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Submitted by:

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Investigating The Implementation of English as a Medium of Instruction in Material Sciences Department (Branch of Physics) at Biskra University

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A Case Study 1st year students and teachers

A Dissertation Submitted to the Department of Foreign Languages as Partial Fulfillment of the Requirements for the Degree of Master in Sciences of Language

Board of Examiners

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Declaration

I, kafia RIHANI, hereby certify that the content of this dissertation is the result of my personal academic effort and original research. All findings, analyses, and interpretations presented in this work have been undertaken independently and are entirely my own, except where explicit references have been made to the work of others.

I further declare that this dissertation has not been submitted previously, whether in part or in full, to fulfill the requirements of any academic degree, nor has it been published by any university or academic institution.

This study was carried out and formally submitted as part of the academic requirements at Mohamed Kheider University of Biskra, Algeria.

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Dedication

In the name of Allah, the Most Gracious, the Most Merciful,

Thank you, Allah, whose infinite wisdom and guidance has been my constant support throughout this journey. Without Your blessings and mercy, none of this would have been possible

I dedicate this dissertation to:

My beloved parents, Your unwavering love, support, and prayers have been the foundation of every success in my life. I am forever grateful.

To my beloved siblings; my first friends and forever anchors, Your love and laughter have shaped my world in countless ways.

My husband,

Thank you for your patience, encouragement, and belief in me every step of the way.

My wonderful children IYAD, DJAD,ISHAK

You are my greatest inspiration and the reason I strive to be better every day.

To my dear friends: WAFA,YOUSSRA,CHAHINAZ, who have been brought into my life through a bond of sincere love and indescribable loyalty. Your love and support will forever be engraved in my heart

My colleagues and friends, Your collaboration, motivation, and kindness have made this journey smoother and more meaningful. I deeply appreciate your presence in my life.

Thank you all for your endless support and encouragement. This accomplishment is as much yours as it is mine.

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Abstract

This study examines the implementation of English as a Medium of Instruction (EMI) in the Department of Material Science, a branch of the Physics program, focusing on the experiences of physics teachers and first-year students. Using a quantitative approach, narrowing down, case study design and cluster sampling techniques are implemented, data were collected from 13 physics teachers and 40 first-year students through structured questionnaires. Both of the questionnaires were delivered via Google Forms. Descriptive analysis of the responses revealed a range of challenges related to EMI, categorized into linguistic, psychological, and institutional factors. Linguistic difficulties included struggles with understanding and expressing complex scientific concepts in English, while psychological barriers involved reduced confidence, anxiety, and low engagement, especially among students. Institutional challenges included a lack of EMI training for teachers, limited resources, and unclear policy support. Despite these obstacles, both groups recognized the value of EMI in accessing global scientific knowledge. The study suggests targeted language support, teacher training, and clearer institutional policies to improve EMI implementation in science education.

Keywords: English as a medium of instruction, challenges, university teachers of material sciences department, first year students of physics, higher education institutions, linguistic, psychological and institutional challenges

List of Acronyms

EMI: English as a Medium of Instruction

CLIL: Content and Language Integrated Learning

CBI: Content Based Instruction

EFL: English as a Foreign Language

ESP: English for Specific Purpose

EGP: English for General Purpose

ELF: English as a Lingua Franca

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General Introduction

The linguistic shift in Algeria's educational landscape reflects a complex interplay of historical, political, and cultural influences. After gaining independence from France in 1962, Arabic and Berber were presented as national languages, while French continued to hold significant place in higher education and government. In recent years, there's been a growing emphasis on integrating both Arabic and French in classrooms especially in higher education, with French often seen as essential for global connectivity and economic mobility. However, there are significant efforts to promote the use of Berber, especially after its official recognition in 2002. This multilingual framework has created both opportunities and challenges in balancing linguistic identity and modern educational needs.

In recent years, it is noticeable that there has been a shift towards prioritizing English, as it is seen as a global lingua franca, especially in fields like science and technology. Many universities in Algeria now offer English language courses, and there is a growing interest among young people to learn English to improve their employment prospects and connect with global culture. That being said, English is still not widely spoken in everyday life. French remains the dominant second language for most Algerians, while Arabic and Berber are used in daily

English as a medium of instruction refers to the use of English language to teach academic subjects in schools, colleges, and universities. It is commonly used in many countries to facilitate global communication, access to resources, and participation in international academic and professional fields. While it enhances global understanding, it can also cause challenges for non-native speakers, especially in countries where English is not the first language.

The use of English as a Medium of Instruction (henceforth, EMI) in science and technology causes significant challenges for non-native speakers, as it can create barriers in

understanding complex technical concepts, lead to miscommunication, and hinder academic performance. These challenges are often compounded by limited proficiency in academic English, which can affect both written and verbal communication. Non-native teachers may struggle with specialized terminology, the pace of instruction, and the expectation to produce research or reports in a language they are not fully comfortable with, potentially limiting their engagement and success in the field.

1. Statement of the problem

Using English as a medium of instruction for non-native teachers around the world, and in many universities, comes with several challenges. These teachers often face difficulties related to language proficiency, limiting their ability to effectively convey complex concepts and engage students in meaningful discussions. Additionally, differences in pronunciation, grammar, and vocabulary may create misunderstandings, affecting the learning process. Cultural barriers and varying teaching methodologies further complicate the situation, making adaptation to an English-based curriculum more demanding. Without proper training and support, these challenges can hinder both teaching effectiveness and student comprehension.

Moving to the Algerian context, Non-native teachers in Algerian universities may struggle to deliver lectures effectively due to language barriers (French and Arabic background) and a lack of sufficient language training. Limited proficiency in English can make it difficult for them to explain complex ideas clearly, engage students in discussions, and respond to questions with confidence. Pronunciation issues, grammatical errors, and limited vocabulary may further hinder communication, leading to misunderstandings in the classroom. Without proper language training and support, these challenges can impact both teaching quality and student comprehension, making it harder to achieve effective learning outcomes.

In the field of science and technology, both teachers and students often struggle with understanding and using scientific concepts and terminology effectively. Many scientific terms are highly specialized and may not have direct translations in other languages, making it difficult for non-native English speakers to grasp their precise meanings. Additionally, complex concepts require clear and accurate explanations, which can be challenging if teachers and students lack proficiency in the language of instruction. Misinterpretations of key terms can lead to confusion and hinder learning, affecting both comprehension and the ability to apply scientific knowledge in practical contexts. Without proper language support and training, these challenges can create significant obstacles in scientific education and research.

To sum up, both in and outside Algeria, significant challenges arise in scientific feild due to the complex nature of the field, which hinders teachers' ability to provide comprehensive explanations. Scientific concepts and terminology are often intricate and require precise communication, making it difficult for university teachers who may struggle with language barriers or lack sufficient training in English. This can lead to unclear explanations, misunderstandings, and reduced engagement among students. Without strong language proficiency and adequate instructional support, these challenges can limit the effectiveness of science education and slow the development of critical thinking and research skills.

2. Research Questions

- **RQ1**. What are the perceptions of faculty members and students regarding the implementation of EMI in the Physics Department?
- **RQ2**. What are the challenges faced by faculty members and students in using and learning physics through English?

- **RQ3** How does the implementation of EMI affect students' comprehension of physics concepts and their academic performance?
- **RQ4**. What are the perceived benefits and drawbacks of EMI in the Physics Department?
- **RQ5.** What recommendations can be made to improve the effectiveness of EMI in the Physics Department?

3. Research Hypothesis

- **RH1:** First year students and University teachers struggle with phonetics and mispronunciations due to their linguistic background.
- **RH2:** Shyness and inhibition among first year students of physics may hinder teachers from effectively using English as a medium of instruction, affecting their confidence and communication.
- **RH3:**The limited vocabulary of teachers can decrease the effectiveness of teaching, making it harder to convey concepts clearly and engage students.
- **RH4:** The mixing of languages (French, Arabic, and English) has hindered the effectiveness of English as a medium of instruction in Algerian universities, creating confusion and disrupting the English language development.

4. Research Aims:

The overall aim of the current study is to identify key problems which could be associated with using English as the primary source of education in the Algerian universities, and to be more specific Biskra university (science and technology field). In addition, it aims to propose potential solutions to address these issues. The current study aims to:

- The first aim is to identify the major difficulties that Biskra university teacher and first year students of material sciencesdepartment face during using EMI
- Understanding the reasons behind these difficulties is essential for addressing them effectively (psychological, linguistic, financial reasons).
- Addressing teachers who prioritize results over language used, it is important to encourage them to embrace EMI by highlighting its potential to enhance learning outcomes and broaden students' opportunities.
- Suggest reasonable solutions to enhance the use of EMI in material sciences department

5. Research methodology

Research methodology in language sciences is the process of studying how languages are structured, used, and learned using different methods like experiments, observations, and data analysis. It includes qualitative approaches (e.g., interviews, text analysis) and quantitative approaches (e.g., surveys, statistical modeling) to understand language patterns and behaviors.

Due to the nature of the research, which requires a thorough examination, the researcher decided that using qualitative approaches would be more suitable to meet the study's needs. These approaches allow for an in-depth understanding of the subject by focusing on detailed observations, interviews, and text analysis. By adopting this approach, the researcher can explore complex aspects of the study that may not be easily captured through quantitative measures. The flexibility of qualitative research also enables a deeper investigation of patterns, meanings, and interpretations within the data. Therefore, this approach was chosen to ensure a comprehensive and insightful analysis.

Narrowing down and being more specific, the research design to be used is a case study, as it aligns with the specific needs of the study at hand. This design allows for an in-depth exploration of the use of EMI among university teachers and first year students in material sciences department (branch of physics). To gather comprehensive data, the researcher will use two questionnaires, ensuring a thorough investigation of different perspectives and experiences. The questionnaires will help collect quantitative data on teachers' and students' attitudes, challenges, and practices. By employing this tool, the study aims to cover all aspects of EMI usage, addressing both practical and pedagogical concerns.

To analyze the gathered data, the researcher will employ descriptive analysis for the data collected from the both of questionnaires. Descriptive analysis will be used to summarize and interpret the quantitative data from the questionnaire, focusing on patterns, trends, and frequencies to provide an overview of the participants' responses.

6. Population and sampling technique

The population for this study consists of university teachers and students of material sciences department at Biskra University. However, the sample is specifically drawn from university teachers and first year students from material sciences branch of physics. This targeted sampling ensures the verity of participants who are directly involved in the use of EMI in their teaching practices.

Regarding the sampling technique, since the researcher is currently a university employee, gathering data from within the institution is more convenient. Therefore, a non-random sampling technique is used, specifically cluster sampling. This method allows the researcher to select participants based on accessibility and availability, ensuring an efficient and practical approach to data collection.

7. Significance of the study

The significance of studying the use of EMI among university teachers and students indepartment of material sciences(branch of physics) is multifaceted, addressing both academic and practical concerns within the global educational landscape. As universities increasingly adopt English as the primary language for instruction, especially in fields like science and technology, it is crucial to understand how this shift impacts teaching and learning processes and assessment. English is often seen as the global lingua franca in academia, and its role in higher education has become particularly pronounced in fields where international collaboration, research dissemination, and access to knowledge rely heavily on English-language resources. By examining how university teachers and students in these fields use EMI, the study can reveal critical insights into both the challenges and opportunities that arise from this practice.

One of the key aspects of this study is its potential to contribute to the improvement of pedagogical practices in science and technology education. The use of English in these fields is not merely a linguistic challenge but also an academic and cultural one. Teachers must navigate the complexities of delivering highly specialized content while ensuring that students comprehend complex scientific concepts in a second language. By investigating how university teachers and students in material sciences department adapt their strategies, the study can offer valuable recommendations for enhancing instructional effectiveness in EMI settings. It can also highlight the need for professional development programs that equip both of teachers and students with the necessary language and pedagogical skills to use English, thus improving the overall quality of education.

Additionally, this study holds significance for policy development in higher education institutions, particularly those that are considering or have already adopted EMI. Understanding the experiences and perspectives of both university teachers and students of

material sciences department can inform institutional decisions regarding language policies, curriculum design, and teacher training programs. Institutions may use the findings to refine their approaches to EMI, addressing any gaps in support and resources for both teachers and students. Moreover, this research could serve as a valuable resource for universities in non-English-speaking countries like Algeria, helping them navigate the complexities of integrating English into their educational systems while maintaining academic rigor and accessibility for all students.

In conclusion, the significance of this study lies in its potential to improve both the quality of teaching and the overall educational experience for students in material sciences department. By shedding light on the use of English as a Medium of Instruction among university teachers and students, the research will contribute to a better understanding of how EMI impacts teaching practices, academic performance, and institutional policy. As universities continue to embrace English in an increasingly globalized academic environment, this study provides a timely and relevant analysis of how to effectively support and enhance the use of English in higher education.

FIRST CHAPTER

Chapter one: literature review

Introduction:

This chapter provides a comprehensive review of the existing literature on English as a Medium of Instruction (EMI), with a particular focus on its application and impact within the field of physics education. As the global use of English in academic settings continues to grow, many non-English-speaking countries, including Algeria, have begun implementing EMI in higher education institutions. This shift has raised a number of questions regarding its effectiveness, challenges, and implications—especially in content-heavy and technically demanding subjects like physics.

This chapter begins by defining the concept of teaching the English language and highlighting its growing importance in academic and professional contexts. It then introduces English as a Medium of Instruction (EMI), explaining how it is used to teach academic subjects in English rather than the students' native language. The chapter further explores the connection between EMI and the study of physics, a subject that relies heavily on precise language and complex terminology. Understanding this relationship is essential, as language proficiency can significantly influence students' ability to grasp scientific concepts, participate in class, and succeed in their studies.

1.1 Teaching and learning English

Teaching and learning English is a dynamic process that involves both linguistic and cultural understanding. As Richards and Rodgers (2014) state, "Language teaching is not only a matter of techniques but also of creating opportunities for meaningful communication." Effective instruction requires interactive methods that engage students, while learners must be active participants, practicing regularly to build fluency. The process is influenced by various factors such as motivation, exposure, and teaching strategies, all of which contribute to successful language acquisition**.**

1.1.1. English and globalization

English has become the dominant language of globalization, shaping communication, education, business, and international relations across the world. Its widespread use is not merely the result of historical events such as British colonialism or the economic influence of the United States, but also due to its adaptability and acceptance as a global lingua franca. AsDavid Crystal aptly states, “a language achieves a genuinely global status when it develops a special role that is recognized in every country” (Crystal, 2003, p. 3). English fulfils this criterion through its official or second-language status in numerous nations and its use in key global domains, including science, technology, and diplomacy. The rise of the internet, multinational corporations, and international education has further cemented English's global role, making it an essential tool for participation in the interconnected world. In many countries, proficiency in English is closely linked to economic advancement, educational opportunities, and access to global knowledge, thus reinforcing its power and presence in the era of globalization.

> Why a language becomes a global language has little to do with the number of people who speak it. It is much more to do with who those speakers are. Latin became an international language throughout the Roman Empire, but this was not because the Romans were more numerous than the peoples they subjugated. They were simply more powerful. And later, when Roman military power declined, Latin remained for a millennium as the international language of education, thanks to a different sort of power – the ecclesiastical power of Roman Catholicism.

1.1.2. English as a lingua franca

English as a lingua franca plays a crucial role in facilitating communication among speakers of different native languages, especially in international contexts such as business,

academia, and travel. It is not necessarily spoken in the same way as native varieties, but rather adapted to serve as a practical tool for mutual understanding across cultures. As Seidlhofer (2011) points out, “English as a lingua franca is a way of using the language for communication between people who do not share a common native language” (p. 7). This global function of English promotes intercultural exchange and

reduces language barriers, making it an essential resource in our increasingly interconnected world.

1.1.3. English as a foreign language

English as a Foreign Language (EFL) refers to the teaching and learning of English in countries where it is not the native or official language, and where English is primarily used in academic or professional contexts rather than daily communication. EFL learners often encounter the language only in classroom settings, which can affect the level of exposure and practice they receive.

According to Harmer (2007), "learning English as a foreign language typically means studying it in a country where English is not the main means of communication" (p. 19). This setting requires carefully structured instruction and materials to help learners develop the necessary skills for international communication, academic success, or career advancement. As globalization continues to increase the demand for English proficiency, EFL education plays a crucial role in preparing learners to participate in a globalized world, he also stated that EFL refers to situations in which learners study English to communicate with other English speakers around the world, such as in tourism or international business contexts. Typically, these students learn English in their home country, although some may also attend short-term language courses in English-speaking nations like the UK, the USA, or Australia.....etc.

1.1.4. English as a specific purpose and general English

English for Specific Purposes (ESP) and English for General Purposes (EGP) serve different but complementary roles in language education. ESP focuses on teaching English tailored to specific fields such as medicine, engineering, or business, where language instruction is closely aligned with learners' professional or academic needs. As Hutchinson and Waters (1987) explain, “ESP is an approach to language teaching in which all decisions as to content and method are based on the learner’s reason for learning” (p. 19).

In contrast, EGP emphasizes broader language skills used in everyday contexts, aiming to build a general foundation in listening, speaking, reading, and writing. According to Harmer (2007), EGP “focuses on the development of general language competence irrespective of the learner’s specific future use of the language” (p. 22). While EGP provides learners with essential communicative skills, ESP equips them with targeted language competence relevant to their goals, making both approaches valuable depending on the context and objectives of the learner. Loucif (N.D) summarised the difference between ESP and GE in the table bellow

Table.1

The difference between ESP and GE

	ESP	**GE**
Learners	Specially designed for working adults.	Specially designed for high school students.
Aims	To meet the needs of particular learners.	To improve overall English competence.
Concerns	Designing courses for different types of learners in accordance with their disciplines or needs.	Designing courses targeting vocabulary, spelling, grammar,…

Language Skills	The course focuses on the language skill(s) most needed by the learners.	All four language skills are stressed equally.

To sum up, the table compares English for Specific Purposes (ESP) and General English (GE). ESP is tailored for working adults and focuses on specific language skills based on learners' professional or academic needs, while GE is aimed at high school students and emphasizes overall language competence across all four skills. ESP courses are customized according to learners' fields, whereas GE courses focus on general vocabulary, grammar, and language use.

1.2. The internationalisation of higher education and English language

The internationalisation of higher education has significantly increased the role of the English language as a global medium of instruction and communication. As universities expand cross-border partnerships, student exchanges, and international programs, English often serves as the common linguistic bridge. This trend not only enhances global mobility and academic collaboration but also places English at the center of knowledge exchange. Consequently, proficiency in English has become essential for students and scholars seeking to participate fully in the global academic community.

1.2.1. The status of English in higher education

English holds a dominant and increasingly influential status in higher education worldwide, serving as a key medium for instruction, research, and international collaboration. In many non-English-speaking countries, universities are adopting English as a medium of instruction (EMI) to enhance global competitiveness and attract international students. This shift reflects the perception of English as the global lingua franca of academia and science, enabling access to the latest research and fostering cross-border academic mobility. While this

trend can broaden educational opportunities, it also raises concerns about linguistic equity, academic performance of non-native English speakers, and the marginalization of local languages. As institutions continue to embrace EMI, it is essential to balance the benefits of internationalization with strategies that support linguistic diversity and inclusive learning environments.

1.2.2. English as a medium of instruction

English Medium Instruction (EMI) has been defined as 'the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language (L1) of the majority of the population is not English" (Macaro, 2018, p. 19).English as a medium of instruction refers to the use of the English language to teach academic subjects in schools, colleges, and universities, rather than teaching in a student's native or local language. It means that English is not just taught as a subject, but is the primary language through which all other subjects—such as science, mathematics, history, and geography—are delivered. This approach is often used to improve students' English proficiency, enhance access to global knowledge, and prepare learners for international opportunities in education and employment.

1.2.3. EMI practices in the global context

English as a Medium of has become a widespread practice in higher education institutions across the globe, particularly in regions aiming to internationalize their academic offerings and increase their presence in global rankings. Countries in Europe, Asia, the Middle East, and Latin America have increasingly implemented EMI programs to attract international students and improve graduates’ employability in a global market. For instance, universities in countries like the Netherlands, Sweden, and South Korea have established numerous programs taught entirely in English, despite English not being the native language.

These practices vary in terms of implementation, teacher preparedness, and student support, with some institutions providing strong language assistance and pedagogical training, while others struggle with issues of quality and accessibility. Overall, EMI in the global context reflects both the opportunities and complexities of integrating English into diverse educational systems, requiring thoughtful policy and inclusive practices to ensure its success.

1.2.4. EMI classroom practices

EMI classroom practices vary widely depending on the educational context, the proficiency levels of both instructors and students, and institutional support. In EMI classrooms, teachers often adopt strategies such as simplified language, visual aids, repetition, and code-switching to facilitate understanding and maintain student engagement. Lecturing remains a common method of delivery, but interactive techniques like group discussions, peer collaboration, and problem-based learning are increasingly used to support both language development and content mastery.

However, challenges persist, particularly when instructors lack formal training in language pedagogy or when students struggle with academic English. Effective EMI classroom practices therefore require a balanced integration of content and language support, with emphasis on clear communication, scaffolding techniques, and continuous professional development for faculty. These practices aim not only to deliver subject knowledge but also to enhance students' academic literacy in English.

1.2.5. Terminology related to EMI

Terminology related to English as a Medium of Instruction reflects the complexity and evolving nature of its global implementation. Key terms include various concepts and definitions that have emerged in response to the widespread adoption of English as the primary language of instruction in educational contexts worldwide. Key terms include:

- **Content and Language Integrated Learning (CLIL):** "CLIL is an educational approach where subjects are taught in a foreign language with a dual focus on the subject and the language" (Coyle, Hood, & Marsh, 2010). This definition highlights the integrated nature of learning both content and language simultaneously, often used in EMI settings.
- **Content-Based Instruction (CBI):** CBI is the integration of content learning with language teaching aims. More specifically, it refers to the concurrent study of language and subject matter, with the form and sequence of language presentation dictated by content material. (Brinton, Snow, &Wesche, 2003). This approach underpins EMI practices by using academic content as the vehicle for language acquisition.
- **Translanguaging:** "Translanguaging refers to the process by which bilingual students use their languages as an integrated communication system" (García, 2009, p. 45). It supports the use of students' full linguistic resources in EMI classrooms, allowing for deeper understanding and engagement.
- **Language Proficiency Threshold:** "There is a threshold level of second language proficiency below which students may not be able to cope with the academic demands of EMI instruction" (Macaro, 2018, p. 125). This concept stresses the importance of sufficient language skills to access and succeed in content learning through English.

1.2.6. EMI classroom practices

EMI classroom practices refer to the specific strategies, behaviours, and methods used by teachers and students when teaching and learning content subjects through English. Here are some common EMI classroom practices with quotations from scholarly sources:

1.2.6.1. Scaffolding Language Support

In EMI classrooms, teachers often help students understand the material by breaking down complex ideas into simpler parts. They might explain concepts in different ways, use images or diagrams, and offer key vocabulary to make the content easier to follow. This kind of support helps students keep up with lessons even if they are still developing their English skills. According to Dearden (2014) “Teachers often need to scaffold students' understanding by rephrasing, using visuals, and providing glossaries to support content learning through English”

1.2.6.2. Code-Switching

Code-switching in EMI classrooms happens when teachers switch between English and the students’ first language during lessons. This approach helps clarify difficult ideas, explain instructions, or check understanding, especially when students struggle to grasp content in English alone. It allows teachers to maintain the flow of the lesson while ensuring students stay engaged and can follow along. By using both languages strategically, teachers support learning without overwhelming students with too much unfamiliar language at once (Macaro, Curle, Pun, An, & Dearden, 2018). This approach helps clarify difficult ideas, explain instructions, or check understanding, especially when students struggle to grasp content in English alone. It allows teachers to maintain the flow of the lesson while ensuring students stay engaged and can follow along. By using both languages strategically, teachers support learning without overwhelming students with too much unfamiliar language at once.

1.2.6.3. Interactive Teaching Methods

Interactive teaching methods play a key role in effective EMI instruction, as they promote both subject comprehension and language development. Encouraging students to engage in group work, participate in discussions, and deliver presentations creates a dynamic learning environment where English is used actively and purposefully.

These strategies not only help students understand academic content more deeply but also provide them with regular opportunities to practice and improve their English communication skills. Through such interactive activities, students are more likely to stay engaged, collaborate with peers, and build confidence in using English in academic contexts. This approach enhances the overall learning experience and supports dual goals of mastering content and developing language proficiency (Pun &Macaro, 2019).

1.2.6.4. Focus on Comprehensible Input

In EMI classrooms, it is essential for teachers to focus on making their English as clear and understandable as possible to support student learning. This involves using clear pronunciation, selecting vocabulary that matches the students' level, and repeating key points when needed. By doing so, teachers help students follow lessons more easily and reduce the risk of confusion caused by language barriers. Ensuring that the input is comprehensible allows students to engage more effectively with the content and builds their confidence in using English for academic purposes (García, 2009).

1.2.6.5.Assessment Adaptation

In EMI settings, adapting assessments is often necessary to ensure that students' performance reflects their understanding of the subject rather than their level of English proficiency. When language becomes a barrier, students may struggle to express their knowledge effectively, even if they fully understand the content. To address this, educators may modify assessment formats, simplify language in questions, or provide additional support to help students demonstrate what they have learned. These adaptations aim to create a fairer evaluation process that focuses on content mastery rather than language skills alone (Ball & Lindsay, 2013).

1.3. Benefits of EMI

EMI offers several academic benefits, especially in higher education settings. One major advantage is that it gives students access to a wider range of academic resources, many of which are published in English. This exposure allows students to engage with up-to-date global knowledge and research, enhancing their understanding of subject matter beyond local contexts. EMI also encourages the development of academic language skills, enabling students to write papers, give presentations, and participate in discussions in English, which can be valuable for their academic and professional futures (Macaro, Curle, Pun, An, & Dearden, 2018).

In addition to academic benefits, EMI can provide students with improved career opportunities. Since English is widely used in international business, science, and technology, proficiency in both subject knowledge and English can give graduates a competitive edge in the job market. Employers often look for individuals who can communicate effectively in English and collaborate in international settings. Therefore, EMI can help students build the language confidence and cross-cultural communication skills needed for success in global work environments (Pun &Macaro, 2019).

1.4. Challenges of EMI

1.4.1. Linguistic challenges

One of the main challenges of EMI is the language barrier that both students and teachers face. Many students may have limited English proficiency, which can make it difficult for them to fully understand complex subject content. This language gap often leads to lower participation, reduced confidence, and sometimes even poor academic performance. Additionally, teachers may struggle to balance teaching the subject matter while also supporting students' language needs, which can affect the overall quality of instruction (Dearden, 2014).

In addition, Vocabulary and terminology can be a major challenge in EMI because students often struggle with the specialized language needed to understand and discuss complex subject matter. Many academic fields use technical terms that may be unfamiliar or difficult to grasp, especially when

students are still developing their general English skills. This can lead to misunderstandings, confusion, and difficulty in keeping up with lessons or completing assignments. Without a strong grasp of the necessary vocabulary, students may find it hard to express their ideas clearly or fully engage with the course content.

1.4.2. Resources availability

Another significant challenge is the lack of adequate training and resources for EMI instructors. Many teachers are experts in their academic fields but may not have sufficient training in teaching through English or in language teaching methodologies. Without proper support, they might find it hard to implement effective teaching strategies or adapt materials to meet students' language levels. This can result in a less engaging and accessible learning environment, limiting students' success in EMI programs (Macaro, Curle, Pun, An, & Dearden, 2018).

1.4.3. Teachers' trainings

The lack of training for teachers in EMI can be a major challenge because even if they are experts in their subject, they might not have the skills needed to teach effectively in English. Without proper training, teachers may struggle with how to explain complex ideas clearly, how to support students who have different levels of English proficiency, or how to use teaching methods that help both content learning and language development. This can lead to lessons that are hard to follow, less student engagement, and ultimately, poorer learning outcomes. Essentially, without the right preparation, teachers may find it difficult to balance teaching the subject and addressing language barriers, which is crucial for successful EMI.

According to a study by Dearden (2014), a majority of respondents from 55 countries reported a shortage of qualified teachers to deliver EMI, with 83% stating there were not enough. Only Ghana indicated having sufficient qualified teachers, which was surprising given the generally negative public opinion on the issue.

1.4.4. Psychological challenges

Psychological challenges, such as anxiety, low confidence, and fear of making mistakes, can significantly affect the quality of EMI. As Dearden (2014) notes, “Language anxiety and lack of confidence can create barriers that prevent students from fully engaging with EMI courses, ultimately affecting their academic success”. When students or teachers feel insecure about using English, they may participate less in class, avoid speaking up, or struggle to express their ideas clearly.

This can limit meaningful interaction, reduce engagement, and hinder effective communication, all of which are essential for successful learning. For teachers, anxiety about language proficiency can lead to less dynamic teaching or a reliance on simpler content, which may lower the overall quality of instruction. In short, psychological barriers can create a less supportive learning environment and negatively impact both teaching and student outcomes in EMI settings.

1.5. Support for EMI practices

Support for EMI practices is essential to ensure both teachers and students can succeed in environments where English is the language of instruction. One critical area of support is teacher training. Many educators are experts in their subject areas but lack the skills to effectively teach through English. Providing professional development that focuses on EMI pedagogy, language support strategies, and classroom communication techniques is vital. As Ball and Lindsay (2013) emphasize, “Without adequate support, content teachers may find it difficult to deliver subject knowledge clearly and effectively in a second language, which can compromise students’ understanding.”

Students also require targeted support to navigate the challenges of learning content through a second language. This includes access to academic English resources, language development programs, and adapted instructional materials. Scaffolding techniques such as glossaries, visual aids, and simplified texts can make a significant difference. According to Dearden (2014), “Students need structured language support to successfully engage with EMI

content; otherwise, the language barrier can become an obstacle to meaningful learning." Providing these supports not only improves comprehension but also helps build students' confidence and academic performance in EMI settings.

1.6. Principal reasons for and against EMI

The implementation of EMI has sparked significant debate in global education. Supporters highlight its potential benefits, while critics point to several drawbacks. Understanding the main reasons for and against EMI is essential to evaluating its effectiveness and impact across different educational contexts.

1.6.1. Principal reasons for EMI

One of the principal reasons for adopting EMI is to enhance students' English proficiency, which is often seen as essential for global competitiveness in education and employment. Many institutions believe that using English as the language of instruction better prepares students for international careers and further academic opportunities. As Dearden (2014) explains, "EMI is often introduced as a way of internationalising the curriculum and increasing students' access to the global academic and professional world." Additionally, EMI can help attract international students and raise the profile of universities in the global education market, making it a strategic choice for institutions seeking greater visibility and prestige.

Another important reason for implementing EMI is to facilitate access to cutting-edge knowledge and research, much of which is published primarily in English. By using English in instruction, students and faculty can engage more directly with the latest academic developments, scientific literature, and global discussions in their fields. This helps bridge the gap between local education and international academic standards. As Macaro et al. (2018) point out, EMI can "enhance students' access to high-quality academic content and foster participation in the global knowledge economy."

Another reason for adopting EMI is the desire to modernize and reform national education systems. Many governments view EMI as a strategy to align their higher education institutions with global trends and to improve the overall quality of education. Introducing English into universities is often part of broader educational reforms aimed at making graduates more competitive and institutions more internationally recognized. As Dearden (2014) notes, "EMI is sometimes seen as a symbol of progress and modernization within national education policy."

1.6.2. Principal reasons against EMI

One major concern is that EMI can create significant language barriers for students who are not proficient in English, which may hinder their understanding of subject content and negatively affect academic performance (Ball & Lindsay, 2013). Additionally, critics argue that EMI may lead to the erosion of local languages and cultures, as the dominance of English can marginalize native languages and reduce their use in educational and social contexts (Tollefson, 2015).

There is also a concern that teachers may lack sufficient training to effectively teach through English, which can compromise the quality of instruction and student learning outcomes (Macaro et al., 2018). Finally, some argue that the focus on English can widen educational inequalities, as students from privileged backgrounds often have better access to English learning resources compared to their less advantaged peers (Doiz, Lasagabaster, & Sierra, 2013).

1.7. The effects of EMI on learning outcomes

The effects of EMI on learning outcomes are complex and often depend on factors such as students' English proficiency, teacher preparation, and the availability of support mechanisms. On one hand, EMI can enhance students' academic performance by giving them access to a broader range of scholarly materials and fostering critical thinking in a global language. This exposure can strengthen both content understanding and English language development. As Pun and Macaro (2019) note, EMI may lead to improvements in students' English proficiency while maintaining comparable academic outcomes to instruction in the first language.

However, EMI can also have negative consequences when students do not possess adequate English skills. In such cases, the language barrier may hinder their ability to grasp complex subject matter, which can lower academic achievement and confidence. Macaro et al. (2018) emphasize that students with limited English proficiency may experience cognitive overload, affecting both comprehension and performance. Additionally, if teachers are not well-prepared to manage both language and content demands, this can further compromise the quality of instruction and outcomes. These mixed effects highlight the importance of contextual factors and support systems in determining whether EMI enhances or limits student success.

Another important effect of EMI is its influence on classroom participation and student engagement. When students are not confident in their English abilities, they may be less likely to participate in discussions, ask questions, or express their ideas freely. This reduced interaction can limit the development of both language skills and deeper subject understanding. According to Dearden (2014), “Students often remain silent in EMI classrooms, not because they lack content knowledge, but because they are afraid of making language mistakes.” This fear can create a passive learning environment, where students disengage and miss opportunities to clarify concepts or think critically. Therefore, EMI may unintentionally lower the quality of interaction and collaborative learning unless language support and inclusive teaching practices are in place.

1.8. Teachers’ view about EMI

Teachers generally hold mixed opinions about the implementation of EMI. On the positive side, many view EMI as a pathway to internationalize higher education and improve students’ English language abilities, which are seen as essential for global academic and professional environments. According to Dearden (2014), teachers in several countries believed EMI could enhance their students’ future opportunities and raise the academic standing of their institutions. Some educators also expressed that teaching in English allowed them to grow professionally and engage more with international academic resources.

However, a significant number of teachers also express concerns about EMI's challenges. Macaro et al. (2018) reported that many teachers felt inadequately trained to deliver content in English and worried that their limited language skills might hinder effective instruction. Furthermore, educators noted that students often struggled to understand lessons and participate actively, especially when their English proficiency was low. Teachers also highlighted that EMI could slow the teaching process and add pressure to simplify complex ideas, which may affect the depth of learning. These concerns underline the importance of proper training and support for teachers working in EMI contexts.

1.9. Students' view about EMI

Students' views on English as a Medium of Instruction (EMI) vary widely depending on their language proficiency and learning context. Many students see EMI as a valuable opportunity to improve their English skills, which they associate with better career prospects and access to global academic resources. They often express positive attitudes toward learning in English, especially in fields where international communication is important. According to Macaro et al. (2018), students generally believe that EMI can enhance their employability and academic opportunities, especially in competitive global markets.

On the other hand, some students face difficulties adjusting to EMI due to limited English proficiency. These language challenges can make it harder to understand lectures, participate in discussions, and complete assignments effectively. Dearden (2014) highlights that in many countries, students felt anxious and less confident in EMI classrooms, which could hinder their academic performance and engagement. For these students, EMI can be stressful and may lead to feelings of exclusion or frustration, particularly if adequate language support is not provided. These mixed experiences show that while students often recognize the benefits of EMI, their success heavily depends on their English abilities and the support available.

1.10. Overcoming problems of EMI

Overcoming the challenges of EMI requires a multifaceted approach that addresses both pedagogical and linguistic issues faced by teachers and students. One of the most crucial steps is providing targeted professional development for instructors. Many subject teachers are experts in their fields but lack training in teaching through English or supporting students with varying language proficiency.

Equipping teachers with EMI-specific strategies—such as how to simplify language without diluting content, use visual aids, scaffold instruction, and encourage interaction—can significantly enhance the effectiveness of EMI. Macaro et al. (2018) emphasize the importance of ongoing teacher training and institutional support, arguing that well-prepared teachers are central to successful EMI implementation. Moreover, institutions should ensure that teachers feel confident using English in the classroom by offering language development opportunities alongside pedagogical training.

Another critical area for overcoming EMI problems is the provision of structured language support for students. While EMI aims to enhance English proficiency, students often need assistance to meet the dual demands of learning both content and language. Language support services such as academic English courses, discipline-specific glossaries, writing centers, and tutoring programs can help bridge the gap. Additionally, the adaptation of assessments—ensuring they test subject knowledge rather than just language ability—is essential. Ball and Lindsay (2013) suggest that adapting the linguistic complexity of assessments, rather than their content, allows students to demonstrate understanding without being penalized for language limitations. Creating a supportive and inclusive learning environment, where students are encouraged to participate and make mistakes, can also reduce anxiety and build confidence. These combined efforts—support for both teachers and students—are key to overcoming the inherent difficulties of EMI and ensuring it leads to positive learning outcomes.

Conclusion

The literature on EMI presents a broad overview of its growing role in education, highlighting both its potential advantages and key concerns. Researchers generally agree that EMI is expanding globally and influencing teaching and learning in significant ways. While many studies point to its benefits, such as increased internationalization and language development, others emphasize the challenges it poses for teachers, students, and educational systems. Overall, the literature reflects a balanced view, suggesting that the effectiveness of EMI depends on how it is implemented and supported within different contexts. Overall, the literature suggests that while EMI offers valuable opportunities, its success depends on thoughtful planning, adequate support structures, and continuous evaluation to ensure it meets the diverse needs of all learners.

The Second Chapter

Chapter two: Fieldwork and Data Analysis

Introduction

This chapter explains how the research was carried out and why certain methods were chosen. It begins by discussing the overall approach and way of thinking behind the study, including the type of research and how it was planned. The chapter then goes on to describe the tools used to collect information. These tools included two questionnaire was dedicated to both university teachers and their students to gather their thoughts and experiences.

Next, the chapter explains how the information was collected step by step, and what methods were used to make sense of the data afterward. It also describes how the participants were chosen, explaining the sampling technique in simple terms. Finally, this chapter presents what was found through the questionnaires and interviews. It shares the key results and provides a thoughtful discussion that connects the findings to each other. By the end, readers will have a clear understanding of how the research was done and what it revealed.

2.1. Research Methodology for this Study: Choices and Rationale

2.1.1. Research approaches

Research approaches are general plans or strategies used to conduct a study, and they typically include Qualitative, quantitative, and mixed methods. They represent distinct approaches to research, each with unique characteristics and purposes. Qualitative research focuses on exploring phenomena through detailed, descriptive data, often gathered via interviews, observations, or open-ended surveys, allowing for in-depth understanding of participants' experiences and meanings. In contrast, quantitative research emphasizes numerical data, statistical analysis, and objective measurements to test hypotheses and examine relationships between variables. Mixed methods research combines both qualitative and quantitative techniques to benefit from the strengths of each approach and to provide a more comprehensive view of the research problem. As Cohen et al. (2018) explain, "Mixed

methods research brings together qualitative and quantitative approaches within a single study, aiming to draw on the strengths and minimize the weaknesses of both" (p. 33). This integration allows researchers to address complex questions with greater depth and breadth than either method alone.

In the study at hand, we implemented the qualitative approach because it aligns with the nature of the research, which requires in-depth and detailed data. This approach allows for a deeper exploration of participants' experiences, perspectives, and meanings, making it suitable for understanding complex issues that cannot be captured through numerical data alone. By using qualitative methods such as interviews or observations, the study aims to uncover rich, contextual insights that support a comprehensive understanding of the research problem.

2.1.2. Research design

Research design is the overall strategy or blueprint that outlines how a study is conducted, guiding the methods for collecting, analyzing, and interpreting data. It provides a structured plan to ensure that the research questions are effectively addressed and that the results are valid and reliable. A research design includes decisions about the type of research (qualitative, quantitative, or mixed methods), the data collection techniques, sampling methods, and the procedures for analyzing the data. Ultimately, it serves as a framework that connects the research problem with the appropriate methodology to produce meaningful and trustworthy findings.

Table 2

Alternative research design (Creswell & Creswell, 2018, p.60)

Qualitative	**Quantitative**	**Mixed method**

Narrative research	Experimental	Convergent
Phenomenology	Non experimental	Explanatory sequential
Grounded theory	Longitudinal	Exploratory sequential
Ethnographies		Complex design
Case study		

According to Creswell and Creswell (2018, p. 60), there are various alternative research designs categorized into three main types: qualitative, quantitative, and mixed method approaches. In qualitative research, the designs include narrative research, phenomenology, grounded theory, ethnographies, and case study. Quantitative research, on the other hand, encompasses experimental, non-experimental, and longitudinal designs. Mixed method research combines elements from both qualitative and quantitative approaches, and includes convergent, explanatory sequential, exploratory sequential, and complex design methodologies. Each of these designs offers a distinct approach for conducting research, depending on the nature and objectives of the study.

In this study, and to align with its nature, it is suitable to choose the case study as the research design. The case study approach allows for an in-depth and detailed examination of a specific instance or context, making it ideal for exploring complex phenomena within real-life settings. According to Creswell and Creswell (2018), a case study is “a qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information” (p. 96). This design supports a comprehensive understanding of the subject being studied and is particularly effective when the boundaries between the phenomenon and its context are not clearly defined.

Since physics is a scientific field that is significantly affected by EMI, this study focuses on first-year physics students and their teachers as the case under investigation. The adoption of EMI represents a linguistic shift that can influence both teaching and learning processes, particularly in content-heavy subjects like physics. By examining this specific group, the study aims to explore how EMI impacts the understanding and communication of scientific concepts within the classroom context.

2.1.3. Data collection methods

In language research, data collection methods are closely tied to the research approach qualitative, quantitative, or mixed methods. Each with its own set of tools and techniques. As Creswell and Creswell (2018) emphasize, selecting appropriate data collection methods is essential to ensure alignment with the research questions and the overall design of the study.

Qualitative research typically employs methods such as interviews, observations, open-ended questionnaires, and document analysis. These methods are well-suited for exploring language use, beliefs, and experiences in depth. According to Cohen et al. (2018), qualitative methods "focus on understanding the meaning people give to their experiences and how they interpret the world around them" (p. 288), making them ideal for studies that require rich, contextual data.

In contrast, quantitative research uses structured tools like surveys, standardized tests, and statistical analysis of linguistic data to measure variables and examine relationships. Creswell and Creswell (2018) note that quantitative methods "involve the processes of collecting, analyzing, interpreting, and writing the results of a study in a systematic and objective manner" (p. 147). Mixed methods research combines both approaches, using tools from each to gain a more comprehensive understanding of complex language phenomena, thus leveraging the strengths of both qualitative and quantitative designs.

In this study, the researcher chose to use a qualitative approach as the main method for collecting data. This decision was made in order to gain a deeper and more meaningful understanding of the topic being investigated, especially the complex issues and challenges related to EMI. Qualitative tools are particularly useful when the goal is to explore participants' thoughts, feelings, and experiences in detail, rather than simply collecting numerical data.

To achieve this, the researcher designed and distributed questionnaires as the primary data collection instruments. These questionnaires were carefully developed to gather rich, descriptive information from two different groups involved in the EMI context: first-year physics students and university teachers. By including both students and teachers, the researcher aimed to capture a well-rounded view of the challenges and realities faced by both sides of the teaching and learning process. The insights gathered through these tools helped the researcher explore the topic more thoroughly and provided a deeper understanding of how EMI is experienced in the academic setting.

2.1.3.1. Questionnaire

The questionnaire is a research tool used to collect data from participants through a set of pre-formulated questions. It is widely employed in language and educational research for gathering information on attitudes, behaviors, and experiences. According to Cohen et al. (2018), a questionnaire is "a widely used and useful instrument for collecting survey information, providing structured, often numerical data... and often being comparatively straightforward to analyse" (p. 475). Questionnaires can take different forms depending on the level of structure. Structured questionnaires use fixed wording and order, ensuring consistency across respondents, while semi-structured questionnaires allow for some flexibility in how questions are posed or followed up. There are also unstructured

questionnaires, which are more open and exploratory, giving respondents greater freedom in how they answer. These types serve different research purposes and are chosen based on the nature of the study and the kind of data needed.

After a thorough discussion with the supervisor, it was finally decided to implement two semi-structured questionnaires as part of the data collection process for this study. The first questionnaire is designed for first-year students, aiming to gather insights into their experiences and challenges related to EMI in physics. The second questionnaire is specifically dedicated to university instructors in the Department of Physics at Biskra University, focusing on their perspectives and instructional practices in the EMI context. The use of semi-structured questionnaires allows for a balance between consistent data collection and the flexibility to capture more detailed, context-rich responses from both groups.

2.1.3.1.1. Structure and aim of students' questionnaire

The aim of the student questionnaire was to gain in-depth insights into the challenges faced by first-year students in the Department of Physics at Biskra university regarding the implementation of EMI. By focusing on students' personal experiences, perceptions, and difficulties, the questionnaire seeks to uncover the specific linguistic and academic obstacles they encounter in adapting to EMI in a scientific and technical field like physics. This approach helps to better understand the impact of EMI on students' learning processes and overall academic performance.

Moving to the structure of the students' questionnaire, it consists of a total of 18 questions. As the questionnaire is semi-structured, the questions vary in format, allowing for both guided responses and the opportunity for students to elaborate on their experiences. This flexibility ensures that the questionnaire covers all relevant aspects of the study concerning the implementation of EMI. The questions were carefully designed to explore a range of

themes, including linguistic challenges, comprehension of subject matter, classroom interaction, and students' overall attitudes toward learning physics through English. This structure allows for the collection of both consistent and in-depth data to better understand the impact of EMI on first-year physics students.

2.1.3.1.2. Structure and aim of teachers' questionnaire

Moving to the university teachers' questionnaire, the aim of the university instructors' questionnaire was to gain in-depth insights into the challenges they face in implementing EMI within the Department of Physics. This questionnaire was designed to explore their experiences, perceptions, and the pedagogical difficulties associated with teaching complex scientific content in a non-native language. It also aimed to investigate how EMI affects their instructional strategies, student engagement, and overall classroom dynamics. By focusing on the instructors' perspectives, the study seeks to understand the broader implications of EMI on teaching practices and to identify potential areas where additional support or training might be needed to enhance the effectiveness of instruction in an EMI context.

Moving to the structure of the teachers' questionnaire, it consists of 16 questions designed to explore various dimensions of EMI within the context of physics education. As a semi-structured instrument, the questionnaire includes both open-ended and closed-ended questions, providing a balanced approach that combines consistency with flexibility. The closed-ended questions offer structured responses for easier comparison and analysis, while the open-ended ones allow instructors to elaborate on their experiences, perceptions, and challenges in greater detail. This varied structure ensures that all key aspects of the study are addressed, including instructional practices, language-related difficulties, student comprehension, and the overall impact of EMI on teaching and learning.

2.1.4. Data collection procedures

For the data collection procedures, the researcher utilized Google Forms to distribute the questionnaires to both university instructors and first-year students in the Department of Physics. This online method was chosen for its efficiency, accessibility, and convenience, allowing participants to complete the questionnaires at their own pace and from any location.

A total of 13 instructors responded to the teachers' questionnaire, providing valuable insights into their experiences, challenges, and strategies in implementing EMI. Additionally, 40 first-year physics students participated by completing the student questionnaire, offering important perspectives on the academic and linguistic difficulties they face under EMI. The combination of responses from both groups enabled a more comprehensive understanding of the issue. Using Google Forms also facilitated the organization and analysis of data, while the number of participants helped enhance the reliability and credibility of the study's findings.

2.1.5. Data analysis procedures

Concerning the data analysis procedures, the researcher employed a descriptive analysis approach to examine the responses from close ended questions and thematic analysis for open ended questions collected from both questionnaires, as the research tools used in this study were exclusively semi-structured questionnaires targeting university instructors and first-year students in the Department of Physics. Descriptive analysis was chosen because it is particularly suitable for summarizing and interpreting data in a clear and organized manner, closed-ended responses; meanwhile, the thematic analysis is for the open ended questions because it goes through the perspectives and the insights of the participants.

For the closed-ended questions, the researcher analyzed the frequency and percentage distributions to identify common patterns, trends, and general attitudes among the participants regarding the implementation of EMI. In contrast, the open-ended responses were carefully

reviewed and categorized based on recurring themes and key insights to capture the depth and diversity of participants' perspectives. This method allowed for a comprehensive understanding of the collected data, ensuring that both quantitative summaries and qualitative interpretations were effectively integrated. By applying descriptive analysis to both sets of responses, the researcher was able to present a balanced and informative account of the challenges, perceptions, and experiences of both students and instructors within the EMI context.

2.1.6. Population and Sampling Technique

The population targeted in this study includes university teachers and students from the Department of Material Sciences, representing the broader academic community affected by the implementation of EMI. However, for the purposes of this research, a specific sample was selected to focus the investigation more effectively. The sample consists of physics instructors and first-year students from the Department of Physics. This group was chosen because they are directly engaged in teaching and learning complex scientific content through EMI, making them particularly relevant to the study's aims. By narrowing the focus to this sample, the research was able to gather more detailed and context-specific data regarding the challenges and experiences related to EMI, while still reflecting broader issues within science education at the university level.

Since the researcher is an employee in the Department of Material Sciences, the sampling technique used in this study is cluster sampling. This non-probability sampling method was chosen due to the researcher's direct access to faculty members and students within the university, which made the data collection process more practical and efficient. By selecting participants who were readily available and willing to take part specifically physics

instructors and first-year physics students the researcher was able to gather relevant and timely information without the need for complex recruitment procedures.

2.2 The results of the study

The main goal of this section is to present and make sense of the information gathered through two qualitative research tools. These include an unstructured questionnaire used with university teachers and another questionnaire given to first-year physics students. The section aims to explore and discuss the responses in depth, providing detailed explanations and reflections. Through this analysis, the intention is to gain a clear and meaningful understanding of the data, offering insights that help explain the views and experiences shared by the participants.

2.2.1 Results of students' questionnaire

As previously mentioned, the researcher selected questionnaires as the primary data collection tool in order to obtain deeper insights and detailed information about the challenges associated with EMI at Biskra University. This method was chosen because questionnaires allow participants to express their views, experiences, and difficulties in a structured yet open manner, making it easier to explore complex educational issues such as EMI. Among the two questionnaires used in this study, one was specifically designed for first-year physics students at Biskra University. These students were selected because they are directly involved in EMI courses and are likely to face various academic and language-related challenges as they adjust to learning in English.

The questionnaire aimed to gather their personal opinions and experiences regarding the use of English in their lectures, the difficulties they encounter, and how it affects their overall understanding and performance. In total, 40 students responded to the questionnaire, providing a valuable set of data that reflects the real experiences of learners in an EMI

environment. The information collected from their responses played a crucial role in identifying common issues and forming a clearer picture of how EMI is implemented and received at the university level.

Q1-What is your native language?

The purpose of this particular question was to confirm that all the participating students are native Arabic speakers. Although the study focuses on students at Biskra University, it is important to recognize that, like many other universities, Biskra University may host a number of foreign students who speak different native languages. Therefore, this question was essential to ensure that the responses analyzed in the study reflect the experiences of students whose first language is Arabic. This distinction is significant, especially in a study exploring the challenges of EMI, since language background can greatly influence how students perceive and cope with EMI. By confirming the participants' native language, the researcher aimed to maintain consistency in the data and ensure that the results are relevant and specific to the target group of Arabic-speaking students.

All the responses to this question confirmed that the participating students are native Arabic speakers by saying “My native language is Arabic.” Or “Arabic is my native language ”or even replying using Arabic language saying “العربية”. This confirmation was important for the study, as it aimed to focus specifically on the experiences of Arabic-speaking students facing the challenges of EMI at Biskra University. Although the university may include students from different linguistic backgrounds, especially international students, this question was included to ensure that the data collected came solely from students whose first language is Arabic.

Q2- how long have you been studying physics?

The aim of this question was to determine the length of time Algerian students have been studying physics. Understanding how long students have been engaged with the subject provides useful context for interpreting their experiences with English as a Medium of Instruction (EMI). It helps the researcher assess whether the students' level of familiarity with physics content has any influence on their ability to follow and comprehend lessons delivered in English. By identifying the number of years students have been studying physics, the researcher can also examine whether those with more experience in the subject face fewer language-related difficulties compared to those who are newer to the field. This background information is essential for analyzing the relationship between content knowledge and language proficiency in an EMI setting, especially within the Algerian academic context.

The majority of the students' responses indicated that they began studying physics during middle school and continued through high school. They used statements like "Since the first year of middle school" "I studied physics in middle and high school, then chose it as my major in my first year at university""متوسط اولى سنة منذ ادرسها " "منذ 9 سنوات" "8years since i was in first year middle school" and" 1متوسط "

This finding highlights that most of the participants had several years of prior exposure to physics before entering university. However, it is important to note that during these earlier stages of education, physics was most likely taught in Arabic, not in English. This background suggests that while students may have a foundational understanding of physics concepts, the transition to learning the subject in English at the university level introduces a new set of challenges. These challenges are often not related to the subject matter itself, but rather to the shift in the language of instruction. Understanding this educational trajectory is crucial for interpreting students' experiences with EMI, as it helps to distinguish between difficulties related to content and those related to language comprehension.

Q3- how long have you been learning English?

This question aims to explore and understand the students' experiences with the English language. Specifically, it seeks to gather information about their background in learning English, including when they began studying it. Understanding their experiences with English is essential in the context of this study, as it helps to assess how prepared students feel when faced with EMI. It also provides insight into whether language proficiency might be a barrier to fully understanding course content and participating effectively in academic settings.

The students provided varied responses regarding their experiences with the English language. Some reported that they began learning English as early as middle school, by stating "Since middle school" , "I studied English in middle and high school, but I'm still very weak at it", "اولى متوسط" , giving them several years of exposure to the language before entering university. Others, however, indicated that their experience with English is more recent, by stating "recent period", "I have been learning English for approximately three years " and "منذ سنة", having only started learning or using it seriously in the last few years. This variation in language background highlights the differences in students' levels of confidence and proficiency, which can significantly impact their ability to follow lectures, understand course materials, and participate in discussions when English is used as the medium of instruction.

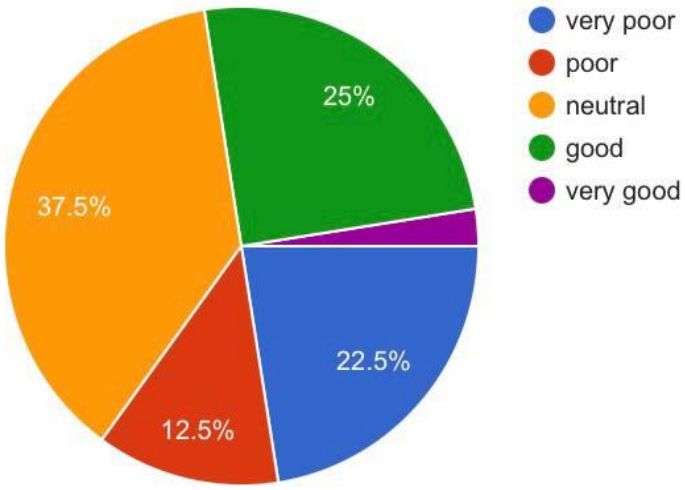
Q4- on a scale of 1 to 5 (1 being very poor 5 being very good), how would you rate your current English language proficiency in:

The aim of this question is to assess students' self-perceived English language proficiency across different skills using a simple rating scale. By asking students to rate their abilities from 1 (very poor) to 5 (very good), the researcher can gain insight into how confident students feel about their current level of English. This helps identify areas of strength and weakness, which is crucial in understanding how language proficiency might influence their performance and experience in an English-medium learning environment.

1* Reading scientific texts

Figure 1

Language proficiency in reading



The pie chart presents data on first-year university physics students' self-assessed ability to read scientific texts in English as a Medium of Instruction (EMI). The largest portion of respondents, 37.5%, rated their reading skills as neutral, suggesting a balanced confidence level—neither particularly strong nor weak. 25% of students considered their ability to be good, while 22.5% believed it was very poor. Meanwhile, 12.5% of the students rated their skills as poor, and only a small minority, 2.5%, felt they had very good abilities in

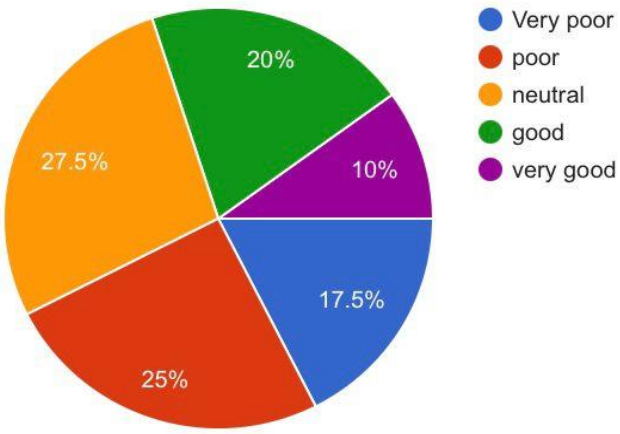
this area. This distribution highlights that while a quarter of students feel relatively confident, a significant number still struggle, with over a third (35%) rating their skills as poor or very poor.

These results likely stem from a combination of factors. First-year students may not have had sufficient exposure to scientific English before entering university, especially if their previous education was not conducted in English or lacked emphasis on technical vocabulary. The complex nature of scientific texts—with dense terminology, passive constructions, and abstract concepts—can also pose challenges even for those with general English proficiency. Furthermore, confidence levels may be affected by the transition to university-level expectations and the pressure of learning new content through a second language. The small percentage of students who rated their skills as very good may have had prior international education, strong language backgrounds, or personal interest in reading scientific material, setting them apart from their peers.

***2- Understanding lectures in English**

Figure 2

Language proficiency inunderstanding lectures in English



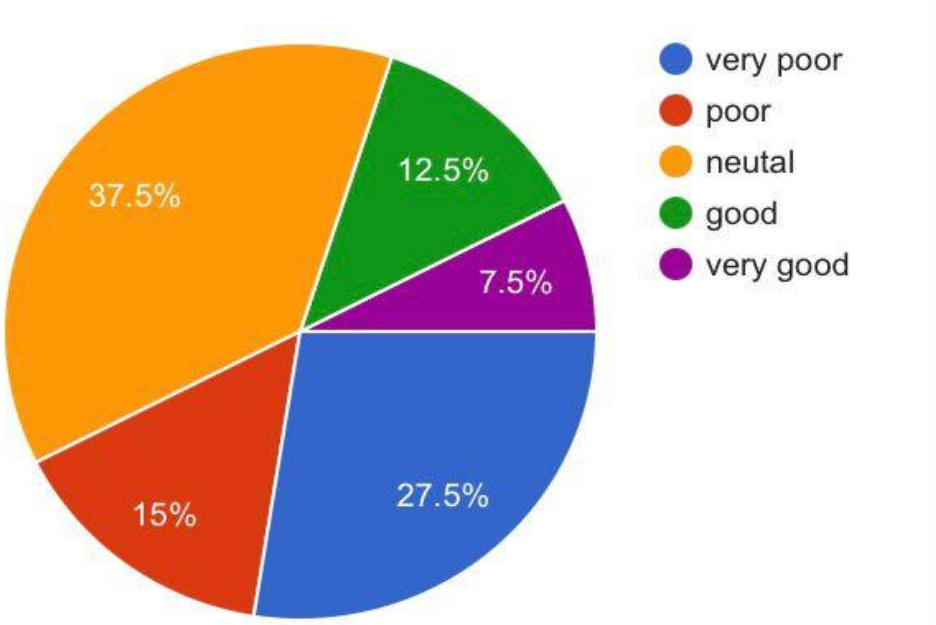
This pie chart illustrates the self-assessed understanding of lectures delivered in English (EMI) among first-year university physics students. The largest proportion of students, 27.5%, rated their comprehension as neutral, indicating a moderate level of comfort with English-language lectures. A close 25% of students felt their understanding was poor, while 17.5% reported it as very poor, highlighting a significant portion of students who struggle with following lectures in English. On the more positive side, 20% assessed their comprehension as good, and only 10% rated it as very good. Overall, while about 30% of students are confident in their lecture comprehension, nearly 43% perceive it as weak.

These results can be explained by several contextual and educational factors. Listening to academic content in a foreign language, especially in a complex field like physics, demands not only language proficiency but also familiarity with subject-specific terminology and lecture styles. Many students may not have had sufficient training in listening comprehension or exposure to spoken academic English before university. The pace, accent, or delivery of lecturers might also be challenging for non-native speakers. Additionally, students new to EMI environments may feel overwhelmed by the dual task of grasping both content and language, which could explain the relatively high percentage of poor and very poor ratings. The modest group who reported high comprehension likely had prior exposure to English-language instruction or developed strong listening strategies through extracurricular practice.

***3-Participating in discussions in English**

Figure 3

Language proficiency in Participating in discussions in English



The pie chart illustrates the perceptions of first-year physics students at the university regarding the quality of their participation in discussions conducted in EMI. The data reveals a significant spread of opinions. A large proportion of students (37.5%) consider their participation to be neutral, indicating uncertainty or mixed feelings about their performance. Meanwhile, 27.5% rated their discussion quality as very poor and 15% as poor, suggesting that over 40% of students experience difficulty or lack confidence when engaging in discussions in English. On the positive side, only 12.5% reported good participation and a

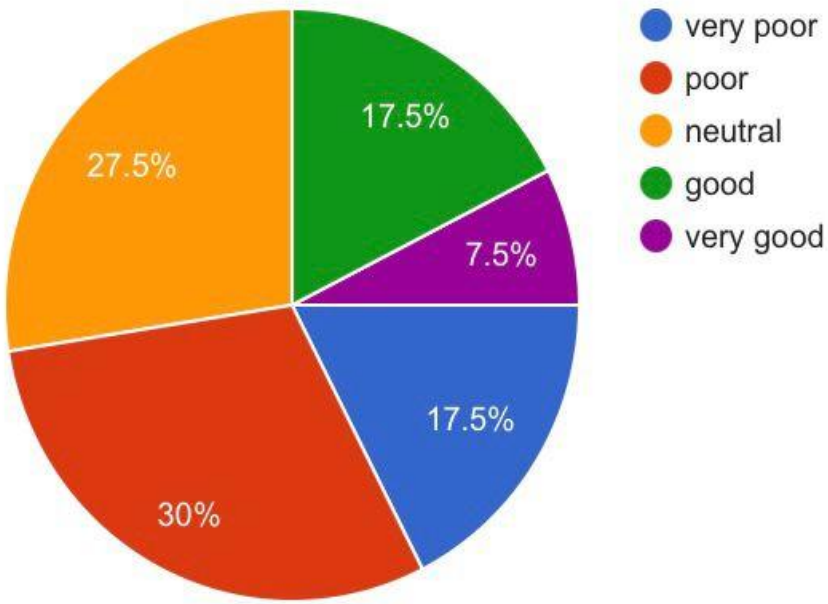
mere 7.5% assessed their engagement as very good, showing a minority who feel comfortable or proficient in such discussions.

These results may be attributed to several underlying factors. First-year physics students might still be adapting to EMI, especially if their previous education was primarily in another language. The technical nature of physics, combined with the challenge of using a second language, can make expressing complex ideas more difficult. Additionally, students may lack sufficient vocabulary or fluency in academic English, leading to hesitation or low confidence during discussions. The relatively low percentage of students who rated their participation as good or very good could also reflect limited prior exposure to discussion-based learning in English, which may not have been emphasized in their earlier educational experiences.

***4- Writing reports and assignments in English**

Figure 4

Language proficiency in Writing reports and assignments in English



The provided pie chart illustrates the perceived quality of writing reports and assignments concerning EMI among first-year physics students. A significant portion of students rated the quality as "poor" (30%), followed closely by "neutral" (27.5%). "Very poor" and "good" categories each account for 17.5% of the responses, while a smaller percentage (7.5%) considered the quality to be "very good." This distribution suggests a general dissatisfaction or ambivalence regarding the current state of EMI report and assignment writing among this student group.

The probable reasons behind these results could stem from several factors. First-year physics students, especially those new to EMI, might struggle with the academic language demands of writing complex scientific reports in English, even if they have a foundational understanding of physics concepts. This difficulty could be exacerbated by a lack of sufficient support or explicit instruction in academic writing conventions within an EMI context. Additionally, the transition from secondary education to university-level academic writing, coupled with the challenges of a new language of instruction, could contribute to students feeling unprepared or overwhelmed, leading to lower perceived quality in their written work.

Q5-Have you previously been taught any subjects in English?

Among the first-year students surveyed regarding their experience with EMI, responses to the question "Have you previously been taught any subjects in English?" revealed a nearly balanced split. Out of the total participants, 22 students responded "Yes," indicating prior exposure to subjects taught in English, while 18 students answered "No," suggesting they had not encountered EMI before entering university.

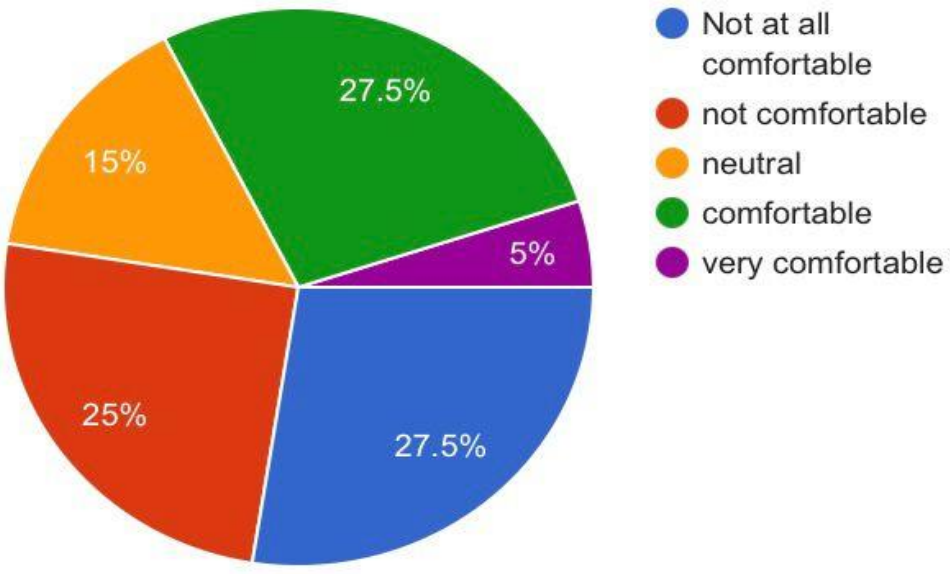
This data shows that a slight majority of the students had some familiarity with EMI, indicating that they had been exposed to learning academic subjects through English before entering university. This prior exposure may give them a certain level of comfort or

confidence when faced with EMI at the higher education level. However, it is also important to note that a significant portion of the group, nearly half of the respondents, entered higher education without any previous experience in learning through English. This suggests a clear divide in the students' educational backgrounds, with many encountering EMI for the first time in their university studies. The presence of both experienced and inexperienced EMI learners in the same academic environment highlights the varied preparedness levels among students, which can have implications for how effectively they engage with content taught in English.

Q6- How comfortable do you feel when learning physics in English?

Figure 5

Learning physics in English comfort



This pie chart illustrates the comfort levels of first-year physics students regarding learning physics using English. The largest proportion of students, at 27.5%, reported feeling "not at all comfortable" with this approach, mirroring the 27.5% who indicated they were

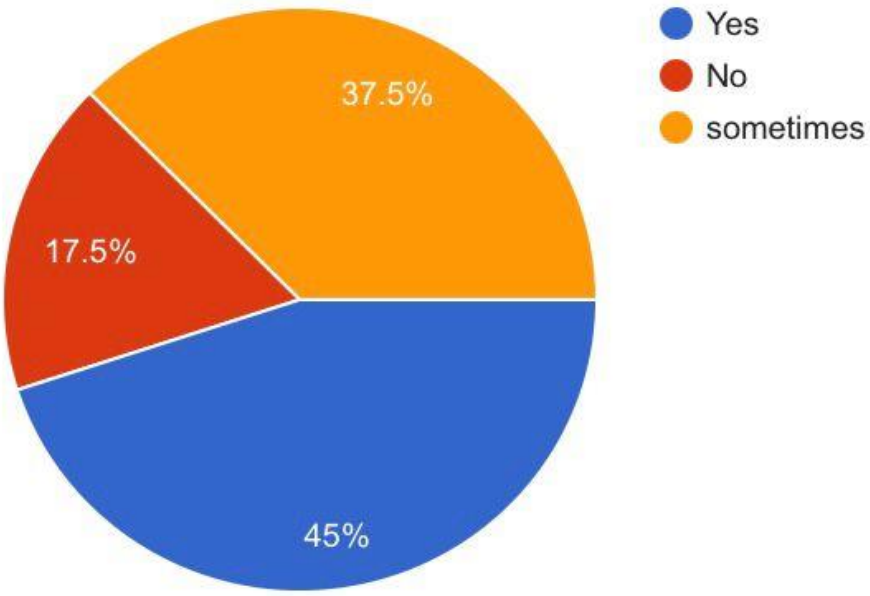
"comfortable." Following closely, 25% of students reported feeling "not comfortable," while 15% remained "neutral." The smallest segment, at 5%, felt "very comfortable" learning physics in English.

The observed distribution of comfort levels likely stems from several factors. Given that the context is first-year physics students, many may be transitioning from a primary education system where English was not the primary language of instruction for scientific subjects. This could lead to a lack of familiarity with scientific terminology in English, contributing to the high percentages of students feeling "not at all comfortable" or "not comfortable." Conversely, the 27.5% who feel "comfortable" and 5% who feel "very comfortable" might include students who had more exposure to English through prior schooling, extracurricular activities, or personal interest, or perhaps those who are more adept at language acquisition in general. The "neutral" group could represent students who are adaptable but have no strong preference, or those whose comfort level is still developing.

Q7- Do you find it harder to understand physics when it's taught in English instead of French?

Figure 6

Learning physics using English or French



This pie chart illustrates the responses of first-year physics students to the question of whether they find it harder to understand physics when taught in English compared to French. The majority of students, a significant 45%, responded "Yes," indicating they do find it harder to understand physics in English. A substantial 37.5% of students chose "sometimes," suggesting a fluctuating or conditional difficulty. The smallest proportion, 17.5%, responded "No," implying they do not find it harder to understand physics when taught in English.

The results likely reflect the linguistic background and prior educational experiences of the first-year physics students. Given that French is often a prominent language of instruction in many educational systems, particularly in regions where this survey might have been conducted, students would naturally be more accustomed to learning complex subjects like physics in French. This familiarity with French as the language of academic discourse,

including scientific terminology, would make the transition to English-medium instruction challenging for a large segment of the student population. The "sometimes" response could indicate that certain topics or instructors present greater linguistic hurdles, or that students' comfort with English varies depending on the specific context. The smaller group who find no additional difficulty might have had more extensive exposure to English in their prior education or possess a higher proficiency in the language.

Q8 -If yes, what are the main difficulties you face?

Based on the responses collected from the question “If yes, what are the main difficulties you face?” regarding challenges in EMI, the findings reveal several recurring themes. Out of the 40 responses, the most commonly reported difficulty was understanding technical vocabulary, mentioned consistently in various forms such as "scientific words" or "new physics words." Another significant challenge was the speed of delivery, with many students stating that fast-paced lectures made comprehension difficult.

A notable number also struggled with understanding nuances, referring to the inability to grasp subtle meanings, context, or implied information in English. Several responses combined all three challenges, indicating that students often experience overlapping difficulties when learning in English. A few students responded in Arabic by using statements like “« كون تعلم شئ جديد ويتطلب شرح يجب أن تستخدم اللغة الام في ذالك” and « لمفردات و عدم فهم السياق » , reinforcing these points by expressing frustration about not understanding the lessons, and one noted that using the native language would be more effective for learning new concepts.

The probable reasons behind these difficulties can be attributed to limited prior exposure to English in academic contexts, particularly in technical or subject-specific vocabulary. Many students likely studied in educational systems where content was delivered

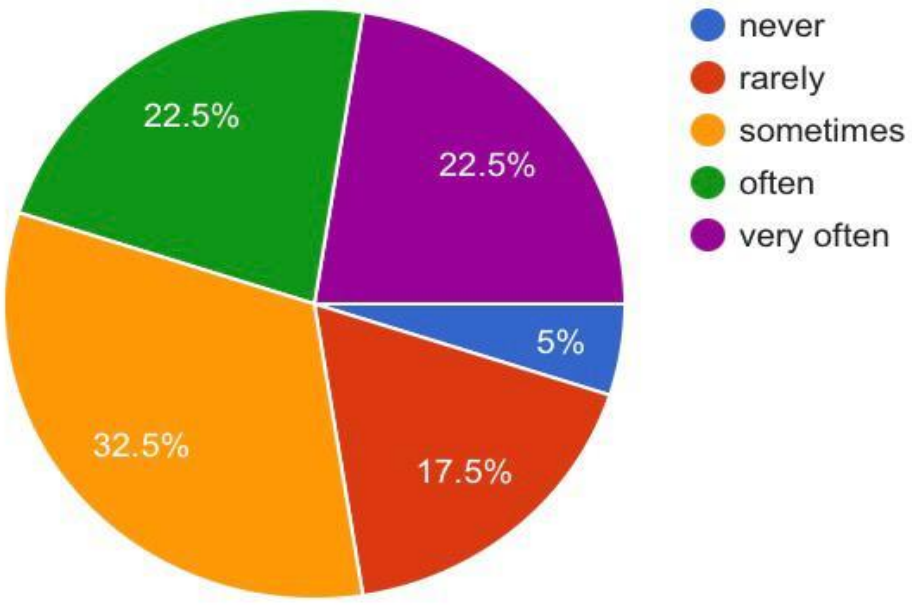
in their first language, leaving them underprepared for the linguistic demands of EMI. The speed at which lecturers speak may further complicate comprehension, especially for students who are still developing their listening and processing skills in English. Additionally, understanding nuances requires a more advanced level of language proficiency, which not all students have yet achieved. These challenges highlight the importance of providing language support and adapted instructional strategies to help students better cope with EMI demands.

Q9. How often do you have trouble understanding English in the following?

1*Lectures

Figure 7

Frequency of understanding lectures in English



The pie chart illustrates the responses of first-year physics students regarding how frequently they struggle to understand English in lectures conducted through EMI. According to the data, the largest portion of students (32.5%) reported that they “sometimes” face

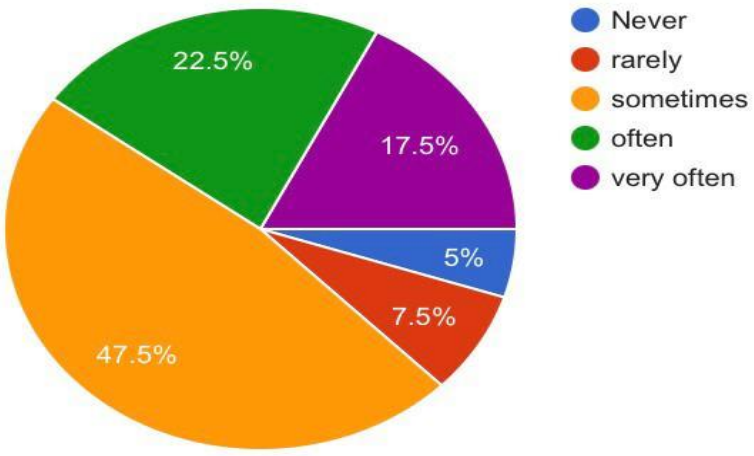
difficulties. This is followed by equal percentages of students (22.5% each) who indicated they “often” and “very often” have trouble. A smaller group (17.5%) mentioned they “rarely” encounter such issues, while only 5% of students claimed they “never” have problems understanding English during lectures.

These results suggest that a significant number of first-year physics students are facing language barriers in EMI-based instruction. One possible explanation for this trend is that many of these students may come from educational backgrounds where English was not the primary medium of instruction. Additionally, the technical and abstract nature of physics can amplify comprehension difficulties, especially when concepts are presented in a non-native language. Lack of prior exposure to academic English and limited vocabulary related to physics terminology could also contribute to these challenges. The results underline the importance of providing language support to help students bridge the gap and enhance their understanding in EMI contexts.

2* Text books and reading materials

Figure 8

Frequency of understanding text books and reading materials in English



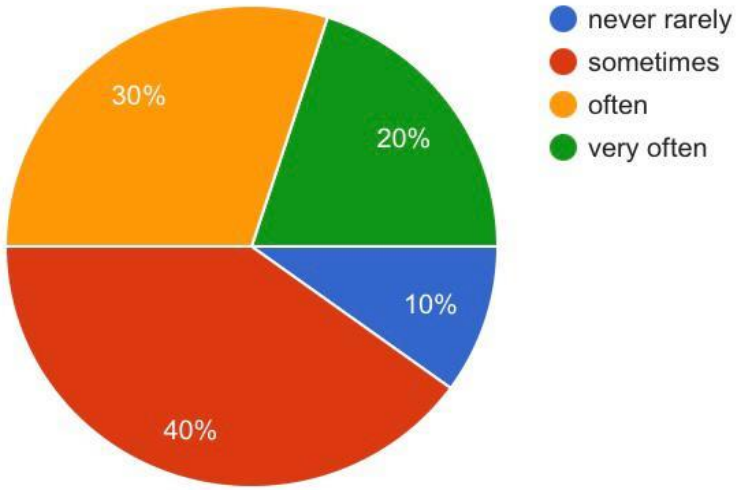
The pie chart presents the responses of first-year physics students regarding how often they face difficulties understanding English in their textbooks and reading materials, particularly in the context of EMI. According to the data, the majority of students (47.5%) report that they “sometimes” struggle with comprehension. This is followed by 22.5% who “often” face difficulties, and 17.5% who encounter such issues “very often.” A smaller portion of the students report less frequent challenges, with 7.5% indicating they “rarely” have trouble and only 5% stating they “never” struggle to understand English in their course materials.

Several reasons could explain why a significant number of students struggle with understanding English in academic texts. First, the language used in physics textbooks is often technical and complex, which can be challenging even for native speakers, let alone those learning in a second language. Additionally, many students in EMI programs may not have had prior academic training in English, making it difficult to grasp concepts presented in this language. Limited vocabulary, unfamiliarity with scientific jargon, and differences in grammatical structure between English and the students’ native language may further hinder comprehension. Lastly, lack of support resources, such as language bridging programs or bilingual materials, can exacerbate these challenges for first-year students transitioning into EMI environments.

3* Assignements and exams

Figure 9

Frequency of understanding assignments and exams in English



The pie chart illustrates the frequency with which first-year physics students experience difficulty understanding English in assignments and exams within the context of EMI. According to the chart, the highest proportion of students (40%) report that they "sometimes" encounter trouble. This is followed by 30% who say they "often" struggle, and 20% who "very often" face difficulties. Only a small percentage, 10%, report that they "never or rarely" have issues comprehending English in their assessments. This distribution indicates that a significant majority of students (90%) face at least occasional challenges in understanding the language used in their academic evaluations.

Several factors contribute to these difficulties. Academic assessments typically require not only content knowledge but also the ability to interpret complex instructions and articulate responses clearly in English. For students who are not proficient in English, this dual demand

becomes a major hurdle. The pressure of exams and assignments can amplify anxiety and reduce comprehension under stress, particularly when students are uncertain about academic vocabulary or grammatical structures. Additionally, the absence of adequate language support systems—such as glossaries, simplified instructions, or language workshops—can leave students unprepared to tackle English-language assessments confidently. This situation underscores the need for institutions to provide more robust language support tailored to the needs of EMI learners in scientific disciplines.

Q10- Do you feel that learning in English has affected your understanding of the subject matter?

Table 3

The effectiveness of English on understanding

	Positively	Negatively	No significant impact	Total
Frequency	**15**	**14**	**11**	**40**
Percentage	**37.5%**	**35%**	**27.5%**	**100%**

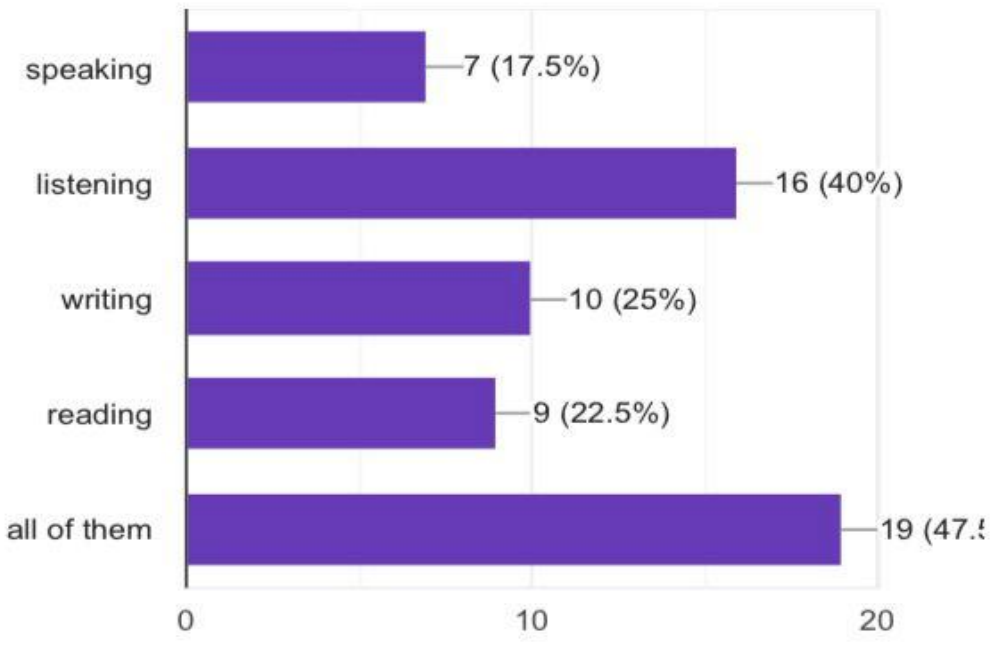
The table presents responses to the question: “Do you feel that learning in English has affected your understanding of the subject matter?” among first-year physics students in an EMI setting. Out of 40 students surveyed, 15 (37.5%) reported that learning in English has affected their understanding positively, while 14 students (35%) felt it had a negative impact. The remaining 11 students (27.5%) believed it had no significant impact on their comprehension of the subject. These results reflect a nearly balanced split in perceptions, with slightly more students reporting a positive impact than a negative or neutral one.

There are several reasons behind these differing perceptions. Students who view EMI positively may have stronger English proficiency, allowing them to access a broader range of resources, engage more confidently in academic discussions, and prepare for international academic or professional opportunities. On the other hand, those who perceive EMI negatively may struggle with the language barrier, which can hinder their ability to grasp complex scientific concepts, follow lectures, or express themselves clearly in assessments. Furthermore, inconsistent teaching methods, lack of bilingual support, or limited prior exposure to academic English can amplify these difficulties. For those who saw no significant impact, it is likely they have adapted to the language environment or rely more on conceptual understanding rather than language proficiency alone.

Q11-Do you feel that learning physics in English has improved you English language skills?

Figure 10

The improved skills



The bar chart presents responses to the question: “Do you feel that learning physics in English has improved your English language skills?” among first-year physics students studying under an EMI model. The results reveal that 19 students (47.5%) felt that all areas of their English skills had improved. Listening was the most commonly cited specific skill, with 16 students (40%) noting improvement. Writing and reading followed, with 10 (25%) and 9 (22.5%) students respectively indicating growth in those areas. Meanwhile, speaking was the least selected, with only 7 students (17.5%) recognizing improvement in that skill alone.

These results suggest that immersion in EMI environments does contribute positively to the development of English language skills, especially in receptive skills like listening and reading. The prominence of “all of them” as a response may indicate a general improvement across language domains due to constant exposure to English in both written and spoken forms. However, the lower percentage for speaking suggests fewer opportunities for verbal interaction in class, possibly due to a lecture-dominated teaching style or lack of confidence among students. Writing and reading improvements are likely linked to the consistent use of English in assignments, textbooks, and exams. Overall, these findings point to the potential of EMI to serve as a dual-purpose platform, enhancing both content knowledge and language skills—though targeted support might be needed to boost productive skills like speaking.

Q12. How do you deal with the language difficulties in your physics courses? (For example: using a dictionary, asking classmates, asking teachers, using online help)

Based on the responses to Question 12, which asked students how they deal with language difficulties in their physics courses, the majority of students indicated that they rely heavily on online help as their primary strategy. This includes searching the internet, using translation apps like Reverso, or consulting tools such as Chat GPT to clarify unfamiliar terms or concepts. Many also mentioned using dictionaries, both traditional and digital, to look up

difficult vocabulary. Additionally, a considerable number of students seek assistance from their classmates and teachers, showing a strong reliance on both peer support and instructor guidance when dealing with language-related challenges in their coursework. Some students combine multiple strategies, such as asking classmates, using translators, and checking online explanations to overcome language barriers.

The widespread use of online resources and translation tools among students likely reflects their accessibility, speed, and convenience in providing immediate answers. It also suggests that many students are proactive in managing their learning despite linguistic difficulties. The frequent mention of asking classmates and teachers further highlights the importance of a collaborative learning environment where students feel comfortable seeking support. However, a few responses revealed uncertainty or a lack of clear strategy, including one student stating "I don't," which may indicate a need for more structured language support. Overall, these findings emphasize the diverse approaches students take to handle EMI-related language challenges in physics, and they point to the importance of providing both technological and human support to facilitate content comprehension.

Q13. Do you think students get enough support to deal with English in physics classes?

Table. 4

Language support of students

	Yes	No	Partly	Total
Frequency	**6**	**24**	**10**	**40**
Percentage	**15%**	**60%**	**25%**	**100%**

The table displays the responses to the question: “Do you think students get enough support to deal with English in physics classes?” among first-year physics students in an EMI environment. Out of 40 students surveyed, only 6 (15%) responded “Yes,” indicating they feel sufficient support is provided. In contrast, a significant majority—24 students (60%)—answered “No,” suggesting a notable lack of support. The remaining 10 students (25%) responded “Partly,” implying that while some help is available, it may not be adequate or consistent enough to meet their needs.

These results point to a widespread concern among students regarding the level of English-language support in their physics education. The dominance of negative responses highlights potential gaps in institutional support systems, such as the absence of language-integrated instruction, insufficient scaffolding in content delivery, or lack of access to academic English resources. Many students may struggle with scientific terminology, complex sentence structures in textbooks, or understanding lectures delivered in advanced English. Additionally, instructors may not always be equipped with training in language-sensitive teaching practices. These factors collectively suggest the urgent need for targeted interventions—like language support programs, bilingual glossaries, or collaboration between language and content instructors—to enhance students’ learning experience in EMI settings.

Q14-What kind of additional support would you find helpful for learning physics in English?

Based on the responses to the question “What kind of additional support would you find helpful for learning physics in English?” the findings clearly indicate a strong demand among students for structured language assistance. The most frequently mentioned supports were language support classes, bilingual resources, and glossaries of technical terms. Many

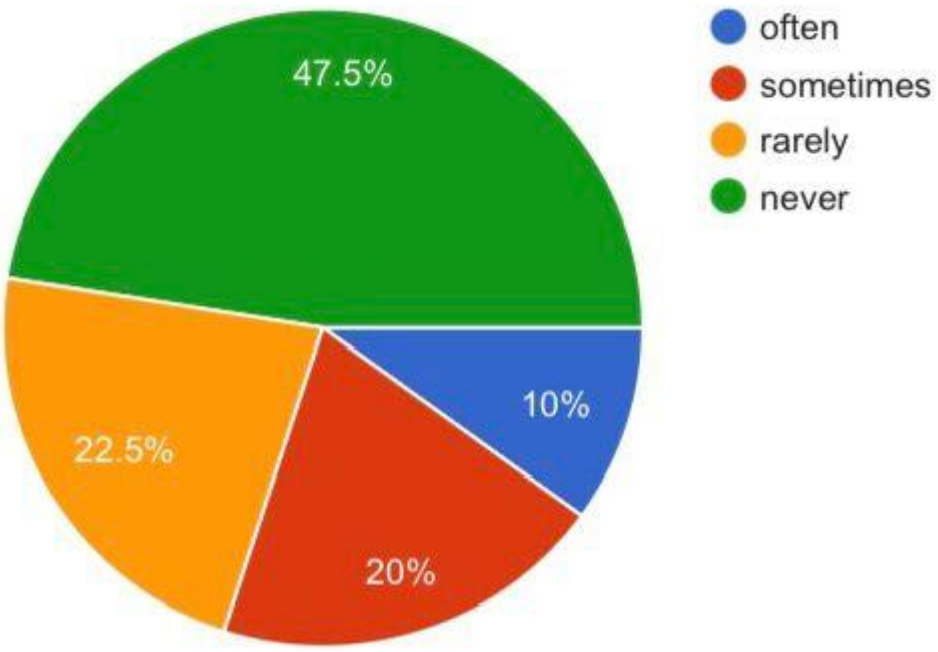
students emphasized the need for dedicated English language classes that specifically target academic and scientific vocabulary, highlighting the challenge of understanding complex content in a second language. Several students also expressed that such support should be mandatory and integrated into the curriculum, suggesting that the current provisions are inadequate. Responses were given in both English and Arabic, reflecting a multilingual learning environment and reinforcing the importance of bilingual support to bridge linguistic gaps. Additionally, some students recommended that proficiency tests like TOEFL or IELTS be included as part of the academic preparation for EMI courses.

The prominence of these suggestions' points to several probable reasons behind students' preferences. First, the specialized vocabulary used in physics presents a major barrier for non-native English speakers, making glossaries of technical terms a critical resource for comprehension. Second, the repeated call for language support classes indicates that students recognize the need to build not just general English skills, but also scientific literacy in English. Third, bilingual resources serve as a valuable bridge between students' first language and the medium of instruction, helping to clarify difficult concepts without sacrificing depth. The suggestions also hint at challenges related to time constraints and program intensity, as one student noted the lack of time to attend language centers due to a packed schedule. These findings underscore the importance of integrating tailored linguistic support within EMI programs to ensure that language does not become a barrier to content learning.

Q15-Do you actively participate in class discussions and ask questions in English?

Figure 11

The frequency of classroom participation



The pie chart illustrates student responses to the question: “Do you actively participate in class discussions and ask questions in English?” among first-year physics students studying under an EMI framework. The majority of students (47.5%) responded “never,” indicating a significant reluctance or inability to engage verbally in English during class. Meanwhile, 22.5% said they “rarely” participate, and 20% noted they participate “sometimes.” Only 10% of students reported that they “often” participate in class discussions in English. This pattern suggests that active verbal participation in English is limited among the majority of students.

There are several reasons why students might be hesitant to participate in English during physics classes. A key factor is likely a lack of confidence in their spoken English

skills, particularly when dealing with complex scientific concepts that require precision. Fear of making mistakes, peer judgment, or misunderstanding the academic content can deter students from speaking up. Additionally, classroom dynamics such as teacher-centered instruction, time constraints, or lack of encouragement might reduce opportunities for meaningful interaction. Cultural factors may also play a role, especially in contexts where students are not accustomed to speaking out in class. These findings highlight the need for more inclusive and supportive classroom environments that encourage and scaffold English communication, such as through small group discussions, structured question prompts, or language support activities embedded in content delivery.

1.2.2. The results of Teachers' questionnaire

The second used tool in this study was also a questionnaire to explore the challenges of EMI at Biskra University. This method was selected for its ability to collect detailed insights from participants in a structured format. One of the two questionnaires targeted university physics teachers, who are directly involved in teaching through English and can best identify the related pedagogical and linguistic issues.

The questionnaire gathered teachers' opinions and experiences regarding EMI, focusing on the challenges they face and its effect on student understanding. Responses from 13 teachers provided valuable data that helped highlight common difficulties and offered a clearer view of how EMI is implemented and perceived at the university level.

1. What is your native language?

The data reveals that all participating university physics teachers at Biskra University reported Arabic as their native language. This unanimous result is significant, as it underscores a shared linguistic and cultural background among the faculty. It also highlights a potential challenge in implementing EMI, as none of the teachers are native English speakers.

This commonality may affect the ease with which instructors deliver complex scientific content in English, and it points to the importance of providing targeted linguistic and pedagogical support to help teachers bridge the gap between their native language and the instructional language.

2-How long have you been teaching physics?

The responses to the question "How long have you been teaching physics?" ranged from 3 to 20 years, indicating a diverse level of teaching experience among the participants. This range suggests that the data collected comes from both relatively new instructors and seasoned professionals, offering a balanced perspective on the implementation and challenges of EMI in physics education. The presence of experienced teachers (with over a decade of teaching) adds credibility and depth to the findings, as they are likely to have observed long-term patterns and shifts in instructional practices. At the same time, the inclusion of teachers with fewer years in the profession brings fresh insights and possibly a greater sensitivity to recent changes, such as the introduction of EMI. This variation in teaching experience enhances the reliability and richness of the data, allowing for a more comprehensive analysis of how EMI is perceived and navigated by faculty members at different stages of their careers.

3- How long have you been teaching physics in English?

The results of Question 3 reveal that most physics teachers at Biskra University have been teaching in English for approximately two years, while a smaller number reported only one year of experience. This indicates that EMI is a relatively recent practice in the physics department and is still in its early stages of implementation. The limited duration of experience suggests that many instructors are likely still adapting to the linguistic and instructional demands of teaching complex scientific content in a non-native language. This

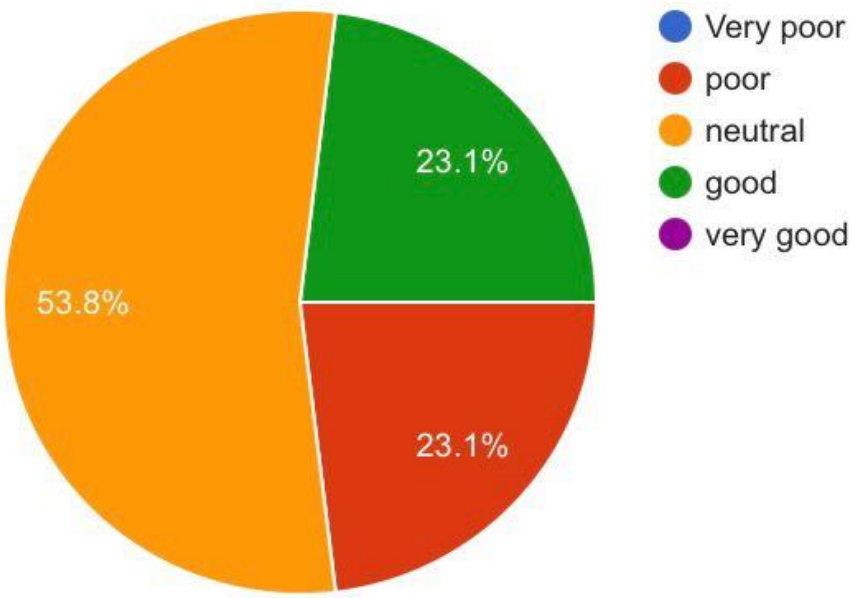
early phase may also explain the presence of certain challenges in EMI delivery, as teachers continue to develop the necessary language proficiency and pedagogical strategies to effectively conduct their courses in English.

4-on a scale of 1 to 5 (1being very poor,5 being very good), how would you rate your current English language proficiency in teaching physics:

1*Delivering lectures.

Figure 12

Language proficiency in delivering lectures



The pie chart illustrates the responses to Question 4: “On a scale of 1 to 5 (1 being very poor, 5 being very good), how would you rate your current English language proficiency in teaching physics, specifically in delivering lectures?” among university professors. The rating options were categorized into five levels—Very Poor, Poor, Neutral, Good, and Very Good—each represented by a different color. However, only three of these categories are shown in the chart:

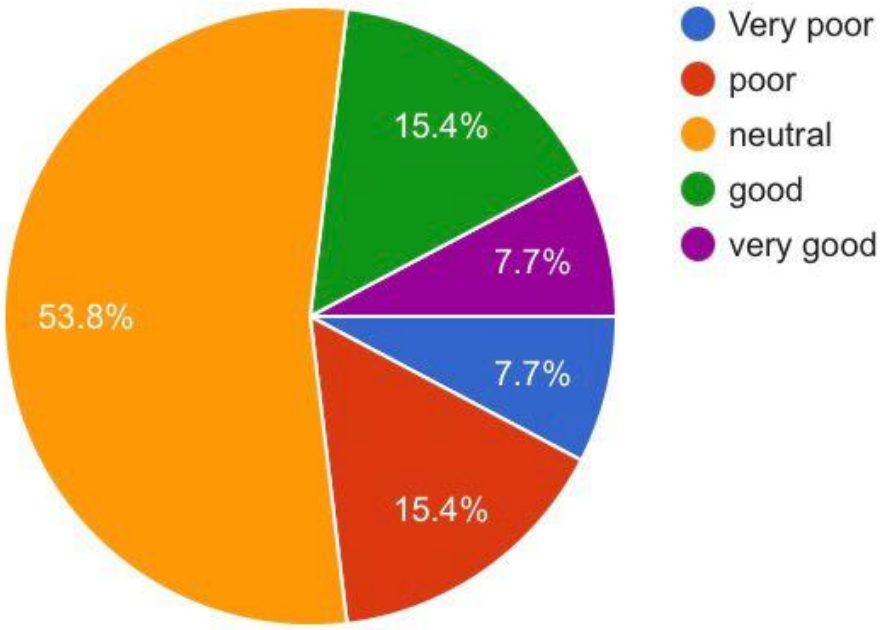
Neutral (orange), Good (green), and Poor (red). The chart does not include any responses for Very Poor (blue) or Very Good (purple), indicating that no respondents rated themselves at the extremes.

According to the data, the majority of the professors (53.8%) rated their proficiency as Neutral, suggesting that more than half of the participants feel average in their ability to deliver physics lectures in English. An equal percentage (23.1%) rated their proficiency as either Good or Poor. This distribution indicates a balanced perception among the remaining respondents, with some feeling confident in their skills and others recognizing areas for improvement. The absence of ratings at the Very Poor and Very Good ends of the scale suggests a modest, middle-ground self-assessment, where most respondents avoid extreme judgments about their capabilities.

2* Explaining complex concepts

Figure 13

Language proficiency in explaining complex concepts

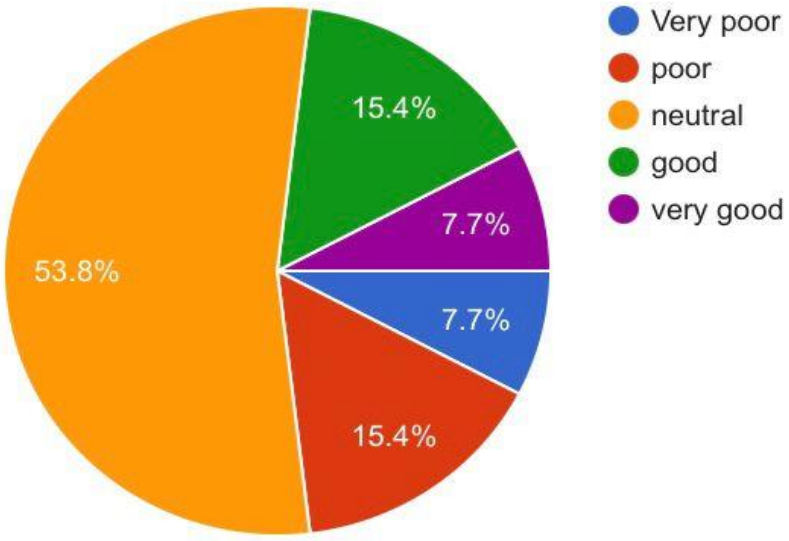


The data shows that a majority of the respondents (53.8%) consider themselves Neutral in their ability to explain complex concepts in English, indicating a moderate level of confidence. Meanwhile, 15.4% rated their proficiency as Poor, and another 15.4% as Good, suggesting a balanced distribution between those who feel challenged and those who feel capable. Interestingly, a small percentage (7.7%) rated themselves as Very Poor, while an equal portion rated themselves as Very Good, showing a wide range of self-assessments. This distribution suggests that while most professors are moderately comfortable, there is a notable diversity in self-perceived proficiency, possibly influenced by factors such as teaching experience, language background, or training.

3* Answering student questions

Figure 14

Language proficiency in answering student questions



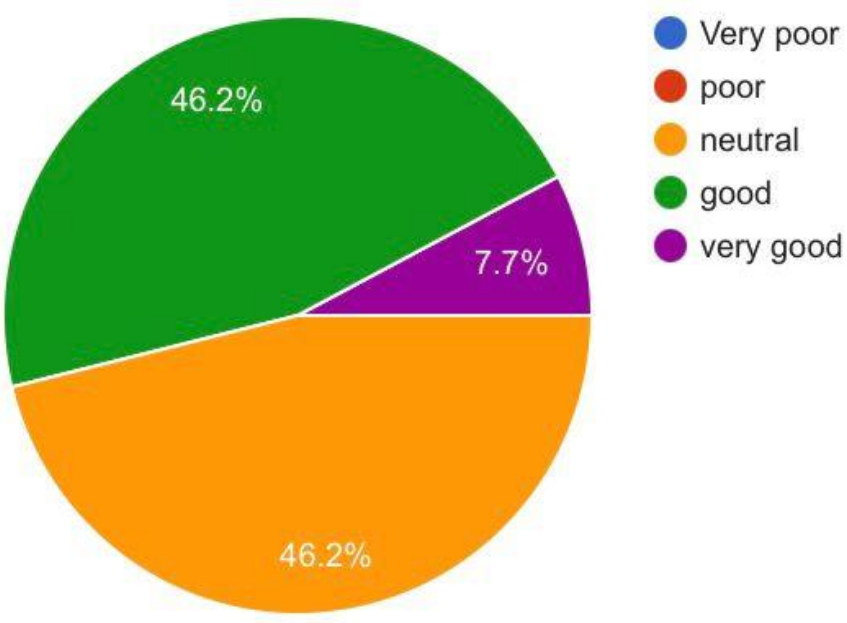
The pie chart presents the results of Question 4, which asked university physics professors to rate their current English language proficiency in answering students' questions. This visual breakdown offers insights into how confident professors feel about their ability to respond to student inquiries effectively in English within the context of teaching physics.

According to the results, the largest proportion of respondents (53.8%) rated themselves as Neutral, indicating that most professors feel moderately competent but not fully confident in this area. An equal share of 15.4% chose Poor and Good, showing a nearly balanced split between those who struggle and those who are comfortable in this skill. Additionally, 7.7% of professors rated themselves as Very Poor, while another 7.7% felt Very Good about their proficiency. This distribution highlights a diverse range of self-perceived ability levels among university physics professors, suggesting that while many manage adequately, a significant number may benefit from further training to enhance their responsiveness to students' questions in English.

4* Writing teaching materials and assessments

Figure 15

Language proficiency in writing teaching materials and assessments



The pie chart illustrates responses to Question 4, which asked university physics professors to evaluate their English language proficiency in writing teaching materials and assessments. The scale ranged from 1 to 5, with 1 indicating "Very Poor" and 5 indicating "Very Good." The pie chart captures responses in three categories.

The results show that the majority of university physics professors rated themselves either as Neutral (46.2%) or Good (46.2%) in their ability to write teaching materials and assessments in English. A smaller portion, 7.7%, felt their proficiency was Very Good. The absence of ratings in the lower categories points to a generally positive self-assessment, with most professors expressing at least a moderate level of confidence. This indicates that writing in English for academic purposes may be a relatively strong skill among this group, though a large portion still sees room for improvement to move from a neutral to a more confident level of proficiency.

Q5 -Have you received any specific training or support for teaching in English?

Table.5

Percentage of received training and supports

Responses	Frequency	Percentage
Yes	**7**	**53.8%**
No	**6**	**46.2%**
Total	13	100%

The table presents the results of the question: "Have you received any specific training or support for teaching in English?" Out of 13 respondents, 7 (53.8%) answered "Yes", indicating they had received some form of training or support, while 6 (46.2%) responded

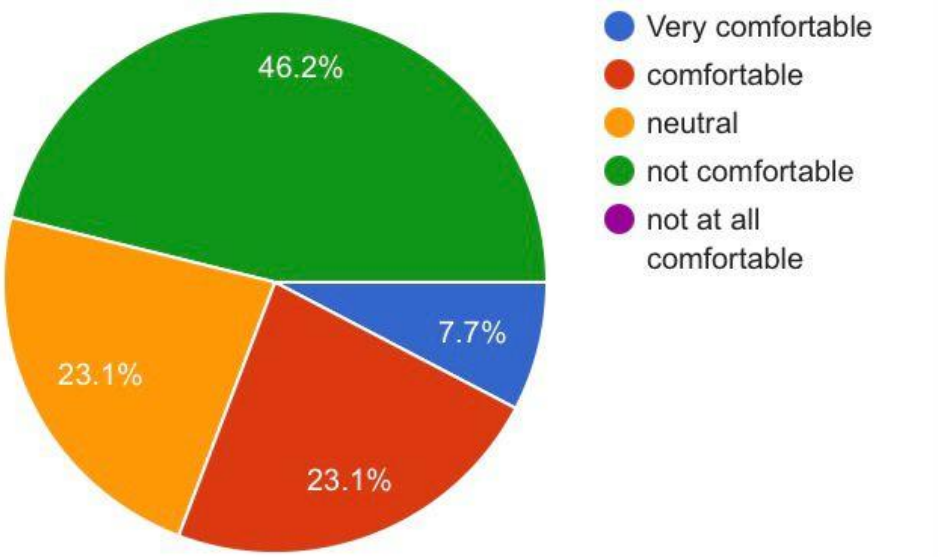
"No", showing that nearly half had not received any such support. This relatively even split highlights a mixed experience among instructors when it comes to institutional or professional preparation for teaching in English.

The probable reason behind this distribution could be the transitional nature of EMI adoption in many educational contexts, especially in non-native English-speaking regions. Some institutions may have begun implementing EMI policies without fully equipping all staff with the necessary training. As a result, while a slight majority have received support, a significant minority still lack formal preparation. This uneven access likely contributes to the previously observed demand for pedagogical training, as teachers who lack support may feel underprepared or uncertain about effective EMI practices in teaching complex subjects like physics.

Q6 -How comfortable do feel when teaching physics in English?

Figure 16

Teaching physics in English comfort



The pie chart illustrates the level of comfort experienced by university physics department teachers when teaching physics using the English language. The data reveals a significant discomfort among the respondents: 46.2% of teachers reported feeling “not comfortable” teaching in English, which is the largest group. This is followed by equal proportions (23.1%) who feel either “neutral” or “comfortable.” A smaller segment, 7.7%, reported feeling “very comfortable,” while none of the participants selected “not at all comfortable,” as that category is missing from the chart.

These results may suggest several underlying factors. The high percentage of teachers feeling “not comfortable” could stem from a lack of proficiency or confidence in using English as a medium of instruction, especially in a highly technical subject like physics. Additionally, the educational and professional backgrounds of the instructors might not have emphasized English-language instruction, particularly in non-English-speaking countries. Cultural and institutional factors could also play a role, such as limited access to training in English for academic purposes or a dominant use of the native language in scientific discourse within the institution. These factors collectively might contribute to a sense of unease or inadequacy when tasked with delivering complex subject matter in a non-native language.

Q7-Do you find it more challenging to explain complex physics concepts in English compared to French language?

Table.6

The challenges of explaining complex physics concepts

Responses	Frequency	Percentage
Yes	7	**53.8%**

No	1	**7.7%**
Sometimes	5	**38.5%**
Total	**13**	**100%**

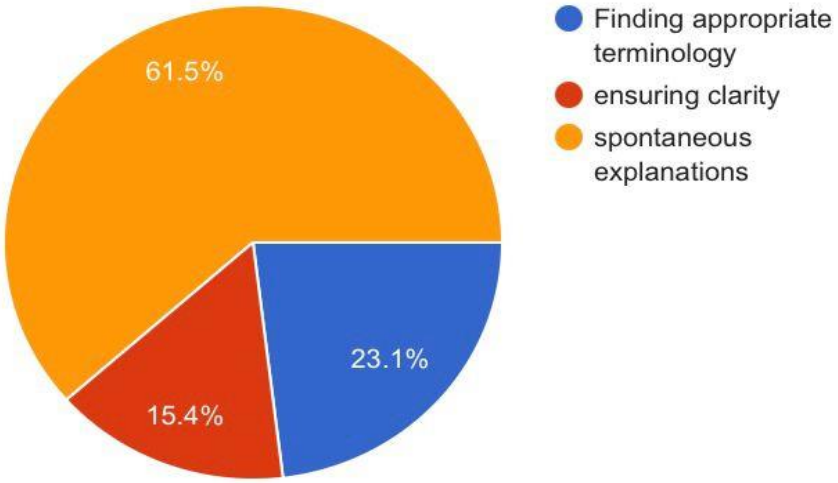
The table summarizes responses to the question: “Do you find it more challenging to explain complex physics concepts in English compared to the French language?” Out of 13 participants, a majority of 7 respondents (53.8%) answered “Yes”, indicating that they do indeed find it more difficult to explain physics concepts in English. 5 participants (38.5%) selected “Sometimes,” showing they occasionally encounter this difficulty, while only 1 respondent (7.7%) answered “No”, suggesting a small minority experience no added challenge.

This distribution suggests that for most instructors, English presents a significant or at least occasional barrier when it comes to explaining complex subject matter like physics. The probable reason lies in the linguistic and cognitive demands of translating or explaining abstract scientific concepts in a non-native language. Even if instructors have a functional command of English, the precision and clarity required in scientific discourse can make EMI challenging—especially in comparison to French, their likely native or more fluent language. This finding aligns with the earlier emphasis on the need for pedagogical training in EMI, highlighting a gap not just in language proficiency but in the pedagogical strategies required for effective instruction in a second language.

8-If yes, what are the main difficulties you face?

Figure 17

Difficulties of EMI



The pie chart demonstrates the primary difficulties faced by university teachers when delivering physics lectures in English. The data shows that the most significant challenge is providing spontaneous explanations, cited by 61.5% of the respondents. This indicates that a majority of teachers struggle with expressing ideas fluently and naturally in real-time, which is essential during interactive teaching. The next most common issue is finding appropriate terminology, reported by 23.1% of the teachers. This suggests that many instructors find it difficult to recall or use the correct scientific terms in English while teaching. Lastly, ensuring clarity was identified by 15.4% of respondents as a major concern, indicating that a smaller yet notable group of teachers is worried about making their explanations comprehensible to students.

The reasons behind these difficulties likely stem from both linguistic and contextual factors. The prominence of the issue with spontaneous explanations suggests that many teachers may lack sufficient fluency or confidence in English to speak without preparation, especially on complex or abstract topics in physics. This could be due to limited opportunities to practice English in academic settings or a lack of training in using English specifically for teaching.

The challenge with terminology points to gaps in vocabulary acquisition, particularly technical or domain-specific terms that are not commonly used outside scientific discourse. Ensuring clarity might be hindered by differences in pronunciation, sentence structure, or even cultural expectations about teaching styles, which can affect how effectively information is conveyed and understood in English. Addressing these issues would likely require targeted professional development in both language proficiency and instructional strategies.

***Please explain more**

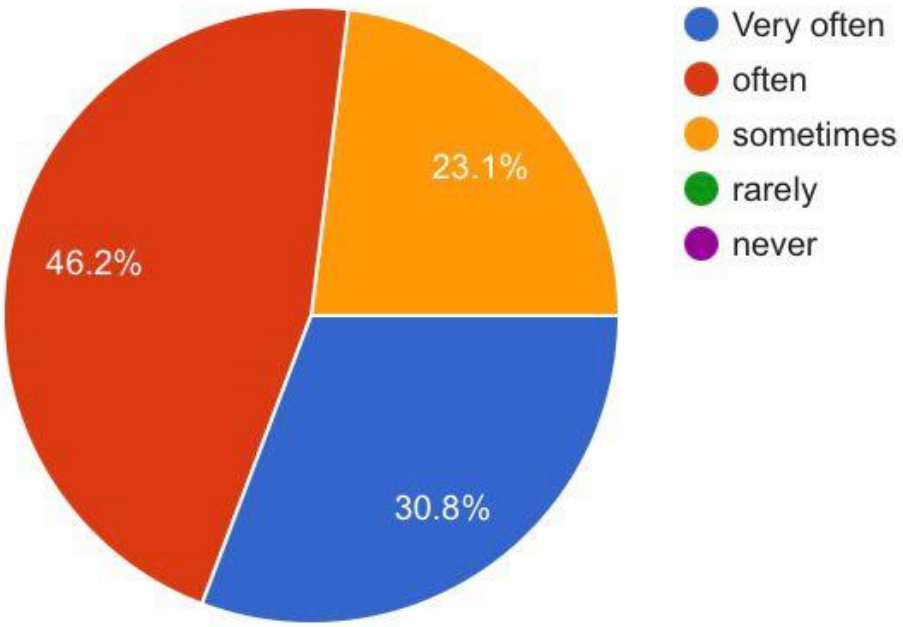
The answers to this question reveals that the most common challenges experienced by instructors relate to language use, particularly in scientific contexts. A significant number of responses highlighted difficulties with terminology, such as “finding appropriate terminology,” “صعوبات في العثورعل بالمصطلحات العلمية,” and “difficulty explaining scientific terms to students.” These comments reflect the struggle instructors face when teaching a subject like physics, which is rich in specialized vocabulary and requires precise language. The need to accurately convey technical concepts in a language that instructors have not fully mastered adds to the complexity of their task. Additionally, the challenge of writing clear and precise exam questions further demonstrates the pressure instructors face to maintain academic standards in English.

Another prominent theme in the responses is related to communication and classroom interaction. Instructors mentioned the difficulty of conveying ideas clearly, especially when students have limited English proficiency. Statements like “I struggle with spontaneous explanations in English” and “low classroom interaction quality” suggest that both the instructors and students are affected by the language barrier. This leads to reduced engagement and less effective teaching and learning experiences.

Q9– How often do you observe language-related difficulties among your students in physics courses taught in English?

Figure 18

The frequency of difficulties



The pie chart presents responses to the question of how frequently university physics instructors observe language-related difficulties among their students in courses taught in English. According to the data, the majority of teachers (46.2%) indicated that

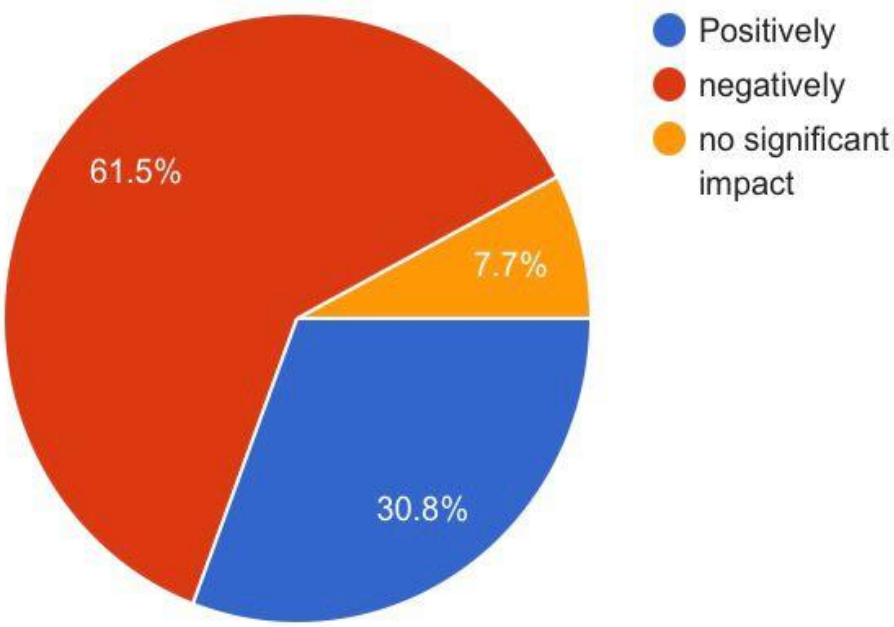
they “often” notice such issues, while 30.8% reported witnessing these difficulties “very often.” An additional 23.1% observed them “sometimes.” Notably, no respondents selected “rarely” or “never,” suggesting that all surveyed instructors regularly encounter language barriers in their English-medium physics classes to varying degrees.

These findings can likely be attributed to several underlying causes. English, for many students, is not their first language, and understanding complex scientific concepts in a foreign language can be particularly challenging. Physics often involves abstract reasoning, technical terminology, and dense academic language, all of which can pose significant obstacles to non-native English speakers. Moreover, students may lack sufficient training in academic English or in the specific language used in scientific discourse, which can hinder their ability to grasp content, participate in discussions, or express their ideas clearly. The prevalence of these challenges emphasizes the need for integrated language support within content courses or parallel language instruction tailored to the academic demands of physics.

Q10 – In your opinion, does the use of English as the medium of instruction affect the student's understanding of physics concepts?

Figure 19

The effect of EMI in understanding physics



The pie chart displays university physics instructors' opinions on whether using English as the medium of instruction affects students' understanding of physics concepts. The majority of respondents (61.5%) believe that English instruction negatively impacts students' comprehension. In contrast, 30.8% of instructors think it affects understanding positively, and a small minority (7.7%) feel that it has no significant impact. This distribution reveals a clear trend: most educators perceive English-medium instruction as a barrier to effective learning in physics.

The negative perception likely stems from students' limited English proficiency, which can obstruct their ability to grasp complex scientific ideas, follow lectures, and engage with course materials. Physics demands not only conceptual understanding but also precise language skills to interpret problem statements, equations, and theoretical explanations—areas where language barriers can significantly hinder learning. On the other hand, those who view the impact positively may believe that learning physics in English offers long-term benefits, such as improved access to global scientific literature and international academic opportunities. Still, the dominant concern among instructors suggests a pressing need for support systems that bridge the language gap without compromising content mastery.

***Please explain**

The answers reveal a range of perspectives, though the majority indicate that language plays a significant role in shaping students' comprehension. Many participants noted that students with limited English proficiency face clear challenges, such as confusion and difficulty grasping physics concepts, as seen in comments like "language difficulties may cause confusion" and "because some students face language difficulties that hinder their understanding." Several responses emphasized that the focus on understanding the language often overshadows the actual learning of scientific content, such "as "الاهتمام باللغة على حساب المادة العلمية" and " يركزون على فهم اللغة اكثر من تركيزهم على فهم دروس الفيزياء."

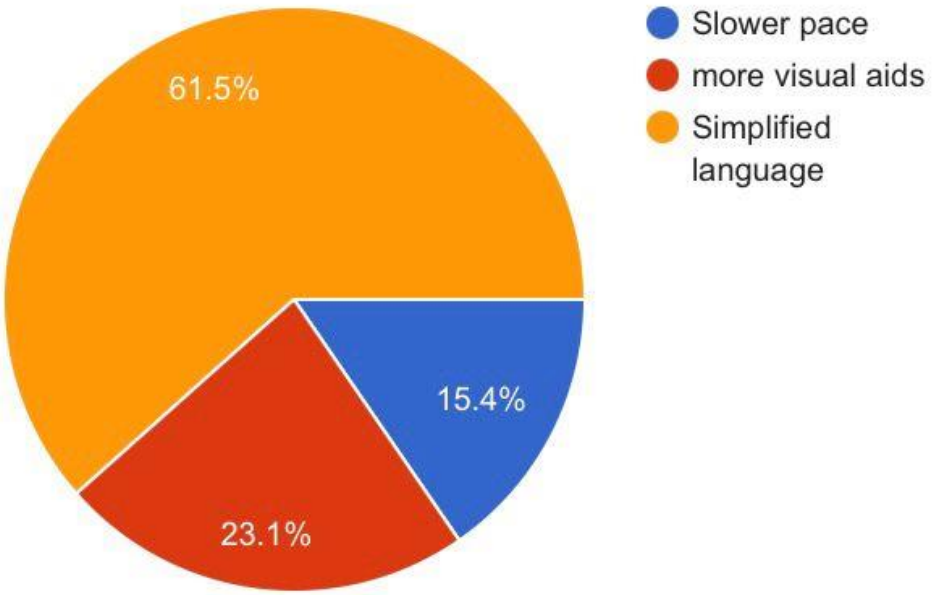
Others mentioned that teachers sometimes revert to French or struggle to bridge the gap between scientific content and linguistic clarity, which disrupts the learning process. However, a few responses acknowledged the long-term benefits of EMI, especially for students interested in international research, noting that "English is the language of

science" and it "helps students access global resources." Overall, while EMI is seen as beneficial in broadening academic opportunities, it also introduces substantial obstacles that require support for both students and instructors to ensure effective comprehension and instruction.

Q11 –Do you feel that the language demands of EMI in physics require you to adjust your teaching methods? If yes, how?

Figure 20

Adjusting teaching methods



The pie chart shows how university physics instructors have adjusted their teaching methods in response to the language demands of EMI. A significant majority of respondents (61.5%) reported using simplified language to make their lectures more accessible. Another 23.1% indicated that they rely on more visual aids to support student understanding, while a smaller portion, 15.4%, mentioned that they teach at a slower pace.

This distribution suggests that nearly all instructors recognize the need to adapt their teaching strategies when delivering physics content in English.

These adaptations likely reflect efforts to overcome the language barriers that both teachers and students face in EMI settings. Simplifying language can help reduce cognitive load, especially for students who are still developing proficiency in English. The use of visual aids, such as diagrams, graphs, and simulations, provides alternative channels for understanding complex concepts when verbal explanations fall short. Slowing down the pace of instruction gives students more time to process information, ask questions, and take notes effectively. Collectively, these adjustments highlight the proactive steps instructors are taking to bridge the language gap and ensure effective content delivery despite the challenges of teaching physics in a second language.

***Please explain more**

The answers show that most instructors acknowledge the need to adapt their teaching strategies to address language-related challenges. A common adjustment mentioned is the simplification of language, with several teachers noting they use "simplified language," "speak more slowly," and "check students' understanding regularly" to ensure clarity. Many also emphasized the use of visual aids such as "diagrams, animations, simulations," and data show presentations " التدريس بالداطاشو لتسهيل عمليه الشرح واظهارالوسائل المساعدة بدل استخدام الشرح النظري" as alternatives to extensive theoretical explanation, aiming to support student comprehension visually. Some instructors provide written summaries and bilingual glossaries to bridge the linguistic gap.

One respondent highlighted that while English references make lesson preparation easier for teachers, students struggle with understanding due to the subject's foundational nature, thus requiring simplified explanations. Although a minority mentioned that EMI

does not significantly alter their teaching methods because "basic concepts do not change," the majority agreed that EMI necessitates adjustments in pace, delivery, and resources. This pattern suggests that teaching physics through EMI imposes linguistic barriers that push educators to adopt more student-centered and multimodal teaching approaches to enhance understanding.

12-Do you feel there is adequate institutional support for faculty teaching in English?

Table .7

The availability of adequate institutional support

Responses	Frequency	Percentage
Yes	4	30.8%
No	4	30.8%
Partially	5	38.5%
Total	**13**	**100%**

The table reflects responses to the question: "Do you feel there is adequate institutional support for faculty teaching in English?" Out of 13 participants, only 4 respondents (30.8%) said "Yes," and an equal number, 4 (30.8%), answered "No." Meanwhile, 5 respondents (38.5%) chose "Partially," indicating that while some support exists, it is not comprehensive or sufficient for their needs.

This near-even distribution reveals a lack of consensus among faculty regarding institutional backing for teaching in English. The fact that the largest group selected "Partially" suggests that many faculty members perceive gaps in the institutional support system—perhaps in areas such as training, teaching resources, or ongoing assistance. The

identical proportions of “Yes” and “No” further indicate inconsistency in how support is provided across departments or individuals. This fragmentation likely contributes to the earlier findings where faculty prioritized pedagogical training and resources for multilingual learners, signaling that more coordinated and comprehensive institutional efforts are needed to effectively support English-Medium Instruction.

***Please elaborate**

The responses reveal a mix of appreciation and concern regarding the current level of institutional assistance provided to university instructors under the EMI policy. The provided data shows that while some faculty members acknowledge the existence of support mechanisms, such as training workshops and teaching resources, there is a widespread perception that this support is insufficient and needs to be expanded and sustained.

Several participants noted the presence of initial support, including language development programs, materials, and EMI training sessions. These were seen as beneficial for enhancing teaching effectiveness and helping instructors gain confidence in using English. As one respondent mentioned, such support “helps improve teaching in English and build confidence.” However, this sentiment is often accompanied by a call for more continuous, structured, and accessible support. Teachers stressed the need for regular language workshops, additional bilingual teaching resources, and ongoing professional development opportunities rather than one-time or irregular sessions.

Another prominent theme in the data is the lack of pre emptive support both for instructors and students. Some responses highlighted that institutional backing often comes too late or is too limited in scope. The call to “reduce the hourly workload” reflects the concern that time constraints hinder proper lesson planning and adaptation to EMI

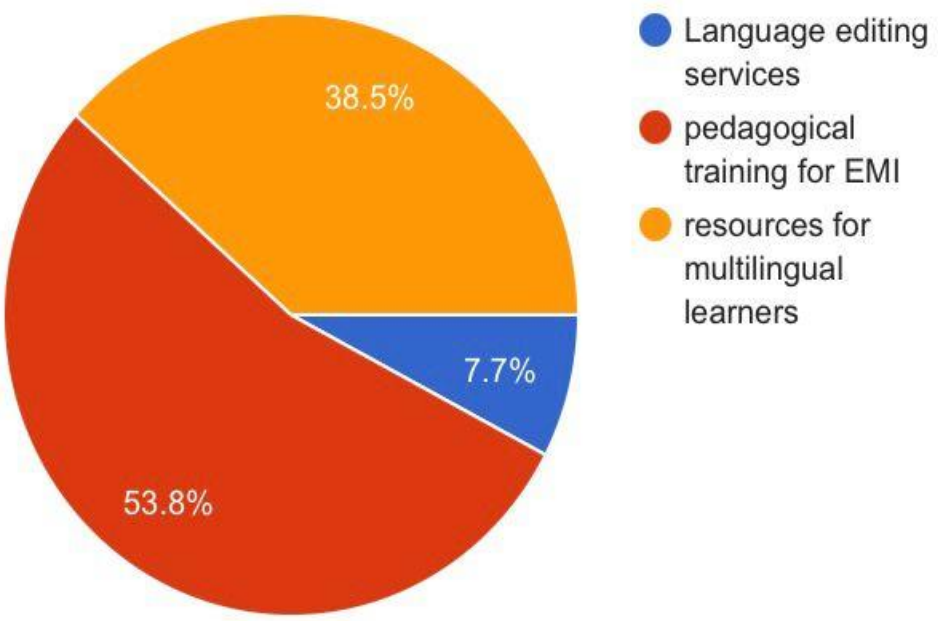
requirements. Furthermore, comments like "لا يوجد دعم كافي للتدريس باللغة الانجليزية" (There is not enough support for teaching in English) and "نقص الدورات والتربصات" (lack of training and workshops) underscore the belief that institutional efforts are still falling short of what is necessary for effective EMI implementation.

In summary, the descriptive data suggests that while institutions such as Mohamed Kheider University have taken initial stepstoward supporting EMI through training and resources, faculty members continue to face significant challenges due to limited, inconsistent, or delayed support. The findings highlight a need for more sustainable and comprehensive institutional policies, including time management reforms, consistent professional development, and stronger support frameworks tailored to both instructors and students.

Q13– What kind of additional support would you find helpful for teaching physics in English?

Figure.21

Suggested additional support



The pie chart presents the distribution of responses to the question, “What kind of additional support would you find helpful for teaching physics in English?” The largest portion, 53.8%, indicated a need for pedagogical training for EMI, reflecting a clear concern among educators about effectively delivering content in English rather than their native language. Following this, resources for multilingual learners were selected by 38.5% of respondents, emphasizing the importance of support materials tailored for students who may struggle with English as a second language. Only 7.7% prioritized language editing services, suggesting that fewer instructors are primarily concerned with editing or refining their own English usage in materials or communication.

This distribution likely reflects the challenges educators face in transitioning to English-medium teaching environments. The dominant preference for pedagogical training implies that teachers feel unprepared in terms of instructional strategies specific to EMI contexts — possibly due to a lack of prior training in this area. The significant interest in resources for multilingual learners further supports the idea that language barriers in student comprehension are a shared concern. Meanwhile, the low demand for editing

services could indicate that instructors feel relatively confident in their English proficiency, or that they prioritize structural and pedagogical adjustments over linguistic refinement.

*** please explain more**

The data gathered from participants reveals a clear consensus on the types of support and improvements needed to make the implementation of EMI in the Physics Department more effective. A descriptive analysis of these responses shows that both teachers and students recognize the value of institutional and pedagogical support systems to overcome the linguistic and instructional challenges they face.

One of the most recurring suggestions was the need for regular EMI training workshops for faculty members. Respondents emphasized the importance of specialized training programs that focus on both language development and subject-specific communication strategies. This reflects a gap in current professional development provisions, particularly since some mentioned that English language instructors are trained but not in a way that aligns with their actual teaching schedules or classroom demands one participant stated “I need regular EMI training workshops, bilingual teaching materials, support in developing scientific vocabulary and communication strategies, and enough time for lesson preparation”. Participants also stressed the need for bilingual teaching materials and glossaries, indicating that such resources would significantly ease the delivery of complex scientific content and bridge the language gap between instructors and students.

Additionally, several responses highlighted the importance of visual and digital teaching aids, such as the use of data show (projectors), which help minimize linguistic barriers by presenting information through diagrams, simulations, and visual representations. This aligns with EMI pedagogy, which encourages multimodal instruction to support learners with limited language proficiency.

Participants also proposed tailored English support lessons for students, especially those struggling with scientific terminology and academic English. Some noted that multilingual peers or instructors could provide additional help in understanding lessons. This suggestion emphasizes peer support and collaborative learning as useful strategies in EMI contexts. Furthermore, the data reflects a broader concern for time constraints, with teachers mentioning the need for sufficient preparation time when teaching in English, reinforcing the idea that EMI requires additional effort and planning.

In conclusion, the analysis of the responses suggests that the successful implementation of EMI in the Physics Department relies heavily on targeted institutional support, including training for both teachers and students, access to bilingual and visual resources, and time allowances for preparation. These factors, if addressed, could enhance the effectiveness of EMI and reduce the barriers currently experienced by both faculty and learners.

Q14. Do you feel that teaching physics in English has impacted you teaching effectiveness?

Table .8

The impact of English on teaching

Responses	Frequency	Percentage
Positively	**7**	53.8%
Negatively	**5**	38.5%
No significant impact	**1**	7.7%
Total	13	100%

The table displays responses to the question: “Do you feel that teaching physics in English has impacted your teaching effectiveness?” Out of 13 participants, 7 respondents (53.8%) indicated a positive impact, while 5 (38.5%) reported a negative impact, and 1 respondent (7.7%) said it had no significant impact. This shows that a slight majority view teaching in English as beneficial to their effectiveness, though a substantial portion experience challenges.

The reason behind these mixed outcomes likely stems from the diverse levels of comfort, training, and language proficiency among faculty members. Those who felt positively impacted may have benefited from prior English-language experience, institutional support, or exposure to international academic standards, thereby improving their confidence and competence. Conversely, those reporting a negative impact may struggle with language barriers, student comprehension issues, or a lack of proper EMI training. The data underscores the need for tailored support systems that enhance the benefits while minimizing the drawbacks of EMI, as seen in earlier responses.

***Please explain**

The responses to the question “Do you feel that teaching physics in English has impacted your teaching effectiveness? reflect a range of experiences, highlighting both positive developments and significant challenges associated with EMI in the Physics Department. From a positive perspective, several instructors acknowledged that teaching in English has contributed to their professional growth, particularly in terms of language skills and content delivery. Some noted that it helped them organize their ideas more clearly, communicate physics concepts more professionally, and even enhance their access to scientific literature and global academic resources. For instance, one respondent remarked that teaching in English has improved their ability to communicate

internationally, while another mentioned that it supports more accurate access to scientific information. These views indicate that, for some, EMI not only boosts their instructional clarity but also strengthens their role as researchers and global educators.

However, the data also reveals significant challenges that impact teaching effectiveness. A number of faculty members reported linguistic fatigue, as they often have to translate complex physics content into English and then re-express it in simpler terms for students with limited language proficiency. One participant expressed this as " إرهاق في ترجمة الدروس للإنجليزية ثم العكس للطلبة" (fatigue from translating lessons into English and then back for the students). Others emphasized that language demands can shift focus away from physics content, leading to more emphasis on language instruction than subject mastery — a concern encapsulated in the statement "بدل الاهتمام بالفيزياء صار الاهتمام بالإنجليزية" (instead of focusing on physics, attention is now on English).

Moreover, there is a shared concern that not all instructors feel confident in their English proficiency, which can result in difficulty delivering lessons smoothly. This is particularly true when instructors must adapt their teaching style to ensure students' understanding in a second language, often slowing down the pace or using more visuals and simplified explanations.

In summary, the descriptive analysis shows that while EMI has positively influenced instructors' communication skills and access to academic resources, it also introduces pedagogical and linguistic challenges. These challenges may lead to extra cognitive effort, reduced content focus, and a need for ongoing support and training to fully balance language demands with effective subject teaching.

Q15 –What are your observation on student's participation and engagement in class taught in English compared to those taught in your native language (if applicable)?

In analyzing the responses to question 15, a clear pattern emerges regarding student participation and engagement in English-taught classes compared to those taught in the native language. The majority of university physics instructors observed a noticeable decline in student interaction during English-medium instruction stating that "Student participation in classes taught in English is lower due to language difficulties, while engagement is higher in classes taught in the native language" and "Participation tends to be lower, especially among students with limited English proficiency". Students tend to be more passive, often refraining from asking questions or engaging in discussions. This is attributed to language barriers such as limited vocabulary, fear of grammatical mistakes, and general discomfort with English communication. Teachers noted that while students attempt to adapt over time, their initial engagement remains weak, with many showing signs of confusion and decreased concentration. Despite these challenges, some instructors mentioned that teaching in English encouraged them to refine their communication skills, adopt more precise scientific terminology, and prepare lessons more carefully to enhance clarity and accessibility.

> In general, student participation tends to be lower in English-taught classes compared to those delivered in the native language. Many students hesitate to ask questions or express ideas due to limited vocabulary, fear of making grammatical mistakes, or lack of confidence.

The primary reasons behind these observations stem from the linguistic and cognitive challenges associated with learning physics in a non-native language. Since the participants are university physics instructors, their courses often involve complex concepts that require

precise understanding and articulation. Students with low English proficiency struggle to grasp technical terms, which hampers both comprehension and confidence. Moreover, cultural and educational backgrounds may not have emphasized English proficiency, making the transition to English-medium instruction particularly difficult. Instructors also highlighted a general student preference for simplicity and familiarity, further contributing to reduced participation. However, they acknowledged that consistent exposure to English in academic contexts could gradually improve student competence and engagement, especially if supported by clear, well-prepared instruction.

Q16 – What are your overall thoughts on having physics courses taught in English in your department? What are the potential benefits and challenges?

The responses reflect a generally positive attitude toward teaching physics in English, recognizing its strategic value in aligning students and faculty with global academic and research standards. Many respondents highlight key benefits such as improved language proficiency, better access to international scientific resources, and enhanced opportunities for collaboration, scholarships, and academic visibility. The responses also reveal enthusiasm about the potential for higher quality scientific research and the development of stronger communication skills in a global context. However, significant challenges were also emphasized. Chief among them are the language barriers faced by both students and faculty, which can hinder comprehension, participation, and overall learning effectiveness. Several respondents noted the need for a gradual implementation process supported by training programs, expressing concern over abrupt transitions that could negatively impact academic outcomes.

> Having physics courses taught in English has both promising benefits and real challenges. On one hand, it aligns the department with international standards and

prepares students for global academic and professional environments. On the other hand, if students (or even instructors) lack the necessary language skills, it can negatively affect learning outcomes, comprehension, and classroom dynamics.

Teaching physics in English has benefits such as access to global scientific resources, improving English language skills, and preparing students for academic futures. However, there are challenges like understanding difficulties due to language barriers, the need for continuous training for instructors, and additional pressure on students.

The mixed nature of these responses can be attributed to several underlying factors. First, there is a variation in English proficiency levels among both students and instructors, which influences their capacity to adapt to English-medium instruction. Those with stronger language skills tend to view the shift more positively, while others struggle with understanding complex concepts in a non-native language. Secondly, the institutional and governmental support for such a transition appears insufficient, with calls for more structured training, longer adaptation periods, and sustained pedagogical support. Cultural and systemic inertia also play a role; abrupt policy shifts without adequate preparation naturally lead to resistance or scepticism. These results underscore the importance of a well-planned, gradual, and inclusive approach to integrating English into higher education, especially in scientific disciplines like physics.

2.3. Discussion and Synthesis of the Findings

The previous section focused on analyzing the collected data, highlighting patterns, recurring themes, and the main challenges faced by participants in the context of EMI in physics education. In the current section, the researcher aims to move beyond analysis to synthesize the findings, drawing connections between individual responses and broader

educational implications. This synthesis involves interpreting the data in light of existing literature and theoretical frameworks to better understand the impact of EMI on teaching and learning. The discussion section, therefore, serves to contextualize the results, evaluate their significance, and explore how they align with or diverge from previous research. Ultimately, it aims to provide deeper insights into the research questions, suggest practical implications, and offer directions for future studies.

Q1. What are the perceptions of faculty members and students regarding the implementation of EMI in the Physics Department?

Both students and teachers generally hold a positive view of EMI, recognizing its value for accessing international scientific literature and enhancing future academic and career opportunities. However, they also express concerns about the linguistic and pedagogical. In response, both groups actively seek strategies to overcome these obstacles. Through these adaptive efforts, they strive to balance the benefits of EMI with the practical realities of teaching and learning physics in a non-native language.

The perceptions of faculty members and students regarding the implementation of EMI in the Physics Department are diverse and reveal both support for and concerns about its impact on teaching and learning. Many faculty members acknowledge the potential long-term benefits of EMI, particularly in terms of preparing students for international academic and research opportunities. Several instructors emphasized that English is the global language of science, and adopting EMI allows students to access a broader range of scientific resources, participate in international discourse, and enhance their future career prospects.

However, the responses also highlight significant challenges, especially from the perspective of both instructors and students whose English proficiency is limited. Many students reportedly struggle to grasp physics concepts when taught in English, often

prioritizing understanding the language over comprehending the subject matter itself. Faculty members expressed concerns that EMI shifts attention away from the scientific content, making it more difficult to achieve deep conceptual understanding. This issue is particularly critical in a subject like physics, which already demands high cognitive engagement.

Q2. What are the challenges faced by faculty members and students in using and learning physics through English?

Faculty members teaching physics through EMI encounter several interrelated challenges that stem primarily from the linguistic demands of the discipline. First, the highly specialized terminology inherent to physics often lacks direct equivalents in the instructors' native language, making it difficult to find precise English terms on the fly. This leads to slower lesson delivery and the need for extensive preparation of glossaries or written summaries. Second, the cognitive load of translating complex concepts into a second language in real time can strain instructors' fluency and confidence, prompting some to revert to French or Arabic to maintain clarity, which undermines the EMI framework. Finally, designing assessments such as exam questions that are both technically accurate and linguistically accessible adds an additional layer of complexity to instructors' workloads.

Students, on the other hand, face their own set of hurdles when learning physics in English. Many report that limited English proficiency causes confusion and misinterpretation of key concepts, especially when explanations rely heavily on unfamiliar vocabulary. This often shifts their focus from understanding the physics itself to deciphering the language used to teach it. Furthermore, slower lecture pacing and an overemphasis on linguistic comprehension can reduce classroom interaction and discourage spontaneous participation. As a result, students may feel overwhelmed, which can negatively impact their engagement,

motivation, and overall performance in a subject that already demands high levels of analytical thinking.

Both groups also grapple with the time-consuming nature of EMI: instructors must invest extra hours in lesson planning—preparing visuals, translations, and bilingual glossaries—while students often need to allocate additional study time to brush up on their English skills alongside mastering physics content. These parallel efforts, though beneficial in the long run, can lead to fatigue and frustration in the short term. Moreover, without institutional support—such as EMI-specific training for faculty or targeted language support for students—these challenges risk persisting and even widening the achievement gap in physics courses.

Students and teachers both face significant psychological challenges when EMI, including increased anxiety, shyness, and decreased motivation. Many students feel inhibited about speaking up in class due to fear of making language errors, which leads to reduced participation and limits opportunities for clarification and engagement. This inhibition often stems from low confidence in their English proficiency, causing them to focus more on avoiding mistakes than on learning the subject matter. Teachers, in turn, may experience performance anxiety and lack confidence in their own language skills, worrying that their simplified explanations or occasional code-switching may undermine their credibility. Together, these psychological barriers create a classroom environment where both instructors and learners hesitate to engage fully, hindering the dynamic interaction and mutual feedback essential for effective teaching and learning under an EMI framework.

It is obvious that both students and teachers face significant linguistic challenges when implementing EMI in physics. Students often struggle with specialized scientific vocabulary, lacking the equivalent terminology in their native language and experiencing difficulty across the four language skills—listening, speaking, reading, and writing—which hampers their

ability to follow lectures, participate in discussions, and complete assignments effectively. Teachers, meanwhile, must navigate the cognitive load of translating complex concepts into English in real time, often resorting to simplified language or visual aids to ensure clarity. Both groups may find it challenging to maintain the precision required in physics discourse, leading to slower lesson delivery, misunderstandings, and occasional reversion to the first language, all of which can disrupt the learning process and obscure students' true grasp of the subject matter.

What is also remarkably observed is that institutional challenges related to EMI in the Physics Department manifest in several key areas: there is often insufficient policy guidance or clear strategic planning for EMI implementation, leaving both students and teachers without a coherent framework or set of standards to follow; dedicated language-support services such as specialized English-for-Science courses, writing centers, or tutoring programs are frequently underfunded or entirely absent; professional development opportunities for instructors to enhance their academic English and EMI pedagogy are limited, resulting in uneven teaching quality; curricular materials and textbooks in English may not be readily available or up-to-date, forcing teachers to rely on translated or outdated resources; and technological infrastructure, like language labs and multimedia classrooms, is often inadequate, hampering the delivery of interactive, multimodal instruction. Together, these institutional gaps undermine both the effectiveness of EMI and its potential benefits for teaching and learning physics.

To sum up, both students and teachers encounter significant linguistic challenges when implementing EMI in physics. They often struggle to find equivalent terms for specialized scientific terminology, which can lead to misunderstandings or incomplete explanations. Many participants reported limited proficiency across the four language skills (listening,

speaking, reading, and writing) which hampers their ability to follow, deliver, or engage with course content effectively. This combined deficit makes it difficult for instructors to present complex concepts clearly and for students to grasp and articulate their understanding in English.

In addition to linguistic hurdles, psychological and institutional factors further impede EMI's success. Students frequently experience shyness and inhibition, resulting in low motivation to participate in class discussions or ask questions behaviors that diminish their learning opportunities. Teachers, meanwhile, lament the lack of targeted training programs to enhance their own English proficiency and pedagogical techniques for EMI, leaving them underprepared to support students' needs. Furthermore, both groups often revert to their first language (L1) when faced with difficulty, preferring the comfort and fluency it offers over English, which can undermine the objectives of an EMI approach.

Q3. How does the implementation of EMI affect students' comprehension of physics concepts and their academic performance?

The implementation of EMI in physics significantly influences students' comprehension of complex scientific concepts. Many students report that limited English proficiency leads to confusion over key terminology, causing them to expend cognitive resources on decoding language rather than on understanding the underlying physics. When explanations are simplified or supplemented with visual aids and bilingual glossaries, comprehension improves; however, the extra effort required to translate in real time can still interrupt the flow of learning. As a result, students often feel they must prioritize language understanding over content mastery, which can fragment their grasp of sequential or abstract topics in physics.

These comprehension challenges have tangible effects on students' academic performance. Several instructors noted that students taught through EMI tend to require longer study times and more frequent clarification sessions, which may not always be feasible within standard course schedules. Lower participation rates (often stemming from shyness or fear of making language errors) further reduce opportunities for formative feedback, leaving gaps in students' knowledge unaddressed until formal assessments. Consequently, grades on exams and assignments can suffer, not necessarily due to a lack of conceptual understanding, but because language barriers obscure students' ability to demonstrate what they know in English.

Despite these obstacles, EMI also offers potential benefits that can, over time, bolster academic outcomes. Exposure to scientific English enhances students' ability to engage with international research, broadening their access to current literature and methodologies. Some students even report that the challenge of learning physics in English motivates them to improve their overall language skills, which in turn supports deeper engagement with the subject matter. Ultimately, the effect of EMI on comprehension and performance depends on the degree of linguistic and pedagogical support provided: when instructors employ adaptive strategies and institutions offer targeted language training, students are better equipped to overcome initial hurdles and achieve both language proficiency and physics mastery.

Q4. What are the perceived benefits and drawbacks of EMI in the Physics Department?

The implementation of EMI in the Physics Department is perceived to offer significant long-term academic and professional advantages. First and foremost, students gain direct access to the vast body of international scientific literature, databases, and research publications, which are predominantly in English. This exposure not only enriches their understanding of cutting-edge developments in physics but also trains them to critically

evaluate and integrate diverse sources of knowledge. Faculty members believe that familiarizing students with the conventions of scientific English early in their studies better prepares them for graduate programs, international conferences, and collaborative research projects.

Secondly, EMI is seen as a powerful driver of students' language development alongside their disciplinary learning. By regularly engaging with English in lectures, laboratories, and assessments, students gradually build competence in the four language skills—reading, writing, listening, and speaking—in a context that is directly relevant to their field. Instructors report that this dual focus boosts students' confidence and autonomy, as they become more comfortable expressing complex ideas, presenting results, and participating in academic discourse. Over time, such bilingual proficiency can distinguish graduates in a competitive global job market.

Finally, both students and teachers highlight the motivational aspect of EMI. The challenge of mastering physics through a foreign language often fosters a growth mindset, encouraging learners to take ownership of their study strategies—seeking out supplementary materials, practicing with peers, and utilizing digital tools. Similarly, faculty find that EMI offers an opportunity to innovate pedagogically, incorporating multimedia resources and interactive activities that may not have been as readily adopted in a monolingual setting. Together, these factors contribute to a dynamic learning environment where linguistic and scientific competencies evolve hand in hand.

However, it is worthy to say that faculty and students alike identify several key drawbacks of EMI in the Physics Department, foremost among them being the increased cognitive load it imposes. Instructors report that translating complex physical concepts into English, often in real time, not only slows the pace of the lesson but also diverts their attention from

pedagogical concerns to linguistic accuracy. Students, meanwhile, expend significant mental energy decoding terminology and grammatical structures, which can fragment their focus and weaken conceptual understanding. This constant "double task" of learning physics and a foreign language can lead to fatigue, reduced retention, and, in some cases, disengagement.

A second major concern is the impact on classroom interaction and participation. Both teachers and students describe a noticeable drop in spontaneous dialogue: students, wary of making mistakes, may remain silent, and instructors may hesitate to pose open-ended questions for fear of language confusion. This reticence undermines the collaborative, inquiry-based learning that physics education ideally fosters. As a result, classes can become more teacher-centered and less dynamic, limiting opportunities for peer learning and real-time feedback that are critical for mastering complex scientific ideas.

Finally, there are broader institutional and motivational drawbacks. Without sufficient support structures—such as targeted language-for-science training, up-to-date English-medium resources, or EMI-focused pedagogical workshops—both faculty and students feel underprepared and isolated. The extra time required for lesson preparation and self-study in English can dampen enthusiasm and detract from curriculum development or research activities. Moreover, when instructors and students revert to their first language to cope with difficulties, the very goal of EMI (to immerse learners in scientific English) can be undermined, perpetuating a cycle of partial implementation that neither fully supports language acquisition nor optimizes physics learning.

Q5. What recommendations can be made to improve the effectiveness of EMI in the Physics Department?

To enhance the effectiveness of EMI in the Physics Department, it is essential to invest in systematic professional development for both faculty and students. Regular, scheduled EMI training workshops should be organized (timed to align with instructors' working hours) to build their confidence in using English for scientific instruction. These workshops would cover pedagogical strategies for teaching complex physics concepts through a second language, with hands-on sessions on developing scientific vocabulary and communication techniques. Parallel training sessions for students would focus on academic English skills, ensuring that learners are better equipped to follow lectures and engage in discussions without linguistic inhibition.

Equally important is the provision of robust bilingual teaching resources. Instructors and students should have access to glossaries of key physics terms in both English and the local language, as well as carefully curated bilingual textbooks and handouts. Special supplementary lessons (designed to bridge language gaps rather than reteach physics content) can reinforce terminology and conceptual understanding before or after core lectures. Moreover, enlisting multilingual teaching assistants or peer-mentors who are more familiar with both English and the students' first language can provide real-time support, clarifying doubts and facilitating smoother classroom interaction.

Finally, integrating multimodal instructional aids such as data show presentations, diagrams, animations, and simulations—can significantly reduce the language burden on both teachers and students. By presenting complex phenomena visually, educators can minimize the need for lengthy verbal explanations and help students grasp abstract ideas more quickly. To support this, departments should allocate dedicated time within instructors' schedules for lesson preparation, ensuring that these materials are thoughtfully designed and effectively deployed. Collectively, these recommendations—structured training, bilingual resources,

multilingual support, and enhanced visual aids—offer a comprehensive approach to overcoming EMI challenges and fostering both language proficiency and physics mastery.

Conclusion

In conclusion, this chapter outlined the methodological framework used to investigate the implementation of EMI in the Physics Department. It detailed the research approach, design, data collection tools, and analysis procedures employed to explore the perceptions, challenges, and strategies related to EMI. The findings derived from the study provide meaningful insights into the experiences of both faculty members and students, laying the groundwork for deeper understanding and future improvements in EMI practices within scientific disciplines.

General Conclusion

The present study set out to explore the implementation of EMI within the Physics Department, focusing specifically on the experiences, perceptions, and challenges faced by both university instructors and first-year students. Through the use of qualitative methods, particularly semi-structured questionnaires, the research aimed to gather detailed and authentic insights from participants directly involved in EMI. The findings revealed a generally positive perception of EMI among both students and teachers, despite the notable linguistic, pedagogical, and institutional challenges that accompanied its implementation.

At a more analytical level, the study highlighted key difficulties such as limited English language proficiency, lack of specialized training for faculty, and the psychological effects on students such as shyness and reduced classroom participation. These challenges directly influenced teaching practices and student comprehension of complex scientific concepts. Nonetheless, many instructors reported adapting their teaching strategies by using simplified language, visual aids, and bilingual resources to help students grasp the content

more effectively. The study also emphasized the need for institutional support, including regular training workshops and access to teaching materials tailored for EMI contexts.

Broadening the scope, the study contributes to the growing body of research on EMI in non-English-speaking higher education settings, particularly in scientific disciplines that require precision and clarity. The findings underscore the importance of aligning language policy with pedagogical support to ensure that EMI serves as a bridge rather than a barrier to learning. Ultimately, this research reinforces the view that EMI can be a valuable tool for academic and professional development if implemented thoughtfully, with adequate resources and continuous support for both educators and students.

Implications

The findings of this study carry several important implications for educational institutions, policymakers, and faculty members involved in the implementation of EMI in science-based departments such as physics. First, the study underscores the need for comprehensive language support for both students and instructors. As language proficiency plays a significant role in students' ability to grasp complex scientific content, institutions should consider integrating language development programs alongside subject instruction. This could involve offering English for Academic Purposes (EAP) courses tailored to the specific needs of science students.

Secondly, the results imply that instructors require ongoing professional development to effectively teach in an EMI context. Many faculty members reported the need to simplify language, use visual aids, and create bilingual resources to support student understanding. Therefore, providing targeted EMI training workshops can help educators enhance their instructional strategies and become more confident in delivering content in English. These

trainings should focus not only on language use but also on pedagogical techniques suited for multilingual classrooms.

Institutional support also emerges as a key implication. The study highlights the necessity of providing adequate teaching resources, such as bilingual glossaries, accessible scientific texts, and technology-assisted tools like data projectors, to improve lesson delivery and student engagement. Administrators should also consider adjusting workloads and offering incentives for instructors who teach in EMI settings, recognizing the additional effort required to plan and deliver lessons in a non-native language.

Lastly, the study suggests that EMI implementation should be accompanied by continuous evaluation and feedback mechanisms. Gathering regular input from students and faculty can help institutions identify ongoing challenges and adjust their EMI strategies accordingly. Overall, the implications of this study advocate for a more holistic and supportive approach to EMI that considers language, pedagogy, and institutional readiness to foster an effective and inclusive learning environment.

Limitations and Suggestions for Further Research

This study's use of convenience sampling—drawing exclusively from physics instructors and first-year students accessible via the researcher's department—limits the generalizability of its findings. Because participation was voluntary and based on availability, the sample may not accurately reflect the broader population of physics educators or students, either within this university or at other institutions. Consequently, the experiences and perceptions captured might be skewed toward those who were more motivated or confident in their English proficiency, while under representing those who struggled most with EMI.

Another key limitation is the sole reliance on semi-structured questionnaires for data collection. While these instruments provided valuable insights into participants' perceptions

and self-reported behaviors, they did not allow for the depth of exploration afforded by interviews or classroom observations. As a result, the study may overlook subtleties in teaching practices and student engagement that are better captured through qualitative methods such as focus groups or ethnographic observation. Additionally, the closed-ended items, though helpful for descriptive statistics, may have constrained respondents' ability to articulate more nuanced challenges or innovative strategies.

Finally, the cross-sectional nature of the study provides only a snapshot of attitudes and practices at a single point in time. Without longitudinal follow-up, it is difficult to assess how perceptions of EMI, and related language competencies evolve as both instructors and students gain more experience. Moreover, the study did not systematically measure actual learning outcomes or language proficiency gains, relying instead on participants' subjective assessments. Future research incorporating performance metrics and tracking changes over an academic year would be necessary to paint a more complete picture of EMI's long-term effectiveness in physics education.

Concerning the suggestions to further researchers, and to build on the findings of this study and address its limitations, future research could benefit from including a more diverse and representative sample. Expanding the study to involve participants from different departments and universities would help provide a broader view of EMI implementation across various academic settings. This would allow researchers to compare experiences and challenges among disciplines and institutions, leading to more generalizable conclusions.

In addition to surveys, incorporating a mix of qualitative methods such as interviews, focus groups, or classroom observations—would offer deeper insights into how EMI affects both teaching and learning. These methods could help uncover subtle issues related to classroom interaction, student engagement, and teaching strategies that may not be fully

captured through questionnaires. Observational data, for example, would provide real-time evidence of how language barriers impact the delivery and comprehension of content in physics classes.

Another important recommendation is to include a longitudinal approach in future studies. Tracking the same group of students and teachers over time would reveal how their experiences, language skills, and academic performance develop with continued exposure to EMI. This would offer a clearer picture of the long-term effects of using English as the medium of instruction and help determine whether early challenges are overcome with time and support.

Lastly, further research should explore the effectiveness of institutional support mechanisms, such as teacher training programs, English language workshops, and access to bilingual teaching resources. By evaluating which strategies are most beneficial, future studies can guide educational institutions in developing more effective EMI policies and practices that better support both faculty and students.

List of References

Ball, P., & Lindsay, D. (2013). Language demands and support for English medium instruction in tertiary education. Learning and Teaching in Higher Education: Gulf Perspectives, 10(2), 1–17.

Brinton, D. M, Snow, M. A., &Wesche, M. (2003). Content-Based Second Language Instruction (2nd ed.). Ann Arbor: University of Michigan Press. https://doi.org/10.3998/mpub.8754

Cohen, L., Manion, L., & Morrison, K. (2018). Research Methods in Education (8th ed.). Abingdon, Oxon: Routledge.

Coyle, D., Hood, P., & Marsh, D. (2010). CLIL: Content and Language Integrated Learning. Cambridge University Press.

Creswell, J. W., & Creswell, J. D. (2018).Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

Crystal, D. (2003). English as a global language (2nd ed.). Cambridge University Press.

Dearden, J. (2014). English as a medium of instruction – A growing global phenomenon. British Council. https://www.britishcouncil.org/sites/default/files/e484_emi_cover_option_3_final_web.pdf

Doiz, A., Lasagabaster, D., & Sierra, J. M. (2013). English-medium instruction at universities: Global challenges. Multilingual Matters.

Harmer, J. (2007). The practice of English language teaching (4th ed.). Pearson Longman.

García, O. (2009). Bilingual education in the 21st century: A global perspective. Wiley-Blackwell.

Loucif. (N.D). Lecture notes on English language and literature: Module ILS. University of Batna 2 – MostefaBenboulaid, Department of English Language & Literature.

Macaro, E. (2018). English medium instruction content and language in policy and practice. Oxford: Oxford University Press.

Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. Language Teaching, 51(1), 36–76. https://doi.org/10.1017/S0261444817000350

Pun, J., &Macaro, E. (2019). The effect of English medium instruction on the language proficiency of students: A systematic review. TESOL Quarterly, 54(3), 588–620. https://doi.org/10.1002/tesq.558

Richards, J.C. and Rodgers, T.S. (2014) Approaches and Methods in Language Teaching. Cambridge University Press, Cambridge, England.

Seidlhofer, B. (2011). Understanding English as a lingua franca. Oxford University Press.

Tollefson, J. W. (2015). Language policies in education: Critical issues (3rd ed.). Routledge.

Appendices

Student's questionnaire

Dear participant,

I kindly invite you to take part in my research study by completing this questionnaire. The aim of this study is to investigate the key challenges and obstacles encountered by first-year students in the sciences of material department at Biskra University when using English as the language of instruction. Your input is highly appreciated and will be a significant contribution to my research.

Background information

Q1-what is your native language?

Q2-How long have you been studing phsics?

Q3-How long have you been learning English ?

Q4-on scale of 1 to5 91being very poor, 5 being very good) how would you rqte your current English language proficiency in :

*Reading scientific tsxts

*2/understanding lectures in English

*3/Participating in discutions in English

*4/ writing reports and assignments in English

Q5-Haveyou previously been taught any subjects in English?if yes ,wich ones and how long?

Expriences whith EMI in physics:

Q6. How comfortable do you feel learning physics in English? (Not at all comfortable/not confortabal/ neutral/ comfortable / Very comfortable)

Q7. Do you find it harder to understand physics when it's taught in English instead of French? (Yes / No / Sometimes)

Q8. If yes , what are the main difficulties you face? (eg .technical vocabulary .speed of deliver, understanding nuances)

Q **9.** How often do you have trouble understanding English in the following?

- **Lectures** (Never / Rarely / Sometimes / Often / Very often)
- **Textbooks and reading materials** (Never / Rarely / Sometimes / Often / Very often)
- **Assignments and exams** (Never / Rarely / Sometimes / Often / Very often)

Q 10- Do you feel That learning in English has affected your understanding of the subject matter?(positively/negatively/No significant impact) please explain

Q11. -Do you feel that learning physics in English has improved you English language skills?(list speeking / writing reading /all of them)

Q12. How do you deal with the language difficulties in your physics courses? (For example: using a dictionary, asking classmates, asking teachers, using online help)

Q13. Do you think students get enough support to deal with English in physics classes? (Yes / No / Partly)

Please explain your answer:

Q14. -What kind of additional support Would you find helpful for learning physics in English? (e.g glossaries of technical terms , language support classes bilingual resources)

Q15. 15-DO you actively participate in class discussions and ask questions in English ? (often/ Sometimes/Rarely/Never) if rarely or never .Why?(eg lack of confidence , difficulty formulating thoughts in English)

Q16. If you have studied physics in both English and French, how do English-taught classes compare? (Better / Worse / About the same / I haven't taken both)
Please explain your answer:

Q17-Do you believe that learning physics in English will be beneficial for you future career prospects?(YES/NO/MAY BE) please explain.

Q18-What are your overall thoughts on having physics courses taught in English?

Teacher's questionnaire

Dear participant,

I kindly invite you to take part in my research study by completing this questionnaire. The aim of this study is to investigate the key challenges and obstacles encountered by teachers in the sciences of material department physics branch atBiskra University when using English as the language of instruction. Your input is highly appreciated and will be a significant contribution to my research.

Background information

1-What is you native language?

2-How long have you been teaching physics?

3- How long have you been teaching physics in English?

4-on a scale of 1 to 5 (1being very poor,5 being very good), how would you rate your current English language proficiency in teaching physics:

*Delivering lectures. (Very poor/ poor / neutral/good/very good)

*Explaining complex concepts (Very poor/ poor / neutral/good/very good)

*Answering student questions (Very poor/ poor / neutral/good/very good)

*Writing teaching materials and assessments (Very poor/ poor / neutral/good/very good)

5 -Have you received any specific training or support for teaching in English ? If yes , please describe.

Expriences whith EMI in physics:

6 -How comfortable do you feel when teaching physics in English?(:Not all comfortable / neutral confortable/Very comfortable)

7 -Do you find it more challenging to explain complex physics conceps in English compared to French language ? (Yes / No / Sometimes)

8-If yes , what are the main difficulties you face ?(e.g finding appropriate terminology,ensuring clarity ,spontaneous explanations) please more?

9 – How often do you observe language-related difficulties among you students in the phsics courses taught in English? (Never /Rarely / Sometimes / often / Very often)

10 – In you opinion , does the use of English as the medium of instruction affect the student's understanding of physics concepts? (positively /Negatively / No significant Impact) please explain.

11 –Do you feel that the language demands of EMI in physics require you to ajust your teaching methods ? If Yes , how?(e.g slower pace, more visual aids, simplified language)

12-Do you feel there is adequate institutional support for faculty teaching in English? (yes /No / Partially) please elaborate……

13 – What kind of additional support would you find helpful for teaching physics in English?(e.g language editing services, pedagogical training for EMI, resources for multilingual learners) explain more.

14 –Do you feel that teaching physics in English has impacted you teaching effectiveness?(positively / Negatively / No significant impact) please explain.

15 –What are your observation on student's participation and engagement in classe taught in English compared to those taught in your native language (if applicable)

16 – What are your overall thoughts on having physics courses taught in English in your department? What are the potential benefits and challenges?

ملخص الدراسة

تتناول هذه الدراسة تطبيق اللغة الإنجليزية كلغة للتدريس في قسم علوم المواد، وهو فرع من برنامج الفيزياء، مع التركيز على تجارب أساتذة الفيزياء وطلاب السنة الأولى. استخدمت الدراسة منهجًا كميًا بتصميم دراسة حالة، واعتمدت على أسلوب العينة غير العشوائية من خلال تقنية العينة المتيسرة، حيث تم جمع البيانات من 13 أستاذًا و40 طالبًا باستخدام استبيانات منظمة. كشفت نتائج التحليل الوصفي عن مجموعة من التحديات المرتبطة باستخدام اللغة الإنجليزية كلغة تدريس، وقد تم تصنيف هذه التحديات إلى لغوية ونفسية ومؤسسية. شملت التحديات اللغوية صعوبات في فهم وتعبير المفاهيم العلمية المعقدة باللغة الإنجليزية، بينما تضمنت التحديات النفسية ضعف الثقة بالنفس والقلق وقلة التفاعل، خصوصًا بين الطلاب. أما التحديات المؤسسية، فتمثلت في نقص التدريب المناسب للأساتذة، وقلة الموارد التعليمية، وغياب السياسات الواضحة لدعم تطبيق اللغة الإنجليزية في التدريس. وعلى الرغم من هذه الصعوبات، أقرّ كل من الأساتذة والطلاب بأهمية اللغة الإنجليزية في الوصول إلى المعرفة العلمية العالمية. وتوصي الدراسة بضرورة توفير دعم لغوي مستمر، وبرامج تدريبية مخصصة للأساتذة، ووضع سياسات مؤسسية واضحة لتعزيز فاعلية تطبيق اللغة الإنجليزية في التعليم العلمي

الكلمات المفتاحية: اللغة الإنجليزية كاداة للتدريس،التحديات، الاساتذة الجامعيين لكلية علوم المادة ، طلبة سنة اولى تخصص فيزياء ،هيئات التعليم العالي ، التحديات اللغوية ،النفسية والمؤساساتية.