component of bilingual language proficiency. She defines it as "a regular and meaningful practice in multilingual conversations" (p. 53). That is to say, CS is a normal behavior in multilingual context, and there is reason for it in speech interactions, not a shortcoming of language.

According to contemporary inquiries, especially those about computational or linguistics analysis of speech/text corpus, translation (Natural language Processing or Multilingual Discourse Analysis), Bhowmick et al. (2023) define the term CS as follows: " The use of more than one language in the same conversation or utterance, with switches occurring at various linguistic levels (sentences, clauses, words)" (p. 3). This applies to modern computational and linguistic research including Natural Language Processing (NLP), a field that studies how computers analyze and process human language. And multilingual discourse studies where scholars use large amount of collected data through communication (spoken and written) to analyze.

In accordance with all these definitions, one can abridge that Code-Switching is not only a cognitive process using two or more languages to communicate or express thoughts, but it goes beyond being a social practice and efficiency to facilitate communication, even the digital one such as programming language and translation. In other cases, it expresses the linguistic state and cultural differences of many societies; it may even define their identity and linguistic diversity to make them fertile ground for linguistic studies.

1.1.1. The Linguistic Situation and Code-Switching in Algeria

The current linguistic situation in Algeria can be described as a complex multilingualism, marked by the coexistence between dialectal Arabic (the majority mother tongue), Tamazight (the national language), classical Arabic (official language) and French (a very important language used in education, administration and media). This mix creates a form of triglossia or linguistic conflict, where languages are hierarchical between the vernacular (spoken), the official and the prestigious one. What makes CS an omnipresent aspect of Algerian communication, occurring in everyday conversation, media, education and digital platforms.

Algerian Arabic and French dominate the bilingual scene in Algeria, a legacy of colonial history reinforced by French's status as a prestige language in education and public life in addition to the rapid spread of the English language in the past few years, which has become part of the linguistic mix in Algerian community. Each language has its own unique status from different perspectives, political, historical, social, or linguistic (Amazouz et al., 2017).

1.1.1.1. The Arabic Language

The Arabic Language is the standard Arabic language, literary or classical, a language learned in Koranic schools and in Algerian schools. It is mainly used in state institutions, in addition to its religious function. It has a high place in Algeria because it represents the language that unites all groups in society. This why it is the recognized language in the constitution. It is also used by all Muslims around the world to pray, regardless of their mother tongue.

However it exists a different Arabic that widely used in the Algerian society referred to as Dialectal Arabic, which is the mother tongue of the majority of the Algerian population, is the language of daily life. It is used in informal situations. It is spoken in the street, within the family, in the office between colleagues, or between employees, and at the market between customers and merchants. Dialectal Arabic is the language of transactions par excellence (Moulasserdoun, 2022).

1.1.1.2.The Amazigh/Berber Language

Tamazight is the mother language of the Berber speaking communities such as Shawiya, Kabyle, Tuareg; it is one of the oldest languages in North Africa. After the 2016 constitutional revision, Tamazight became a national and official language. Like the High Council of the Arabic Language, the Council of the Tamazight Language was created. The latter is linked to the presidency; its main purpose is to concretize the use of the language and the ways of applying it in the educational context. In the same vein, the Algerian grouping of Tamazight as a national aspect (called the grouping) brings together the writings of Tamazight throughout the national territory and works to develop the language.

Although Tamazight is an official language, in reality it is not compulsory like Arabic in the Algerian school. So, it is up to people to choose to learn this language for their children. Most of rural zones such as Kabylie, Aures and some areas of the Algerian Sahara (B'ni Mzab and Touarag) still speak Amazigh language and pass it to their children as an act of preservation of the original identity of the inhabitants, this what has made it to this day a precursor language and has not disappeared because of its importance as a symbol of resistance and northern African identity (Chahboub & Belaidi, 2023).

1.1.1.3.The French Language

Despite the fact that it is not officially recognized in the country, it remains to be an established force in some domains, including trade, the media, and the field of higher learning,

such as science, biology and business. However, it is losing its influence as the government focuses on Arabization and the use of the English language. This is already being witnessed, as the hours allocated for the study of the French language in the national curriculum from 2025 onwards are less (Zeghar, 2024).

French Language remains influential, especially among intellectuals, yet its status is still debated in relation to the Algerian complex identity, and linguistic policies. French is often perceived both as language of prestige and legacy of colonialism creating diverse opinions and attitudes toward its use in society, reflecting a dynamic coexistence between historical attachment to French and the expansion of English within educational, and institutional context (Bentchikitou, 2026).

1.1.1.4.The English Language

English language has no official status in Algeria, but it is progressively making its way through, particularly in higher education and primary schools. Its acquisition is being promoted, as a political policy to restraint French. Among younger generations, it is becoming the predominant foreign language, particularly in scientific, technological, and economic sectors. The presence of English in Algeria is increasingly evolving in higher education. This trend is occurring in a setting where English has become indispensable for gaining academic and professional prospects on an international level. English serves as the main vehicular language for mediated international culture, emphasizing its undeniable significance (Mekaoussi, 2025).

Algeria is domicile to a variety of codes, dialectal Arabic, Standard Arabic, Tamazight, French, and English. In different contexts, people often alternate between these languages naturally. This phenomenon is known as *Triglossia*. Dialectal Arabic is usually used during conversations with friends and family members. Standard Arabic is utilized in formal settings such as government offices, educational institutions, and religious ceremonies. Tamazight was recognized as an official language in 2016. However, its limited teaching in schools restricts its

daily use. French continues to be dominant in both education and professional environments. Its usage is gradually declining. English, on the other hand, is increasingly privileged, particularly among the youth and in scientific fields. The linguistic heterogeneity in the Algerian community is influenced by historical and political factors deep sunken in the country (Dkhakhechna, 2026).

1.1.2. Approaches to Code-Switching

Many Approaches consider CS as an eminent topic in the multilingualism contexts. Turibio (2009) have noted that there are three major approaches that investigate CS: the structural, the psycholinguistic, and the sociolinguistic.

1.1.2.1.The Structural Approach

The Structural Approach is concerned with the role of CS in disclosing different levels of language (syntax, semantics, phonology, etc.). In this field, CS is not purposeless or aimless, but it is a systematic phenomenon and communicative system. However, because the forms of CS originated from both language systems, bilingual speakers are able to distinguish between the grammatical and ungrammatical patterns of CS. Many disciplines (phonology, semantics, discourse, etc.) are concerned with the relation between CS and morpho-syntax. However, few researchers deal with the interaction between phonology and code conversion. For this reason, such kind of studies should be developed (Turbio, 2009).

1.1.2.2. The Psycholinguistic Approach

The psycholinguistic Approach focuses on the cognitive mechanisms and neuro-anatomical structures that are involved in the control of two languages. The use of the two codes during conversation is examined through Language Switching Tasks (LST). LST is used to evaluate bilingual control, attention, and memory. The psycholinguistic approach investigates CS to understand the cognitive techniques, which lie in the production, perception, and acquisition of the bilingual speakers (Treffers-Daller et al., 2021).

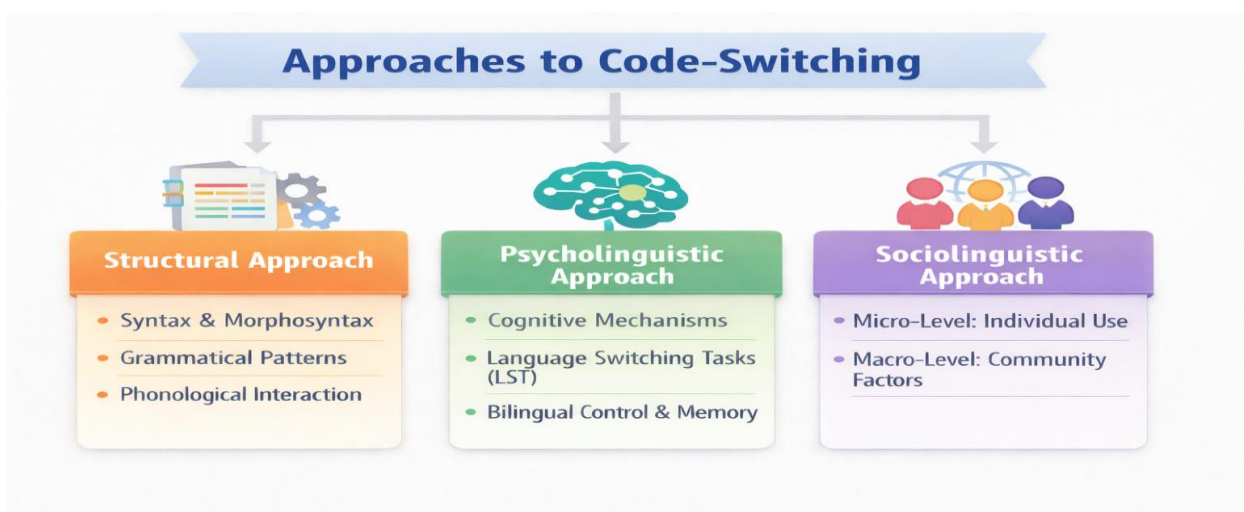
1.1.2.3.The Sociolinguistic Approach

Isurin and Winford (2009) mentioned in their book Multidisciplinary Approaches to Code-Switching, in which they explain CS in detail and show the position of the phenomenon in several approaches, they state:

For many researchers, CS provides direct insights into the ability of bilinguals to manage and to deploy different linguistic systems even while alternating between them. This ability arises from a confluence of cognitive, linguistic, and social factors, each of which is normally studied independently of the other. Cognitive approaches generally focus on CS as an index of a bilingual’s ability to selectively inhibit or activate a language. (2009, p.191)

They have Investigated CS based on the existing frameworks, which have studied the monolingual behavior at the macro and micro levels. While the macro level (society) views CS as a "community behavior" and examines it based on societal elements and the social context, the micro level views CS as a "individual performance", it concentrates on the discourse itself.; it investigates CS according on the societal factors and the social context.

Figure 1
Approaches To Code-Switching (AI generated)



1.1.3. Types of Code-Switching

There are four main types of code switching:

- **Extra-sentential / Tag Switching**

This type involves inserting a tag from one language into an utterance in another language. For example: *Bro*, no es tu tipo, *you know what I mean!* Another example: the use of boundary terms by Turkish students like *ama* “but” or *yani* “I mean” while speaking English or other languages (Suhardianto & Afriana, 2022).

- **Inter-sentential Switching**

In inter-sentential , code switching occurs at sentence boundaries; the beginning or end of a sentence. This type is often used by fluent bilingual speakers. For example: Si tu es en retard pour l’anniversaire de maman cette fois, tu es *dead* ! (Suhardianto & Afriana, 2022).

- **Intra-sentential Switching**

In this type, the shift is done right in the middle of a sentence, no interruption, pauses or second thoughts. In simple words it is a spontaneous move by the speaker. For instance: You are sleepy *cogu zaman* (most of the time), because you spend *saat* (hours) in your bed (Client Challenge, n.d.).

- **Intra-word Switching**

The Code-Switching occurs at the word-level language, when elements from two different languages within a single word, typically involving a lexical stem from language one and morphological affixes from language two. For example: English stem (like) + French suffix [Er] = *Liker*, a second example as in: English verb stem (check) + French suffix [Er] = *Checker* (Sabty et al., 2021).

1.1.4. Patterns/ Models of Code-Switching

Blom and Gumperz (1972) introduced two main patterns of Code-Switching *namely Situational CS and Metaphorical CS*. Later on , Gumperz (1982) developed the Metaphorical CS and suggested a new model *Conversational CS* .

1.1.4.1.Situational Code-Switching

This model *Situational switching* was introduced in the 1970s . It is viewed as the change of code that is influenced by the context and the interlocutor . It includes shift for topic ; it depends on the fact that a linguistic variety is allocated to a cluster of different themes, topics , speakers or communicational purposes. For example, changing language when boss enters the office (Myers – Scotton & Ury , 1977).

1.1.4.2.Metaphorical Code-Switching

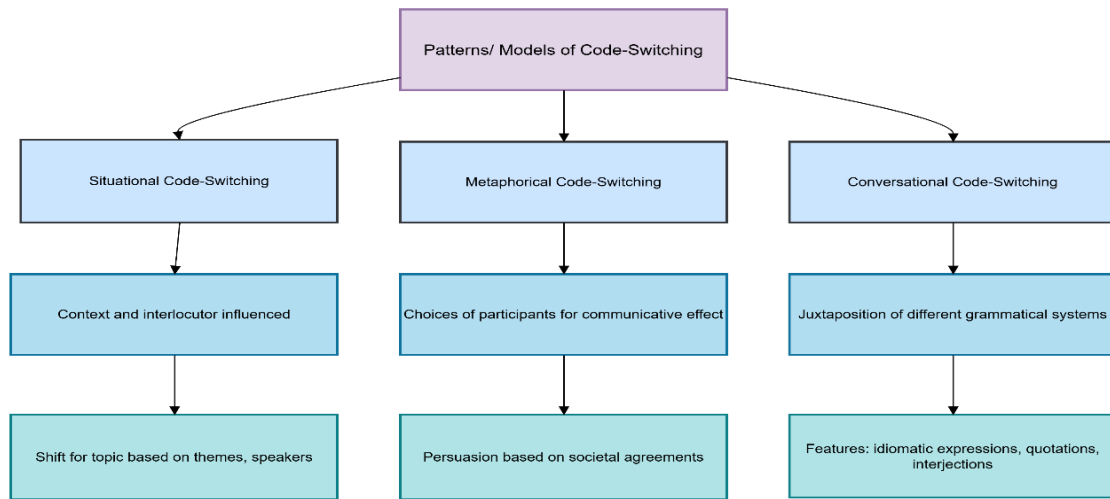
The model depends on the choices that participants make to switch codes at a specific time during conversation .Therefore , the speaker switches to achieve a special communicative effect on listeners. Myers _ Scotton and Ury (1977) believe that "metaphorical switching also depends on societal agreements " (p.5). This means, it includes the allocation of codes according to the societal conventions. Actually, metaphorical CS is used to convince, persuade or to draw attention. For example, during a family dinner (informal gathering) speakers may switch to a high- prestige language to discuss serious business topics changing the tone.

1.1.4.3.Conversational Code-Switching

Gumperz (1982) developed metaphorical code switching and introduced the concept of *Conversational code switching* which is "the juxtaposition within the same speech exchange of messages belonging to two different grammatical systems or sub – systems" (p. 57) . Conversational CS has some specific features as: idiomatic expression, quotations, interjections, intentions and subjective judgements (Arief & Khotimah, 2019).

Figure 2

Patterns Of Code-Switching



1.1.5. Linguistic and Cognitive dimension of Code-Switching

In neuroscience, Code-Switching is a cognitive arduous process but beneficial; it is directly connected with the control mechanisms of bilinguals. Rather than random switches, it is a work of brain that mediates attention, thinking and words; this procedure processes in language production before even speaking (Özkara et al., 2025). It is found that code-switching involves executive functions, including self-consciousness and task alternation because it pushes the speaker to put on hold one language while activating another. It highlights the fact that CS provides insight into bilingual processing with respect to how bilinguals manage two co-existing systems, thus shaping cognitive flexibility and efficiency in task processing (Khatib et al., 2025).

It is challenging to measure and determine bilingual competence in linguistics because code-switching adheres to different competences, syntactic, semantic, and pragmatic rules that define language structure and communicative skills, and CS reveals a hybrid linguistic system rather than two distinct languages (Rayo et al., 2024). Also, the switching into one system, the speakers can make real time meaning constructions faster through optimal choice of linguistic

options in interaction, thus relieving their cognitive burden. This has a remarkable impact on discourse systemization, identity assertion by showing who you are through accent or behavior , and pragmatic thinking helping to understand the hidden intentions in a specific context. In general, both cognitive and linguistic dimensions of CS are deeply intertwined. Because they influence each other in various ways (Mrani & Azmi, 2025).

1.1.6. The Socio-linguistic Dimensions of Code-Switching

Code-Switching is socially embedded in communicative practices which manifests processes of identity formation, power dynamics, and situational accommodation. Obviously and with solid evidence, speakers from multilingual background code-switch intentionally to create and establish in-group identity, group affiliation, social solidarity or social distance depending on the context of interaction (Buriyeva, 2025). In a multilingual society, CS serves as a symbol for identity management in that it allows the speakers to be affiliated to certain socio-cultural communities and differentiate themselves from others. Sociolinguistic studies have showed that the use of language in a context is dependent on various factors like place of occurrence, topic of conversation and participants. Language choice is made based on situational contexts in order to comply with social norms and the objectives of the conversation. CS is becoming more and more a common ground in civic areas and in the mixed contexts such as international universities, typically among young generations. It is seen as a symbol for hybridity and a modern multilingual identity (Jehan et al., 2025).

1.1.7. Pedagogical Role of Code-Switching

In Algeria, during classroom observations show that teachers and students switch between English, Arabic and French to fill lexical gaps, facilitate teaching and often do so unconsciously, although teachers tend to view the practice negatively.

1.1.7.1.Code-Switching in Education

Code-switching in education is when teachers or students switch between two or more languages during a lesson. This happens a lot in classrooms where people speak more than one language. When teachers or students switch languages, they do it to help everyone understand better. Teachers use code-switching for reasons. It helps explain ideas that students do not assimilate the idea in the main language. It also helps give instructions, check if students understand, and make the classroom feel more comfortable, especially for beginners. Sometimes it helps teachers save time when explaining words, grammar rules or expressions that that are specific to any culture.

There are ways code-switching happens in classrooms. One way is when the speaker switches languages between sentences. Another way is when they switch languages in the sentence itself. A third way is when they add phrases or words from another language into a sentence (Lavadia et al., 2025).

In classrooms where people speak languages like when French is taught as a foreign language, teachers might switch between French and the student's main language like Arabic or the local dialect. This helps students understand and communicate well. When used correctly, code-switching can be a way to help students learn and interact in the classroom. But some experts in education do not think code-switching is a good idea. They think it might make students not hear the language enough. So, some teaching methods say to use the language as much as possible and only use code-switching when it is really needed (Ramaila, 2025).

1.1.7.2.Code-Switching in Medical Studies

Code-Switching is always seen as a strategic practice in multilingual context. Not just in class but even in hospitals between healthcare staff and patients to ensure an effective communication and understanding. In medical studies and education, it can be considered as a kind of translation to simplify accurate and complex terminology and make it accessible to

students especially at the beginning of learning the basics, also to enhance their engagement. This shows that the alternation between medical jargon and standard English is a sort of adaptation to the linguistic situation in some cases that require intervention and finding a pedagogical exit (Chen, 2025).

In the Algeria, CS is not a new phenomenon, but it is a natural practice even in languages teaching, where professors may use the Arabic or the Algerian dialect to explain some complex concepts, which is recommended and accepted. Now with the introduction of English, Code-Switching is relevant to accelerate the transition that the Algerian University is witnessing these couple of years, and to raise the standards of local medicine to a higher international level.

1.1.8. The Shift from French to English Instruction in Medical Studies

The transition of the language of study in Algerian medicine from French to English, it appears to be an institutional reform under the wider reform of the language policy in higher education in Algeria. This transition is a new development in Algerian higher education system where French had been used as a legacy in medicine and scientific studies. It has been progressively replaced by English as the new language of study since reforms were imposed from 2023 and up to 2025–2026 academic year , where all first-year medical faculties (medicine, dentistry and pharmacy) would have been required to be conducted in English, following the Directives of the Ministry of Higher Education, 2025 (Sakrane, 2025) .

This critical reform has been attributed to a national policy designed to integrate Algerian medical training to world medical sciences where English language predominates both for studies and researches. This indicates that the reform mainly affects the scientific and medical studies which are required to be in English due to pressures from globalization and demand for the strengthening of international academic communication, publishing and effective participation in international events. This is to enable ambitious Algerian researchers to emerge and highlight their potentials in prestigious international forums and to impose their presence

as effective elements in the evolution of the scientific field notably in medicine (Ghouali, 2024).

At the pedagogical and institutional levels, the use of English in medical education has needed significant structural resources, in particular the training of teachers and the curriculum planning. While intensive training has been rolled out across the country in order to prepare medical teachers to teach in English bearing in mind their professional acceptance as a condition of this radical change. diverse strategies are now in place to support the initiation of English medical education since 2025 by providing specific instructions and by designing appropriate teaching materials.

Despite the advantages, the current problems in teaching of medicine in English are still largely due to professors' weak language and communicative skills, inadequacy of pedagogical tools and difficulties encountered by students. They are outweighed by the solid instrumental goals which are more designed to achieve a full access to international medical knowledge, greater visibility in academic research and the competitiveness of graduates in the international market. However, these scholars note that the process of this reform is slow and has been subject to transitional multilingual model where the dominance of English over French is still hanging (Tihal, 2025).

1.2. English-Medium Instruction (EMI)

1.2.1. Definition and Conceptualization

English Medium Instruction (EMI) involves diverse definitions that vary across educational disciplines. The concept in Higher Education research is associated with related terms as Content and Language Integrated Learning (CLIL), English-Medium Education (EME), and English Taught Programs (ETPs). However, EMI maintains certain features that distinguish it from the given approaches.

EMI is conceived of by most recent research as English Language teaching of non-language subjects in a multilingual context other than their mother tongue so as to further improve the quality and efficiency of curricula. Most recently (EMI) has been viewed as a technology-Enhanced Pedagogical Approach, that is, as a means of mediating disciplinary content delivery and academic language development through the use of English and artificial intelligence. Hence, EMI is no longer seen simply as an instructional medium, but rather as a responsive and dynamic environment in which humans and technologies engage in learning.

Tang and Curtis (2025) define EMI as the use of English as the medium of instruction in order to give students access to content other than the English language (as a linguistic code), most particularly in non-English-medium instructions in the contexts of higher education systems. The recent literature within applied linguistics would thus refer to EMI as an attempt to use English in a context with most of the students being L2 learners.

Malki (2025) highlights the perspective of learners and sees EMI as a practice, where subjects are taught to L2 learners through the medium of English in diverse learning settings. Many universities, not English-speaking, have already adopted this change. Nevertheless, the decision seems to worry the Algerian scientific community. The concerned parties (teachers of English or teachers of scientific matters) are also concerned.

A conceptual study considers EMI as a way of integrating content-related linguistic skills with disciplinary knowledge in English-medium settings. Most recent research considers EMI as a policy-driven, globalization related strategy with particular impact on the academic fields. (McKinley, 2024).

Smit (2023) describes EMI as an umbrella term which encompasses English-medium instruction of non-language subjects to L2 users, and the term is said to take different forms depending on the circumstances and methods of implementation. In summary, EMI is regarded

as a pedagogical and policy-driven practice involving the delivery of non-language content subjects in English, typically in multilingual contexts other than L2 students.

1.2.2. Background of EMI In Algeria

The rise of English-Medium Instruction (EMI) in Algeria cannot be separable from the context of the country's history, languages, and education system. Arabic is the official language, French is the main language in administration, and there is a promising investment in English as an international language. EMI in Algeria is recognized as a new reform by the government. It officially supports it to improve international existence and global ambition. the Algerian Ministry of Higher Education and Scientific Research has started this change in 2022 by introducing English as a medium of instruction, particularly in technical and scientific domains. This transition represents a shift from the traditional predominance of French to using English as the language of science and universalization (Kira & Zehi, 2024).

From an educational angle, EMI has been gradually rolled out across Algerian universities, often beginning with first-year undergraduate programs. A case study at the University of Algiers 2 (2023–2024) illustrates the introduction of EMI through specific modules taught in English within the humanities, showing a gradual and partial implementation strategy. Likewise, research at institutions like the Oran Graduate School of Economics highlights the use of partial and full immersion models, pointing to attempts with different teaching methods (Bechgag & Zehi, 2024).

EMI in Algeria exists within a complex multilingual environment where Arabic, French, and English are fused together. Studies show that this shift is not straightforward. In classrooms, teachers and students often switch codes, reflecting how they adjust. Whilst learners generally consider EMI as a strategy to improve their English proficiency and access wider academic knowledge, they still struggle with understanding and communicating due to limited language skills (Dali Mhammed et al., 2024).

Experts in Education identify major challenges both at the institutional and teaching levels. Teachers with non-English background like in our case Faculties of Medicine where the majority of its doctors, professors and instructors were tutored solely in French language, did not receive enough language training, even after the accelerated learning programs (B2–C1 levels) to enable them to teach in English language (Bouzidi, 2024).

In short, EMI in Algeria is associated to substantial trends in internationalization and regulations. Researchers stress that adopting English is driven by the need to bring Algerian higher education in line with international standards and enhance graduates' job prospects in a global market. However, the process is still in progress and uneven, with different levels of implementation across various fields and institutions (Touahmia & Bakar, 2024).

1.2.3. The Motives Behind EMI in Algeria

Introducing EMI in Algeria is not accidental but rather a result of interconnected political, socio-cultural, and pedagogical factors, also as a strategy to advance education and to keep up with what is happening in the world language policies.

1.2.3.1. Political Factors

From a political angle, EMI in Algeria is directly tied to language policy, as a kind of separation from the language of the colonizer. This reform underlines that the shift from French to English represents an intentional effort to reduce the dependence on the colonial linguistic heirloom and reposition of Algeria within a globalized, Anglophone-dominated academic world, because it is important for Algeria to be politically active and stay on going with current developments in various domains (Senouci & Gacem, 2024).

EMI is framed as a state-led reform affiliated with internationalization policies, aiming to enhance Algeria's global academic competitiveness and visibility. This reflects what scholars

describe as a “policy-driven linguistic transition,” where English is promoted as the language of science, diplomatic relations, and global communication (Rouaghe et al., 2025).

1.2.3.2. Sociocultural Factors

The rise of EMI indicates changing mindset toward English as a global lingua-franca and as sign global integration. Studies show that English is progressively seen by Algerian learners and community as a language of opportunities, flexibility, and eminence, comparing to French or other languages (Senouci & Gacem, 2024).

At the same time, EMI operates within Algeria’s complex multilingual blender (Arabic–French–Tamazight–English), leading to hybrid practices such as code-switching and translanguaging in classrooms, highlighting the role of student motivation and identity, where engagement in EMI courses is influenced by psychological and social factors, including the desire to access global knowledge and participate in international academic communities (Saidania & Belmihoub, 2025).

1.2.3.3. Educational / Pedagogical Factors

In education, EMI is motivated by the need to upgrade the academic knowledge, access to expertise, and modernity. Educational experts underscore that English is the dominant language of scientific research; thus, adopting EMI allows Algerian students to engage directly with accurate academic resources and up-to-date information. These educational motives are accompanied by major obstacle that cannot be ignored such as teachers’ attitude, resource accessibility, and student proficiency gaps, which affects the efficiency of EMI integration (Amara, 2024).

EMI is seen as an approach to enhance both content learning and English language proficiency simultaneously, to equip students with the required linguistic skills and prepare them to join the scientific research world as well as the international labor market. It is also

driven by the goal of conforming the Algerian higher education with global academic standards, while improving both disciplinary knowledge and language adequacy (Taroua & Belkhir, 2025).

1.2.4. The Rise of EMI in Scientific Research in Algeria

The rise of EMI in scientific research in Algeria is part of a wider change that has occurred in the global academia wherein English has established itself as the main language for producing and evaluating knowledge. This transitional phase goes beyond being merely pedagogical but intertwined with the practice of conducting research and publishing in International Journals. This change is related to many circumstances :

- **English as the scientific language of publishing**

The motive behind the adoption of EMI in Algerian universities is because English is the primary language of high impact in scientific publication. Most prestigious journals, reviews, and international conferences operate in English, making it indispensable for Algerian intellectuals to embrace EMI in order to access, produce, and disseminate research effectively. As a result, EMI has become more and more prominent in scientific disciplines such as medicine, engineering, and technology, where the use of English allows researchers to engage directly with the avant-garde knowledge without linguistic intercession (Saidoun & Bensemmane, 2024).

- **Enhancing the research visibility**

EMI contributes to the international visibility of Algerian research. Via publishing in English, Algerian academics can reach wider audiences, increase citation impact, and participate in international forums and conferences.

EMI promotes international collaboration, allowing scholars and researchers to:

- Engage in cooperative research projects and interact with their peers sharing knowledge and ideas ;
- participate in international conferences with confidence and poise ;
- Get global funding opportunities like scholarships and training programs.

This aligns with national higher education policies that aim to position Algerian universities within global rankings and research networks, helping all its affiliates joining science and compete with major universities (Touahmia & Bakar, 2024)

- **EMI and the continuous research transformation**

Amara (2025) confirms that EMI has remarkably influenced the scientific research world and academic knowledge through encouraging researchers and scholars to improve:

- Academic writing and communicational skills in English ;
- Curriculum specific jargon;
- Familiarity with international research conventions .

The significance of EMI in contemporary scientific environments is further reinforced by the growing use of digital and technology resources like corpora, online databases, AI-assisted writing tools, etc., which make research more efficient and accessible.

- **Institutionalization of EMI in Scientific contexts**

Currently, recent developments show that EMI is becoming progressively institutionalized in Algerian scientific education and research. Policy reforms have introduced English in key domains such as medical and technical education, reflecting a strategic alignment with global scientific standards. This is after the French language was the dominant language in these fields without dispute, with mentioning that currently most of academic events and national initiatives like EMI focused study days and training programs for teachers, doctors and students indicate

a promising recognition of English language as a central component of research development and academic achievements (Simon & Nasri, 2025).

1.2.5. Challenges related to English-Medium Instruction

Chenini (2025) clarifies that despite the rapid growth of EMI, its integration into scientific research in Algeria confronts many challenges:

- **Linguistic barriers:** Limited English proficiency among students and researchers affects comprehension and publication quality; it requires years of learning and training to master a new language.
- **Teacher and researcher preparedness:** Many academics lack sufficient training in English academic discourse because the integration was implemented rapidly without sufficient preparation, even if it was expected.
- **Resource requirements:** Shortage of English-medium materials and institutional support in Algeria, and lack of the experience in publishing using English.
- **Transitional conflict:** The coexistence of French and English creates contradictions in research practices, because French still has a heavy weight in Algerian community and university in particular.
- **Resistance and the historical dimension of the linguistic situation in Algeria :** It is difficult to convince some parties that English has become a necessity in all fields, especially in the scientific field, creating global opportunities for researchers, professors and even students abroad.

These challenges can create and block the effectiveness of EMI and slow its full integration into scientific research systems.

1.2.6. The Rise of EMI In Medical Studies in Algeria

The adoption of English-Medium Instruction (EMI) in medical studies in Algeria represents one of the most significant and recent transformations in higher education. Unlike other disciplines, medicine has become a priority field for EMI implementation, due to its strong connection with global scientific research, international standards, and access to up-to-date medical knowledge.

1.2.6.1. Policy makers' orientation

EMI in Algerian medical education is a new but rapidly expanding reform, strongly encouraged by national policies aiming to improve scientific output and align with global academic practices. Studies indicate that the shift from French to English in medicine is part of a broader strategy to enhance research quality and international integration. Algeria government today represents a strong country that makes its decisions, to the extent that the political interventions have become in English to prove its position among the major decision makers in the world.

It is now viewed as indispensable because medical studies and research are predominantly produced in English, making it necessary for students and practitioners to engage directly with international literature and innovations. Doctors and researchers are also a part of the political interface of the World Health Organization (Hamzaoui, 2025).

1.2.6.2. Educational and pedagogical purposes

The rise of EMI in medical studies is also reflected in institutional initiatives and pedagogical reforms. A recent national conference on EMI in Algerian Medical Education (2026) highlights that medical faculties are actively working to integrate content and language learning, promote collaboration between subject specialists and linguists, and develop innovative teaching strategies (As cited in Ouarniki & Ammi, n.d.).

This shows a shift toward what experts describe as integrated EMI, where:

- Medical content is taught in English gradually respecting learners level;
- Language support is inserted within disciplinary training;
- Collaborative teaching models technology tools are progressively applied;
- The significance of the approval of EMI in the medical field.

1.2.6.3. Students' learning objectives

From the students' perspective, EMI in medical studies is perceived as both an opportunity and a challenge. Most of students recognize its importance for:

- Accessing global medical research and use them as valuable references;
- Providing them with the needed qualifications to enter the job markets;
- Participating in international academic communities, conferences and medical events.

On the other side, studies disclosed difficulties related to:

- Limited English proficiency in communication and linguistic skills;
- Sudden transition from French to English created confusion;
- Lack of adequate resources and support (Hamzaoui, 2025).

1.2.7. Examples of the integration of EMI

- **Example N. 01**

As an example of the adoption of the English language, the University of Tlemcen. Faculty of Medicine implemented a specialized EMI training program for medical instructors, including workshops, pedagogical strategies, and international collaborations as well in order to prepare teachers for the new transformations. This kind of training shows the importance of introducing EMI as a serious commitment by the government and institutions (University of Tlemcen, 2025).

- **Example N. 02**

A second example is the University of Batna, a conducted study examined the receptiveness of medical instructors to adopt EMI and establish a strong institutional support for the shift. The majority of teachers expressed positive attitudes toward replacing French with English, or at least use both languages to teach, while also focusing on the necessity for a training and continuous professional development (Ghodbane et al., 2026).

Overall, The emergence of EMI in medical studies in Algeria is a result of logic and rational understanding of the importance of aligning the teaching processes with international standards in terms of the use of the English language in scientific studies. Although the implementation of EMI in educational institutions has been gradual owing to various issues, the field of medicine in Algeria is one of the leaders when it comes to applying EMI.

1.2.8. The Introduction of EMI in University of Khenchela

The introduction of English-Medium Instruction (EMI) at Abbes Laghrour University of Khenchela is a part broader national reform initiated by the Algerian Ministry of Higher Education in 2023, which aimed to progressively replace French with English in scientific and academic instruction (*Abbes Laghrour University Khenchela*, n.d.).

The University of Khenchela emerged as part of the 2023–2024 national reform, where English began to be introduced as a medium of instruction, particularly in scientific and technical disciplines. This reform was backed by putting at disposal all the Intensive Language Teaching Centers (ILTCs), to prepare university teachers linguistically and pedagogically for EMI delivery (Yousfi et al., 2026).

At Khenchela notably, a significant number of teachers enrolled in these centers to reach the required B2 level, indicating a structured and an emergency driven approach to EMI application, a conducted study revealed that teachers generally recognize the importance of EMI for academic and scientific advancement. but, many of them are facing real challenges

related to linguistic proficiency and pedagogical adaptation. Training programs play a very important role in supporting the current transition, though their effectiveness varies across disciplines (Yousfi et al., 2026).

Academic initiatives such as national forums on English language policies (2024) demonstrate that the university is actively engaging in debates on EMI, language policy, and educational reform. This means that EMI is no longer a matter of learning language but it goes beyond that, applying it in research practices and academic events as well (ABBES Laghrour University Khenchela, 2025).

Regardless of all the statutory efforts, it is found that the introduction of EMI at Khenchela occurs within a complex multilingual setting, where Arabic, Tamazight and French still dominant languages. Research conducted at the university highlights gaps in students' English for Specific Purposes (ESP) competence, particularly in professional and technical vocabulary. These challenges require serious measurement like strengthening ESP programs to fit the demands and adopting Code-Switching as a flexible practice at this stage, because we are still in a very early transitional phase (Saoudi & Arbet, 2024).

1.2.9. The Introduction of EMI in the Faculty of Medicine / University of Khenchela

The introduction of EMI in the Faculty of Medicine in Khenchela fits within the general context of national reform in Algeria toward the gradual introduction of English instead of French in higher education, especially scientific and medical subjects, which is both linked to universal scientific necessities and national ambitions in reforming higher education. It is worthwhile to recall the context of creation of the annex of the faculty of Medicine in Khenchela in 2024-2025, which represented the first important establishment of this new faculty aiming to train future doctors and strengthen research with a local implementation of scientific and pedagogical standards aligned with international requirements. Its establishment can be placed in the context of the adoption of the English language in the country and is itself designed to be

situated within the context of a new pedagogical and linguistic project. So, it was designed to function with EMI rather than EMI is introduced within it in a second stage (Abbes Laghrour University Khenchela, 2025).

From the national perspective, the implementation of EMI in medical education in university of Abess LAGHROUR should be considered as an urgent transformation a necessity to adopt the English language, which now dominates scientific production and publication. Medical sciences and other science domains are regarded as the priority domains to develop through EMI, since their literature and scientific publication fields are primarily conducted in English and an important scientific internationalization of these fields occurred. Since then, all the higher education institutions, including the Faculties of Medicine are invited to develop EMI as well in education and research practices. This leads to EMI in Khenchela to be seen as a part of a systematic development of education in Algeria including many institutional, pedagogical, scientific, cultural aspects, and academic support for learning. (Medical Faculty Khenchela).

From the pedagogical angle, EMI Faculty of Medicine is implemented through a transitional and hybrid approach rather than through a fully immersive system. Currently, only the first 2 years of the medical curriculum are taught in Khenchela before students transfer to other medical faculties like Constantine. Such an approach implies a gradual integration of EMI alongside with the existing French and Arabic systems within pedagogical practices. Furthermore, such an approach to EMI is closely associated with broader academic and scientific objectives, such as a development of research, access to medical knowledge sources and engagement in scientific communities. Conferences, academic events, and projects within the faculty (Kheliel & Saaidia, 2025).

Conclusion

The first chapter covers both Code-Switching and English-Medium Instruction (EMI). It explains bilingual speakers' use of multiple languages and examines EMI as an important

reform in Algeria driven by the global importance of English, especially in the medical field. The chapter also highlights the opportunities and challenges of EMI at the University of Khenchela. The next chapter will be devoted to methodology, data analysis, interpretation and the discussion of the main findings.

Chapter Two: Research Methodology

Introduction

This chapter is mainly dedicated to research methodology adopted to conduct this study to explore the implementation of English-Medium Instruction within the occurrence of Code-Switching as a pedagogical mediator in the Faculty of Medicine at Abbes Laghrour University of Khenchela. It delineates research methodology with the research design, data collection tools applied to conduct the study, the findings, and data analysis and interpretation. The chapter culminates in discussing the findings in order to shed light on the new perspectives of this research and answer the questions being advanced.

2.1. Research Design

The current study follows a mixed methods research approach to investigate the use of Code-Switching along with the introduction of English-Medium Instruction in medical studies. The blend of the qualitative and quantitative approaches allows for a comprehensive understanding of both concepts in teachers' and students' classroom practices. The qualitative approach offers a deep breakthrough into the contextual dimensions of CS and EMI while the quantitative approach provides measurable data and statistics to analyze in order to expand the scope of the study.

This research adopts a descriptive and exploratory sequential mixed methods design. Since the main objective is not to test a hypothesis, but to explore and to acquire a deep understanding the correlation between CS and EMI in classrooms through analyzing attitudes of students and teachers. The shortage of data makes this particular design accurate and suitable as given the recent introduction of EMI and relying on CS as a pedagogical strategy in Algerian medical education. This methodological design makes it possible to examine the phenomenon from different perspectives and to provide a more comprehensive interpretation of how code-switching functions in medical lectures and how students perceive its pedagogical value.

2.2.Population

The targeted population of this research consisted of medical students in the first place and a certain number of teachers as an extra setting to cover all the facets of the topic. It focuses specifically on 1st and 2nd year medical students (n=87), as they represent the primary group exposed to English-Medium Instruction in its initial stages.

2.2.1. Focused Population

The selection of participants aimed to include students belonging to different academic levels as indicated in the questionnaire especially first year and second year medical students since they represent the category that is regularly exposed to medical lectures where both English and French may be used during explanation, teaching and clarification. This diversity made it possible to gather responses reflecting different levels of comprehension, classroom engagement, and attitudes toward code-switching.

2.2.1.1. Sampling Method and Technique

This study follows a non-probability sampling method. It also adopts a purposive sampling technique. Because EMI has been recently implemented in the faculty of medicine, the study focuses on a group of participants who are directly exposed to EMI; namely first-year and second- year medical student. the purposive sampling allows the researcher to conduct the study and select participants based on their relevance and the set of objectives being underlined, rather than random selection. It also facilitated data collection and made it possible to obtain responses related to students' comprehension, engagement, and attitudes towards the alternation between English and French in the classroom.

2.3.Institutional Context

This study was conducted within the institutional context of a newly initiated (*annex*) Faculty of Medicine at Abbes LAGHROUR University of Khenchela (2024-2025), in a rich multilingual environment where two dominant languages French and Arabic coexist. It should

be noted that the language of instruction in medical institutions until last year was French. The Ministry of Higher Education and Scientific Research has made major changes, including teaching in English or what is referred to as EMI that is now in its early stages and it is being gradually introduced. This transitional phase has imposed code-switching to cope with the current situation.

2.4.Tools of Investigation

To collect data, two main research tools were applied: the first one is the classroom observation using two observation grids, one for teachers and the other one for students while the second tool is an online questionnaire to first- and second-year students. The observation inspects the teaching/learning environment and provides a deeper understanding of EMI as well as the strategic use of Code-Switching. The questionnaire, on the other hand, was a logical move to gather extra data and examine students' attitudes and opinions about CS and EMI. This combination of these tools ensured data triangulation to enhance both reliability and validity of the study.

2.4.1. Observation

The classroom observation was designed as a qualitative data collection instrument to investigate and delve into the actual implementation of EMI with the use CS.

2.4.1.1.Description

Observation with three teachers over the course of three sessions in this case is specifically designed as a primary data collection tool to review and inspect learning environment where English-Medium Instruction, Code-Switching and students' acquisition of medical terminology take place. The purpose is to cover all the possible aspects related to learning, teaching and perception, such as the alternation between French and English, learning mechanisms, taking notes, interaction and group discussions. The first observation grid examines the context, goal, and pedagogical function of teachers' code-switching between French and English during

medical lectures. During the same sessions, the second grid looks at students' attitudes, understanding, interactions, and behavioral reactions. Since both grids seek to examine how teachers' code-switching strategies affect students' participation, comprehension, and engagement in the EMI classroom, they are related (See appendix A).

2.4.1.2. Conducting the Observation

Classroom observation can be assorted into two main categories participant and non-participant. In this study, the most appropriate choice was non-participant observation to collect data from distance without being directly involved with subjects (three teachers and total of 87 medical students). Each session took about 45 minutes to 1 hour. The researcher attended classes as a passive observer using an observation grid to take notes and ensure the consistency through the total of four observed sessions. The reason behind following this approach was to gain comprehensive understanding of the situation and deep insight about both EMI and CS use in classroom context. Ethical measurements were taken into consideration, as both students and teachers, along with the Dean of the Faculty, were informed before the procedure.

2.4.2. Questionnaire

The questionnaire is constructed with a series of targeted questions to collect both quantitative and qualitative data. The online questionnaire has the ability to access a wide range of population and to get more information in short time.

2.4.2.1. Description

The online questionnaire was structured into four main sections, and is consisted of a total of **20 questions**, the first section was to collect general information including academic level and English proficiency. The second section was mainly to examine participants' acceptance of both CS while exposed to EMI. The third section focused on the students' engagement, comprehension and the clarity aspects during CS and the implementation of EMI. The last

section was devoted to exploring participants' attitudes and perception, such as their preferences and the accessibility of scientific knowledge and research.

The questionnaire included a combination of closed-ended questions using Likert Scale (agree, strongly agree, strongly disagree), and a certain number of open-ended questions to provide the students with freedom to express their opinions, thoughts and individual experiences (See appendix B)

2.4.2.2. Administration

The questionnaire was administrated to medical students after finishing the last observation session. Before the administration, participants were informed about purpose of the research and were assured that their responses and identities will remain anonymous and confidential. After that, the researcher made sure to explain the questions of each section to ensure accurate non-biased answers and gave them the approximate time (10-15 minutes) to complete it. Finally, it was distributed online using (Google Forms) via emails, students' groups, etc.

2.5. Data Analysis and Interpretation

The collected data has been analyzed both qualitatively and quantitatively. starting with a classroom observation then a distributed online questionnaire. The analysis of the findings will follow this order respectfully.

2.5.1. Observation

- **Session N.01: 17-02-2026_Subject: Anatomy (TP) / 1st year medical students**
- **Session N.02: 30-03-2026_Subject: Histology (TP) / 1st year medical students**
- **Session N.03: 16-04-2026_Subject: Physiology (TP) / 1st year medical students**

In order to conduct this study, the use of an observation grid was necessary to follow each step of both the teacher and the students in the classroom. For that matter, two observation grids were created. The choice of the three subjects was not a coincidence; rather it was subjected to

certain criteria to facilitate monitoring, including the handouts, slides and books in English language (See appendix A and appendix C).

2.5.1.1. Teachers' Observation Grid

The teaching practices reveal CS or the alternation between French and English has a systematic and pedagogical role during the explanatory phase when delivering lectures, explaining and clarifying ambiguous anatomical concepts or medical terminology in particular. The French language is the foundation before the transition to English, which confirms that CS is not random but a functional strategy to cover the topic, gain time and help students to assimilate as much as needed of the complex concepts.

In terms of frequency and duration, CS is integrated within EMI as a continuous and a structured strategy. All of the three teachers maintain French as the dominant language (approximately 70%), while English was only to cover medical terminology, reading slides and key concepts. This is an actual transitional EMI model, where English is gradually introduced without a full sudden replacement of French, what created a hybrid approach.

The use of Code-Switching serves multiple functions, such as emphasis, engagement clarification and motivation. The teacher simplifies complex ideas using both languages simultaneously, repeating terminology and making students comfortable by changing even their voice tone during explanation to create a balanced and productive environment filling up the students' needs (See appendix A).

2.5.1.2. Students' Observation Grid

Students' behavior indicates that CS has a significant influence on comprehension, participation and classroom interaction. The majority showed a positive reaction toward the use of both languages and even the use of the Arabic Language occasionally. The note-taking part was mostly in English since the available handouts and the slides were displayed in English.

Students were focused and were trying to collect as much as they can of information, even though their English and French skills were limited (See appendix A).

The fact that some of the students asked for clarification and interacted with the teachers in both languages shows that the bilingual explanation is effective. The interaction during the group work and peer discussion reveal engagement and reflects the dynamic dimensions of CS, such as curiosity, the use of bilingual dictionaries and active participation. The idea of EMI in this environment created a flexible and hybrid model enhancing clarity and communication, as well as helping students grasp difficult concept and face the challenges related the situation.

2.5.2. The Questionnaire

SECTION A : Background Information

Q1.Study Level

Table 1

Distribution of the Sample According to Study Level

Variable	Frequency	Percentage
1 st year	23	76,7%
2 nd year	7	23,3%
Total	30	100%

Figure 3 : Distribution of the Sample According to Study Level

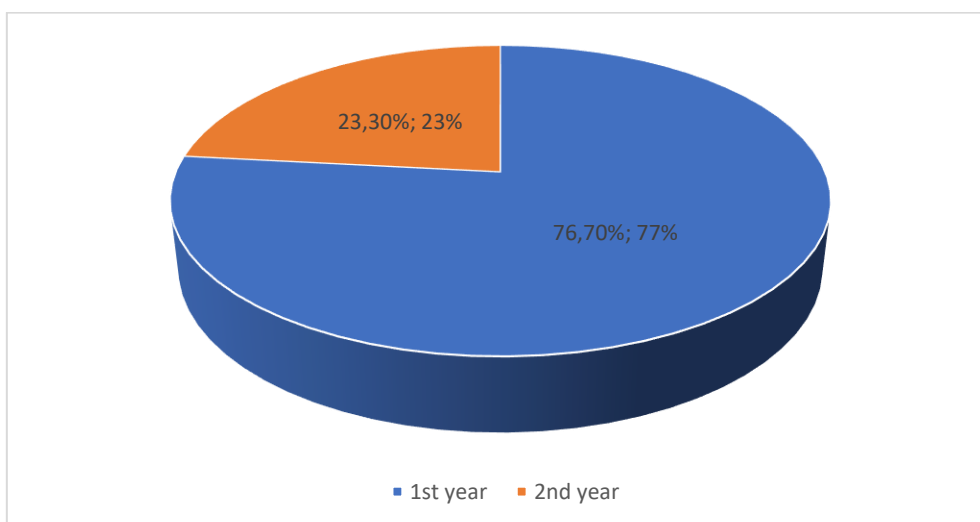


Table 1 presents the distribution of participants according to study level. The results show that most subjects belong to the first year with a frequency of 23 students representing 76.7% of the total sample while second year students represent seven participants corresponding to 23.3%. These results demonstrate that first year students constitute the majority of the sample, which means that the findings mainly reflect the perceptions of learners who are at an early stage of medical studies and who are beginning to experience English-Medium medical lectures where Code-Switching may play an important role in facilitating comprehension. This distribution also suggests that first year students may rely more on language alternation because they are still adapting to medical terminology and lecture discourse.

Q2. Which language are medical courses taught in?

Table 2

Distribution of language are medical courses

Variable	Frequency	Percentage
English	10	33,3%
French	6	20%
Both	13	43,3%
English, Arabic, French	1	3,3%
Total	30	100%

Figure 4: Distribution of language are medical courses

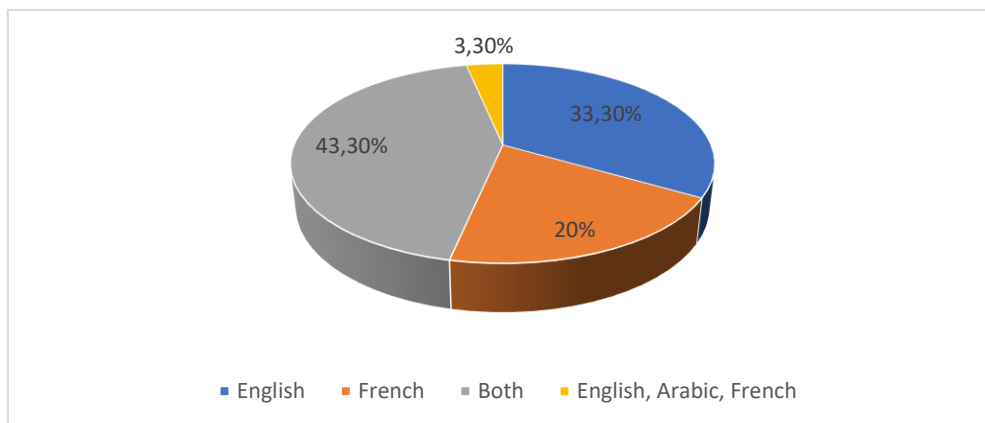


Table 2 shows the distribution of subjects according to the language used in medical courses. The results show that 13 students representing 43.3% reported that medical courses are taught using both English and French, which represents the highest proportion in the sample. In comparison, 10 students corresponding to 33.3% indicated that courses are taught in English while six students representing 20% reported French as the language of instruction. Only one participant representing 3.3% stated that English Arabic and French are used together.

According to the findings, it is clear that bilingual instruction is the most common situation experienced by the participants which confirms the frequent presence of code-switching in medical lectures. The predominance of both English and French reflects the multilingual reality of medical education where teachers may switch between codes to facilitate explanation and improve students' understanding especially when dealing with specialized medical content.

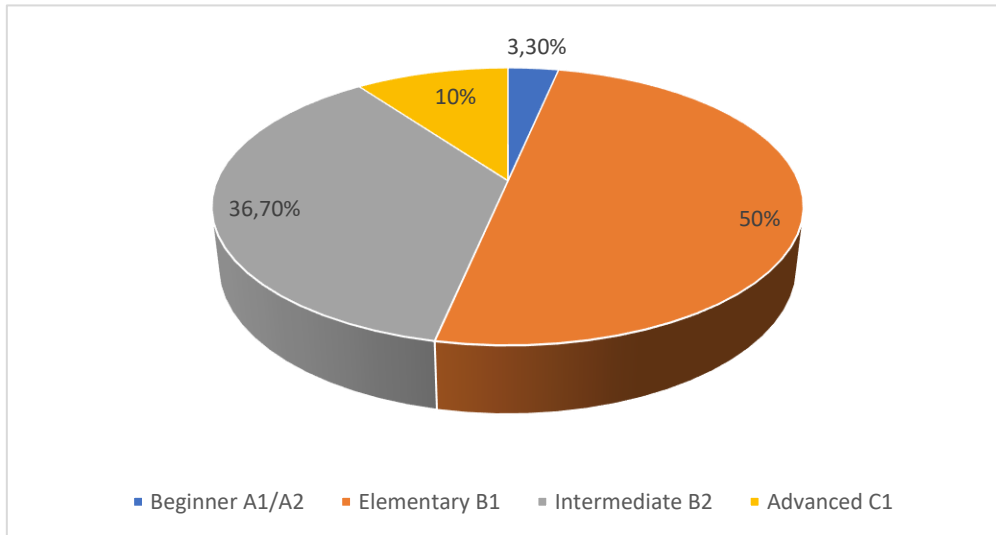
Q3.How would you describe your English proficiency?

Table 3

Distribution of the Sample According to English Proficiency Level

Variable	Frequency	Percentage
Beginner A1/A2	1	3,3%
Elementary B1	15	50%
Intermediate B2	11	36,7%
Advanced C1	3	10%
Total	30	100%

Figure 5: Distribution of the Sample According to English Proficiency Level



In table 3 the distribution of subjects is related to their self-evaluated English proficiency level. The results demonstrates that 15 students representing 50% of the sample reported an elementary level B1 which constitutes the highest category. In addition, 11 students corresponding to 36.7% indicated an intermediate level B2 while 3 students representing 10% reported an advanced level C1. Only one respondent corresponding to 3.3% identified as beginner level A1/A2.

Based on the data findings, the majority of participants possess an intermediate or developing command of English which may explain the pedagogical importance of code-switching during medical lectures. Students at elementary and intermediate levels may need occasional support in French when dealing with specific medical terminology or complex concepts, which makes language alternation a useful strategy for improving comprehension and classroom engagement.

Q4.What do you know about Code-Switching?

Table 4

Respondents' Knowledge of Code-Switching

Variable	Frequency	Percentage
Correct definition (switching between two or more languages in conversation)	16	53,3%
Partial understanding (mixing languages, explaining ideas, bilingual use)	7	23,3%
No knowledge / no answer (“nothing”, “I don’t know”)	7	23,3%
Total	30	100%

Figure 6: Respondents' Knowledge of Code-Switching

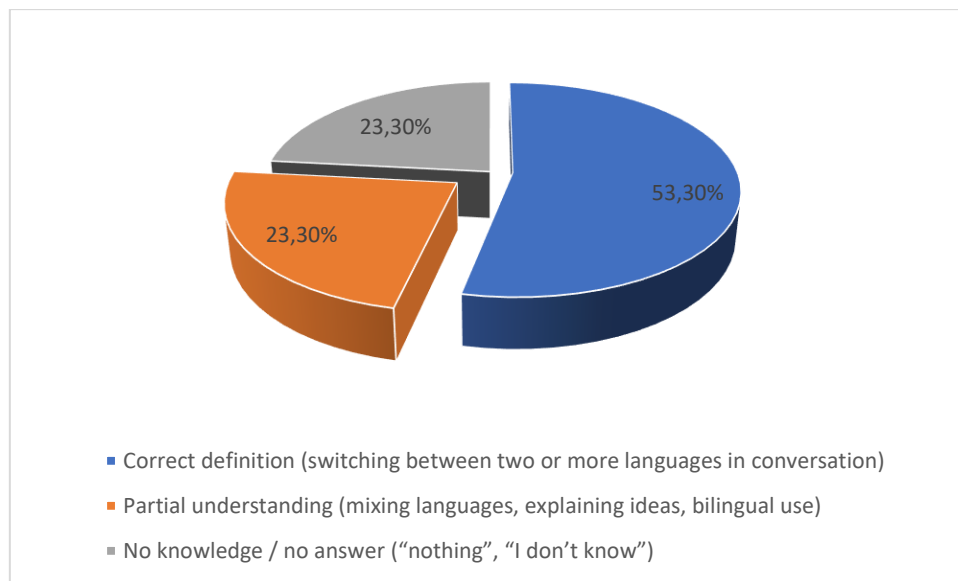


Table 4 demonstrates participants' knowledge of Code-Switching. 16 of the students representing 53.3% provided a correct definition by identifying code-switching as the alternation between two or more languages in communication. In addition seven students corresponding to 23.3% demonstrated partial understanding by referring to language mixing bilingual use or explaining ideas through more than one language. seven other students representing 23.3% reported no knowledge or did not provide a clear answer.

Based on these results, more than half of the participants have a clear idea of the concept of Code-Switching, which suggests that the phenomenon is already familiar to many medical students in their academic context. At the same time the presence of partial understanding and lack of knowledge among a considerable proportion of respondents shows that awareness of the concept remains uneven, which may influence how students perceive its pedagogical role during medical lectures.

SECTION B: Exposure to Code-Switching

Q5.To what extent do teachers use both French and English in lectures ?

Table 5

Frequency of Teachers' Use of French and English in Lectures

Variable	Frequency	Percentage
Very often	5	16,7%
Often	10	33,3%
Sometimes	13	43,3%
Rarely	2	6,7%
Never	0	0%
Total	30	100%

Figure 7: Frequency of Teachers' Use of French and English in Lectures

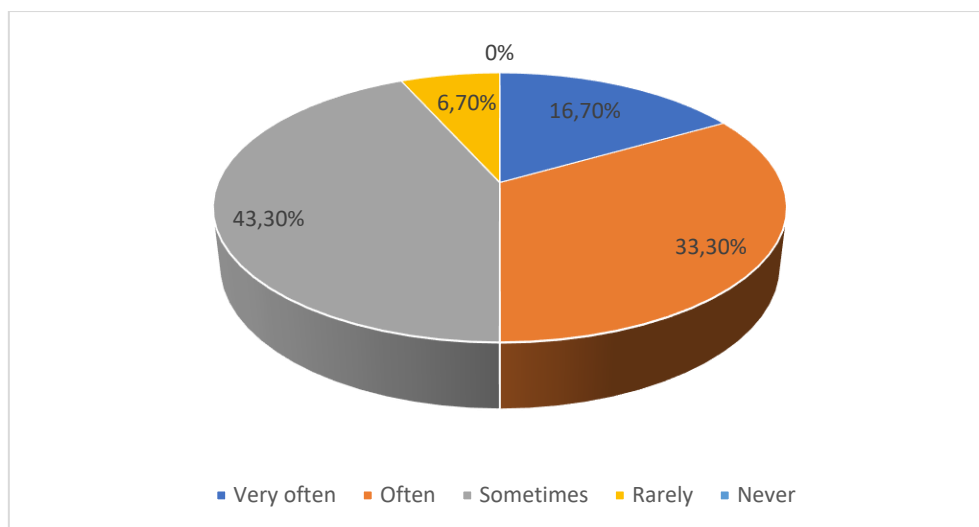


Table 5 presents the frequency of teachers' use of both French and English during medical lectures. The results show that 13 students representing 43.3% reported that teachers sometimes use both languages, which represents the highest proportion. In addition 10 students corresponding to 33.3% indicated that this practice occurs often while 5 students representing 16.7% stated that it happens very often. Only 2 respondents corresponding to 6.7% reported that teachers rarely use both languages whereas no respondent selected “never”.

The presented results indicate that Code-Switching is a regular practice in medical lectures since the majority of students confirmed that teachers alternate between French and English at different levels of frequency. The predominance of the responses ‘sometimes’ and ‘often’ suggests that language alternation is commonly used as a teaching strategy especially when teachers need to clarify content or facilitate students' understanding during lectures

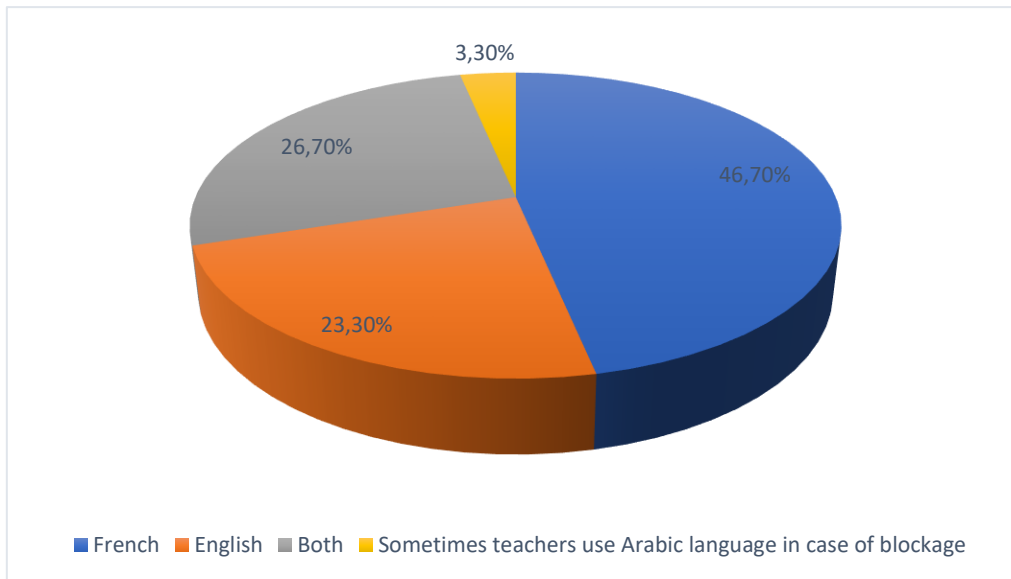
Q6. Which language is dominant in lectures?

Table 6

Distribution of Respondents According to Dominant Language Used in Lectures

Variable	Frequency	Percentage
French	14	46,7%
English	7	23,3%
Both	8	26,7%
Sometimes teachers use Arabic language in case of blockage	1	3,3%
Total	30	100%

Figure 8: Distribution of Respondents According to Dominant Language in Lectures



In table 6 presents participants' views concerning the dominant language used in medical lectures. The use French language is the most common, according to 14 students representing 46.7% of the sample. In comparison eight respondents corresponding to 26.7% indicated that both English and French are used with similar importance while eight students representing 23.3% reported that English is the dominant language. Only one participant corresponding to 3.3% mentioned that teachers sometimes use Arabic when communication difficulties occur.

These findings demonstrate that French remains the dominant language in many medical lectures despite the presence of English as a language of instruction. This reflects the linguistic reality of medical education in Algeria where French continues to play an important explanatory role especially when teachers need to clarify complex content. The presence of both languages in a considerable number of responses also confirms that code-switching is an established pedagogical practice in the classroom.

Q7. When does Code-Switching mainly happen?

Table 7:

Respondents' Views on the Main Contexts of Code-switching in Lectures

Variable	Frequency	Percentage
Medical terminology explanation	7	23,3%
Complex concepts	6	20%
Transitions between topics	4	13,3%
Answering questions	4	13,3%
All of the above	17	56,7%
Total	30	100%

Figure 9: Respondent s' Views on the Main Contexts of Code-switching in Lectures

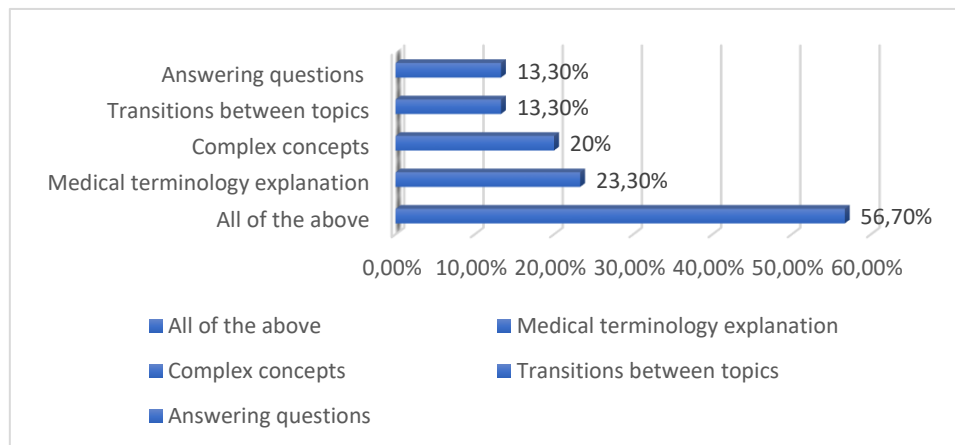


Table 7 presents participants' views concerning the main situations in which code-switching occurs during medical lectures. The results show that 17 students representing 56.7% selected all of the above which indicates that code-switching takes place in several teaching situations rather than in a single context. In addition, seven students corresponding to 23.3% identified medical terminology explanation as a main context while six students representing 20% referred to complex concepts.” Transitions between topics” and “answering questions” were each selected by four respondents representing 13.3%.

Based on the data findings, Code-Switching is used as a flexible pedagogical strategy across different moments of the lecture. This suggests that teachers alternate between languages

whenever clarification is needed whether for explaining terminology, simplifying difficult concepts, organizing lecture progression, or interacting with students through questions and answers. This confirms that code-switching plays a broad instructional role in medical teaching

SECTION C: Comprehension, Clarity, and Engagement

Q8. Switching between languages help you understand medical concepts

Table 8

Effect of Code-switching on Understanding Medical Concepts

Variable	Frequency	Percentage
Strongly agree	4	13,3%
Agree	16	53,3%
Neutral	5	16,7%
Disagree	3	10%
Strongly Disagree	2	6,7%
Total	30	100%

Figure10: Effect of Code-switching on Understanding Medical Concepts

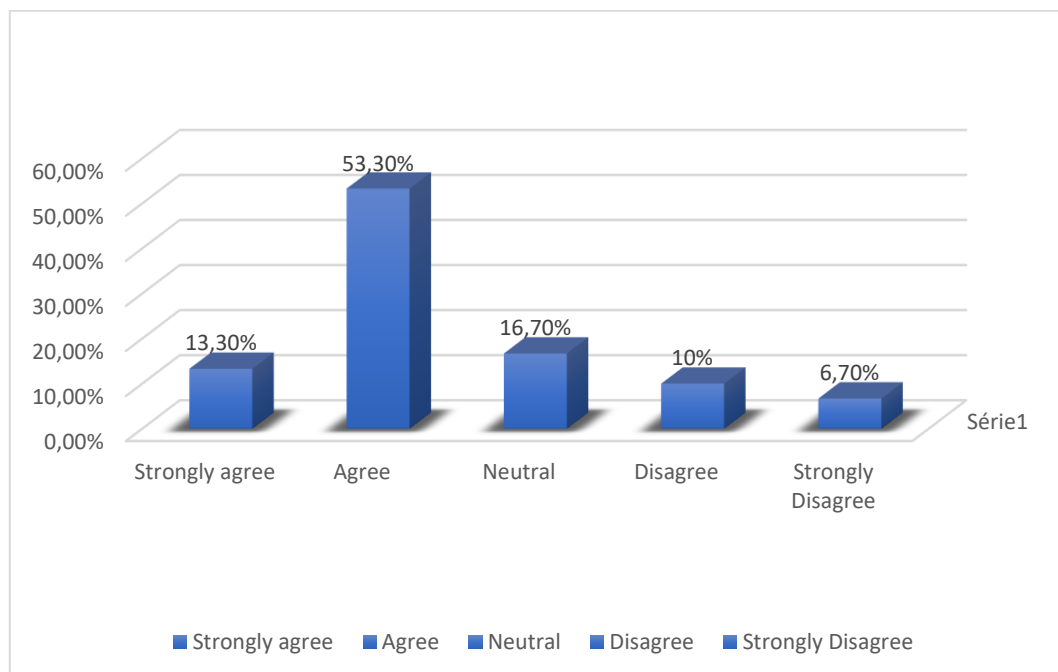


Table 8 presents respondents' opinions about whether switching between languages helps them understand medical concepts. The results show that 16 students representing 53.3% agreed that code-switching helps them understand medical concepts while four respondents corresponding to 13.3% strongly agreed. In contrast, five students representing 16.7% remained neutral while three respondents corresponding to 10% disagreed and two students representing 6.7% strongly disagreed.

Based on the given results, the majority of respondents hold a positive view regarding the role of code-switching in facilitating the understanding of medical concepts. The predominance of agreement suggests that switching between English and French helps students grasp specialized content more easily especially when explanations involve difficult terminology or abstract medical ideas. The smaller proportion of disagreement may reflect differences in language proficiency or individual preferences for receiving instruction in one language only

Q9.Terminology is understood after the teacher switches languages ?

Table 9

Students' Understanding of Terminology After Language Switching

Variable	Frequency	Percentage
Strongly agree	3	10%
Agree	19	63,3%
Neutral	3	10%
Disagree	4	13,3%
Strongly Disagree	1	3,3%
Total	30	100%

Figure 11: Students' Understanding of Terminology After Language Switching

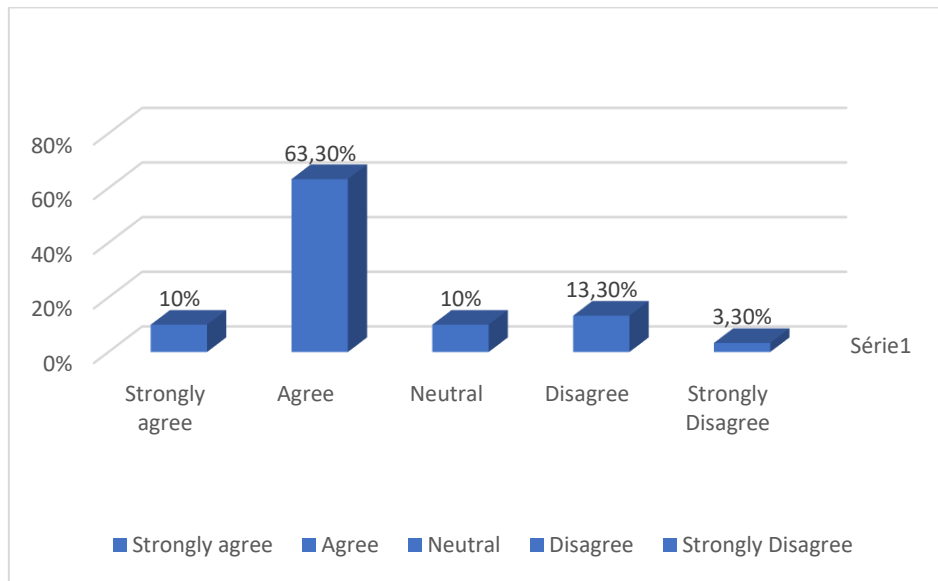


Table 9 presents respondents' opinions regarding their understanding of medical terminology after the teacher switches languages. The results show that 19 students representing 63.3% agreed that they understand terminology better after language switching while three respondents corresponding to 10% strongly agreed. In contrast, three students representing 10% remained neutral whereas four respondents corresponding to 13.3% disagreed and only one student representing 3.3% strongly disagreed.

These results indicate that most participants perceive code-switching as an effective support for understanding medical terminology. The predominance of agreement suggests that switching from English to French or vice versa helps students connect unfamiliar medical terms with clearer explanations, which facilitates comprehension during lectures. This finding also reflects the importance of language alternation when dealing with specialized vocabulary in medical education

Q10. After Code-Switching, does the explanation become clearer ?

Table 10

Clarity of Explanation After Code-switching

Variable	Frequency	Percentage
Yes	21	70%
No	4	13,3%
Most of the time	1	3,3%
Yes when they switch to arabic it does...	1	3,3%
Become clear but when the teacher...	1	3,3%
Most of the time,it helps but sometimes...	1	3,3%
It confuses me	1	3,3%
From time to time	1	3,3%
Depends on the subject or the meaning	1	3,3%
Yes, sometimes	1	3,3%
Total	30	100%

Figure 12: Clarity of Explanation After Code-switching

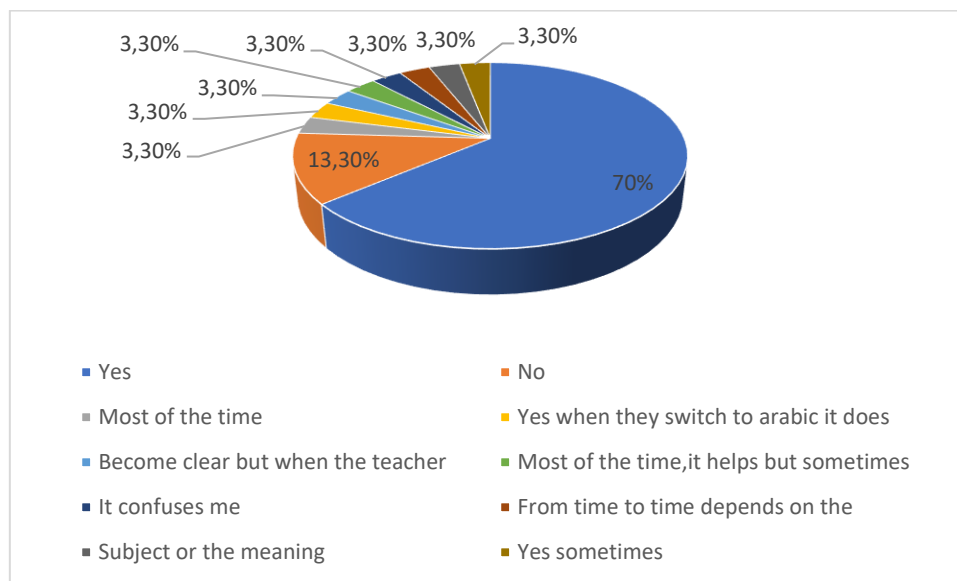


Table 10 presents respondents' views on whether explanations become clearer after code-switching. The results show that 21 students representing 70% answered “yes”, which indicates that the majority perceive language switching as helpful in clarifying lecture content. A smaller proportion of four respondents corresponding to 13.3% answered “no”.

Other responses reveal more nuanced opinions. Some students indicated that clarity improves most of the time or depends on the subject while others mentioned that switching to Arabic can sometimes make explanations clearer. A limited number of respondents also stated that code-switching may occasionally create confusion depending on the context of explanation.

These results demonstrate that Code-Switching generally contributes to improving clarity during medical lectures especially when teachers use another language to explain difficult concepts or unfamiliar terminology. At the same time the presence of varied responses suggests that the effectiveness of code-switching may depend on the teaching context, the subject matter, and the students' own language preferences.

Q11.Do you appreciate it when the teacher switches codes?

Table 11

Students' Appreciation of Code-switching in Lectures

Variable	Frequency	Percentage
Sometimes, it helps, but not always	13	43,3%
Yes, it helps me understand better	11	36,7%
It depends on the topic	11	36,7%
No, I prefer the lecture in one language only	2	6,7%
It helps only when they switch to Arabic	1	3,3%
Total	30	100%

Figure 13: Students' Appreciation of Code-switching in Lectures

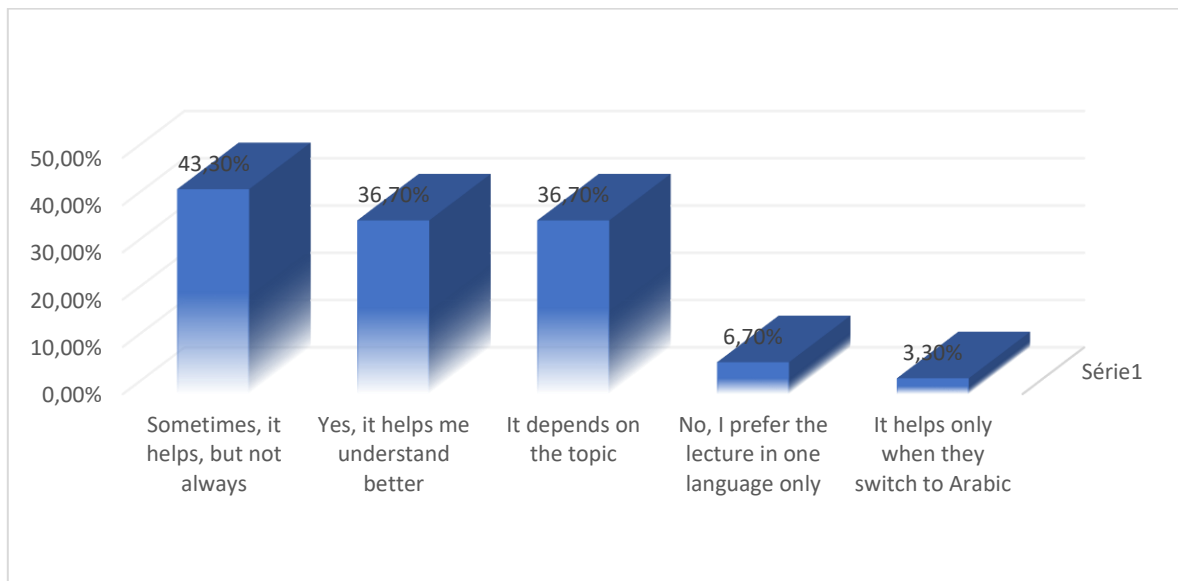


Table 11 presents respondents' opinions regarding their appreciation of code-switching during medical lectures. The results show that 13 students representing 43.3% stated that code-switching sometimes helps but not always, which reflects the highest proportion in the sample. In addition, 11 respondents corresponding to 36.7% reported that it helps them understand better while the same number indicated that its usefulness depends on the topic. Only two students representing 6.7% expressed a preference for lectures conducted in one language only and one respondent representing 3.3% stated that it helps only when teachers switch to Arabic.

These results indicate that students generally hold a positive but conditional attitude toward code-switching. Most respondents appreciate language alternation when it serves a clear explanatory purpose especially in contexts involving difficult content. At the same time, many students associate its usefulness with the nature of the topic, which suggests that code-switching is perceived as more effective in some lecture situations than in others.

Q12. Does switching between languages encourage you to participate and ask questions?

Table 12

Influence of Code-switching on Classroom Participation

Variable	Frequency	Percentage
Most of times	7	23,3%
Sometimes	14	46,7%
Rarely	7	23,3%
Never	2	6,7%
Total	30	100%

Figure 14: Influence of Code-switching on Classroom Participation

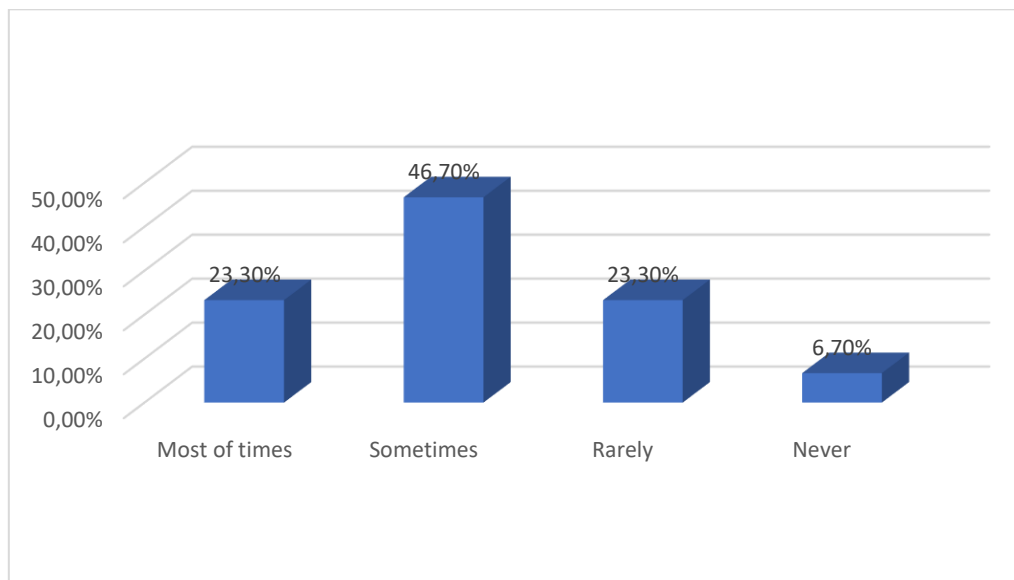


Table 12 presents respondents' opinions about whether switching between languages encourages them to participate and ask questions during medical lectures. The results show that 14 students representing 46.7% stated that code-switching sometimes encourages participation, which represents the highest proportion in the sample. In addition, 7 respondents corresponding to 23.3% reported that it helps most of the time while the same percentage indicated that it rarely has such an effect. Only two students representing 6.7% stated that it never encourages participation.

These results indicate that code-switching has a moderate positive influence on classroom participation. The predominance of the response “sometimes” suggests that language alternation can facilitate interaction in certain situations, especially when students need clarification before asking questions or engaging in discussion. However, the presence of responses indicating rare influence also suggests that participation may depend on additional factors such as confidence language proficiency and classroom atmosphere.

Q13.Does code-switching help you pay more attention?

Table 13

Effect of Code-switching on Students’ Attention

Variable	Frequency	Percentage
It depends on the topic	14	46,7%
Yes, I pay more attention when the teacher switches languages	11	36,7%
Yes, it helps me focus better	9	30%
No, it actually distracts me	4	13,3%

Figure 15: Effect of Code-switching on Students’ Attention

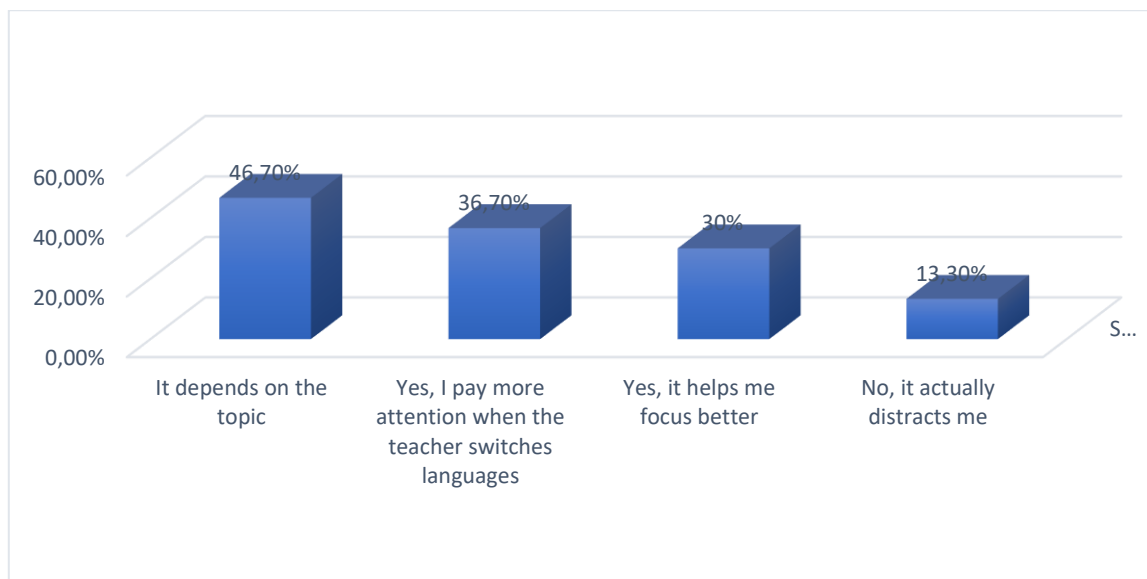


Table 13 presents respondents' opinions regarding the effect of code-switching on attention during medical lectures. The results show that 14 students representing 46.7% stated that the

effect depends on the topic, which represents the highest proportion. In addition, 11 respondents corresponding to 36.7% reported that they pay more attention when the teacher switches languages while nine students representing 30% indicated that code-switching helps them focus better. On the other hand, four respondents corresponding to 13.3% stated that it actually distracts them.

These results indicate that code-switching generally has a positive influence on students' attention although its effectiveness appears to be closely linked to the nature of the lecture content. Many students associate language switching with increased attention and better focus especially when the teacher uses it to clarify important points. However, the presence of some negative responses suggests that excessive or poorly timed switching may distract certain learners.

SECTION E: Attitudes toward Code-Switching and the use of Supporting Materials

Q14. Do you think Code-switching should be used in medical lectures?

Table 14

Students' Opinions on the Use of Code-switching in Medical Lectures

Variable	Frequency	Percentage
Yes, it helps students understand better	13	43,3%
It could be useful, but not always necessary	12	40%
No, lectures should be in one language only	4	13,3%
Only if they switch to Arabic	1	3,3%
I don't know	0	0%
Total	30	100%

Figure 16: Students' Opinions on the Use of Code-switching in Medical Lectures

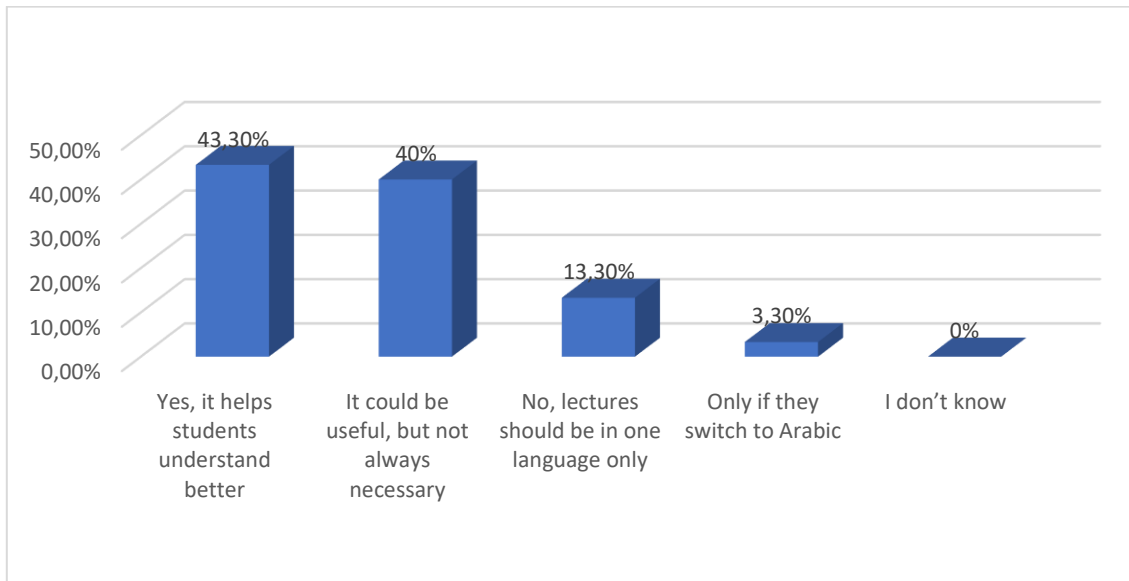


Table 14 presents respondents' opinions concerning whether code-switching should be used in medical lectures. The results show that 13 students representing 43.3% stated that code-switching should be used because it helps students understand better, which represents the highest proportion. In addition, 12 respondents corresponding to 40% considered that it could be useful but not always necessary. By contrast, four students representing 13.3% preferred lectures conducted in one language only while one respondent corresponding to 3.3% supported code-switching only when teachers switch to Arabic.

The present results indicate that most students support the pedagogical use of code-switching in medical lectures either as a regular aid for comprehension or as a situational strategy depending on the teaching context. The predominance of positive responses confirms that many learners view language alternation as beneficial for understanding medical content especially when explanations involve difficult terminology or complex concepts.

Q15. Too much Code-Switching can be confusing

Table 15

Students' Views on Whether Excessive Code-switching

Variable	Frequency	Percentage
Strongly agree	3	10%
Agree	11	36,7%
Neutral	11	36,7%
Disagree	4	13,3%
Strongly disagree	1	3,3%
Total	30	100%

Figure 17: Students' Views on Whether Excessive Code-switching

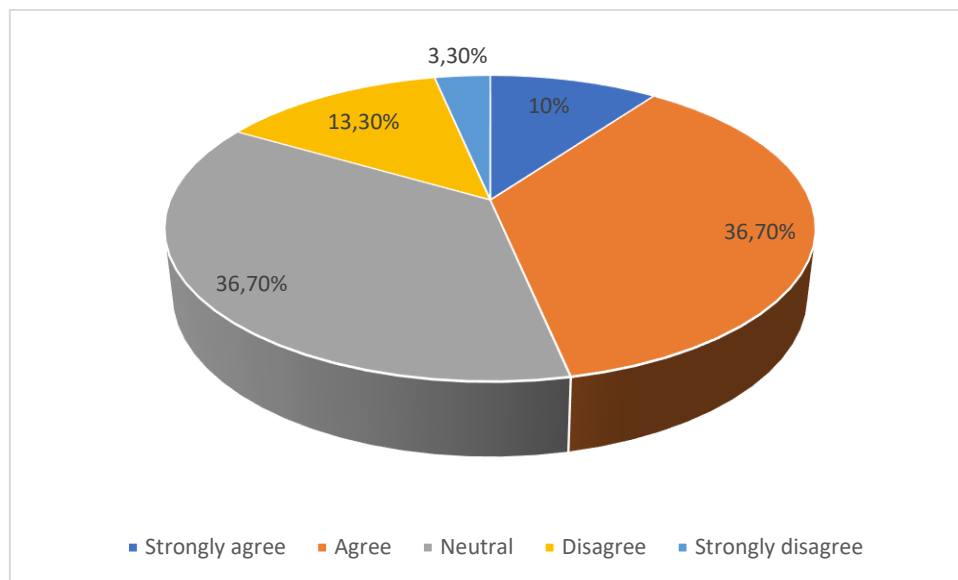


Table 15 presents respondents' opinions regarding whether excessive code-switching can become confusing during medical lectures. The results show that 11 students representing 36.7% agreed that too much code-switching can be confusing while three respondents corresponding to 10% strongly agreed. An equal proportion of 11 students representing 36.7% remained neutral. In contrast, three respondents corresponding to 13.3% disagreed and one student representing 3.3% strongly disagreed.

These presented results explain that although many students recognize the usefulness of code-switching, a considerable proportion also believe that excessive language alternation may reduce clarity and create confusion. The large neutral percentage suggests that students' perceptions vary depending on how frequently and in what context code-switching is used. This finding implies that code-switching is most effective when applied in a balanced and purposeful way during medical lectures.

Q16. Do you prefer lectures with:

Table 16

Students' Preferred Language of Instruction in Lectures

Variable	Frequency	Percentage
English only	8	26,7%
French only	6	20%
A combination of both	13	43,3%
Arabic for explanation when it gets difficult	1	3,3%
I use both languages to learn and look for information	1	3,3%
I personally use both for searching and explanations	1	3,3%
Total	30	100%

Figure 18: Students' Preferred Language of Instruction in Lectures

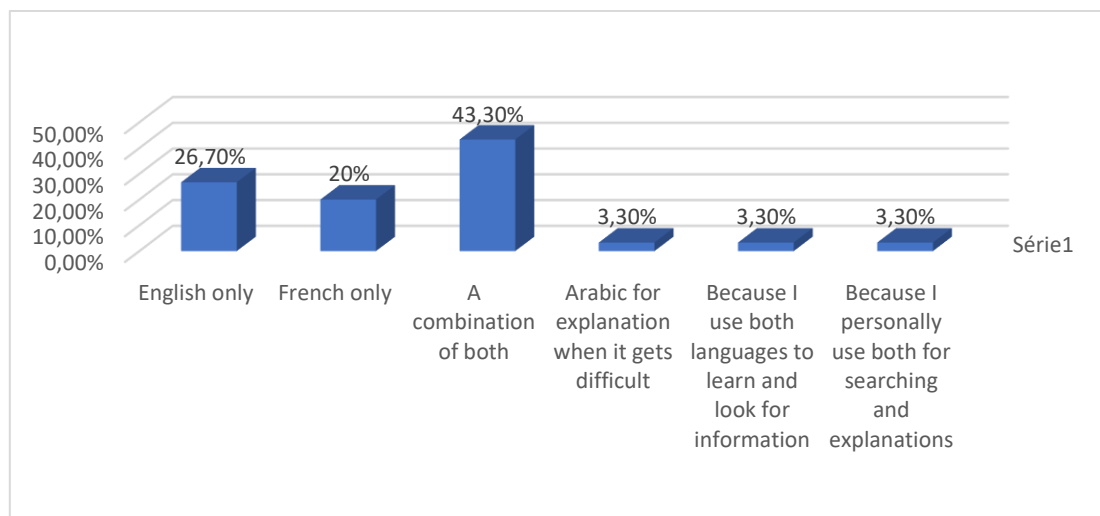


Table 16 presents students' preferred language of instruction during medical lectures. The results reveal that 13 students representing 43.3% preferred a combination of both English and French, which constitutes the highest proportion in the sample. In addition, eight participants corresponding to 26.7% preferred English only, while six students representing 20% selected French only as their preferred language of instruction. By contrast, only 1 respondent (3.3%) preferred the use of Arabic for explanation when lectures become difficult. Similarly, only one student (3.3%) stated that they use both languages to learn and search for information, whereas another respondent (3.3%) indicated personally using both languages for searching and explanations.

These results demonstrate that most students favor a bilingual approach in medical lectures rather than the exclusive use of a single language. The predominance of responses supporting the combination of English and French suggests that code-switching facilitates comprehension and supports students during the current transitional phase toward EMI. At the same time, the lower percentages for Arabic indicate that students still prioritize English and French as the principal academic languages in medical education.

Q17. When materials match the teacher's language switch, does the learning improve?

Table 17

Effect of Matching Learning Materials with Code-switching on Learning Improvement

Variable	Frequency	Percentage
Yes, a lot – Learning improves significantly	15	50%
It helps a bit, but not always	11	36,7%
It can be confusing when materials switch with the teacher	3	10%
No, it doesn't make any difference	1	3,3%
Total	30	100%

Figure 19: Effect of Matching Learning Materials with Code-switching on Learning Improvement

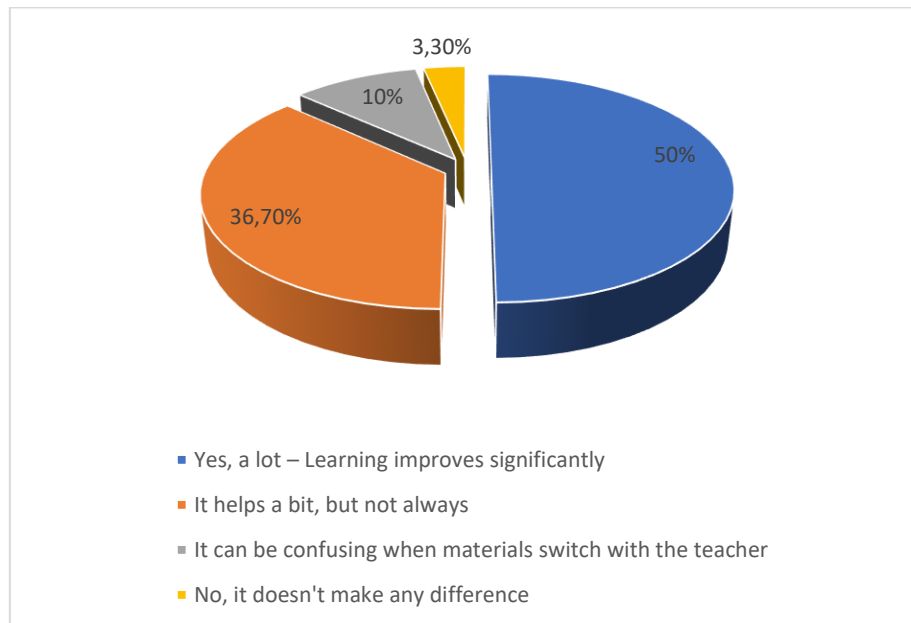


Table 17 presents respondents' opinions regarding whether learning improves when teaching materials match the teacher's language switching during lectures. The results show that 15 students representing 50% stated that learning improves significantly when materials correspond to the teacher's language use, which represents the highest proportion in the sample. In addition, 11 respondents corresponding to 36.7% indicated that it helps a bit but not always. By contrast, three students representing 10% considered that matching materials with code-switching can be confusing while only one respondent corresponding to 3.3% reported that it makes no difference.

These findings indicate that most students perceive a positive relationship between code-switching and the use of supporting materials when both are aligned during medical lectures. The predominance of positive responses suggests that bilingual consistency between oral explanation and written materials facilitates comprehension and reinforces understanding of medical content. At the same time, a limited proportion of students perceive possible confusion which may depend on how materials are presented and how frequently language alternation occurs.

Q18. In your opinion, how does Code-Switching affect your learning in medical lectures?

Positively/ negatively?

Table 18

Students' Perceptions of the Effect of CS on Learning in Medical Lectures

Variable	Frequency	Percentage
Positive effect on learning	10	33,3%
Positive but conditional (depends on topic/usage)	6	20%
Negative effect (confusion, loss of focus)	5	16,7%
Mixed views (both positive and negative)	4	13,3%
Neutral / no strong opinion	2	6,7%
Preference for one language (English more than French)	1	3,3%
Other specific perspectives	2	6,7%
Total	30	100%

Figure 20: Students' Perceptions of the Effect of Code-switching on Learning in Medical Lectures

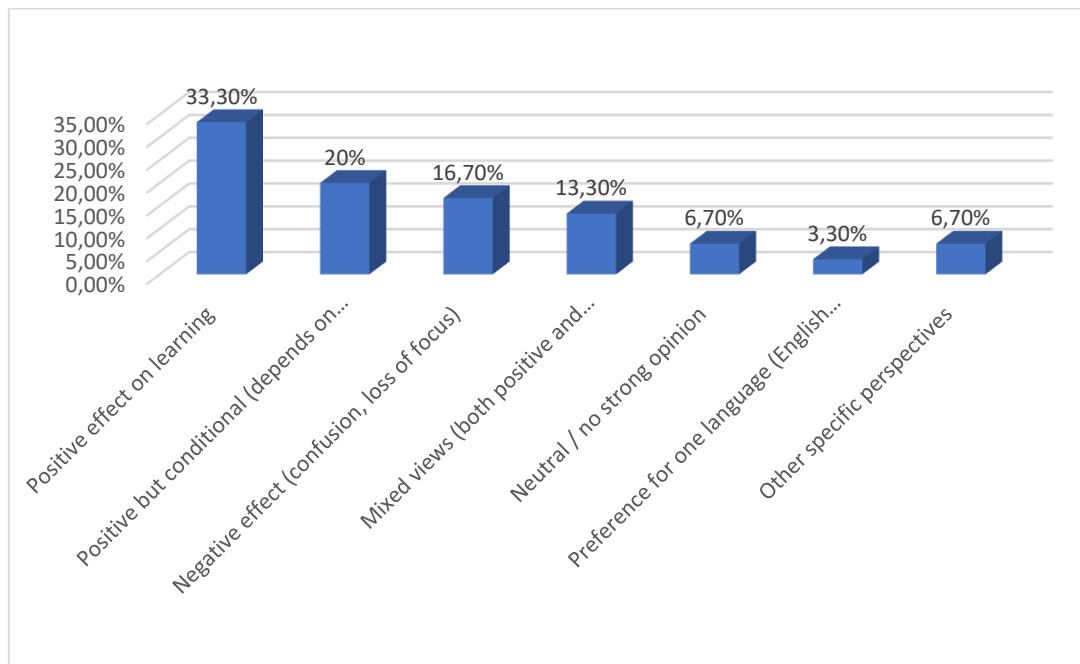


Table 18 presents respondents' perceptions of how code-switching affects their learning during medical lectures. The results show that 10 students representing 33.3% reported a

positive effect on learning, which constitutes the highest proportion in the sample. In addition, six respondents corresponding to 20% indicated that the effect is positive but depends on the topic or the way code-switching is used. On the other hand, five students representing 16.7% considered that code-switching may have a negative effect by creating confusion or reducing concentration. Four respondents corresponding to 13.3% expressed mixed views by recognizing both positive and negative aspects. A smaller proportion of two students representing 6.7% remained neutral and one respondent corresponding to 3.3% expressed a preference for one language mainly English rather than French. Two additional responses representing 6.7% reflected specific individual perspectives.

The results show that students generally perceive code-switching as beneficial for learning although its effectiveness depends largely on how and when it is applied during the lecture. The predominance of positive and conditional responses suggests that language alternation can improve understanding when used purposefully while excessive or poorly managed switching may create difficulties for some learners.

Open-ended Questions

In order to analyze the responses obtained from the open-ended questions, the answers were grouped into thematic categories based on recurring ideas and similar meanings expressed by the respondents. This thematic categorization made it possible to organize qualitative data into clear analytical themes that reflect the main perceptions and experiences related to code-switching in medical lectures.

The objective of this approach is to facilitate the interpretation of open responses by identifying the most frequent tendencies and transforming individual answers into meaningful categories that can support the descriptive analysis of the study results. This procedure also

helps present qualitative findings in a structured way that complements the quantitative data collected through closed-ended question

Q19.Can you describe a situation where switching languages during a lecture was particularly helpful or confusing?

Table 19

Thematic Categorization of Students' Responses

Theme	Frequency	Percentage
Helpful for understanding complex terminology and concepts	10	33.3%
Helpful when French clarifies English content	6	20%
Confusing when switching is too frequent or unstructured	5	16.7%
Helpful depending on subject or context	4	13.3%
Helpful for combining language learning and content learning	2	6.7%
Preference linked to one stronger language	2	6.7%
Total	30	100%

Figure 21: Thematic Categorization of Students' Responses

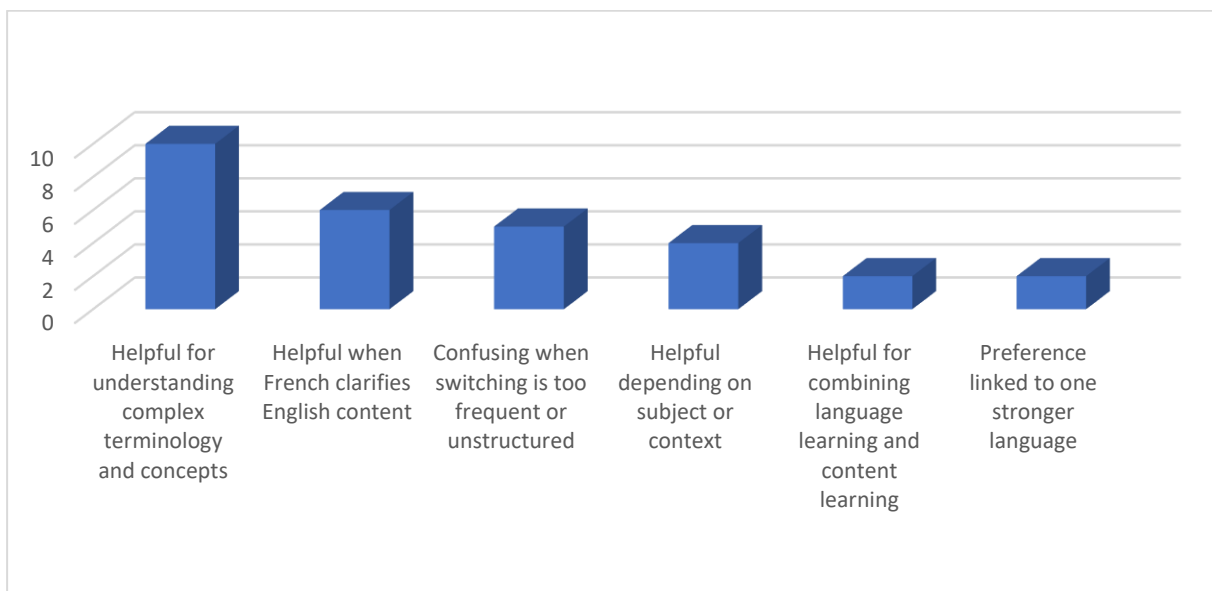


Table 19 shows that the most frequent theme concerns the usefulness of code-switching for understanding complex terminology and difficult medical concepts with 33.3% of responses. A second important theme reflects the role of French in clarifying English explanations representing 20% of responses. In contrast 16.7% of students described code-switching as confusing when language alternation becomes too frequent or lacks clear organization.

The above results show that students generally perceive code-switching as beneficial when used purposefully to support comprehension. However, confusion appears when switching is excessive or pedagogically unstructured, which confirms that effectiveness depends on the way language alternation is managed during the lecture.

Q20. What challenges do you face when the teacher switches between English and French?

Table 20

Thematic Categorization of Challenges Faced During Code-Switching

Theme	Frequency	Percentage
Difficulty understanding French explanations	9	30%
Cognitive overload and loss of focus during switching	6	20%
Difficulty learning and memorizing terminology in two languages	5	16.7%
No major challenge reported	4	13.3%
Difficulty taking notes and organizing information	3	10%
Positive acceptance despite linguistic difficulty	3	10%
Total	30	100%

Figure 22: Thematic Categorization of Challenges Faced During Code-Switching

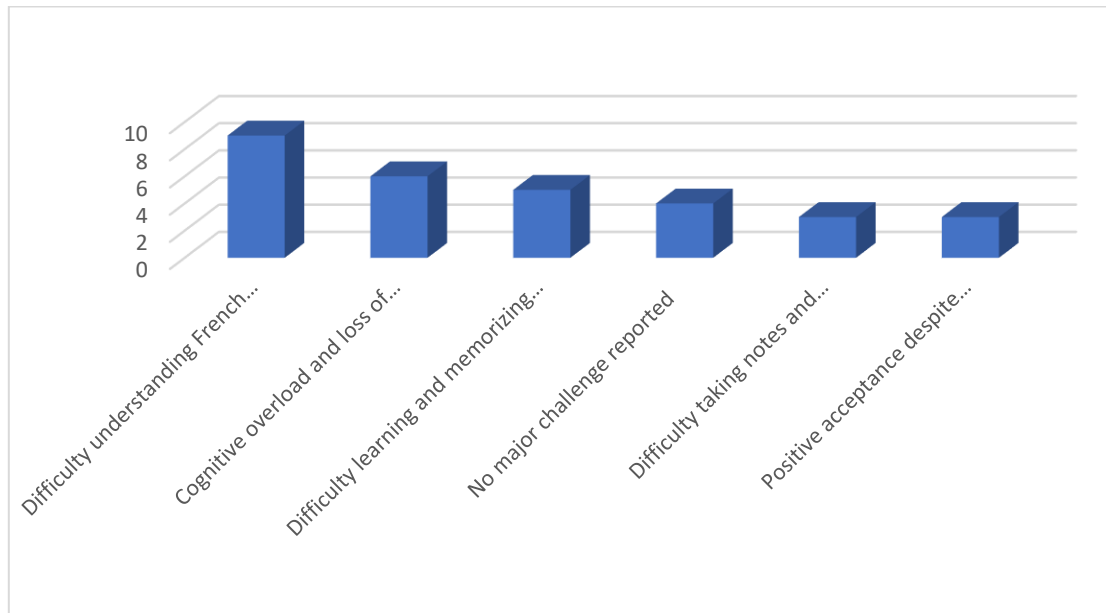


Table 20 shows that the most frequent challenge reported by students concerns difficulty understanding French explanations representing 30% of responses. A second important theme relates to cognitive overload and loss of focus during language switching with 20% of responses. Another recurring difficulty concerns memorizing medical terminology in two languages representing 16.7%.

The present findings indicate that although code-switching can facilitate comprehension in some situations, it also creates linguistic and cognitive challenges for certain students especially when one of the two languages is not sufficiently mastered. At the same time a number of respondents reported no major difficulty or expressed positive acceptance of this practice because they consider bilingual competence important for medical learning and future professional development.

2.6. Interpretation of the findings

2.6.1. Interpretation of The Classroom Observation

During classroom observation, it was noticed that code-switching was pervasive in the EMI medical lectures when teachers attempted to elaborate difficult medical issues or definition and answer students' questions. It seemed that teachers mainly switch between English, French and rarely Arabic to make them understand or maintain the class interaction smoothly. The observation indicated that the more teachers provide explanations supported by code-switching, the more students seem to pay attention. Students in several situations seemed to better understand the difficult issues after they were rephrased by teachers in another language. Thus, code-switching was found to be a scaffolding technique in which the language used helped overcoming comprehension difficulties.

The classroom interaction intensified when students are encouraged to use the languages with which they were familiar. Students' participation was found to be more active and instead of being unwilling to engage in English, the bilingual atmosphere was accepted. In this case, code-switching was used to create a less intimidating and more welcoming learning environment. On the contrary, in some situations, the overuse of code-switching had negative impact as the teachers were unable to complete their lectures fluently. In some situations, some students become so habituated in the translation that they rarely tried to cope with the concept given in English. This would limit the exposure of the students in the English language. In brief, code-switching had a definite and valuable function in supporting EMI medical lectures.

2.6.2. Interpretation of The Online Questionnaire

The questionnaire showed that most of students have a positive attitude towards code-switching in EMI medical lecture. Most students thought that code-switching help them understand better lecture topics (especially when they are specialized terms and complex

concepts). According to the questionnaire results, it appears that most students perceive code-switching as a learning support that makes the message more comprehensible and reduce the lack of understanding. Most students feel more at ease and confident if the teacher mixes occasional explanation in French or Arabic with English. This shows that a multilingual language practice can remove the barriers typically related to EMI environments.

Regarding classroom interaction and engagement, the results showed that code-switching has a moderate rather than a high impact on students' interaction. A large percentage of the students revealed that code-switching increases their interaction only 'sometimes'. It seems that not only language practices but also teaching methods, learner confidence, and interactional features in the classroom contribute to it. Students also think that code-switching should be moderate rather than a constant change, since many respondents confessed that a permanent change of language causes confusion and makes the attention fade away. This clearly states that the students are aware of the benefit of moderateness in multilingualism.

Another significant result concerns language choice; most students think that a bilingual/multilingual teaching style is preferred to an exclusively English one. The majority of students think that bilingual presentation and explanation should be used as a learning support; the visual multilingualism strengthens the understanding and remembering. Overall, the questionnaire shows that code-switching can be seen as a helpful tool to facilitate learning as it helps students to achieve comprehension through thoughtful implementation of this practice.

2.7. Discussion of The Findings

As shown by the findings of both classroom observation and the questionnaire, The synthesis of both observation and questionnaire data has revealed that code-switching plays an influential and complex role in EMI medical lectures. From both sources of data, it is clear that multilingual practice is not random behavior within a classroom; instead, it is a pedagogical strategy actively employed by teachers to support student comprehension, medical terminology,

and participation. The observations indicated teachers use English and French alternately in lectures, at times using a third language like Arabic when they were introducing new difficult vocabulary or explaining concepts. The students' answers in the questionnaire were corroborating and showed that they feel positively about code-switching and the support it lends to understanding the complex medical subjects presented in lectures. This congruence between what was observed in the classroom and the students' opinion fortifies the observation's findings and illustrates that code-switching can meet a genuine need within the EMI medical lecture context.

One of the more apparent themes that arose from both observation and questionnaire data is that code-switching enhances students' comprehension. During classroom observation, the attention of the students increased and they appeared to have a greater grasp of the topic after explanations were reformulated in another language. The questionnaire data confirmed this, showing that students generally agreed that code-switching facilitated their understanding of the lecture. The findings suggest that in EMI lectures, bilingual instruction facilitates easier learning and reduces the amount of linguistic barrier a student might experience. In the context of medicine, students are taught complex subjects that require high amounts of cognitive understanding as well as many new medical terms that cannot always be acquired at once; code-switching in the context of EMI medical lectures is a scaffolding method that aids the students in their quest for understanding.

The observation data also demonstrated that code-switching was able to boost students' participation and interaction within the classroom as they appeared more willing to respond to questions when the lesson was delivered in two languages rather than one. The student responses in the questionnaire confirmed that code-switching can improve participation and that it can also contribute to an easier and more comfortable classroom environment for the students. These findings reinforce the need for teacher-centered education where student

centered practices such as reducing language barriers can make a significant contribution to student learning.

Although code-switching is beneficial, both observation and questionnaire revealed that too much code-switching can actually be detrimental to learning; this may occur when there is constant switching between two languages, which may disrupt the smooth progression of the lecture and confuse students; in the questionnaire, some students believed that a lot of the switches in the lecture tended to disrupt learning, in some instances, creating interference with concentration. One of the more apparent trends in student responses was that they favored a balanced use of the two languages, rather than the exclusive use of English and that this was most evident when paired with bilingual teaching aids such as lecture slides in two languages as opposed to in one language; this preference is expected as it shows that the majority of the students would like to see their existing linguistic knowledge play a role in their learning process as part of EMI lectures.

The fact that a blend of two languages are used throughout lectures is an important piece of information in this study as it raises the pedagogical question of how to strike a balance between increasing student comprehension and exposure to English at the expense of language development. Overall, combining observation and questionnaire data provided evidence that code-switching is an important feature of EMI medical lectures and is seen by both students and teacher as a helpful strategy to achieve effective learning outcomes. Instead of being seen as a failure of EMI, code-switching seems to have developed into an essential component of the EMI medical lecture and must be used with careful attention given to the potential downsides that exist with code-switching. The findings can be discussed in the light of the theoretical frame work, Laggoun Belhoul and Benmoussat (2023), have demonstrated that code-switching promotes comprehension, participation, and understanding of medical terminology in EMI classes, is comparable to the results of the questionnaire. Similarly, Yousfi

(2026) stressed that Algeria's EMI implementation is still in the transitional stage and calls for adaptable multilingual practices. However, the current study shows that the majority of students view code-switching as an essential tool during the transition from French to English, in contrast to some studies that view it as a barrier to EMI.

Conclusion

The above chapter is concerned with the research methods and procedures which were used in carrying out the study of students' beliefs about code-switching and its effect on learning and interaction in EMI medical lectures at the University of Khenchela. This section detailed the nature of the study and identified the research participants as well as data collection and analysis instruments. To answer the above research questions and to achieve the goals of this study, two different data collection instruments were utilized; namely the questionnaire and the observation grid, in order to achieve both qualitative and quantitative aspects. The results show that, depending on its balanced and intentional application, CS at this transitional phase enhances understanding in EMI medical lectures.

General Conclusion

Nowadays, due to the increased status of English as the international language of science, medicine and academic communication, universities all around the world have opted to implement English-Medium Instruction (EMI) as part of their curriculum development. Algeria is also experiencing such linguistic shift, as it has been recently implemented in the medical fields following the guidelines issued by the Ministry of Higher Education and Scientific Research, where English will replace French in medical and scientific learning in a gradual process. Yet, this change is complicated due to the nature of the multilingual universities and the predominance of French in medical training. Hence, the study aimed to analyze the role of the alternation of language (English-French and occasional English-Arabic) in EMI at the Faculty of Medicine of Abbes Laghrour University of Khenchela and its effects on students learning, understanding, and class participation as well as their learning medical term in this transitioning phase.

The first chapter of this dissertation tackled the theoretical study of the global dominance of English as international lingua franca as well as language of science, medicine and academia, English for Medical Purposes (EMP), EMI, bilingualism, multilingualism and pedagogy of code switching in bilingual and multilingual learning contexts. Also, previous studies that were carried out on the subject of EMI and code switching, mainly in the medical fields, and their educational and pedagogical effects, were cited.

The second chapter dealt with the practical part of the study, analysis and interpretation of the data collected by class observation and questionnaire carried out on 1st year and 2nd medical students and instructors. The results indicated that the teachers used code switching not as random activity, but as a purposeful pedagogical practice during EMI learning. It is shown that the teachers code switch so as to make difficult medical concepts understandable and to simplify the information delivered to students while maintaining their interest during the lesson.

They were also aware of students' difficulties to understand the scientific subject in English. Students have favorable attitudes towards EMI; they are convinced about the necessity of using English in medical fields. They acknowledge English as vital tool in their future careers; however, they find difficulties to understand English correctly, there is a big disparity between the teachers' and students' English language competence levels, and this issue will probably raise several challenges regarding learning medical concepts delivered in English. As far as teachers are concerned, most of them use French when explaining concepts in the classroom and they use English for Medical terminology. The majority of the students stated that the lectures should have been entirely taught in English. In conclusion, the findings concluded that EMI at the Faculty of Medicine in Khenchela at the moment does not really implement a purely English-medium education, it is rather transitional, since the majority of teachers use French for explanations, yet the scientific terminology is provided in English; thus code-switching seems to be an integral part of the gradual shift from French to English. The study concluded also that this phenomenon helps reduce the students' linguistic barriers and aids the learning process. The findings concluded that the use of a multilingual approach to learning has benefits on interaction, note-taking and also encourages students participation.

The study highlighted also some drawbacks that are closely associated with EMI. First, limited context of study which was the Faculty of Medicine at Khenchela with a few participants in one department. Second, very recent implementation of EMI in Algeria which limits further comprehensive and relevant empirical and theoretical data on the issue. Future studies will hopefully include a larger sample with different universities, interviews and focus group discussions in order to cover different aspects of EMI from both teachers and students perspectives. Finally, it can be argued that in the Faculty of Medicine of Abbes Laghrour University of Khenchela, EMI works in a mixed way: mainly French is used for explanations, but scientific content is in English; thus, code switching serves as a bridge facilitating the

transition and alleviating the difficulty of learning medicine solely in English. Therefore, it is recommendable to keep the Code-Switching practice as an indispensable part of the English Medium Instruction at the Faculty of Medicine of Khenchela in order to enable students cope better with this pedagogical shift and succeed in their studies and career. It is highly recommended that teachers are to receive further training in order to overcome their linguistic weaknesses in English and to better master its use. Students should also be provided with further linguistic support in terms of preparatory courses. As a matter of fact, those in charge of curriculum development in medical higher education should consider the benefits of code switching. Multilingualism must be considered as a great advantage in the implementation of EMI not an impediment. Finally, creating a supportive and comfortable environment which helps students to get over the fear of English will encourage their participation and also promote the learning of English for medical purpose terminology.

In brief, this study concluded that Code Switching is an integral component in the proper use of EMI in an Algerian context. The use of multiple languages (English, French, Arabic) in the classroom reflects the reality of Algerian Higher education; consequently, it is not a barrier to EMI but instead an aid to enhance teaching and learning. It is only the progressive adaptation with careful planning, strong support of the institution and teacher training that enables successful EMI. In addition, student's centered approaches help students to master medical English as a tool for efficient communication and success in the medical profession. Its potential contribution will enhance the implementation policies and practice of multilingualism in higher education across Algeria.

- **Limitations of The Study**

While this study provides good information on students' views and practices of code-switching in EMI in the EMI medical lecture setting, there are some limitations that need to be addressed. Firstly, this research was confined to the specific EMI context of the medical

program at the University of Khenchela. Results may not be representative of other EMI settings, other universities or other subject disciplines. Depending on the setting, perceptions and practices of code-switching may vary considerably. Secondly, the number of observed students and the observations context were restricted to a limited sample size. A larger sample size can lead to more representative and statistically valid conclusions. Thirdly, data was collected through questionnaires and observation sheets. While valuable quantitative and qualitative data were gathered from these sources, these tools might not always reveal students' underlying attitudes, beliefs, experiences and reasons for their perceptions and practice. Other sources of data, such as interviews or focus groups, would have complemented the findings from questionnaires and observation sheets. Yet another limitation concerns the reliability of the observer. Through being observant but also objective in our data collection, hoping we have maintained integrity.

Yet again, another limitation is that my study focuses more on students' perspectives and the teacher's practice in the EMI classroom; it does not attempt to empirically determine the impact that students' and the teachers' use of code-switching may have on the student's academic achievement or language learning. The results from this study remain limited to one context and perceived rather than empirically measured or proven. Lastly, our study was conducted over a limited period of time, so it can only reflect on the teaching practice that we observed and the beliefs that the students hold; we cannot give long-term indications as to how teaching may change in EMI settings, how students adapt to EMI, and the long-term effects that code-switching has on comprehension and engagement.

- **Recommendation and Suggestions**

EMI medical educators should consider a careful and strategic use of code-switching, such that it be meaningful and reserved only when necessary for clarifying, explaining or to support students' comprehension or production. Otherwise, unnecessary and uncontrolled Code-

Switching could reduce students' exposure to the target language, which is English. EMI teachers should use bilingual pedagogical materials (bilingual slides, glossaries, or explanations) especially when introducing difficult and/or specialized terminology so that students can overcome language difficulties while enhancing their subject-matter and academic vocabulary knowledge.

EMI teachers should receive in-service training on multilingual teaching strategies and effective language management in multilingual classrooms so they can develop a greater awareness and pedagogical awareness of code-switching use. Universities should be aware of and make provisions to mitigate the linguistic difficulties faced by students in EMI programs by implementing academic support programs aimed at helping students develop their English proficiency, particularly in scientific and medical terms. Besides, the use of interactive and student-centered methods could increase students' participation and lower their linguistic anxiety in the EMI medical lectures.

This study should be widened by having a larger sample drawn from different universities and disciplines to widen the scope of the study. There could also be future studies focusing on teachers' use of Code-Switching in different EMI disciplines like engineering, economics, or technology, so that it may be investigated whether Code-Switching plays a different role depending on the disciplines. Another possible study topic would be about teachers' views of Code-Switching in EMI classrooms to better understand, along with students' views, the phenomenon in EMI teaching settings.

Future studies should apply a variety of data collection methods including questionnaires, interviews, focus groups, as well as experimental designs in an EMI setting to reach richer data and better insights into EMI language practices. Longitudinal studies should be carried out to measure the long-term effects of code-switching on students' performance in learning,

understanding, participating and language skills. Last but not least, there should be further investigations into the correlation between code-switching and students' language proficiency, cognitive load, motivation, and anxiety in EMI medical education.

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Appendices

Appendices

Appendix A

Classroom Observation Grid

Classroom Observation Grid

Research Focus: Code-Switching and Learner Response in Medical Lectures

Date: _____

Observation Session No: _____

Instructor: _____

Subject: _____

Part 1: Teacher Code-Switching Observation

Category	Description/Guiding Questions	Observer Notes
<input type="checkbox"/> Moment/Context of Code-Switching	<ul style="list-style-type: none"> • When does the CS occur? • During explanations or transitions? • Trigger? 	
<input type="checkbox"/> Lesson/ lecture	<ul style="list-style-type: none"> • Topic being covered? • Medical terminology? 	
<input type="checkbox"/> Direction of CS	<ul style="list-style-type: none"> • FR → EN / EN → FR ? • Pattern ? 	
<input type="checkbox"/> Estimated Duration	<ul style="list-style-type: none"> • Starting ? • Single sentence or extended? 	

Appendices

<input type="checkbox"/> Pedagogical Purpose of CS	<ul style="list-style-type: none"> • Clarification? • Emphasis? • Engagement? 	
<input type="checkbox"/> insurance of smooth transition	<ul style="list-style-type: none"> • Does the teacher notice students' behavior to repeat and simplify the terms? 	
<input type="checkbox"/> Frequency Count	<ul style="list-style-type: none"> • How many occurrences? • Repeated pattern? 	
<input type="checkbox"/> Clarity of explanation	<ul style="list-style-type: none"> • Does the teacher explain terms clearly? • Are terms simplified? 	
<input type="checkbox"/> Tone and delivering during CS	<ul style="list-style-type: none"> • Dose the voice tone change (emphasis, slowing down, articulation) • Spelling terms 	
<input type="checkbox"/> Use of supporting materials when switching	<ul style="list-style-type: none"> • Does the teacher use English-dominant or French-dominant materials (Slides, diagrams,..) • Use of Bilingual resources 	

General Observation

Part 1: Student Code-Switching Observation

Category	Description/Guiding Questions	Observer Notes
<input type="checkbox"/> Student Attitude	<ul style="list-style-type: none"> • Eye contact? • Posture? • Note-taking? 	
<input type="checkbox"/> Comprehension Indicators	<ul style="list-style-type: none"> • Correct responses? • Following explanations? • Clarification requests? 	
<input type="checkbox"/> Student-Teacher Interaction	<ul style="list-style-type: none"> • Questions asked? • Participation level? 	
<input type="checkbox"/> Student-Student Interaction	<ul style="list-style-type: none"> • Peer explanations? • Micro discussions? 	
<input type="checkbox"/> Changes Linked to Code-Switching	<ul style="list-style-type: none"> • Improved engagement? • Improved clarity? 	
<input type="checkbox"/> Behavioral Indicators	<ul style="list-style-type: none"> • Facial expressions? • Body language? 	
<input type="checkbox"/> Frequency Count	<ul style="list-style-type: none"> • How many observed behaviors? 	

Appendix B

Participants' Questionnaire

MEDICAL STUDENTS' PERCEPTION OF CODE-SWITCHING AND ITS IMPACT ONE COMPREHENSION AND ENGAGEMENT IN ENGLISH-MEDIEUM MEDICAL LECTURES

Dear participants,

This questionnaire is part of an Academic study investigating Medical Students' perception of code-switching (the alternation between French and English) in English-Medium Instruction (EMI) medical lectures. The study aims to explore how code-switching influences students' comprehension, engagement, and interaction during lectures, as well as their attitudes toward its pedagogical use. This questionnaire takes approximately 5 minutes to complete. The data collected will be used solely for academic research purposes. All responses will remain confidential and anonymous, and no individual participant will be identified in any publication or report. Please answer the questions honestly, based on your personal learning experiences and perceptions during medical lectures.

Thank you for your collaboration and for the time you devoted to answer the questionnaire.

SECTION A

Background Information

1. Study Level

- 1st year
- 2nd year

2. Which language are medical courses taught in ?

- English
 - French
 - Both
 - Other:
-

3. How would you describe your English proficiency ?

- Beginner A1/A2
- Elementary B1
- Intermediate B2
- Advanced C1

4. What do you know about Code-Switching?

SECTION B

Exposure to Code-Switching

5. To what extent do teachers use both French and English in lectures ?

- Very often
- Often Sometimes
- Rarely
- Never
- Other:

6. Which language is dominant in lectures ?

- French
- English
- Both
- Other:

7. When does Code-Switching happen mainly ?

- Medical terminology explanation
 - Complex concepts
 - Transitions between topics
 - Answering questions
 - All of the above
 - None of the Above
-

SECTION C

Comprehension Clarity and Engagement

8. Switching between languages help you understand medical concepts

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

9. Terminology is assimilated after the teacher switches languages

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

10. After Code-Switching, does the explanation become clearer ?

- Yes
- No
- Other:

11. Do you appreciate it when the teacher switches codes ?

- Yes, it helps me understand better.
- Sometimes, it helps, but not always.
- It depends on the topic. No,
- I prefer the lecture in one language only.
- Other

12. Does switching between languages encourage you to participate and ask questions ?

- Most of times
 - Sometimes
 - Rarely
-

- Never
- Other:

13. Does code-switching help you pay more attention ?

- Yes, it helps me focus better.
- Yes, I pay more attention when the teacher switches languages.
- It depends on the topic.
- No, it actually distracts me.
- Other:

SECTION E

Attitudes toward Code-Switching and the use of Supporting Materials

14. Code-switching should be used in medical lectures .

- Yes, it helps students understand better.
- It could be useful, but not always necessary.
- No, lectures should be in one language only.
- I don't know.
- Other:

15. Too much Code-Switching can be confusing.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

16. Do you prefer lectures with ?

- English only
- French only
- A combination of both
- Other:

17. Do Bilingual slides help you understand lectures ?

- Yes, they help me understand complex topics better.
- They can help, but not always necessary.
- No, I don't need bilingual slides to understand lectures.
- Other:

18. When materials match the teacher's language switch, does the learning improve?

- Yes, a lot –
- Learning improves significantly when materials match the teacher's language switch.
- It helps a bit, but not always.
- It can be confusing when materials switch with the teacher.
- No, it doesn't make any difference to me.
- Other:

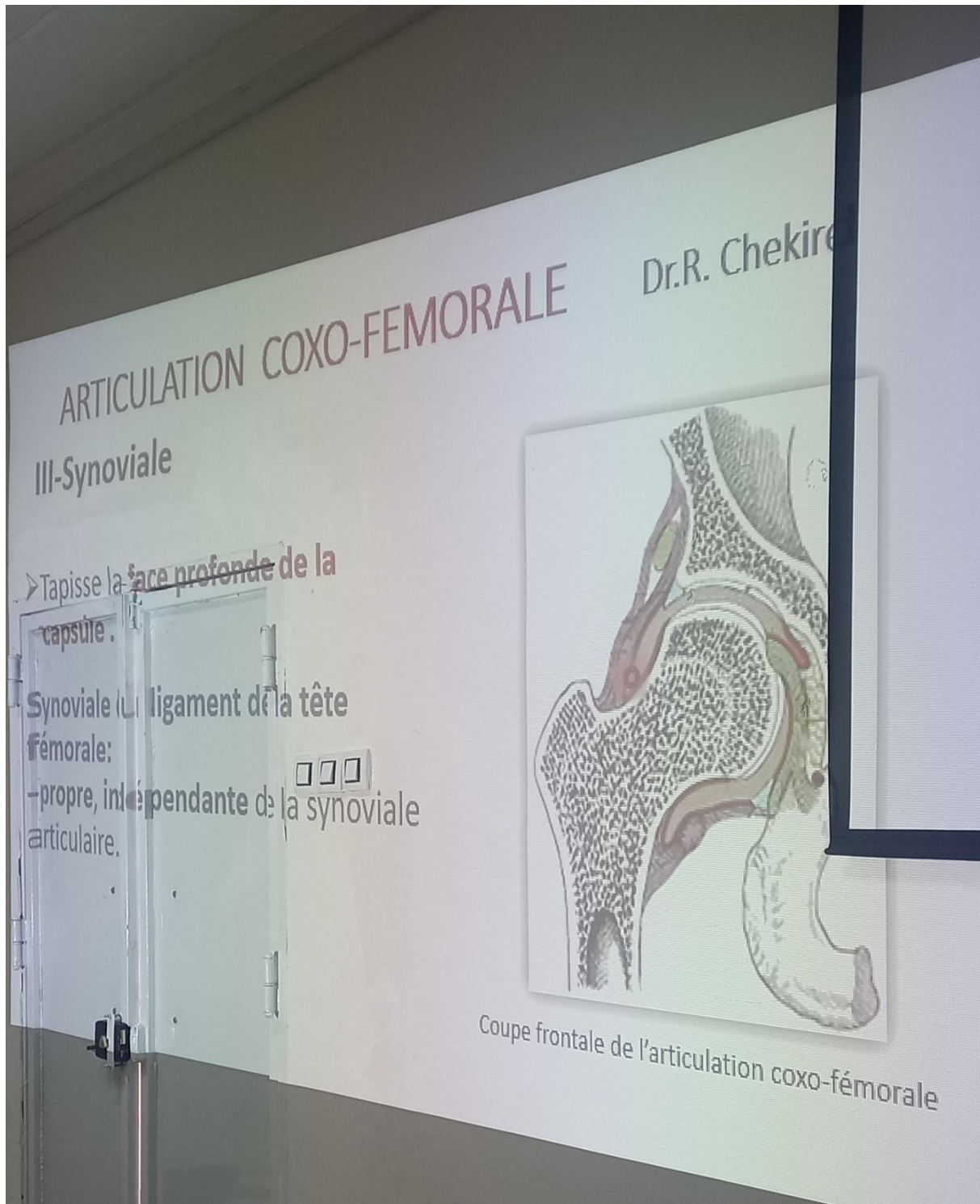
19. In your opinion, how does Code-Switching affect your learning in medical lectures? positively/ negatively ?

20. Can you describe a situation where switching languages during a lecture was particularly helpful or confusing?

21. What challenges do you face when the teacher switches between English and French?

Appendix C

Handouts (slides and Documents)



Ribosomes in prokaryotic and eukaryotic cells have a similar structure and function. However, the length of the main rRNA molecules, the L and S protein content of each subunit and the size of the elements differ between prokaryotes and eukaryotes (see table below).

	Prokaryotic cell	Eukaryotic cell
Large sub-unit	- 23S and 5S rARN - 31 to 34 proteins L - sedimented at 50S	- 28S, 5,8S and 5S rARN - 45 to 50 proteins L - sedimented at 60S
Small sub-unit	- rARN16S - 21 proteins S - sedimented at 30S	- rARN 18S - 30 to 33 proteins S - sedimented at 40S
Ribosome assembled and active	- Reduced size - Fewer - sedimented at 70S	- Larger size - More of them - sedimented at 80S

Note: ribosomes are also found in chloroplasts and mitochondria. Chloroplast ribosomes are similar to prokaryotic ribosomes (70S), whereas mitochondrial ribosomes have smaller rRNAs and fewer proteins than prokaryotic ribosomes.

IV. ORGANIZATION AND CONNECTION SITES

The ribosome has four binding sites located exclusively on rRNAs: an mRNA binding site located on the rRNA of the small sub-unit and three tRNA binding sites located mainly on the rRNA of the large sub-unit.

- The aminoacyl-tRNA binding site (site A), which binds the incoming tRNA molecule, carrying a new amino acid.
- The peptidyl-tRNA binding site (site P), which binds the tRNA molecule carrying the growing polypeptide; this is the site where a new peptide bond is formed between two amino acids; this site is formed by the 23S rRNA. Peptidyl transferase is therefore not a ribosomal protein enzyme but an rRNA playing the role of an enzyme (hence the name ribozyme for the ribosome).
- And finally, the empty tRNA binding site (E or Exit site).

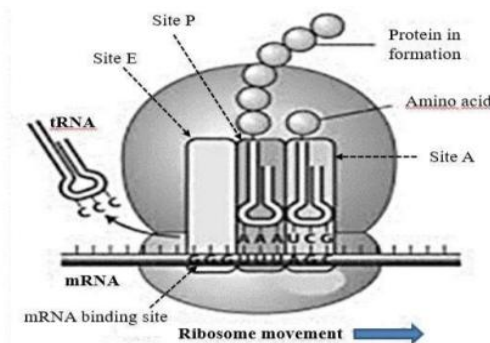


Figure 2: Location of the four-ribosome binding sites.

catalyses the formation of peptide bonds that link amino acids together to form a polypeptide chain.

The two elements come together on an mRNA molecule at its 5' end to begin translation. The ribosome moves along the mRNA translating the nucleotide sequence codon by codon in the 5'-3' direction into an amino acid sequence, using the tRNAs as adapters to add the correct order of each amino acid to the end of the growing polypeptide chain. The 2 sub-units separate when the synthesis of the protein or polypeptide is complete.

Molecules involved in translation: the molecules involved in the various stages of protein synthesis are briefly:

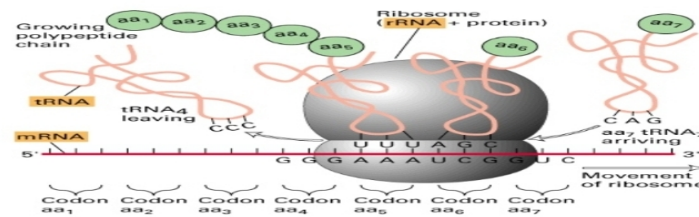
- rRNAs making up the ribosome, some of which act as enzymes,
- mRNA from the nucleus carrying genetic information in the form of codons (triplets of bases),
- tRNAs also coming from the nucleus with the anticodon and carrying the activated amino acids, coming from the cytosol,
- Amino acids present in the cytosol,
- Several types of cytosolic factors: factors responsible for the activation of amino acids and their attachment to tRNAs, which differ between prokaryotes and eukaryotes, initiation, elongation and termination factors, ATP (adenosine triphosphate) and GTP (guanosine triphosphate).

Pathology

As these diseases affect the structure and/or function of ribosomes, they are collectively referred to as “ribosomopathies.” All ribosomopathies are rare diseases, and the molecular mechanisms underlying ribosome “assembly defects” remain poorly understood.

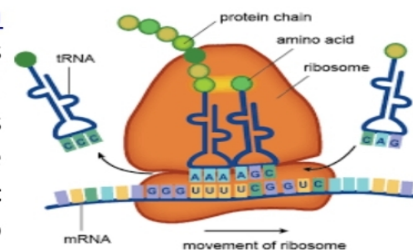
Some genetic disorders result from mutations in factors involved in ribosome biogenesis or in ribosomal components themselves. For example, Diamond–Blackfan anemia is the first recognized ribosomal disease. It is caused by a mutation in the ribosomal protein S19. Clinically, it is characterized by erythroblastopenia, growth retardation, and various congenital malformations.

Chapter VII. Ribosome



Ribosome

• **ribosome**, particle that is present in large numbers in all living [cells](#) and serves as the site of [protein synthesis](#). Ribosomes occur both as free particles in [prokaryotic](#) and [eukaryotic](#) cells and as particles attached to the membranes of the [endoplasmic reticulum](#) in eukaryotic cells. The small particles that came to be known as ribosomes were first described in 1955 by Romanian-born American [cell](#) biologist [George E. Palade](#), who found them to be frequently associated with the [rough endoplasmic reticulum](#) of eukaryotic cells.



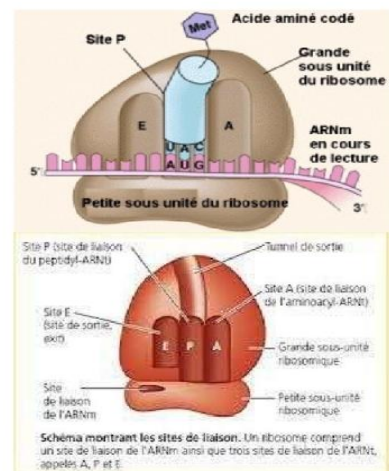
Ribosomes

- Each ribosome is composed of two subunits, a larger one and a smaller one, each of which has a [characteristic](#) shape. In eukaryotes, ribosomal subunits are formed in the [nucleolus](#) of the cell's [nucleus](#). The subunits typically are referred to in terms of their [sedimentation](#) rate, which is measured in Svedberg units (S), in a centrifugal field. The small and large subunits of eukaryotes are designated 40S and 60S, respectively, while prokaryotes contain a small 30S subunit and a large 50S subunit.

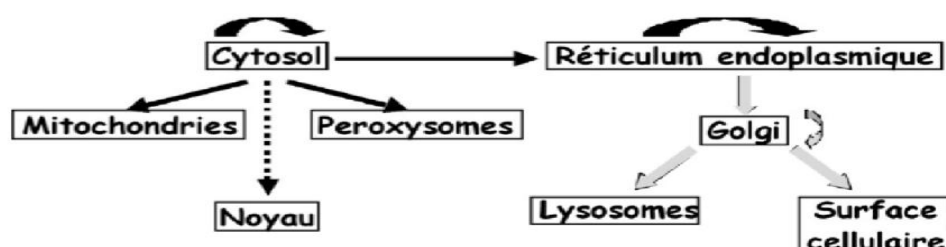
Ribosomes

- Each ribosome is composed of two subunits, a larger one and a smaller one, each of which has a characteristic shape. In eukaryotes, ribosomal subunits are formed in the nucleolus of the cell's nucleus. The subunits typically are referred to in terms of their sedimentation rate, which is measured in Svedberg units (S), in a centrifugal field. The small and large subunits of eukaryotes are designated 40S and 60S, respectively, while prokaryotes contain a small 30S subunit and a large 50S subunit.

- **Ribosomal Binding Sites**
- The ribosome contains four RNA-binding sites:
- An mRNA binding site.
- The aminoacyl-tRNA binding site (A site), which accommodates the incoming tRNA molecule carrying an amino acid.
- The peptidyl-tRNA binding site (P site), which holds the tRNA linked to the growing end of the polypeptide chain.
- The exit site (E site), where the deacylated tRNA exits the ribosome.



Destination of proteins



Appendix D

Authorization

وزارة التعليم العالي والبحث العلمي
Ministry of Higher Education and Scientific Research
جامعة عباس لغرور خنشلة
Abbas Laghrou University – Khenchela

Faculty of Letters and Languages كلية: الآداب واللغات

Department of English Language and literature قسم: الآداب واللغة الإنجليزية



خنشلة في : 2025/11/30

ترخيص

إن رئيس قسم اللغة الإنجليزية يرخّص للطالب (ة): ملاح ياسمينه
السنة: ثانية ماستر .التخصص: لغة و ثقافة
بالقيام بدراسة ميدانية على مستوى ملحقة الطب بجامعة عباس لغرور-خنشلة-
وذلك في الفترة الممتدة من: 30 نوفمبر 2025 إلى 30 فيفري 2026

إمضاء رئيس القسم


د. بروال كمال
رئيس قسم الآداب واللغة الإنجليزية



Appendix E

Written Request

إلى السيد
مسؤول ملحقة الطب
لجامعة عباس لغزور
مختلصة

المراسلة : ملاح ياسمينية
الإختصاص اللغة الإنجليزية
المستوى : الثانية ماستر
رقم الهاتف : 06 72.12.89.07
البريد الإلكتروني : mallahyasminia@gmail.com

الموضوع : طلب الموافقة على إتمام دراسة ميدانية

بشرفي أن أتقدم إلى سيادتكم المسترمة بطلب
هذا، والمتعلق بطلب الموافقة على إتمام دراسة ميدانية
على مستوى ملحقة الطب بجامعة مختلصة بغرض إتمام
مذكرة التخرج لنيل شهادة الماستر
ويجدون مرافقا لهذا الطلب، ترخيص السيد رئيس قسم
اللغة الإنجليزية.

وأرجو أن ينال طلبي هذا موافقتكم
وفي الأخير تقبلوا مني خاتمة التقدير والإحترام

د. رضوان تكواشت

مسؤول ملحقة الطب



إلى سيادتي

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Appendix F

Example of the observation notes

Classroom Observation Grid

Classroom Observation Grid n=001

Research Focus: Code-Switching and Learner Response in Medical Lectures
 Date: 17-02-2025
 Observation Session No:
 Instructor: Dr. Chelkired . Rabab
 Subject: Anatomy (TP)

Part 1: Teacher Code-Switching Observation

	Description/Guiding Questions	Observer Notes
<input checked="" type="checkbox"/> Moment/Context of Code-Switching	<ul style="list-style-type: none"> • When does the CS occur? ✓ • During explanations or transitions? ✓ • Trigger? 	- most ly when teachers explain body part, the slides were in French. it was used as a translation and explanation at the same time
<input checked="" type="checkbox"/> Lesson/ lecture	<ul style="list-style-type: none"> • Topic being covered? ✓ • Medical terminology? 	The topic was the (hip joint) the structure, and how it functions - (Frontal (coronal) symphysis cavity - Use of medical terminology!
<input checked="" type="checkbox"/> Direction of CS	<ul style="list-style-type: none"> • FR → EN / EN → FR ? • Pattern ? 	The teacher starts the explanation in French first then she moves to english (Fr → Eng)
<input checked="" type="checkbox"/> Estimated Duration	<ul style="list-style-type: none"> • Starting ? • Single sentence or extended? + 	The duration : Approximately 15 min from the starting (explanation → Question → answers → clarification
<input checked="" type="checkbox"/> Pedagogical Purpose of CS	<ul style="list-style-type: none"> • Clarification? ✓ • Emphasis? ✓ • Engagement? ✓ 	- This helps students to identify the anatomical structures - Understand the functions - link the relation between structure function (mobility + stability)

Classroom Observation Grid

<input checked="" type="checkbox"/> Insurance of smooth transition	<ul style="list-style-type: none"> • Does the teacher notice students' behavior to repeat and simplify the terms? 	<p>The teacher dominates the whole situation, explaining, repeating the terms using both languages to make sure the lesson is fully covered.</p>
<input checked="" type="checkbox"/> Frequency Count	<ul style="list-style-type: none"> • How many occurrences? • Repeated pattern? 	<p>- from the start to the end of the lesson, the pattern was always Fr → En, and sometimes in arabic in case of blockage.</p>
<input checked="" type="checkbox"/> Clarity of explanation	<ul style="list-style-type: none"> • Does the teacher explain terms clearly? ✓ • Are terms simplified? ✓ 	<p>Definitely, the teacher makes sure that every term is explained and simplified using the slides as a pedagogical support most of the time.</p>
<input checked="" type="checkbox"/> Tone and delivering during CS	<ul style="list-style-type: none"> • Does the voice tone change (emphasis, slowing down, articulation) • Spelling terms 	<p>- The focus was not on the accent but on the terms, the articulation with the emphasis on spelling. The voice and the tone varied from clear to loud.</p>
<input type="checkbox"/> Use of supporting materials when switching	<ul style="list-style-type: none"> • Does the teacher use English-dominant or French-dominant materials (Slides, diagrams,...) • Use of Bilingual resources x 	<p>- slides were in Fr; - The french was dominant 60% of the time, and english was the second to use as a translation of what was explained, and the slides.</p>

General Observation

Classroom Observation Grid

Part 1: Student Code-Switching Observation

Category	Description/Guiding Questions	Observer Notes
<input type="checkbox"/> Student Attitude	<ul style="list-style-type: none"> • Eye contact? ✓ • Posture? ✓ • Note-taking? ✓ 	<p>Most of the students were following the slides, taking picture and following the teacher's explanation.</p> <p>- taking notes as well from the white board</p>
<input type="checkbox"/> Comprehension indicators	<ul style="list-style-type: none"> • Correct responses? • Following explanations? ✓ • Clarification requests? ✓ 	<p>- Rarely asking questions, since the subject is new.</p> <p>- only 2 students asked for clarification</p>
<input type="checkbox"/> Student-Teacher Interaction	<ul style="list-style-type: none"> • Questions asked? • Participation level? 	<p>- few only asked questions and participated during the class</p>
<input checked="" type="checkbox"/> Student-Student Interaction	<ul style="list-style-type: none"> • Peer explanations? ✓ • Micro discussions? ✓ 	<p>The class was prepared for a group work, student were divided into 5g, each 3 to 4 st. with models of juma in front of the students to manipulate.</p>
<input checked="" type="checkbox"/> Changes Linked to Code-Switching	<ul style="list-style-type: none"> • Improved engagement? • Improved clarity? 	<p>There was a change and improvement especially because, even the students use both Pges in discussion and peer work.</p>
<input checked="" type="checkbox"/> Behavioral Indicators	<ul style="list-style-type: none"> • Facial expressions? • Body language? 	<p>The atmosphere of the class was lively and suitable for this type of lessons (TP), most of the students were involved and excited to learn with their peers.</p>
<input checked="" type="checkbox"/> Frequency Count	<ul style="list-style-type: none"> • How many observed behaviors? ✓ • Patterns? 	<ul style="list-style-type: none"> - Peer discussions / arguments - Curiosity about the models - Manipulation of the models - Sharing information.

Classroom Observation Grid

<input checked="" type="checkbox"/> Student perceived clarity after CS	<ul style="list-style-type: none"> • Do students appear to better understand after CS? • Do they nod, take notes? 	They do understand and feel comfortable switching codes with themselves during discussion and even when taking notes.
<input checked="" type="checkbox"/> Student responsiveness	<ul style="list-style-type: none"> • Do students react (raise hands, intervene) ? 	Note while the teacher is explaining but when one of them present they intervene and ask questions.
<input checked="" type="checkbox"/> Student engagement with supporting materials	<ul style="list-style-type: none"> • Do they follow along better when the teacher uses bilingual materials? ✓ • Do the slides enhance students understanding? ✓ 	- The slides were in french in this class. - yes, the slides were so important for students, in particular taking notes and following the teacher's explanation.

General Observation

Coding Keys:

- ✓ = Positive behavior ;
- ✗ = Negative behavior ;
- ↔ = Neutral behavior ;

- (FR→EN) = French to English CS ;
- (EN→FR) = English to French CS ;
- (↑) = Increase (↓) = Decrease.

Résumé

La présente étude examine le rôle de l'alternance codique dans la mise en œuvre de l'enseignement dispensé en anglais (English-Medium Instruction – EMI) au sein de la Faculté de Médecine de l'Université Abbès Laghrour de Khenchela, en Algérie. Dans un contexte marqué par l'orientation progressive de l'enseignement supérieur algérien vers l'anglais dans les domaines scientifiques et médicaux, cette recherche analyse l'impact des pratiques multilingues sur les processus d'enseignement et d'apprentissage. Adoptant une approche mixte, l'étude a combiné des observations de classe et des questionnaires administrés aux étudiants de première et deuxième année (87 participants) de médecine ainsi qu'aux enseignants (trois enseignants au cours de trois séances). Les résultats montrent que l'alternance codique entre l'anglais, le français et l'arabe constitue une stratégie pédagogique essentielle permettant de faciliter la compréhension, d'expliquer la terminologie médicale complexe et de renforcer l'interaction en classe. Les résultats révèlent également que, malgré des attitudes généralement positives envers l'EMI en raison de son importance académique et professionnelle, plusieurs difficultés linguistiques persistent, notamment en ce qui concerne la maîtrise de l'anglais et l'accessibilité des contenus. L'étude démontre enfin que l'EMI à la Faculté de Médecine de Khenchela demeure un modèle transitoire et hybride, caractérisé par la coexistence de plusieurs ressources linguistiques plutôt que par l'usage exclusif de l'anglais. Cette recherche souligne ainsi l'importance des pratiques multilingues flexibles, de la formation des enseignants et du soutien linguistique pour garantir l'efficacité de l'EMI dans l'enseignement médical algérien.

Mots-clés : Enseignement en anglais (EMI), alternance codique, enseignement médical, multilinguisme, Français, enseignement supérieur

المخلص

تهدف هذه الدراسة إلى استكشاف دور التبديل اللغوي في تطبيق التعليم باللغة الإنجليزية (EMI) بكلية الطب بجامعة عباس لغرور خنشلة في الجزائر. وفي ظل التوجه المتزايد للتعليم العالي الجزائري نحو اعتماد اللغة الإنجليزية في التخصصات العلمية والطبية، تسعى هذه الدراسة إلى تحليل تأثير الممارسات اللغوية المتعددة على عمليتي التعليم والتعلم. اعتمدت الدراسة على المنهج المختلط من خلال توظيف الملاحظة والاستبيان الموجه لطلبة السنة الأولى طب والأساتذة. أظهرت النتائج أن التبديل اللغوي بين الإنجليزية والفرنسية يمثل استراتيجية بيداغوجية فعالة تُستخدم لتسهيل الفهم، وشرح المصطلحات الطبية المعقدة، وتعزيز التفاعل داخل القسم. كما كشفت الدراسة أن المشاركين يحملون مواقف إيجابية تجاه التعليم باللغة الإنجليزية نظرًا لأهميته الأكاديمية والمهنية، رغم استمرار بعض الصعوبات اللغوية المرتبطة بإتقان اللغة الإنجليزية وفهم المحتوى العلمي. وأوضحت النتائج أيضًا أن تطبيق التعليم باللغة الإنجليزية في كلية الطب بخنشلة لا يزال في مرحلة انتقالية وهجينة، حيث تتعايش عدة لغات داخل البيئة التعليمية بدل الاعتماد الكامل على الإنجليزية فقط. وتؤكد الدراسة في الأخير على أهمية الممارسات اللغوية المرنة، وتكوين الأساتذة، والدعم اللغوي لضمان فعالية التعليم باللغة الإنجليزية في التعليم الطبي الجزائري

الكلمات المفتاحية: التعليم باللغة الإنجليزية، التبديل اللغوي، الفرنسية، التعليم الطبي، التعدد اللغوي، التعليم

العالي، الجزائر، جامعة خنشلة