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The Role of English as a Medium of Instruction on Learner's Subject Matter Performance

Case Study of Third Year Biology Students at Mila University Center

A Dissertation Submitted in Partial Fulfillment for the Requirements of the Master Degree in
Didactics of Foreign Languages

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Dedication

All praise is due to **Allah**, the Lord of all worlds, Glorified and Exalted, to Him alone belongs perfection.

Peace and blessings be upon our **Prophet Mohammed**, His faithful Messenger, and upon all the prophets and messengers.

I thank **Allah** Almighty who blessed me with the completion of this work.

To those who supported me every step of the way, and who stood by me without limits.

To my kind **Father** and my Beloved **Mother**

I dedicate this work in deep gratitude for their sacrifices, which are beyond measure.

They were my light when the path was dark and my strength when I stumbled.

To my dear sisters: **Besma Mimouna**, **Nessma**, and **Roumaissa**,

You have always been my true supporters, giving me strength when I felt weak.

Your love and care have been among the greatest motivations I could ever have.

To my brothers: **Mabrouk** and **Amine**,

You have always been my support.

And to my dear sister ,s daughters and sons : **Titi**, **Rawane**, and **Yahya**,

Your simplicity and joy brought color to my days and smiles to my heart.

To everyone who truly loved me and stood by me without expecting anything in return,

I dedicate this work as a token of loyalty and sincere love.

Abderrezzak Tharoua

Dedication

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

I humbly dedicate this work:

To my beloved grandfather **Mohamed** and grandmother **Alaâjia**,

Whose love, kindness, and prayers are forever engraved in my heart.This work is for you.

To my **father**

Your strength, guidance, and silent sacrifices have shaped who I am. Your unwavering support is a light that still leads my way.

To my **mother**

The heart of my life. Your love, patience, and prayers are the true foundation of all that I have achieved. Thank you for everything.

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You are my pride, my support, and my joy. Thank you for always being there, believing in me, and lifting me up.

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Your presence, warmth, and kindness make everything feel lighter. I'm so lucky to have you.

To my dear friends **Sidra**, **Belkisse**, and **Wissal**,

Thank you for your love, your laughter, and your beautiful souls. You made this journey more joyful, less lonely, and truly unforgettable. I will always cherish your friendship.

This work is for **all of you**. With all my love and deepest gratitude.

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Abstract

In recent years, the use of English as a Medium of Instruction (EMI) has increased significantly in higher education institutions worldwide. Algeria has followed this trend by introducing EMI in its university programs, particularly in scientific fields such as Biology. The primary goal of this shift is to provide students with broader access to global knowledge and enhance their academic and professional prospects. However, this transition brings about various challenges, especially concerning the gap between the linguistic demands of scientific education and students' actual proficiency in English. In a complex field like Biology, limited language skills can hinder students' ability to follow lectures, participate in discussions, and express their understanding in both oral and written assessments. This study seeks to explore two key questions: How does EMI impact the academic performance of third-year Biology students? And what specific language-related difficulties do they encounter due to this educational reform? To answer these questions, a descriptive and analytical methodology was adopted, using questionnaires distributed to both students and teachers to gather comprehensive insights into the impact of EMI. The findings reveal that many students recognize the academic value of studying Biology in English, particularly in terms of grasping scientific concepts and improving communication skills. Nonetheless, they continue to face significant challenges in attending lectures, contributing to class discussions, and succeeding in evaluations. Moreover, current English language support programs are often seen as insufficient for addressing their academic needs. Therefore, both students and educators emphasize the importance of developing tailored English for Specific Purposes (ESP) courses that focus on Biology-related vocabulary and academic tasks to better support their learning process.

Keywords: English as a Medium of Instruction , Biology, Academic achievement, Language obstacles, Language proficiency.

List of abbreviations

ADDIE: Analysis, Design, Development, Implementation, Evaluation

CLIL: Content and Language Integrated Learning

EAP: English for Academic Purposes

EBE: English for Business and Economics

EMI: English as a Medium of Instruction

EOP: English for Occupational Purposes

ESP: English for Specific Purposes

ESS: English for Social Studies

EST: English for Science and Technology

EU: European Union

JGB: Junior General Biology

L1: First Language

PHD: Doctor of Philosophy

Q: Question

%: Percentage

SCI: Science Citation Index

UN: United Nations

USA: United States of America

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Background of the Study

In the current global academic environment, the language used for instruction is crucial in influencing students' educational journeys and career prospects. English has emerged as the predominant language in the fields of science, research, and international collaboration.As Crystal (2003) explained that " a language achives a genuinely glabal status when it developes a special role that is recognized in every country "p.3. This highlighted that English has a achieved a distinct a global status due to its extensive usage and recognition . Consequently, numerous countries where English is not the first language are beginning to implement English as a Medium of Instruction (EMI) to update their curricula, encourage internationalization, and improve the competitiveness of graduates. However, this transition is not just about language; it signified larger educational reforms aimed at aligning with global standards.

In Algeria, the transition from French to English is becoming more apparent, particularly in scientific fields. The topic of EMI in Algeria gained attention in 2019 when the Algerian minister of higher Education emphasized the need to improve the status of English. While EMI facilitates access to scientific information and global interaction, it also introduces considerable challenges in environments where English proficiency is limited. Specifically, subjects like Biology, which require understanding complex and abstract ideas, demand a high level of language skills. Therefore, insufficient English knowledge can impede students' understanding, involvement, and academic success.

As a result, the use of EMI may unintentionally create learning barriers and affect students’ confidence. Thus, this study explores the impact of EMI on third-year Biology students at Mila University Center. Specifically, it examines how EMI influences their understanding, performance, and interaction with course content. Ultimately, the findings aim

to inform educators and policymakers on how to better implement EMI in a way that supports student performance.

1.Statement of the Problem

In recent times, Algeria has experienced a substantial change in its higher education language policy by shifting from French to English as the primary language for instruction across various subjects. This shift, on the one hand, aims to align the Algerian educational system with international academic standards and improve the competitiveness of its graduates. On the other hand, however, the swift adoption of English as a Medium of Instruction (EMI) has raised concerns regarding its effect on students' academic understanding and performance, especially in scientific disciplines such as Biology.Although both students and educators generally welcome the transition to English, significant challenges persist. Many universities still lack adequate resources and proper training to ensure the successful implementation of EMI. In addition, there remains a noticeable gap in language proficiency and pedagogical preparedness, which may hinder the teaching and learning process.

Given this context, and considering the complex nature of Biology, effective comprehension necessitates a certain level of linguistic ability. Thus, the sudden transition to EMI without sufficient support could hinder students' understanding of the subject matter. Therefore, this study aims to collect teachers and students perception about the impact of EMI on the academic performance of third-year Biology students at Mila University Center and to examine their challenges and experiences in adapting to this new language of instruction.

2.Significance of the Study

This study is important because it addresses a critical gap in the literature concerning the implementation of English as a Medium of Instruction (EMI) in higher education institutions in Algeria, particularly in scientific disciplines such as Biology. By exploring the connection between EMI and academic performance among students, this study adds to the comprehensive understanding of the impact of language policies on educational outcomes.Additionally, the findings of this study have practical relevance for policymakers, educators, and those developing curricula. By highlighting the benefits and limitations of EMI, it offers Recomodations and suggestions for enhancing students' English proficiency and for more effective incorporation of EMI into scientific education. The overarching aim is to enhance academic success among students and prepare them for future opportunities in global scientific communities.

3.Aims of the Study

The purpose of this study is to investigate teachers' and students' perception about the impact of EMI on the academic performance of third-year Biology students at Mila University Center. Additionally, it aims to explore the challenges and diffuclties that students encounter in comprehending biological content due to language barriers present in an EMI setting.

4. Research Questions

Based on the objectives outlined above, this research seeks to answer the following questions:

1. How does the implementation of English as a Medium of Instruction affect third-year Biology students' subject-matter performance?

2. What are the obstacles and difficulties that Biology students encounter due to the adoption of EMI in Algerian higher education?

5. Research Methodology

To tackle the research questions, this study adopted a mixed-methods strategy that integrates both quantitative and qualitative data analysis. Two separate questionnaires were designed: one for third-year Biology students and the other for their instructors at the Department of Biology, Mila University Center. The student questionnaire examines the influence of English as a Medium of Instruction (EMI) on their comprehension of Biological content and the obstacles they encounter due to language barrires. Meanwhile, the teachers' questionnaire seeks to understand their views on the effectiveness of EMI and the challenges they face when teaching scientific concepts in English. This dual approach guarantees a thorough insight into the effects of EMI on academic performance in Biology.

6. Structure of the Study

This dissertation is divided into two primary chapters. The first chapter offers a theoretical framework, encompassing previous studies related to English as a Medium of Instruction (EMI) and its significance in non-English-speaking regions, such as Algeria. It consists of two parts: the first part defines EMI, highlights its status , Historical context, role, importance, and explores its application in Algerian higher education.and the second part focuses on students . EMI provides students subject matter performance , with a focus on Biology. The second chapter is devoted to the practical component of the study. It outlines the research methodology, detailing the design and distribution of questionners, the description of the sample and population, and the analysis of the gathered data. This chapter seeks to assess both the effectiveness and the challenges of EMI from the perspectives of teachers and students.

Chapter One: The role of English as a Medium of Instruction (EMI) on Learner's Subject Matter Performance

Section One: English as a Meduim of Instruction (EMI) in Biology

Introduction

In recent years, using English as a Medium of Instruction (EMI) has become a major topic in education and policy talks, especially as globalization makes English the main language in areas like Business, Science, and Technology. Many countries where English is not the first language have started using EMI in higher education to boost their global competitiveness and attract international students. EMI provides several benefits, such as better job opportunities, access to worldwide resources, and improved language skills. However, its effectiveness largely relies on the quality of the teaching materials available. Well-organized and relevant content helps students grasp challenging ideas, remain engaged, and link theory to practice, which is particularly vital for those who have limited English skills.

In the area of English for Specific Purposes (ESP), content is essential for meeting the practical language and job-related needs of students. Good ESP materials include specific vocabulary related to subjects, real-life scenarios, and communication skills that match students' academic and career ambitions. When EMI and ESP programs provide accessible, well organized, and meaningful content, they not only aid language growth but also enhance understanding, participation in class, and long-term learning success. Thus, effectively implementing EMI requires flexible planning, teacher training, and ongoing assessment to ensure fairness, cultural relevance, and academic achievement.

1.1.1. Status of English as a Global language in Science

English has become a vital global language due to its broad use in Science, Technology, Business, Education, and international relations. Over the past century, it has evolved into a global medium connecting people from diverse backgrounds. This is due not only to colonization but also to its practical value today. As Gohil (2013) stated that English serves as a global language and is quickly becoming the foremost language for communication worldwide. It is also the most commonly taught foreign language, especially in Europe, where Gohil (2013), reported that almost 89% of students in the European Union learn English as their primary foreign language, which illustrate underscoring its significance in education and its function as a bridge to international communication.

English is also the main language of academic publishing and research. As early as 1997, the Science Citation Index showed that most of its articles were in English. Gohil (2013) observed that while just 50% of the authors came from English-speaking nations, 95% of the articles released were composed in English, this indicated that English is the leading language in scientific publishing, even for researchers in countries where English is not the primary language. It highlighted that English serves as the common language for the worldwide academic communityand proving its role as a shared language among scientists. Beyond academia, English plays a key role in daily and professional life, often linked to prestige and opportunity. Gohil (2013) stated, “English is a status symbol in society” (p. 11), This implies that using English is frequently regarded as a symbol of education, status, or social standing, inspiring people to acquire the language for advancement and acknowledgment and underlining its cultural importance.Furthermore, English serves as the main language for global organizations and industries. It is the official language of the UN, the International Olympic Committee, and global communication protocols. Gohil (2013) wrote, “English is the lingua franca of the modern era” (p. 8),This indicated that English

serves as the shared language among individuals with various mother tongues, particularly in fields like international trade, diplomacy, and scientific research, stressing its role in international cooperation and exchange. In sum, English continues to grow in importance, serving both as a communication tool and a symbol of modernity and connection in a globalized world.

1.1.1.1. Historical Context of English Language Instruction in Algerian Science Education Over the years, the role of English in Algeria's educational system, particularly in science, has been quite limited. In contrast to Arabic and French, which have significantly influenced different educational levels, English is primarily regarded as a foreign language. Khelifa (2023), noted that the primary and secondary education systems in Algeria predominantly use Arabic for instruction, while French and English are incorporated into the language curriculum.This reveals that English has not been utilized as a medium for essential subjects such as science, and its role has been peripheral, lacking institutional backing in both curricula and teacher training.This restricted function is connected to Algeria's linguistic landscape post-independence, which has been heavily influenced by its colonial history. French has retained its strength due to the historical, cultural, and academic connections with France. As Khelifa observed that Algeria's historical and cultural heritage has generally been more connected to France than to countries where English is the dominant language. This indicated that the educational and language systems in Algeria have been significantly shaped by French influence due to its colonial past, resulting in French being more prevalent than English. Consequently, French has maintained a stronghold in higher education and science for an extended period. The outcome of this focus, as noted by Khelifa, is that “French fluency is common, whereas English proficiency is limited” (p. 651), illustrating the longstanding oversight of English.However, with the globalization of science, the necessity of English in research and publication has become more apparent, presenting challenges for

Algerian scholars and students trying to navigate the global academic landscape. In light of this, the government initiated a reform in 2022 aimed at transitioning the medium of higher education, particularly in science, from French to English. Khelifa stated that Algeria plans to substitute French with English as the primary language used for teaching in its universities.

The reform's objective was to modernize education and enhance access to global resources. Khelifa suggested that the change “could facilitate access to English literature and promote international exchange and collaboration” (p. 651). Nonetheless, this reform has been hampered by insufficient infrastructure, a lack of teacher training, and inadequate support for students. Khelifa warned that transitioning to English may reduce the quality of instruction, assessment, and education. This implied that the transition might have a negative effect on the educational system because both educators and students are insufficiently prepared.Professors began their training in late 2022, khelifa (2023) reported that “no training will be provided to students” (p. 651), This implied that while some training is provided for educators, students are expected to handle the language shift without any formal preparation in linguistics. which raises concerns about increasing inequality.

In conclusion, the expanding significance of English in Algerian scientific education signifies a major shift from the historical norm. This transformation is not merely a gradual progression but rather a rapid, directive effort to align with global standards. It is essential to view this movement within its historical backdrop, where English was largely ignored and French was predominant. Khelifa (2023) proposed that Algeria should adopt a careful approach and take into consideration the lessons learned from countries like Rwanda, which have struggled with similar educational language transitions , which signifies that Algeria ought to proceed with language reform carefully, taking lessons from other nations that experienced prolonged educational issues as a result of similar changes.

1.1.1.2. The Role of English in Scientific and Academic Communication In today's interconnected world, English has emerged as a crucial medium for academic and scientific communication. Over the past few decades, it has evolved into the primary channel through which scientific knowledge is created and disseminated. Selvi (2021) affirmed that It has been established that English is the primary language used for academic publications and international research endeavors. This dominance emerged alongside the rise of the United States as a major research hub after World War II. As Selvi (2021) clarified that as the United States expanded its scientific output, it attracted more students and researchers, leading to a significant amount of knowledge being generated, recorded, and disseminated in the English language.This implied that the preeminence of the U.S. in scientific research in the post-World War II era was a factor in making English the dominant language in worldwide science and education. Furthermore, English enables international collaboration and visibility. Most major academic journals operate in English. Selvi (2021) reported that Over 90% of the scientific journals found in prestigious databases such as ISI, Science Citation Index, and Scopus are published in English. This means that almost all respected scientific journals are published in English, necessitating that researchers use it to connect with a broader academic audience and gain recognition.This makes English the default language for global scholarly exchange. Researchers aiming for a wider audience often must publish in English.

English is also embedded in the structure of higher education and research. Selvi noted, “numerous universities worldwide have based their institutional hiring, promotion, reward, and even graduation systems on publishing in eminent international journals” (2021, p. 2).this means that in order to succeed academically at many universities, publishing in high-ranking English-language journals has become a requirement, thereby emphasizing the role of English in career growth.Thus, English is not just a language but a key to academic

success, enabling career growth and knowledge sharing. Its use supports consistency in publishing, peer review, and the spread of research.

In conclusion, English serves as a tool and gateway to global academic and scientific engagement. Its central role supports clarity and access, making it essential for international research and scholarly development.

1.1.1.3. The Importance of English in Biology Education and Research In the current global academic landscape, English has emerged as the predominant language for science and research, making it imperative for Biology students to cultivate strong English language skills in order to effectively engage with the international scientific community. Proficiency in English is not only essential for academic achievement but also serves as a vital asset for future professional opportunities.

As highlighted by Saharudin et al. (2021) reported that English is a global language that connects individuals across numerous professional sectors. This indicated that English serves as a common language worldwide, facilitating communication among professionals from various countries and disciplines such as Biology and science.The extensive use of English established it as the primary language through which scientists exchange ideas, disseminate their research, and collaborate on an international scale. Consequently, having a command of the English language has become a fundamental prerequisite for participating in global scientific discussions.Furthermore, Saharudin et al. (2021) pointed out that “The ability to use the language both either passive or active has become the minimum requirement for everyone to participate and taking part in the global world interaction” (p. 2).It signified that mastering English for reading and speaking has become a fundamental ability required to interact within global educational and professional spheres. Therefore, for students pursuing Biology, learning English is an essential requirement rather than merely an elective.

This significance is mirrored in institutional mandates, exemplified by the obligation to take English as a mandatory course in the Biology Education program at FKIP Jambi University. Saharudin et al. (2021) conveyed that acquiring English skills can “increase the knowledge, make us easier to communicate with other people since English become medium of interaction in the global communication, as provision to continue your education abroad, know the latest technology since the latest technology sometimes always known from outside” (p. 2).This implied that having a good command of English enables students to tap into scientific information, engage in international communication, study overseas, and stay updated with the latest technologies. Thus, English equips students with the means to access the latest advancements, pursue international education, and participate in academic exchanges. In addition, specialized English textbooks tailored for Biology students have been created following the ADDIE model to enhance educational outcomes. These resources are designed to include scientific terminology and topics pertinent to the field. As noted by Saharudin et al. (2021), such materials “motivate and challenge students to improve their ability in English” (p. 3), It means that using English in Biology education can inspire students to develop their language skills, especially when the materials are engaging and tailored to their field and assisting them in acquiring discipline-specific language skills that are crucial for both understanding and interaction.

1.1.2. English as a Medium of Instruction in Biology Higher Education

The implementation of English as a Medium of Instruction (EMI) in higher education Biology is indicative of a worldwide transformation in science education. English, being the primary language in research, equips students for global academic and career prospects. As noted by Dennisson (2019) reported that English was chosen as the language of instruction since it serves as the global language for the Biological sciences. This indicated that English

is the main language of instruction in Biology, as it serves as the universal language for scientists globally within this discipline.

EMI facilitates both the acquisition of content knowledge and the enhancement of language skills. Dennisson (2019) highlighted that “the course provided students with an opportunity to not only improve their Biology knowledge in a small class setting but also build an English repertoire of science-specific language needed for future communications as healthcare professionals” (p. 86). This indicated that learning Biology in English allows students to bolster their comprehension of science and the particular English vocabulary necessary for their career paths and be likely to “create structured notes on lectures and reliable Biology resources in English” and to “communicate acquired knowledge in English through different mediums” (p. 80).Nevertheless, EMI presents cognitive challenges. Learners are tasked with understanding intricate concepts in a second language, which necessitates educational support. Dennisson (2019) explained that the CLIL method necessitates that students learn both vocabulary pertinent to the subject at hand and broader academic language at the same time, which increases cognitive demands and therefore requires effective teaching strategies to aid understanding.This implied that acquiring content and language simultaneously can be challenging for students, thus educators need to assist them gradually.

In spite of these obstacles, EMI fosters active learning. Students were required to “produce English notes, produce their own interpretation of the information in group work, produce visual aids for group presentations, and produce written summaries of the information” (Dennisson, 2019, p. 86).This indicated that EMI promotes active engagement in learning as it mandates students to interact with the material using different methods of expression, all in the English language. It also “provided students with an opportunity to not only improve their Biology knowledge in a small class setting but also build an English

répertoire of science – specific language needed for future communications as healthcare professionals ” (p. 88).it means that The course enhanced students' understanding of Biology and developed their scientific English proficiency for future communications in healthcare.

Successful EMI encompassed teaching discourse practices in addition to vocabulary. Dennisson (2019) noted that “the instructor helped the students with non-content specific language such as how to introduce a topic and make a conclusion” (p. 88). This means that apart from scientific vocabulary, students must also acquire general academic language abilities such as constructing arguments and writing correctly in English.Feedback from students was favorable Every participant in the survey either expressed agreement or strong agreement that the course was helpful in enhancing their learning in the JGB course..This indicates that the students valued the EMI Biology course and believed it aided their understanding in other relevant subjects. Additionally, students “strongly agreed that the students rated the course as highly beneficial, giving it an average score of 4.75 out of 5 on a Likert scale, and expressed a strong interest in enrolling in additional content courses delivered in English.

In summary, EMI in Biology extends beyond merely using a language; it fosters global academic preparedness. Dennisson (2019) asserted that EMI and science courses utilize a scaffolding approach that gradually incorporates active learning activities to improve student comprehension.This implied that the most effective way to teach science in English is by employing a gradual and organized approach that incorporates interactive activities.So, With appropriate support, EMI can serve as a robust instrument for both scientific understanding and language development.

1.1.2.1. Definition of English as a Medium of Instruction in Science and Biology

English as a Medium of Instruction (EMI) is increasingly popular worldwide, especially in non-English-speaking countries where subjects like science are taught in English instead of the native language. Dearden's (2014) foundational report characterized this trend as "the use of the English language to teach academic subjects in countries or jurisdictions where the first language (L1) of the majority of the population is not English" (p. 2). This definition serves as the conceptual basis for the entire report and is reiterated to underscore its importance, drawing a clear line between EMI and frameworks such as CLIL (Content and Language Integrated Learning). In contrast to CLIL, which aimed at developing both content and language learning, EMI "does not (necessarily) have that objective" (Dearden, 2014, p. 4). Science is one of the most common subjects taught through EMI, "with six countries reporting that science is taught through EMI" (p. 23), despite facing notable challenges regarding teacher qualifications and language readiness.Dearden (2014) raised concern about the fact that EMI is often introduced without adequate support. She highlighted that "there is a shortage of linguistically qualified teachers; there are no stated expectations of English language proficiency; there appear to be few organisational or pedagogical guidelines which might lead to effective EMI teaching and learning" (p. 3). This lack of preparation is especially problematic in scientific fields where technical terminology and abstract reasoning are essential. The report also noted that there is little or no EMI-related training in "initial teacher education (teacher preparation) programmes and continuing professional development (in-service) courses" (p. 3). Another significant concern is the way EMI is often implemented from the top down. Dearden stated that "we are quite some way from a 'global' understanding of the aims and purposes of EMI because it appears to be a phenomenon which is being introduced 'top-down' by policy makers and education managers rather than through consultation with the key stakeholders" (p. 3). This top-down approach resulted in

inconsistencies in EMI application, especially in science education, where linguistic clarity is vital. Moreover, the report warns of the socio-linguistic risks associated with EMI, suggested it “may limit access from lower socio-economic groups and/or a fear that the first language or national identity will be undermined” (p. 3). This concerne is especially relevant in the context of science education, where language challenges may hinder comprehension of essential concepts, potentially widening the educational gap. Despite such issues, EMI continues to expand across public and private educational sectors. Dearden emphasized that “there is an urgent need for a research-driven approach which consults key stake-holders at a national and international level and which measures the complex processes involved in EMI (p. 3). This is particularly pressing in scientific disciplines, where miscommunication can significantly affect academic success.

1.1.2.2. EMI Implementation in Biology Programs in Algeria The recent introduction of English as a Medium of Instruction (EMI) in Biology programs at Algerian universities has gained significant attention, especially in light of global academic shifts where English dominates as the primary language in science and innovation. In her study at the University of Tlemcen, Belmehdi (2022) investigated students’ and teachers’ perceptions regarding this change, identifying both the potential benefits and the systemic challenges that accompany EMI implementation in scientific disciplines like Biology. The study reveals that students generally perceive EMI positively and associate it with enhanced academic and professional opportunities. As Belmehdi (2022) noted that the majority of students showed a positive attitude towards English Medium Instruction (EMI), viewing it as an important asset for improving their educational growth and future job opportunities.This means that students typically favor learning Biology in English as they think it will enhance their educational process. Therefore, students recognize English not only as a communication tool but as a means to access the global scientific community. However, despite this enthusiasm, the

implementation of EMI in practice faces several obstacles. One of the most prominent issues is students' limited proficiency in English, especially in understanding technical and academic content. Many students struggle with comprehension, note-taking, and interaction in class. According to Belmehdi (2022) emphasized that the main obstacle in implementing EMI is the students' insufficient command of the English language . This indicated that the primary obstacle for EMI in Algeria is the deficiency in English proficiency among students, which hampers their ability to grasp scientific material effectively. This language gap often discourages students, reducing their participation and motivation.Furthermore, the study highlights that teachers are also unprepared for EMI, with many lacking the linguistic skills required to effectively deliver scientific content in English. Belmehdi (2022) that a major obstacle in executing English Medium Instruction (EMI) is that many teachers do not possess the necessary language skills to effectively instruct scientific topics in English .it suggests that the teachers themselves do not have a strong enough command of English to explain Biology concepts clearly and confidently in the classroom.Consequently, instructors tend to code-switch between English, French, and Arabic, which sometimes confuses students and hinders consistent language development.In addition to language-related issues, institutional shortcomings also obstruct EMI implementation. Notably, there is no cohesive national or university-level policy to support and regulate the use of English in higher education. As the study pointed out, "There is no clear policy or institutional strategy to implement EMI systematically in Algerian universities" (Belmehdi, 2022, p. 89). This suggested that the government and educational institutions have failed to develop a coordinated and systematic approach to help with the move to English-based instruction.This lack of guidance leads to fragmented approaches, where each institution may attempt to apply EMI independently without adequate resources or planning.Moreover, the abrupt transition from French-medium instruction in secondary schools to English at university settings creates a further disconnect.

Although students acknowledge the global significance of English, the sudden shift without adequate support systems often leaves them unprepared. This situation calls for structured preparation. As Belmehdi (2022) recommended that the importance of implementing English Medium Instruction (EMI) through a gradual and thoughtfully planned approach that includes preparing students alongside offering adequate training for educators .This signified that the move to EMI should be implemented gently and thoughtfully, ensuring that there is sufficient readiness for both instructors and students to achieve success.

To ensure the success of EMI, additional measures must be taken. These included offering English language preparatory courses, providing scientific resources in English, and organizing teacher development programs tailored to EMI contexts. Without these, the reform risks being symbolic rather than impactful. Ultimately, EMI in Algerian Biology programs holds considerable promise, but to become effective, it must be supported by comprehensive language, pedagogical, and institutional reforms.

1.1.2.3. Challenges and Benefits of EMI in Biology Education Utilizing English as a Medium of Instruction (EMI) in higher education, especially in Biology, signifies a shift towards global academic integration, albeit with several challenges. Learning Biology in a non-native language can increase cognitive load, as grasping scientific ideas demands thorough understanding. Nevertheless, EMI opens doors for students to pursue advanced studies and international career opportunities.

A significant hurdle is the language barrier. Biology is filled with intricate terminology that can be daunting for students with limited English skills. Poon (2013) noted Students with lower English proficiency encountered difficulties in understanding lessons and comprehending scientific terms associated with Biology. Additionally, discrepancies in language abilities result in uneven classroom interaction. According to Poon (2013) Students with better English abilities were usually more involved in classroom conversations, while

those with weaker skills often remained silent, even when they understand the material.EMI can also induce anxiety, especially during evaluations. The pressure to comprehend scientific content and articulate thoughts accurately in English during tests and assignments adds an additional strain. Some students expressed their worries regarding EMI, stated that “having to write assignments and exams in English” was a considerable challenge (Poon, 2013, p. 51). This indicated that being assessed in English puts additional stress on students, particularly those who grasp Biology but struggle to articulate their thoughts effectively in the language. Consequently, students’ academic outcomes may be adversely affected—not due to a deficiency in Biological knowledge but because of challenges in conveying that knowledge in English. Some students find themselves memorizing terms without true understanding. One student admitted at times, I simply memorize the terms without grasping their meanings, as I'm unsure of their definitions in English.This signifies that certain students turn to memorizing information without truly understanding it due to challenges with language, which hampers their ability to engage in deep learning,and hinders deeper comprehension.

Despite the challenges, EMI offers vital advantages. Exposure to academic English helps students become acquainted with global scientific language. As Poon (2013) pointed out Learners understood the vital role of learning Biology in English, considering it an important step for advancing their studies and career paths in science .This means that, regardless of the challenges, students view EMI as a beneficial move for progressing in academic fields or careers in science. It also bolsters communication skills, which are crucial for both academic and professional settings. According to Poon (2013) reported that A lot of students commented that EMI supported the development of their speaking and writing capabilities, which they considered beneficial in the global workforce. This suggested that EMI supports students in developing their academic English proficiency, which makes them more competitive in careers across international borders.Furthermore, EMI increases access

to contemporary scientific information. Poon (2013) noted that EMI allowed students to read global journals and explore the latest findings in Biology without needing translation services .It signified that the use of English enables learners to access the latest scientific information from around the world, consequently improving their education and research. For some, conquering the language obstacle even heightened their motivation. One student remarked, “even though it’s tough, I take pride in being able to understand and explain Biology in English” (Poon, 2013, p. 56) .This suggested that a number of students are inspired and take pride in their development, since mastering Biology in English enhances their self-esteem and provides a feeling of success.

In conclusion, while EMI in Biology poses significant challenges, its long-term benefits—when adequately supported—tend to surpass the drawbacks. Poon (2013) concluded that regardless of the language obstacles, most students were aware of the lasting benefits of EMI and indicated a desire to boost their English proficiency for upcoming opportunities .This indicated that even though studying in English as a Medium of Instruction (EMI) is tough, students feel it is a valuable endeavor as it leads to opportunities for more education and professional growth.So,With the appropriate support systems in place, EMI can promote both academic success and personal development.

Section Two: Subject Matter Performance on Biology Learners

1.2.1. Definition of English for Specefic Purposes (ESP)

English for Specific Purposes (ESP) is about teaching English in a way that meets the unique needs of learners in various professional, academic, or job-related areas. Mackay and Mountford (1978) explained that “ESP is generally used to refer to the teaching of English for a clearly utilitarian purpose” (p. 2). This means that ESP aims to address practical needs instead of focusing on general language learning. Basturkmen (2006) added that ESP is “not

for its own sake or for the sake of gaining a general education, but to smooth the path to entry or greater linguistic efficiency in academic, professional or workplace environments" (p. 18). This showed that ESP helps learners achieve success in specific academic or job-related situations. Saber (2016) noted that ESP is "a 'variety of English' that can be observed in a given perimeter of society, delineated by professional or disciplinary boundaries" (p. 2), indicated that ESP is shaped by the particular fields or professions it addresses. Sarre and Whyte (2017) defined ESP as "the branch of English language studies which concerns the language, discourse, and culture of English-language professional communities and specialized groups" (p. 150). This highlighted that ESP involves understanding how specific professional groups communicate and their cultural habits.

1.2.2. Branches of English for Specefic Purposes

1.2.2.1. English for Academic Purposes (EAP) English for Academic Purposes (EAP) in Biology focuses on developing the language skills needed for studying and conducting research in Biological sciences. A major component of EAP in Biology is scientific reading, which involves understanding complex research articles and textbooks. This required students to analyze data, identify specialized terminology, and evaluate research findings critically. Students must also learn to extract main ideas from dense texts to better understand Biological research.

Academic writing plays a vital role, especially when it comes to presenting research results. Biology students and researchers should follow structured formats like IMRAD (Introduction, Methods, Results, and Discussion) when creating lab reports, essays, and journal articles. Flowerdew (2008) pointed out that "there is a range of both quantitative and qualitative research which has demonstrated variation across disciplines to be the case" (p. 9), emphasized the need to master writing conventions specific to the Biology field.

Listening and speaking skills are equally important. Students must pay attention during lectures, research talks, and conferences, take notes, and communicate their ideas clearly during discussions, presentations, and thesis defenses.

In conclusion, EAP in Biology prepared students to interact with scientific texts, produce high-quality research papers, and communicate effectively, enabling them to contribute to their field and keep up with scientific advancements.

1.2.2.2. English for Occupational Purposes (EOP) In Biology, English for Occupational Purposes (EOP) plays a vital role in enabling Biologists to communicate effectively within the global scientific community. As Hyland (2009) pointed out, “Academic discourse refers to the ways of thinking and using language which exist in the academy” (p. 1). Since English has become the main language for scientific discussions around the world, it is essential for Biology professionals to be skilled in both writing and speaking English. Biologists must write research papers, grant proposals, and lab reports while adhering to strict scientific guidelines that ensure clarity, precision, and easy understanding of their work. These guidelines are important not only for publication but also for earning recognition and collaborating with others in academia.

In addition to writing, being an effective English speaker is crucial. Biologists frequently present their research at international conferences, participate in meetings with individuals from various fields, and collaborate with colleagues from different backgrounds. To succeed in these situations, they must clearly explain complex Biological concepts using appropriate scientific terminology. As Biber, Conrad, and Reppen (1998) noted, “Scientific texts are characterized by a high frequency of passive constructions, nominalizations, and technical vocabulary” (p. 45). By mastering these elements, Biologists can communicate their ideas clearly, ensuring that their work is understood and appreciated by the broader scientific community.

1.2.3. Subcategories of English for Specefic Purposes (ESP)

1.2.3.1. English for Science and Technology (EST)in the Field of Biology English for Science and Technology (EST) is very important for Biologists who want to share their research with people worldwide. Clear and precise communication is essential to ensure that others understand and use their findings properly. Biologists must produce well-organized and error-free documents such as research papers, lab reports, and grant proposals. Scientific writing should be simple to avoid confusion and to enable others to replicate the research, as even small errors can show future advvancemet

A key element of EST is the use of technical language, which aids in accurately conveying scientific ideas. As Hyland (2006) pointed out, "EAP professionals are concerned not simply with teaching isolated words, structures , lexical phrases and so on, but with exploring the uses of language that carry clear disciplinary values as a result of their frequency and importance to the communities that employ them" (p. 12). Understanding the specific vocabulary of Biology is vital for Biologists to express their ideas clearly in both writing and speaking. This specialized language helps ensure consistency in research and makes collaboration easier among Biologists from different cultures and languages.

In addition to writing, having strong speaking skills is very important in the field of Environmental Science and Technology (EST). Biologists frequently present their research findings at conferences and explain their work to non-scientists, including students, policymakers, and the public. Hyland (2006) emphasized that Biologists must simplify complex ideas while ensuring they remain accurate. Good speaking skills also enable Biologists to engage in important discussions with their colleagues and become leaders in their areas of expertise. Hyland (2006) stated, "These are the description and analysis of relevant target texts; the interpretation of the processes involved in creating and using these texts; and the connections between disciplinary texts and the institutional practices which are

sustained and changed through them" (p. 15).this meant that effective communication in Biology required knowing how scientific texts are built ,applied and connected to the rules and habits of the scientific community, it is also essential for sharing Biological knowledge widely and applying it in real-life situations.

1.2.4. The Relationship Between ESP, EAP, EOP and EST

English for Specific Purposes (ESP) is a part of English language teaching that focuses on developing language skills for certain areas like education, careers, or technical subjects. ESP consists of three main components: English for Academic Purposes (EAP), English for Occupational Purposes (EOP), and English for Science and Technology (EST), which are all interconnected. EAP assisted students in schools by enhancing their reading, writing, and communication skills necessary for studying and research. As Flowerdew and Peacock (2001) stated, EAP is “the teaching of English with the specific aim of helping learners to study, conduct research or teach in that language” (p. 8). The relationship between EAP, EOP, and EST showed the connection between academic and job-related language skills. EAP is about skills for education, EOP focuses on workplace needs, and EST combines both by emphasizing communication in Science and Technology. With the rise of international collaboration in Science and Technology, EST is becoming more important for effective communication in both educational and professional settings.

1.2.5. Strategies for Improvinng ESP in Biology Education

To enhance English for Specific Purposes (ESP) in Biology classes, it's important to use teaching methods that effectively promote language development and understanding of Biological concepts. One effective method is Content and Language Integrated Learning (CLIL). This approach teaches Biology in English, allowing students to deepen their knowledge of the subject while also improving their language skills at the same time. Coyle,

Hood, and Marsh (2010) explained that “CLIL is an innovative fusion of both [content and language], closely related to and shares some elements of a range of educational practices” (p. 1). Through this method, students learn to use scientific vocabulary, describe Biological processes, and construct arguments in English, which help them do better in school and get ready for future jobs.

Another useful strategy is to incorporate real-world resources like Biology textbooks, scientific articles, case studies, and videos. These resources help students learn technical terms and stay updated with the latest advancements in Biology, which in turn boosts their ability to read, understand, and communicate complex ideas in English. This aligns with the view of Flowerdew and Peacock (2001), who stated that "what was needed was an approach to language teaching which was based on descriptions of the language as it was used in the specific target situations" (p. 11). In simpler terms, teaching should focus on how language is actually used in the students’ field, making the learning experience more relevant and effective.

1.2.6. ESP as a Tool For Improving Academic Outcomes in Biology

English for Specific Purposes (ESP) plays a crucial role in supporting Biology students, particularly those who use English as a second language, to succeed in their studies. Biology involves many complex terms and scientific ideas, and most key resources like textbooks and journals are in English. Without strong language abilities, students may struggle to understand these materials. Dudley-Evans and St. John (1998) mentioned that “much ESP teaching, especially where it is specifically linked to a particular profession or discipline, makes use of a methodology that differs from that used in General Purpose English teaching” (p. 4). This showed that ESP employed specialized methods designed to meet the needs of Biology students instead of just providing general English lessons. ESP programs focus on the specific language used in Biology—such as vocabulary, reading

scientific documents, and expressing ideas clearly—helping students improve their understanding and academic performance.

One major advantage of ESP is its targeted approach. Unlike general English classes, ESP courses are designed to address the needs of specific areas. In Biology, this involves learning how to read research articles, write lab reports, and correctly use scientific terms. ESP also emphasizes practical communication skills, such as delivering presentations and engaging in discussions, which are essential activities in Biology education.

1.2.7. Definition of Subject Matter Performance

Subject matter performance is more than just memorizing information; it showed how well someone can understand, explain, and use knowledge in a particular field. It involves thinking critically, asking good questions, and solving real-life problems with what they have learned. The National Research Council (2000) stated that "organizing information into a conceptual framework allows for greater 'transfer'; that is, it allows the student to apply what was learned in new situations and to learn related information more quickly" (p. 17). This type of performance is essential in education and research, where people need to share ideas clearly, create solutions, and contribute new knowledge.

In Biology, subject matter performance is especially important because of the complexity and importance of life sciences. A successful Biology student does not grasps key concepts like Cell structure, Genetic inheritance, and Ecological relationships but also uses this knowledge in tasks like running experiments, analyzing Biological data, or tackling global challenges such as climate change and disease outbreaks.

1.2.8. Types of Performance in Relation to Biology

1.2.8.1. Academic Performance Academic performance in Biology showed how well students grasp important ideas, think like scientists, and apply their Biological

knowledge in real-life situations. Succeeding in this subject involved more than just memorizing terms or facts; it requires critical thinking skills such as analyzing data, forming explanations, and connecting various Biological concepts. According to Wentzel and Wigfield (1998), "Goals to behave in socially appropriate ways have been related positively to social acceptance by classmates and teachers as well as to displays of socially appropriate behavior" (p. 160). This concept is vital in Biology education because students who interact positively with their classmates and teachers are more likely to join in discussions, work well together on projects, and feel confident using their scientific knowledge. In summary, doing well in Biology is closely tied to inquiry-based learning, active participation, and providing students opportunities to practice science in a real way—through exploration, evidence-based reasoning, and self-reflection.

1.2.8.2. Cognitive Performance Cognitive performance refers to how well someone can think, learn, remember, and solve problems. In Biology classes, students must link complex ideas, like how cells work or how different organisms interact. This requires them to think critically and evaluate information effectively. According to the National Research Council (2000), “A critical feature of effective teaching is that it elicits from students their pre-existing understanding of the subject matter to be taught and provides opportunities to build on—or challenge—the initial understanding” (p. 14). Strong cognitive performance is essential for grasping Biological systems, addressing real-world problems, and excelling in Biology classes and research.

In Biology, cognitive performance is more than just memorizing facts; it included analyzing information, predicting outcomes, and linking various concepts to find solutions. Using active learning methods, such as hands-on experiments and group discussions, can boost cognitive skills and enhance understanding.

1.2.8.3. Communication Performance Communication in Biology involved the clear sharing of scientific information through speaking, writing, or visuals. Biologists need to have strong communication skills to share their research findings clearly and work well with others in both academic and professional environments. It is especially crucial for them to explain complicated Biological ideas to policymakers or the general public, particularly in important areas like disease prevention and environmental protection. Brownell et al. (2013) mentioned that "most scientists do not receive formal training in science communication" (p. 1450), which pointed out the difficulties many scientists encounter when talking to audiences who are not experts.

Besides formal communication, Biologists also need to connect with a variety of audiences, including those who are not in the science field. This is especially important in public health and environmental situations, where clear messages can affect public decisions and behaviors. Effective communication is also essential for teamwork in research labs or during fieldwork, ensuring that experiments are done correctly and safely. Research indicated that being part of group discussions and collaborative projects helps students improve their communication skills, preparing them for jobs where clear communication is crucial. In the end, strong communication skills are essential for Biologists as they tackle global challenges like healthcare and environmental sustainability.

1.2.8.4. Skill-based Performance Skill-based performance in Biology combined practical skills with scientific knowledge to tackle problems, carry out experiments, and analyze data. It requires both understanding the theory and gaining hands-on experience, like using lab equipment and being involved in fieldwork. Mastering these skills is essential in various Biology fields, including Genetics and Ecology, as it helps Biologists analyze data accurately and achieve trustworthy results. The National Research Council (2000) stated , "The functional organization of the brain and the mind depends on and benefits positively

from experience" (p. 127), and "Development is not merely a Biologically driven unfolding process, but also an active process that derives essential information from experience" (p. 127). These points showed how important it is to learn through direct involvement and practical use. To build skill-based performance, students should take part in active learning experiences such as lab work, internships, and field studies. These experiences offer valuable real-world practice and help students apply what they have learned. Such activities not only enhance their technical abilities but also deepen their understanding of Biological concepts, while allowing them to work with professionals and learn new methods. Over time, this hands-on experience gets students ready to take on more complex challenges and contribute to scientific progress.

1.2.9. The Relationship Between ESP and Subject Matter Performance

English for Specific Purposes (ESP) plays a crucial role in Biology education because it helps students build the specialized language skills needed to grasp and discuss complex Biological ideas. Since Biology included many technical terms and concepts, students must be good at reading scientific texts, understanding Biological terminology, and writing clearly. ESP courses focus on improving these language skills, which allowed students to engage with academic resources and better understand Biological subjects. As noted by the National Research Council in 2000, "Specific types of instruction can modify the brain, enabling it to use alternative sensory input to accomplish adaptive functions, in this case, communication." P.123. This idea showd how specialized ESP instruction can enhance students' ability to process and understand the specific language used in Biology.

One major benefit of ESP in Biology is its emphasised on specialized vocabulary, which is essential for areas such as Genetics, Ecology, and Physiology. Students who excel in ESP find it easier to grasp scientific literature, which often contained complex technical terms. Seifert and Espin (2012) highlighted that "it is necessary to include vocabulary-

specific interventions to receive effective outcomes in the students' knowledge of terms" (p. 5), emphasized the importance of focused vocabulary teaching in scientific settings.

1.2.10. Using English for Specefic Purposes to Improve Biology Students'Subject Performance

Incorporating English for Specific Purposes (ESP) into Biology classes improved students' ability to understand and discuss complex Biological concepts. By concentrating on vocabulaBy and language structures specific to the subject, ESP help students better grasp scientific material and boosts their reading and analytical skills. Additionally, ESP goes beyond just reading and writing; it also focuses on the listening and speaking skills needed in academic settings. The courses prepare students for lectures, discussions, and presentations by improving their listening abilities and oral communication. These skills allowed students to share their ideas confidently, engage effectively with peers and teachers, and participate actively in class discussions. As Hyland (2006) pointed out, "They learn by participating in the field, by doing, by sharing, and by talking about it with those who know more" (p. 112), which emphasized the importance of interaction and communication in achieving academic success. In conclusion, ESP provided Biology students with crucial language skills that aid their academic achievements and future careers in science.

1.2.11. The Impact of ESP Programe on Improving Academic Performance in Biology

English for Specific Purposes (ESP) programs play a crucial role in helping students excel in Biology by targeting the specific language requirements of the field. These programs focus on aiding students in grasping challenging Biological terms, texts, and concepts by teaching them English that is relevant to science. Since much of the scientific writing in Biology is in English, ESP supported students, particularly non-native speakers, in engaging more effectively with their studies. As Dudley-Evans and St. John (1998) stated, "the main

concerns of ESP have always been, and remain, with needs analysis, text analysis, and preparing learners to communicate effectively in the tasks prescribed by their study or work situation" (p. 1). By concentrating on specialized vocabulary and communication tied to the subject, ESP provided students with the necessary skills to clearly understand and express Biological ideas, leading to better academic achievement.

In addition to improving vocabulary, ESP also enhanced important academic skills such as writing research papers, delivering presentations, and participating in scientific discussions. These skills are vital for success in Biology, where students frequently need to present their findings and explain complex subjects. Ultimately, ESP programs support Biology students by boosting their language abilities, enhancing their academic performance, and fostering a deeper connection to their field of study.

1.2.12. Assessing the Effectiveness of ESP Programs in Enhancing Subject Performance

To evaluate the effectiveness of English for Specific Purposes (ESP) programs in Biology, we need to look at students' understanding of the subject and their growth in language skills. Studies show that students in ESP programs often perform better in Biology because their abilities in reading, writing, and speaking English improve. These language gain usually result in higher grades, clearer scientific writing, and more active involvement in class discussions. This progress is also supported by teamwork between language teachers and subject departments. As Dudley-Evans and St. John (1998) mentioned, “such contacts with the department and the possibilities for research into disciplinary communication often raise the status of the EAP lecturers in the eyes of subject departments” (p. 42). This cooperation led to more relevant and effective language teaching that help students in specific subjects like Biology. Another important aspect of assessing ESP programs is how well they connect language learning with subject content. Good ESP programs use real-life activities, like writing lab reports and giving presentations, to assess how effectively students apply

their English skills in Biology. Ellis (2003) explained that "tasks can function as a useful device for planning a communicative curriculum" (p. 5), enabling teachers to see students using English in meaningful ways while tackling subject-related issues.

Conclusion

In summary, using English as a language of instruction in Biology is very important for how well students perform in the subject. As many schools increasingly adopt English as their main teaching language, it is essential for students to build both language skills and knowledge specific to Biology in order to do well in their studies. Teaching Biology in English allows students to access worldwide scientific resources, explain complex Biological ideas, and take part in global academic and career discussions. However, this can be difficult for students who are not native English speakers, as they may find it hard to understand the specialized vocabulary and academic language needed to grasp Biological concepts.

To tackle these challenges, effective teaching methods that combined language learning with subject instruction, like Content and Language Integrated Learning (CLIL) and English for Specific Purposes (ESP), can be very helpful. These strategies help students learn Biology while also developing the language skills needed to understand and share this knowledge well. Additionally, providing ongoing support through language help, practical tasks, and real-world materials can boost students' ability to use English in relevant situations. At the end, successfully using English as a teaching language in Biology can lead to better academic results and greater readiness for future careers in science, especially in a globalized academic and professional world.

Chapter Two: Research Methodology

Practical Field Teachers and Students Questionnaire

Introduction

The second chapter of this dissertation centers on the analysis and interpretation of data. It addresses the evolution and interpretation of the information collected from participants using one research tool. This chapter details the approaches used to analyze the data obtained from two questionnaires: one distributed to Biology teachers and the other to Biology students at the Institute of Biological and Agricultural Sciences at Abd Elhafid Boussouf University in Mila. At the end, based on the findings, a number of recommendations and implications are proposed to guide future research in this area.

Section One: Teachers' Questionnaire

2.1.1. Sample and population

In this study, a sample of educators teaching Biology at the Institute of Biological and Agricultural Sciences at Abdelhafid Boussouf University Center in Mila for the academic year 2024/2025 has been made. This group consisted of 15 university educators who are actively engaged in the recently implemented English as a Medium of Instruction (EMI) setting. These teachers were chosen for this research because they can offer important perspectives on the influence of EMI on students' performance in the subject matter. As they are directly involved in both teaching and evaluating students, they are ideally placed to notice the academic development, challenges, and successes of learners who are instructed in English. This makes the selected sample particularly relevant for the study, which seeks to explore the effects of EMI on student performance in their Biology classes.

2.1.2. Description of Teachers' Questionnaire

The teachers' questionnaire consists of sixteen questions organized into five well-structured sections. It combines close-ended, and open-ended questions to obtain comprehensive insights into the use of English as a Medium of Instruction (EMI) in Biology education.

Section 01: Background Information (1–3Q)

This section aims to gather essential background details about the teachers, including their academic qualifications, years of teaching experience, and level of English proficiency.

Section 02: English as a Medium of Instruction (4–8Q)

This section aims to explore the extent to which teachers use English to teach Biology, their attitudes toward EMI, and the linguistic challenges they may encounter in the classroom.

Section 03: Subject Matter Performance (9–13Q)

This section assesses the impact of EMI on students' academic performance, scientific expression, and understanding of Biology concepts.

Section 04: The Relationship between EMI and Learners' Subject Performance (14–15Q)

This section focuses on how EMI affects students' performance in scientific research, practical skills, and cognitive abilities.

Section 05: Further Suggestions (16Q)

This final section invites teachers to share their recommendations for improving EMI implementation in Biology education.

2.1.3. The Administration of the Teachers' Questionnaire

The teachers' Questionnaire was administered to Biology teachers at abd Elhafid Boussouf University, Mila, in printed form during their regular lecture and practical (TD) sessions. The data collection process took place over two weeks, from April 26th to May 8th. To ensure maximum participation and gather accurate and reliable responses regarding the impact of English as a medium of instruction on students' understanding of Biology ,Most participants were allowed to take the questionnaire home, providing them with sufficient time to thoughtfully reflect on the questions. This approach aimed to improve the reliability and depth of the data collected by enabling teachers to answer at their own pace.

2.1.4. Teachers ' Questionnaire Analysis and Interpretaion

The analysis of the responses employed a mixed-method approach, integrating both quantitative and qualitative data analysis. The quantitative aspect focuses on interpreting the results from closed-ended questions, multiple-choice questions, and rating scales through numerical data, percentages, and statistical analysis. Conversely, The qualitative method is used mainly to describe, interpret, and understand the answers to open-ended questions and the reasons behind the selected responses, often in the light of previously reviewed theories related to English as a Medium of Instruction (EMI) and science education.

Section 01: Background Information (1_3Q)

1.What is your academic qualification?

Table 1

Teachers ' Academic Qualification

Question	**Frequency**	**Percentage**
Bachelor's degree	0	0%
Master's degree	0	0%
Doctorate (PhD)	15	100%
Total	15	100%

According to Table (1), which presented the academic qualifications of the teachers, all of the Participants (100%) reported possessing a Doctorate (PhD) degree. None of them claimed to hold a Master's or a Bachelor's degree, both of which showed a percentage of (0%).This finding indicates that the entire sample is comprised of highly qualified professionals who have attained the highest academic degree. It suggests a robust academic foundation and considerable expertise in their respective domains, along with extensive experience in teaching at the university level. Consequently, this sample can be considered a dependable and significant source of data for the current research. Moreover, this finding aligned with Selvi's (2021) observation that a significant number of universities worldwide use publication in renowned journals as a basis for academic advancement and recognition. This observation corresponds with the qualifications of the study's participants, who all have PhDs, demonstrating their preparedness to meet such academic expectations.

2.How many years have you been teaching at the university?

Table 2

Teaching experience at the university level

Question 2	**Frequency**	**Percentage**
Less than 3 years	3	20.0%
5-3years	1	6.7%
10-6years	6	40.0%
More than 10 years	5	33.3%
Total	15	100%

As presented in table (2), which details the number of years teachers have been teaching at the university,the largest portion of respondents (40.0%) indicated they have been teaching for between (6) and 10 years. This is followed by those with over (10) years of experience, who represent (33.3%) of the sample. Furthermore, (20.0%) reported having less than (3) years of teaching experience, while only (6.7%) stated they have taught for between (3) and (5) years. These findings imply that a significant number of participants possess considerable teaching experience at the university level, which may enhance the credibility and depth of their responses concerning the utilization of English in teaching and various academic practices. Additionally, the data indicate a wide range of teaching experience within the group, which can provide a rich variety of viewpoints in the findings.

3. How would you rate your level of English Proficiency?

Table 3

Teachers Levels of English Profeciency

Question 3	**Frequency**	**Percentage**
Poor	0	0%
Fair	3	20.0%
Good	10	66.7%
Very Good	0	0%
Excellent	2	13.3%
Total	15	100%

Table (3) represented the teacher's self evolution regarding their English proficiency. A significant portion of the respondents (66.7%) classified their proficiency as Good, reflecting a fair level of confidence in using English within academic settings. This is followed by (13.3%) who rated their English as Excellent, and (20.0%) who described it as Fair. Impressively, there were no participants who considered their English skills to be Poor or Very Good. These findings indicate that the majority of teachers have a satisfactory or above level of English proficiency, which is crucial for employing English as a medium of teaching, particularly in scientific fields such as Biology. The absence of "Poor" assessments supports the notion that the participants generally feel competent in utilizing English in their academic roles.

Section 02: English as a Medium of Instruction (EMI) (4_8Q)

4.Do you use English to teach Biology?

Table 4

Teachers ' Use of English to teach Biology

Question 4	**Frequency**	**Percentage**
Yes	15	100%
No	0	0%
Total	15	100%

According to Table (4), all respondents (15 out of 15) indicated that they use English as the language of instruction for teaching Biology. This complete consensus demonstrated that English is thoroughly embedded in the Biology curriculum for the participants surveyed. The lack of any dissenting opinions (0%) further emphasized the focus on English as the language of instruction in scientific disciplines.Moreover, this finding aligned with Dennisson s (2019) stated that English was selected as the medium of instruction because it is the universal language for Biological sciences.

5.Are you with or against the implementation of English in Higher Education?

Table 5

Teachers ' opinions about the Implementation of English in Higher Education

Question 5	**Frequency**	**Percentage**
With	14	93.3%
Against	1	6.7%
Total	15	100%

If you are with it, is it because:

Table 6

Teachers Reasons for Supporting the Implemetation of English

Question 5-2	**Frequency**	**Percentage**
It prepares students for international academic and professional opportunities.	7	46.7%
Most scientific literature and research in Biology are published in English.	5	33.3%
It enhances students' scientific vocabulary and global communication skills	1	6.7%
English allows easier access to up-to-date resources and educational materials.	0	0%
Using English bridges, the gap between local education and international standards.	2	13.5%
Total	15	100%

According to the data presented in Table (5), a significant majority of participants (93.3%) expressed support for the incorporation of English into higher education, while only one respondent (6.7%) expressed opposition. This overwhelming agreement is indicative of a favorable perception regarding the importance of English in academic environments .Moreover, upon investigating the motivations for this support, it is evident that close to half of the educators (46.7%) feel that proficiency in English equips students for international academic and professional opportunities. Additionally, (33.3%) of participants pointed out

that most scientific literature and research in Biology are in English, underscoring the importance of mastering the language. A smaller group (6.7%) noted that English improves students' scientific vocabulary and global communication skills. Overall, none of the participants chose the response indicating that English provides easier access to current resources and educational materials. Nonetheless, (13.3%) of the educators mentioned that the use of English acts as a bridge between local education systems and international standards.In summary, these results indicate that educators not only endorse the use of English in higher education but also appreciate its capacity to expand students' academic opportunities and connect them with global trends.Moreover, this finding aligned with Belmehdi s (2022), that the vast majority of students and teachers exhibited a constructive attitude towards English Medium Instruction (EMI), seeing it as a crucial resource for their educational progress and future job chances.

6.Do you find it difficult to explain biological concepts in English?

Table 7

Teachers ' Difficulty in Explaining Biological Concepts in English

Question 6	**Frequency**	**Percentage**
Yes	10	66.7%
No	5	33.3%
Total	15	100%

According to Table (6), a considerable percentage of respondents (66.7%) acknowledged experiencing challenges when explaining Biological concepts in English. Conversely, only (33.3%) indicated that they did not encounter any such difficulty.This

suggests that despite English being a common medium for instruction, numerous educators continue to face difficulties with the language requirements needed to communicate scientific information. Thus, it can be inferred that proficiency in the language is still a significant barrier that could impede effective teaching, particularly in disciplines that demand clear and technical explanations like Biology.Moreover, this finding aligned with Poon (2013) observation that having limited English skills creates difficulties in understanding Biological scientific content.

7.Do you feel confident when Teaching Biology in English?

Table 8

Teachers ' Confidence in Teaching Biology in English

Question 7	**Frequency**	**Percentage**
Yes	11	73.3%
No	4	26.7%
Total	15	100%

As indicated in Table (7), the majority of respondents (73.3%) expressed confidence in their ability to teach Biology in English. Conversely, (26.7%) reported a lack of confidence. Even though some teachers face challenges with the language, as discussed in the earlier question, this finding reveals that the majority can still able to maintain a sense of confidence in their teaching. This implies that confidence might derive from experience or comfort with the subject, regardless of whether their language skills are entirely proficient.

8.Do you face language-related challenges when teaching in English?

Table 9

Teachers ' Language Related challenges in Teaching Biology in English

Question 8	**Frequency**	**Percentage**
Yes	12	80.0%
No	3	20.0%
Total	15	100%

If you answered Yes, please specify the challenges you face (you may select more than one):

Table 10

Specefic Language Related Challenges Encountered when Teaching in English

Question 8-2	**Frequency**	**Percentage**
Students struggle with English vocabulary and grammar, which affects content comprehension	8	53.3%
Difficulty balancing language instruction with Biology content delivery	0	0%
Students tend to focus on language accuracy rather than scientific meaning	1	6.7%
Limited availability of Biology teaching materials adapted for EMI contexts	0	0%
Students often revert to L1 (Arabic/French), reducing the effectiveness of EMI	1	6.7%
Teaching in English increases cognitive load for both teacher and students	1	6.7%
Lack of institutional training or support in EMI methodology	1	6.7%
No answer	3	20%
Total	15	100%

As demonstrated in Table (8), a large portion of participants (80%) admitted experiencing challenges related to language, whereas only (20%) said they did not encounter any such difficulties .Furthermore, according to the follow-up in Question (8-2), the primary difficulty reported was students' difficulties with English vocabulary and grammar, affecting their understanding of content comrehension, at a rate of (53.3%). Additionally, a small number of participants (6.7% each) pointed out other concerns, including an emphasis on language accuracy than scientific meaning, resorting to their first language (L1), increased cognitive load, and lack of institutional support . Interestingly, (20%) of the participants chose not to elaborate on their experiences. Thus, it is clear that, despite the widespread implementation of English Medium Instruction (EMI), it continues to pose significant linguistic challenges, particularly for students. Morever, this finding aligned with Belmehdi s (2022) observation that the main obstacle in using English as the medium of instruction is the students' insufficient proficiency in the language.

Section 03: Subject Matter Performance (9_13Q)

Based on your experience, How does using English as a Medium of Instruction affect Students academic performance in Biology?

Table 11

Teachers ' Perception of the Effect of EMI on Students Academic Performance in Biology

Question 9	**Frequency**	**Percentage**
It enhances students' academic performance by improving access to scientific Terminology and Global resources.	5	33.3%
It hinders performance due to limited English proficiency and difficulty understanding content	2	13.3%
It motivates students to improve their English but distracts them from focusing on Biology concepts	7	46.7%
It has little or no impact on their Academic performance.	1	6.7%
Total	15	100%

As shown in Table (9), the majority of respondents (46.7%) mentioned that utilizing English motivates students to improve their language skills; however, they noted that it can detract from a complete understanding of Biology concepts. In comparison, (33.3%) felt that it improves academic performance by granting access to scientific terminology and global resources . Additionally, (13.3%) reported that it negatively impacts performance because of students' limited English proficiency. Only one individual (6.7%) perceived it as having

minimal or no effect at all.Therefore, while some consider English Medium Instruction (EMI) to be a useful asset, others argue that it presents cognitive difficulties that might impede content understanding. Moreover, this finding aligned with Poon's (2013) observation that students who had lower proficiency in English struggled to understand their lessons and the scientific terminology related to Biology.

10.How would you evaluate your students ability to express scientific ideas in English?

Table 12

Teachers ' Evaluation of Students Ability to Express Scientific Ideas in English

Question 10	**Frequency**	**Percentage**
Excellent-They can clearly and accurately express scientific concepts.	0	0%
Good-They can express ideas with occasional language mistakes.	4	26.7%
Fair-They struggle to communicate complex scientific ideas clearly.	7	46.7%
Poor-They have significant difficulty expressing themselves in English.	4	26.7%
Total	15	100%

As shown in Table (10), the majority of respondents (46.7%) rated their students' ability as fair, indicating that students struggle to articulate complex scientific ideas clearly. In addition, (26.7%) rated them as good, acknowledging occasional language mistakes, while another (26.7%) believed students face significant difficulties in expressing themselves.

Notably, no participant considered students to be excellent in this skill. Consequently, while some students demonstrate partial proficiency, the overall picture suggests that expressing scientific content in English remains a considerable challenge for most learners. Moreover, this finding aligned with Poon's (2013) observation that Students who had better English skills were generally more engaged in class discussions, while those with less proficiency often did not speak up, even when they understood the material.

11.Do you find the English language module helpful in solving the above problems?

Table 13

Teachers ' Opinions on the Effectiveness of the English Language Module

Question 11	**Frequency**	**Percentage**
Yes	13	86.7%
No	2	13.3%
Total	15	100%

As shown in Table (11), a vast majority of the participants (86.7%) answered affirmatively, suggesting that the English language module has significantly contributed to alleviating the challenges discussed earlier. In contrast, a minor percentage (13.3%) did not find it beneficial.Therefore, it can be concluded that, even with persistent language issues, a significant number of respondents appreciate the English module as a valuable resource for improving both teaching and learning in EMI (English as a Medium of Instruction) environments.Moreover, this finding aligned with Dennisson s (2019) observation that students had the opportunity through the course to improve their Biology comprehension in a

smaller class format while also developing a scientific English language skill set that is crucial for their prospective careers in healthcare.

12.Which area of English is most required for your students?

Table 14

Teachers ' Identification of Students most Needed Area in English

Question 12	**Frequency**	**Percentage**
English for Academic Purposes (EAP)	6	40.0%
English for Occupational Purposes (EOP)	1	6.7%
English for Scientific Purposes (ESP)	8	53.3%
Total	15	100%

According to the data in Table (12), a significant portion of participants (53.3%) believes that English for Scientific Purposes (ESP) is crucial for their students. This is reasonable given the scientific aspects of Biology and the need for students to comprehend and effectively utilize scientific vocabulary. Moreover, (40%) of those surveyed chose English for Academic Purposes (EAP), highlighting the importance of improving academic language skills for tasks such as reading, writing, and engaging in educational activities. Conversely, only one respondent (6.7%) viewed English for Occupational Purposes (EOP) as a priority, suggesting that workplace language skills are perceived as less immediately necessary within the Biology classroom. Therefore, it can be inferred that a curriculum focusing on ESP, while also incorporating elements of EAP, would be the most advantageous for addressing student requirements in an English Medium Instruction (EMI) Biology

environment. Selvi (2021) confirmed that it has been recognized that English serves as the main language for academic publications and international research endeavors.

13.In your experience, Does using English affect students' performance in practical activities (e.g., lab work)?

Table 15

Teachers'Perception of the Impact of English on Students Performance in Practical Biology Activities

Question 13	**Frequency**	**Percentage**
Yes	12	80.0%
No	3	20.0%
Total	15	100%

According to Table (13), a significant number of respondents (80%) acknowledged that the use of English influences students' performance in practical activities, while just (20%) stated that it does not have an impact.This outcome indicates that having language skills goes beyond just understanding theoretical concepts and significantly affects practical tasks like laboratory activities. Students with limited proficiency in English may struggle to follow laboratory instructions, grasp safety protocols, or communicate properly during experiments, which can adversely affect the quality and precision of their work.Consequently, these results highlight the necessity of integrating language support strategies not only in lecture environments but also within laboratory settings to promote effective learning . Additionally, this aligned with Saharudin et al. (2021), who pointed out that developing English language abilities is vital for broadening knowledge and promoting effective

communication, particularly in academic and scientific arenas where English functions as the worldwide means of communication. Consequently, improving students' proficiency in English is crucial not just for deepening theoretical comprehension but also for securing their success in practical applications, underscoring the significance of incorporating language support strategies into the curriculum.

Section 04: The Relationship between EMI and Learner's Subject Performance (14_15Q)

14.Do you believe English influences the quality of students performance in research and scientific projects?

Table 16

Teachers' Views on the Role of English in Enhancing Students Performance in Research and Scientific Project

Question 14	**Frequency**	**Percentage**
Yes	15	100%
No	0	0%
Total	15	100%

According to the data in Table (14), all respondents (15 out of 15) indicated "Yes," highlighting a unanimous agreement on the beneficial impact of English on students' performance in research and scientific projects. On the other hand, none of the respondents (0 out of 15) selected "No." This unanimous response underscores the crucial importance of English in enabling students to effectively interact with scientific literature, articulate their research findings, and make significant contributions to research endeavors.This discovery

supports Gohil's (2013) statement that while merely (50%) of the authors hail from English-speaking nations, an impressive (95%) of research articles are published in English. This demonstrates that English is the prevailing language of scientific discourse globally, even for those researchers whose first language is not English. Hence, having a good command of English is essential for students to engage with scientific texts effectively, share their findings, and participate significantly in research undertakings.

15.Which types of performance would you advise English teachers to focus on?

Table 17

Teachers 'Recommondations Regarding the Performance Areas English Teachers Should Prioritize

Question 15	**Frequency**	**Percentage**
Academic performance (exam results, comprehension of content)	6	40.0%
Cognitive performance (analysis, critical thinking, problem-solving)	6	40.0%
Communicative performance (scientific writing, presentations, discussions)	0	0%
Skill-based performance (lab work, practical application of knowledge)	3	20.0%
Total	15	100%

According to Table (15), (40.0%) of the respondents (6 out of 15) suggested that English teachers should concentrate on academic performance, including exam results and

understanding of content. Another (40.0%) (6 out of 15) highlighted the importance of cognitive performance, which encompasses skills such as analysis, critical thinking, and problem-solving.Additionally, (20.0%) (3 out of 15) emphasized the significance of skill-based performance, focusing on practical applications like lab work. Interestingly, none of the respondents (0%) recommended that teachers prioritize communicative performance (for instance, scientific writing, presentations, and discussions), suggesting that there may either be a lesser demand for enhancement in this area or it may hold a lower priority in their educational context.these data indicate that evaluation in Biology courses in EMI should focuse on content comprehension and cognitive skills (analysis , critical thinking and problem solving).

Section 05: Further Suggestions (16Q)

Please add any suggestions regarding the role of English as a Medium of Instruction and it is impact on Biology students performance

In terms of further suggestions and insights, participants emphasized through their responses that English as a Medium of Instruction (EMI) significantly shapes Biology students' academic performance. The data revealed that while EMI can enhance students' understanding of scientific content, it also presents challenges related to language proficiency. To improve the effectiveness of EMI, participants suggested the integration of English for Specific Purposes (ESP) courses, access to additional English language resources, and training programs for teachers. These measures aim to support both students and educators in overcoming linguistic barriers and ensuring that EMI contributes positively to the learning experience.

Discussion of the Results

The questionnaire conducted with Biology teachers at Mila University Center provided important perspectives on their views on English as a Medium of Instruction (EMI). In the first section, all participant (100%) indicated that they possessed a PhD, highlighting a highly educated group. Concerning teaching experience, 40.0% reported having taught for 6 to (10) years, (33.3%) for over (10) years, (20.0%) for under 3 years, and (6.7%) for (3 to 5) years. These statistics suggest that the majority of the respondents were fairly experienced.Regarding their English proficiency, (66.7%) described their level as "Good," while (20.0%) rated it "Fair" and only (13.3%) considered it "Excellent." Notably, no respondents reported being at a "Poor" or "Very Good" level of English proficiency, indicating that most instructors possessed a reasonable level of language competency.Moreover, the second section explores the use of EMI in Biology education. Remarkably, all respondents (100%) confirmed that they utilized English in their Biology classes. Additionally, a significant majority (93.3%) supported EMI in higher education. Their rationale included (46.7%) stating EMI helps prepare students for global opportunities, (33.3%) emphasizing English's prevalence in scientific literature, (13.3%) feeling it connected local and global standards, and (6.7%) mentioning its role in developing scientific vocabulary. However, no one mentioned "Easier access to up-to-date resources" as a key reason.

Despite their overall support for EMI, (66.7%) of teachers recognized difficulties in explaining Biological concepts in English, and(80.0%) faced language-related challenges during their teaching. These challenges were attributed to students having issues with vocabulary and grammar (53.3%), prioritizing accuracy over meaning (6.7%), switching to their first language (L1) (6.7%), cognitive overload (6.7%), and lack of institutional support (6.7%). Notably, (20.0%) of teachers did not clarify the nature of the challenges they faced.In

terms of confidence, (73.3%) reported feeling confident while teaching biology in English, whereas (26.7%) expressed a lack of confidence. This resultssuggests a possible gap between the teachers' language skills and their mastery of the subject Additionally, the third section assessed the perceived effects of EMI on students' academic performance. While (46.7%) believed EMI motivated students to enhance their English skills but limited their Biology understanding, (33.3%) viewed EMI favorably for improving access to terminology and scientific resources. Conversely, (13.3%) felt EMI negatively impacted performance due to the students' limited English proficiency, while (6.7%) believed it had no significant effect.When asked students' ability to convey or express scientific ideas in English, (46.7%) rated it as "Fair," (26.7%) as "Good," and another (26.7%) claimed their students faced considerable difficulties, with none rating their students' abilities as "Excellent."Further more, a vast majority (86.7%) agreed that the English language module aided in reducing students' language-related challenges, while (13.3%) disagreed. Furthermore, when asked to identify the most essential English module, (53.3%) opted for English for Scientific Purposes (ESP), (40.0%) for English for Academic Purposes (EAP), and only (6.7%) considered English for Occupational Purposes (EOP) as the most significant.

Concerning the impact of EMI on practical activities such as laboratory work, (80.0%) of participants acknowledged it had affected students' performance, indicating that language difficulties extended beyond theoretical comprehension to practical applications. In contrast, only (20.0%) believed there was no impact.

In the final section, all teachers (100%) concurred that English had a beneficial effect on students’ performance in scientific research and academic projects. Lastly, when asked what performance area English teachers should prioritize, (40.0%) indicated academic performance, another (40.0%) emphasized cognitive performance (including problem-solving and critical thinking), and the remaining (20.0%) alluded to other unspecified areas of focus.

In summary, the findings from the questionnaire highlighted a general agreement among Biology teachers on the importance and benefits of EMI in higher education. Nevertheless, they also shed light on various educational and linguistic obstacles that potentially hindered students' understanding and performance. Therefore, these outcomes underscore the necessity for specialized language support and EMI-focused teacher training to ensure that both educators and students can maximize the benefits of English-medium instruction in scientific fields.

Section Two: Students'Questionnaire

2.2.1. Sample and population

In this study, researchers selected (60) of third-year Biology students at Mila University Center for the 2024/2025 academic year. These students are taking courses that follow the English Medium Instruction (EMI) method, making them important for studying how EMI affects their performance in the subject.

The researchers selected these students because they experience EMI directly, which allows for an evaluation of its effects on their grasp of Biological concepts, participation in class discussions, and overall academic success. The feedback from these students is crucial for understanding both the difficulties and advantages of learning Biology in English. The information collected from this group will help clarify how EMI affects students' understanding of the subject and offer suggestions for enhancing their learning experience.

2.2.2. Description of Students' Questionnaire

The students' questionnaire includes sixteen questions that feature a combination of close-ended, multiple-choice, and open-ended formats. These questions are organized into five sections to collect detailed information about how English as a Medium of Instruction (EMI) affects students' performance in their subjects.

Section 01: Background Information (1-3Q)

This part gathers information about Biology students, including their gender, what they study, and how many years they have been learning English. These details help give a better understanding of their experience with learning English and how it connects to their studies.

Section 02: English as a Medium of Instruction for Biology Students (4-8Q)

This section looks at how students view the use of English as a medium of instruction (EMI) in Biology classes. It discusses how students rate their own English skills, what they think about the need for and effectiveness of EMI, and their experiences learning Biology in English. Additionally, it investigates if students believe that EMI improves their understanding of Biology as well as their English language abilities.

Section 03: Difficlulties in Using English for Learning Biology (9-11Q)

This part looks into the difficulties that Biology students encounter while learning in English. It also points out which language skills they find the hardest when studying Biology, giving us a better understanding of where they might need extra help.

Section 04: English and Biology Learner's Performance (12-15Q)

This section looks into how using English in Biology classes affects students' academic growth and involvement. It seeks to understand how English as the language of instruction influences their learning experiences and helps with their performance in the subject.

Section 05: Further Suggestions (16Q)

This part looks at how using English as the language of teaching affects students' performance in Biology. Students are invited to share their thoughts on how this impacts them.

2.2.3. The Administration of the Students' Questionnaire

The student questionnaire was given to third-year Biology students during their TD and lecture sessions. The data collection lasted about two weeks, from april 26th april to mai 8th.

All students completed the questionnaire during their TD and lecture sessions, ensuring immediate responses. This approach was used to maintain the consistency and reliability of the data while minimizing external influences on their answers.

2.2.4. Students' Questionnaire analysis and interpretation

The researchers used a mixed-method approach to look at the responses, which included both quantitative and qualitative data. For the quantitative analysis, they reviewed the answers from the questionnaires, paying attention to numbers, percentages, and trends. In the qualitative part, they analyzed open-ended responses to better understand how third-year Biology students experienced learning Biology in English and how it affected their learning and performance. The insights from the qualitative analysis were based on important ideas from previous studies.

Section 01: Background Information (1_3Q)

1. What is your gender?

Table 18

Students' Gender

Question 01	**Frequency**	**Percentage**
Male	15	25.0%
Female	45	75.0%
Total	60	100%

Table (1) indicated that a majority of the participants, (75%), were female, while males accounted for only (25%). This suggested that three out of every four respondents were women, represented the total of all participants. The predominance of female participants could have influenced the study's outcomes, particularly if gender played a role in shaping opinions or experiences. Therefore, it was essential to recognize that the results might have primarily represented the perspectives of female respondents.

2.What is your academic major?

Table 19

Students ' Academic Major

Question 02	**Frequency**	**Percentage**
Microbiology	10	16.7%
Biochemy	10	16.7%
Agroecology	10	16.7%
Ecology	10	16.7%
Plant Biotechnology	10	16.7%
Health Biotechnology	10	16.7%
Total	60	100%

Table (2) indicated that the (60) participants were evenly distributed across six academic majors. Each major Microbiology, Biochemistry, Agroecology, Ecology, Plant Biotechnology, and Health Biotechnology contained (10) students, accounting for (16.7%) of the total. This equal distribution ensured that all majors were well represented in the study, provided balanced and reliable insights from students in various Biology-related disciplines.

3.How long have you been studying English?

Table 20

Students ' English Learning Duration

Question 03	**Frequency**	**Percentage**
10-12 years	42	70.0%
13-15 years	18	30.0%
16-18 years	0	0%
More than 18 years	0	0%
Total	60	100%

Table (03) indicated that among (60) participants, the majority, (42) students (70%), had been studying English for (10 to 12) years. Additionally, (18) students (30%) had been learning the language for (13 to 15) years. None of the participants reported having more than (15) years of English study. This implied that all students possessed at least (10) years of experience in learning English, suggesting they likely had a solid foundation in the language, which might have enhanced their ability to utilize English in their academic pursuits.

Section 02: English as a Meduim of Instruction for Biology Students (4_ 8Q)

4.What is your current level of prefeciency in using English when learning Biology ?

Table 21

Students' Profeciency Level in Using English for Learning Biology

Question 04	**Frequency**	**Percentage**
Biginner	16	25.0%
Intermediate	15	26.7%
Advanced	21	35.0%
Profecient	8	13.3%
Total	60	100%

Table (4) displayed the English proficiency levels of participants while studying Biology. Among the (60) participants, (21) students (35.0%) identified themselves as advanced, making this the most prevalent level. This was followed by (15) students (26.7%) at the intermediate level and (16) students (25.0%) at the beginner level. Only (8) students (13.3%) regarded themselves as proficient. These findings indicated that while a significant number of students were confident in their English abilities, many remained at beginner or intermediate levels, which could have impacted their understanding and learning of Biology in English. This aligns with Poon's (2013) observation that students with weaker English skills often struggled to follow lessons and understand complex Biological terms, highlighting the challenges lower-proficiency learners may face in an EMI setting.

5.Do you think that using English as a Meduim of Instruction is required in Biology programs at the university level?

Table 22

Students' Opinions on the Necessity of English as a Meduim of Instruction in Biology Programs

Question 05	**Frequency**	**Percentage**
Yes	53	88.3%
No	7	11.7%
Total	60	100%

Table (5) indicated that among (60) participants, a significant majority (53) students (88.3%) supported the use of English as the medium of instruction in university Biology programs. In contrast, only 7 students (11.7%) expressed disagreement. This overwhelming support implied that most students acknowledged the importance of English in higher education, particularly in scientific disciplines such as Biology, where much of the material, research, and resources are available in English. This finding is consistent with Belmehdi's (2022) observation that most students viewed EMI as a valuable tool for enhancing their academic development and future career opportunities, showing a generally positive perception of learning Biology in English.

6.Do you think that Biology would be easier if taught in English language?

Table 23

Students ' Perception of Biology being Easier when taught in English

Question 06	**Frequency**	**Percentage**
Yes	18	30.0%
No	13	21.7%
May be	29	48.3%
Total	60	100%

Table (6) indicated that out of(60) participants, the largest group, comprising (29) students (48.3%), responded "Maybe" to the question of whether Biology would have been easier if taught in English. This suggested that many students were uncertain and might have required additional support or experience with English in the context of Biology. A smaller group of (18) students (30.0%) answered "Yes," indicating they believed it would have been easier, while (13) students (21.7%) responded "No," suggesting they did not think it would have been easier. These varied responses implied that students had differing levels of comfort and confidence when it came to learning Biology in English. This aligned with Poon's (2013) observation that students often resorted to memorizing terms without fully understanding them due to language difficulties, which could explain their hesitation and uncertainty.

7.Do you feel that using English in Biology class improves both your Science (Biology) and language skills (English) at the same time?

Table 24

Students ˈViews on whether English Improves Both Science and Language Skills

Question 07	**Frequency**	**Percentage**
Yes	46	76.7%
No	14	23.3%
Total	60	100%

Table (7) indicated that out of the (60) participants, (46) students (76.7%) responded "Yes," indicating that they believed using English in Biology classes enhanced their skills in both Biology and English. This aligned with Dennisson's (2019) findings, which showed that students not only improved their understanding of Biology but also developed their scientific English proficiency, demonstrating that learning Biology through EMI supported both content mastery and language development. Conversely, (14) students (23.3%) answered "No," implying they did not experience the same advantages. These results suggested that the majority of students saw value in learning Biology in English for improving their understanding of the subject and their language skills, while a minority encountered challenges or preferred alternative methods of learning.

8. How do you feel about learning Biology in English as the primary language of instruction?

Table 25

Students' Attitude Toward Learning Biology in English

Question 08	**Frequency**	**Percentage**
It helps me understand the subject matter	14	23.3%
It makes learning more challenging	14	23.3%
It has no effect on my understanding	7	11.7%
I'm not sure	25	41.7%
Total	60	100%

Table (8) indicated that out of (60) participants, the largest group (25) students (41.7%) responded with "I'm not sure" regarding their feelings about learning Biology in English. This implied that many students were uncertain about the impact of English on their learning experience. Additionally, (14) students (23.3%) stated that it "helps me understand the subject matter," while another (14) students (23.3%) felt that it "makes learning more challenging," demonstrating a balance of both positive and negative perspectives. Only (7) students (11.7%) believed that English had no impact on their understanding. These varied responses highlighted the diverse experiences and attitudes towards using English as the medium of instruction in Biology. Similarly, Poon (2013) highlighted that students faced mixed reactions to EMI while some appreciated its benefits for understanding scientific content and developing language skills, others found it challenging and experienced anxiety, especially when assessed in English.

Section 03: Difficulties in Using English for Learning Biology (9_ 11Q)

9. How often do you struggle to understand Biology lectures delivered in English?

Table 26

Students' Frequency of Stuggling to Understand Biology Lectures in English

Question 09	**Frequency**	**Percentage**
Always	11	18.3%
Often	16	26.7%
Sometimes	17	28.3%
Rarely	14	23.3%
Never	2	3.3%
Total	60	100%

Table (9) indicated that among the (60) participants (100%), a majority of students reported facing some difficulty in understanding Biology lectures presented in English. The largest group, consisting of (17) students (28.3%), responded with "Sometimes," followed by (16) students (26.7%) who selected "Often," and 11 students (18.3%) who indicated "Always." This suggested that more than (70%) of the participants experienced difficulties at least occasionally. In contrast, (14) students (23.3%) reported that they "Rarely" struggled, while only (2) students (3.3%) claimed they "Never" had difficulties. These findings implied that although a small number of students felt confident with English lectures, many others encountered challenges that could have impacted their learning experience. This aligned with Dennisson's (2019) observation that learning scientific content while simultaneously developing academic English skills placed a significant cognitive burden on students, thus

requiring structured and supportive teaching methods to help them grasp complex material more effectively.

10. Which of the following challenges do you face when learning Biology in English?

Table 27

Students' Challenges in Learning Biology in English

Question 10	**Frequency**	**Percentage**
Difficulty in answering Biology exam questions because they are written in English.	18	30.0%
Difficulty in expressing ideas in English during Biology discussions or presentations.	21	35.0%
Difficulty in taking notes in English during Biology classes.	21	35.0%
Total	60	100%

Table (10) indicated that among the (60) participants, the most frequently reported challenges in learning Biology in English were "Difficulty in expressing ideas in English during Biology discussions or presentations" and "Difficulty in taking notes in English during Biology classes," each noted by (21) students (35.0%). Additionally, (18) students (30.0%) mentioned facing "Difficulty in answering Biology exam questions because they were written in English." These findings suggested that students primarily struggled with using English for communication and note-taking, both of which were essential for their learning. This underscored the necessity for increased language support in these areas to enhance student success. This finding was consistent with Poon's (2013) observation that students found

completing academic tasks in English such as writing exams and assignments particularly challenging, which often led to increased anxiety and hindered their ability to fully demonstrate their understanding of Biology.

11. Which skill challenges you the most when learning Biology in English?

Table 28

Students' Most Challenging Language Skill when Learning Biology

Question 11	**Frequency**	**Percentage**
Reading	10	16.7%
Writing	19	31.7%
Listening	9	15.0%
Speaking	22	36.7%
Total	60	100%

Table (11) indicated that among (60) participants (100%), the skill that posed the greatest challenge for students learning Biology in English was "Speaking," identified by (22) students (36.7%). This was followed by "Writing," selected by (19) students (31.7%). Fewer students reported challenges with "Reading" (10) students (16.7%) and "Listening" (9) students (15.0%). These findings suggested that productive skills, particularly speaking, were more challenging for students compared to receptive skills. This highlighted the potential need for increased practice and support in speaking and writing activities during English-taught Biology lessons. Similarly, Poon (2013) found that students with lower English proficiency tended to stay quiet during class discussions, even when they understood the

content, indicating that limited speaking ability hindered their participation and confidence in expressing ideas.

Section 04: English and Biology Learner's Performance (12_15Q)

12.What tools help student learn Biology English?

Table 29

Students' Preferred Tools for Learning Biology in English

Question 12	**Frequency**	**Percentage**
Teacher's explanation in English	19	31.7%
Textbook and video in English	15	25.0%
Translation tools (dictionary or apps)	12	20.0%
Pictures	6	10.0%
Notes	8	13.3%
Total	60	100%

Table (12) indicated that among (60) participants (100%), the most effective tool for learning Biology in English was the "Teacher's explanation in English," selected by (19) students (31.7%). This was followed by "Textbooks and videos in English," chosen by (15) students (25.0%), and "Translation tools (dictionary or apps)," used by (12) students (20.0%). A smaller number of students indicated "Notes" (8 students, 13.3%) and "Pictures" (6 students, 10.0%) as helpful tools. These findings suggested that students primarily depended on direct instruction from teachers and English-language resources, while visual aids and notes were beneficial but less frequently preferred. This reliance aligned with Dudley-Evans and St. John's (1998) view that ESP employed teaching methods distinct from general

English courses, focusing specifically on the language and skills needed in fields like Biology, which reinforced the importance of tailored explanations and specialized materials for effective learning.

13. Have you find the English module helpful in solving some of your English problems?

Table 30

Students ' Opinions on the Helpfulness of the English Module

Question 13	**Frequency**	**Percentage**
Yes	22	36.7%
No	38	63.3%
Total	60	100%

Table (13) indicated that out of (60) participants, only (22) students (36.7%) reported that the English module was helpful in resolving some of their English issues. In contrast, the majority, (38) students (63.3%), stated that it was not helpful. This suggests that although some students benefited from the module, most did not find it effective in addressing their language challenges. These findings highlight the potential need to enhance the content or teaching strategies of the English module to better meet students' needs.

14.Which branche of English teachers should concentrate on more?

Table 31

Students' Opinions on Which Branche of English Teachers Should Focus more

Question 14	**Frequency**	**Percentage**
ESP Ex: Biology vocabulary, lab instructions	22	36.7%
EAP Ex: Writing reports, undestanding Academic articles	15	25.0%
EOP: Ex: English used in research jobs	8	13.3%
EST: Ex: scientific terms, lab safety procedures	8	13.3%
EBE: Ex: Bussiness letters, economic presentations	1	1.7%
ESS: Ex: Reading sociology articles, discussing political issues	6	10.0%
Total	60	100%

Table (14) indicated that among (60) participants (100%), the largest group (22) students (36.7%) believed that English teachers should have prioritized English for Specific Purposes (ESP), particularly in areas like Biology vocabulary and lab instructions. This was followed by English for Academic Purposes (EAP), which included skills such as report writing and comprehension of academic articles, supported by (15) students (25.0%). Smaller numbers of students favored English for Occupational Purposes (EOP) and English for Science and Technology (EST), each chosen by 8 students (13.3%). A limited number of students selected English for Social Studies (ESS), with 6 students (10.0%), and only 1

student (1.7%) opted for English for Business and Economics (EBE). These findings indicated that the majority of students preferred their English instruction to be closely related to their specific fields of study, particularly in Biology and academic contexts. As Hyland (2006) explained, English for Academic Purposes was not just about teaching isolated words or grammar rules, but about helping learners understand how language functioned within academic disciplines, reflecting their values and communicative practices.

15.Does learning Biology in English help you perform better?

Table 32

Students' Views on Whether Learning Biology in English Improves Performance

Question 15	**Frequency**	**Percentage**
Yes	40	66.7%
No	20	33.3%
Total	60	100%

If yes, which Areas of performance are better ameliorated?

Table 33

Students 'Perception of which Areas of Performance are Improved by EMI

Question 15 – 2	**Frequency**	**Percentage**
Academic performance: Ex: Getting good grades in Biology Exams	14	23.3%
Cognitive performance. Ex: Understanding scientific ideas more easily	10	16.7%
Communication performance: Ex: Giving a clear oral presentation to others	12	20.0%
Skill-based performance: Ex: Writing short report or reading a Biology text in English	4	6.7%
Total	40	66.7%

Table (15) indicated that out of (60) participants (100%), a majority, consisting of (40) students (66.7%), believed that studying Biology in English enhanced their overall performance, while (20) students (33.3%) disagreed. Among those who responded positively (see Table 15-2), the most notable improvement was in academic performance, with (14) students (23.3%) reporting better results in Biology exams and coursework. Additionally, (12) students (20.0%) observed improvements in their communication skills, and 10 students (16.7%) found it easier to understand scientific concepts. A smaller group of 4 students (6.7%) felt that their skills in writing reports or reading Biology texts in English had improved. This aligned with Brownell et al. (2013), who noted that “most scientists did not

receive formal training in science communication," highlighting the importance of integrating communication-focused instruction into Biology education. Overall, this suggested that learning Biology in English primarily contributed to better academic results while also aiding in communication and comprehension of the subject.

Section 05: Further Suggestions (16Q)

16. Add further suggestions about The role and the effect of English as a Medium of Instruction on your performance in Biology?

Among the students, many had expressed positive opinions about using English in Biology classes, stating that it enhanced their understanding and helped them engage more effectively with scientific material. In contrast, some had shared negative views, pointing out that English could complicate learning because of language barriers. These responses indicated that while many students gained from English instruction, others required additional support to thrive.

2.2.5. Discussion of the Results

The questionnaire results showed that Biology students generally accepted and viewed English as a Medium of Instruction (EMI) positively. A significant majority (88.3%) of participants appreciated how English facilitated access to scientific knowledge and enhanced academic performance. The respondents came from various Biology-related majors—Microbiology, Biochemistry, Agroecology, Ecology, Plant Biotechnology, and Health Biotechnology each equally represented at (16.7%), providing a diverse representation across different disciplines. However, despite several years of English study (70% had studied English for 10–12 years and 30% for 13–15 years), many students reported differing levels of proficiency, with (25%) identifying as beginners and (26.7%) as intermediate users. These language challenges often led to difficulties in understanding lectures, articulating thoughts,

taking notes, and answering exam questions in English. The productive skills of speaking and writing were particularly seen as the most difficult, with (36.7%) struggling most with speaking and (31.7%) with writing. While (76.7%) of students recognized that EMI could enhance both their language skills and understanding of the subject, (41.7%) remained uncertain about its overall effectiveness, and (23.3%) felt that learning Biology in English made learning more challenging. They considered teacher explanations and English-language materials, such as textbooks and videos, to be the most effective learning resources, selected by (31.7%) and (25%) of students respectively. Nevertheless, the current English module was largely viewed as inadequate in meeting students' academic language needs. Many students (36.7%) preferred English instruction that was specifically focused on scientific and academic purposes, particularly vocabulary related to Biology and laboratory work. In conclusion, while there was broad support for EMI, the findings pointed to a need for more targeted language support and tailored instruction to better align with students' scientific disciplines for successful implementation.

Limitations and Recommondation of the study

Limitations

• Some educators were unable to participate due to time constraints and busy schedules.

• Relying solely on questionnaires limited the depth of information gathered, especially from teachers.

• The focus on one university restricted the broader applicability of the findings.

• Limited qualitative data reduced the ability to fully explore the challenges experienced by both teachers and students.

• The study may not reflect the full diversity of EMI experiences across different institutions and academic settings.

Recommendations

• Provide training in English for Scientific Purposes (ESP) to both teachers and students.

• Offer ongoing English language support programs tailored to academic and disciplinary needs.

• Adapt teaching methods to suit EMI contexts and accommodate varying levels of English proficiency.

• Use digital tools and online platforms to enhance Biology instruction through English.

• Develop customized ESP courses focusing on Biology-related vocabulary and tasks.

• Encourage active participation in class through interactive and student-centered strategies.

• Promote involvement in continuous research and assessment to monitor EMI effectiveness.

• Ensure access to clear and supportive learning resources in English and, when needed, bilingual formats.

• Implement flexible and inclusive approaches to teaching and learning to support all language levels.

Conclusion

This chapter summarized the practical aspects of the research, which included two separate questionnaires: one directed to third-year Biology students and the other at their teachers at Mila University Center. The aim was to assess the effects of English as a Medium of Instruction (EMI) on students' performance in their subjects and to uncover the challenges faced in an EMI setting. The results indicate that EMI is widely adopted and favored by students and teachers alike. However, the findings also highlighted several difficulties from both perspectives. Instructors expressed challenges in explaining scientific concepts in English because of language barriers, while students reported having trouble comprehending lectures, expressing ideas during discussions, and engaging in laboratory work. These challenges were largely linked to limited vocabulary, grammar difficulties, and a general lack

of confidence in using English for academic purposes. Students indicated that, despite recognizing the benefits of EMI for enhancing their English proficiency and academic success, many felt uncertain regarding its overall impact, with some stating that it complicates their learning process. Additionally, students identified 'speaking' as the most difficult skill, especially when it comes to delivering presentations or responding to exam questions in English. Still, both students and teachers acknowledged the importance of EMI for acquiring scientific knowledge and preparing for a global academic and professional setting. To tackle these challenges, instructors mentioned using various strategies, such as modifying their teaching techniques, providing contextual examples, and fostering classroom interaction. Students, in turn, highlighted the importance of clear explanations from teachers and expressed a preference for supportive materials like textbooks and visual aids. Both groups highlighted the necessity for increased language assistance, particularly in topics related to English for Scientific Purposes (ESP).

In summary, while EMI clearly presents benefits in terms of language enhancement and access to global academic resources, its successful application in Biology education necessitates ongoing pedagogical adjustments, better linguistic support, and specialized teacher training. Addressing these elements is crucial for ensuring that EMI not only promotes language proficiency but also enables a comprehensive understanding of scientific subjects.

General Conclusion

In recent decades, English has become the predominant language of instruction in universities across the globe, particularly in scientific fields like Biology. Algeria has embraced this shift by integrating English as a Medium of Instruction (EMI) into its university curricula to broaden students' access to global scientific knowledge and to enhance their academic and professional prospects. However, this transition brings forth numerous challenges, particularly the gap between the linguistic demands of scientific instruction and the actual English proficiency of students. In a complex subject such as Biology, limited language skills can impede students' abilities to understand lectures, engage in classroom discussions, and convey their knowledge effectively during exams.In Fact that, this study set out to explore the perspectives of both instructors and students regarding the implementation of English as a Medium of Instruction and its impact on students' understanding and academic performance, while also identifying the language-related challenges they encounter. Moreover, the examination of the questionnaires reveals that most students perceive studying Biology in English as advantageous for their academic achievement, resulting in better exam results and improved communication skills. Moreover, a significant number of students reported that learning Biology in English positively affects their understanding of scientific concepts. On the other hand, a large portion of students expressed feelings of doubt and found it challenging to adapt to English Medium Instruction (EMI), with many having difficulty following lectures delivered in English. Language-related challenges primarily involve productive skills, specifically speaking and writing, particularly during classroom activities, presentations, and exams. These challenges impede their ability to expres their thoughts and ideas effectively and to take useful lecture notes. In addition, the current English modules provided appear inadequate in assisting students to overcome these challenges, as few found them helpful in addressing their linguistic difficulties. Both students and

instructors emphasized the need for specialized English for Specific Purposes (ESP) courses, especially those focused on Biology terminology and laboratory instructions, in order to offer better assistance to learners.

In conclusion, while EMI has a positive impact on the academic performance of Biology students, it also presents language-related challenges that must be tackled through improved language support and curriculum adjustments tailored to the specific needs of scientific disciplines.

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Appendices

Appendix 1: Teachers, Questionnaire

Dear Teachers,

This questionnaire is designed to gather your perspectives on the use of English as a Medium of Instruction (EMI) in teaching Biology, and how it may affect students' academic performance and understanding. Your responses will be kept confidential and used solely for academic research purposes.

Thank you for your time and honest participation

Section One: Background Information

1What is your academic qualification?

Bachelor's degree ☐

Master's degree ☐

Doctorate (PhD) ☐

2How many years have you been teaching at the university?

Less than 3 years ☐

5–3years ☐

10–6years ☐

More than 10 years ☐

3How would you rate your level of English proficiency?

Poor ☐

Fair ☐

Good ☐

Very Good ☐

Excellent ☐

Section Two: English as a Medium of Instruction (EMI)

4. Do you use English to teach Biology?

Yes ☐

No ☐

5. Are you with or against the implementation of English in higher Education?

With ☐

Against ☐

If you are with it, is it because:

It prepares students for international Academic and professional opportunities. ☐

Most scientific literature and research in Biology are published in English. ☐

It enhances students' scientific vocabulary and Global communication skills. ☐

English allows easier access to up-to-date resources and Educational materials. ☐

Using English bridges the gap between local education and international standards. ☐

6. Do you find it difficult to explain Biological concepts in English?

Yes ☐

No ☐

7. Do you feel confident when teaching Biology in English?

Yes ☐

No ☐

8. Do you face language-related challenges when teaching in English?

Yes ☐

No ☐

If you answered yes, please specify the challenges you face (you may select more than one):

Students struggle with English vocabulary and grammar, which affects content comprehension ☐

Difficulty balancing language instruction with Biology content delivery ☐

Students tend to focus on language accuracy rather than scientific meaning ☐

Limited availability of Biology teaching materials adapted for EMI contexts ☐

Students often revert to L1 (Arabic/French), reducing the effectiveness of EMI ☐

Teaching in English increases cognitive load for both teacher and students ☐

Lack of institutional training or support in EMI methodology ☐

Section Three: Subject Matter Performance

9. Based on your experience, how does using English as a medium of instruction affect students' academic performance in Biology?

It enhances students' academic performance by improving access to scientific terminology and global resources. ☐

It hinders performance due to limited English proficiency and difficulty understanding content. ☐

It motivates students to improve their English but distracts them from focusing on Biology concepts. ☐

It has little or no impact on their academic performance. ☐

10. How would you evaluate your students' ability to express scientific ideas in English?

Excellent – They can clearly and accurately express scientific concepts. ☐

Good – They can express ideas with occasional language mistakes. ☐

Fair – They struggle to communicate complex scientific ideas clearly. ☐

Poor – They have significant difficulty expressing themselves in English. ☐

11. Do you find the English language module helpful in solving the above problems?

Yes ☐

No ☐

12.Which area of English is most required for your students?

English for Academic Purposes (EAP) ☐

English for Occupational Purposes (EOP) ☐

English for Scientific Purposes (ESP) ☐

Other (please specify): .....

13. In your experience, does using English affect students' performance in practical activities (e.g., lab work)?

Yes ☐

No ☐

Section Four: The Relationship between English as a Medium of Instruction on Learners Subject Matter Performance

14. Do you believe English influences the quality of students' performance in research and scientific projects?

Yes ☐

No ☐

15. Which types of performance would you advise English teachers to focus on?

Academic performance (exam results, comprehension of content) ☐

Cognitive performance (analysis, critical thinking, problem-solving) ☐

Communicative performance (scientific writing, presentations, discussions) ☐

Skill-based performance (lab work, practical application of knowledge) ☐

Section Five : Further Suggestions :

16.Please add any suggestions regarding the role of English as a medium of instruction and its impact on Biology students' performance

……

……

Appendix2: Students , Questionnaire

Dear students ,

You are kindly invited to take part in this questionnaire, which is part of a study Exploring How English as a medium of Instruction influences your understanding and Performance in Biology. It also looks at the role of English for Specific Purposes (ESP) in supporting your Academic development.

Section 1 : Background Information (1Q_3Q)

1.What is your Gender?

_Male ☐

_Female ☐

2. What is your Academic major?

_Microbiology ☐

_Biochemy ☐

_Agroecology ☐

_Ecology ☐

_Plant Biotechnology ☐

_Health Biotechnology ☐

3.How long have you been studying English?

_10–12 years ☐

_13–15 years ☐

_16–18 years ☐

_More than 18 years ☐

Section 2 : English as a Meduim of Instruction for Biology Students (4Q _8Q)

4.What is your current level of prefeciency in using English when learning Biology ?

_Biginner ☐

_Intermediate ☐

_Advanced ☐

_Profecient ☐

5.Do you think that using English as a meduim of instruction is required in Biology programs at the university level ?

_Yes ☐

_No ☐

6.Do you think that Biology would be easier if taught in English language ?

_Yes ☐

_No ☐

_May be ☐

7.Do you feel that using English in Biology class improves both your Science (Biology) and language skills (English) at the same time ?

_Yes ☐

_No ☐

8.How do you feel about learning Biology in English as the primary language of instruction ?

_It helps me undestand the subject matter ☐

_It makes learning more challenging ☐

_It has no effect on my understanding ☐

_I'm not sure ☐

Section 3 : Difficulties in Using English for Learning Biology (9Q_13Q)

9.How often do you struggle to understand Biology lectures delivered in English ?

_Always ☐

_Often ☐

_Sometimes ☐

_Rarely ☐

_Never ☐

10.Which of the following challenges do you face when learning Biology in English?

_Difficulty in answering Biology exam questions because they are written in English. ☐

_Difficulty in expressing ideas in English during Biology discussions or presentations. ☐

_Difficulty in taking notes in English during Biology classes. ☐

11.Which skill challenges you the most when learning Biology in English ?

_Reading ☐

_Writing ☐

_Listening ☐

_Speaking ☐

Section 4: English and Biology Learner's Performance (14-18Q).

12.what tools help student learn Biology English ?

_Teacher's explanation in English ☐

_Textbook and video in English ☐

_Translation tools (dictionnay or apps) ☐

_Pictures ☐

_ Notes ☐

13.Have you find the English module helpful in solving some of your English problems ?

_Yes ☐

_No ☐

14.Which Branche of English teachers Should concentrate on more ?

_ESP :Ex :Biology vocabulary , lab instructions ☐

_EAP :Ex :Writing reports , undestanding Academic articles ☐

_EOP : Ex : English used in research jobs ☐

_EST : Ex : scientific terms , lab safety procedures ☐

_EBE : Ex : Bussiness letters , economic presentations ☐

_ESS : Ex : Reading sociology articles ,discussing political issues ☐

15.Does learning Biology in English help you perform better ?

_Yes ☐

_No ☐

If yes , which areas of performance are better ameliorated ?

_Academic performance : Ex : Getting good grades in Biology Exams ☐

_Cognitive performance :Ex : Undestanding scientific ideas more easily ☐

_Communication performance : Ex : Giving a clear oral presentation to others ☐

_Skill – based performance : Ex : Writing short report or reading a Biology text in English ☐

Section 5 : Further Suggestions (16Q)

16.Add further suggestions about the role and the effect of English as a medium of instruction on your performance in Biology.

……

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Résumé

Cette étude a pour objectif d'examiner l'effet de l'usage de l'anglais en tant que langue d'enseignement sur les résultats académiques des étudiants de niveau licence dans un département de l'institut des Sciences Agronomiques et Biologiques . L'enquête adopte une méthode descriptive et analytique, basée sur deux questionnaires adressés aux enseignants et aux étudiants, afin de collecter des données quantitatives et qualitatives sur l'influence de la langue sur la compréhension des concepts scientifiques. Les résultats montrent que la plupart des enseignants admettent l'importance de l'anglais en raison de la prévalence des termes scientifiques, tout en signalant aussi les difficultés rencontrées par les étudiants en raison de leur maîtrise limitée de la langue. De leur côté, de nombreux étudiants ont exprimé un sentiment de frustration et un manque de motivation lié à la barrière linguistique, ce qui affecte leur engagement. L'étude conclut que l'utilisation de l'anglais sans un soutien linguistique approprié nuit aux performances académiques, soulignant ainsi la nécessité d'une formation préalable pour les étudiants, d'une préparation adéquate des enseignants et d'un cadre d'apprentissage équilibré.

Mots-clés : Anglais, langue d’enseignement, biologie, performance académique, barrières linguistiques, étudiants de l’enseignement supérieur.

الملخص

الغرض من هذه الدراسة هو دراسة كيفية تأثير اللغة الإنجليزية كلغة تعليمية على أداء طلاب السنة الثالثة في معهد العلوم الفلاحية والبيولوجية . استخدمت الدراسة نهجًا وصفيًا تحليليًا ، باستخدام استبيانين موجهان للأساتذة والطلاب ، من أجل جمع بيانات كمية وجودة حول تأثير اللغة على فهم المحتوى العلمي. أشارت النتائج إلى أن غالبية الأساتذة يعتبرون اللغة الإنجليزية ضرورية بسبب هيمنة المصطلحات العلمية في مجالهم ، لكنهم لاحظوا أن الطلاب يواجهون تحديات نتيجة اللامحدودية كفائاتهم اللغوية . من جهتهم, نقل الطلاب مشاعرهم بالإحباط ونقص التحفيز، مما يؤثر على تفاعلاتهم داخل القسم. وخلصت الدراسة إلى أن استخدام اللغة الإنجليزية دون الدعم اللغوي المناسب يؤثر سلبًا على الإنجاز الأكاديمي ، والذي يتطلب توفير تكوين لغوي مسبق للطلبة والتدريب الخاص للأساتذة ، وخلق بيئة تعليمية تأخذ في الاعتبار التوازن بين المحتوى العلمي والتحديات اللغوية.

الكلمات الرئيسية: اللغة الإنجليزية كلغة تعليمية ، علم الأحياء ، الأداء الأكاديمي ، الحواجز اللغوية ، طلاب التعليم العالي.