T.C. KOCAELİ ÜNİVERSİTESİ
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A COMPUTATIONAL INVESTIGATION OF ENGLISH-MEDIUM INSTRUCTION LECTURERS' VERBAL CLASSROOM DISCOURSES: A COMPARISON OF TURKISH AND INTERNATIONAL CONTEXT

(YÜKSEK LİSANS TEZİ)

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10.02.2021/5

KOCAELİ 2021

To my lovely family, husband and baby

ACKNOWLEDGEMENTS

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ABSTRACT

Gaining currency through the internationalization endeavors of higher education, "English-medium instruction" (EMI) is expanding at an unprecedented pace on a global scale. The exponential growth, for such a rapidly growing global phenomenon, has inextricably raised some language-oriented challenges for key stakeholders. Students' having troubles in comprehending their English-medium classes due to their insufficient levels of English proficiency is a fact beyond dispute, yet another aspect to be considered is, no doubt, classroom language performances of lecturers. To that end, the current research was designed on a classroom-based investigation into the lexical and linguistic analyses of EMI lecturers' verbal classroom discourses. It primarily aims to conduct lexical and linguistic analyses of EMI lecturers' verbal classroom discourses by examining a set of discursive dynamics (lexical diversity, situation model, and syntactic complexity) drawn from a computational text analysis tool, Coh-Metrix. Furthermore, it also aims to compare the lecturers' verbal classroom discourses at division and context level, pursuing the question of to what extent, if any, EMI lecturers' verbal classroom discourses vary in terms of the above-mentioned set of components depending on the division and context where they deliver their classes. To achieve these aims, a total of 32 EMI lecturers were selected from various EMI contexts of the world. The results of the quantitative analysis indicated that (i) the lecturers in Social Sciences delivered their classes utilizing more lexical variety compared to the lecturers in Positive Sciences, (ii) foreign EMI lecturers delivered their classes at a more lexico-syntactically complex level compared to the Turkish EMI lecturers. Several pedagogical implications were drawn based on the findings of the research.

Key words: English-medium instruction, classroom discourse, teacher verbal discourse, Coh-Metrix, linguistic features, lexical diversity, situation model, syntactic complexity

ÖZET

Yüksek öğretimi uluslararasılaştırma çabaları ile ivme kazanan "İngiliz dilinde öğretim" (İDÖ), küresel boyutta benzeri görülmemiş bir hızla büyüyor. Böylesine hızla büyüyen küresel bir olgu için bu denli bir büyüme, kilit paydaşlar için kaçınılmaz olarak bazı dil odaklı sorunları da beraberinde getirmiştir. Öğrencilerin yetersiz İngilizce yetkinlik seviyelerinden ötürü İngilizce öğretimde verilen dersleri anlama konusunda sıkıntı yaşadıkları tartışma ötesi bir gerçektir, ancak dikkate alınması gereken bir diğer husus da hiç şüphesiz yükseköğretim elemanlarının sınıf içi dil performanslarıdır. Buradan hareketle, mevcut araştırma İngiliz dilinde öğretim veren yükseköğretim elemanlarının sözlü sınıf söylemlerinin sözcüksel ve dilbilimsel analizine yönelik sınıf temelli bir araştırma üzerine tasarlanmıştır. Araştırma esas olarak hesaplamalı bir metin analiz aracı olan Coh-Metrix'ten elde edilen bir takım dilsel ve söylemsel dinamikleri (sözcüksel çeşitlilik, durum modeli ve sözdizimsel karmaşıklık) inceleyerek yükseköğretim elemanlarının sözlü sınıf söylemlerinin sözcüksel ve dilbilimsel analizlerini yapmayı amaçlamaktadır. Ayrıca, yükseköğretim elemanlarının sözlü sınıf söylemlerinin yukarıda belirtilen bileşenlere göre ne ölçüde farklılaştığı sorusunu gözeterek, sözlü sınıf söylemlerini ders verdikleri akademik bölüm ve bağlam düzeyinde karşılaştırmayı da amaçlamaktadır. Söz konusu amaçları gerçekleştirmek için dünyanın çeşitli ülkelerinden İngiliz dilinde öğretim veren toplam 32 İDÖ yükseköğretim elemanı seçilmiştir. Nicel analiz sonuçlarından elde edilen bulgular, (i) Sosyal bilimlerde ders veren yükseköğretim elemanlarının Pozitif bilimlerde ders veren yükseköğretim elemanlarına kıyasla daha fazla sözcük çeşitliliği kullanarak derslerini icra ettiklerini ve (ii) yabancı ülkelerdeki yükseköğretim elemanlarının, derslerini Türk yükseköğretim elemanlarına kıyasla sözcük-sözdizimsel karmaşıklık açısından daha zor bir seviyede icra ettiklerini ortaya koymuştur. Araştırmanın bulgularına dayanarak çeşitli pedagojik çıkarımlar yapılmıştır.

Anahtar kelimeler: İngiliz dilinde öğretim, sınıf söylemi, öğretmen sözlü söylemi, Coh-Metrix, dilsel özellikler, kelime çeşitliliği, durum modeli, sözdizimsel karmaşıklık

LIST OF ABBREVIATIONS

EFL   **:** English as a Foreign Language

ELF   **:** English for Lingua Franca

ELT   **:** English Language Teaching

EMI   **:** English Medium Instruction

ESL   **:** English as a Second Language

ESP   **:** English for Specific Purposes

FLMI   **:** Foreign Language Medium Instruction

HE   **:** Higher Education

L1   **:** First Language

L2   **:** Foreign/Second Language

MOI   **:** Medium of Instruction

MPLS   **:** Mathematics, Physics and Life Sciences

ORGANIZATION OF THE THESIS

The thesis is divided into six chapters.

Chapter I is the introductory chapter. It presents a brief overview of the focus of the research, significance, and purposes set in the light of the research questions.

Chapter II reviews the relevant literature concerning two main research fields within the theoretical frame, English-medium instruction and classroom discourse. Furthermore, it also presents the general overview of Coh-Metrix, an automated computerized software utilized as the chief research tool in the present research, hand in hand with the empirical studies conducted in relation to Coh-Metrix components.

Chapter III introduces the research methodology applied in the current research by means of the research participants, setting, design, tools, data collection, and analysis. Additionally, quality criteria are offered in the last section.

Chapter IV illustrates the findings of the quantitative analyses carried out in the light of the research questions and hypothesis set.

Chapter V is the discussion section. It discusses the findings unveiled from the research casting light on the relevant studies in the field.

Chapter VI presents the summary of the research in the light of some general remarks hand in hand with the pedagogical implications, suggestions, and limitations of the research.

INTRODUCTION

In parallel with the hegemonic status of English worldwide as the academic lingua franca (Galloway & Rose, 2015: p. v) coupled with globalization and internationalization of higher education (HE), English-medium instruction (henceforth EMI) - "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (Macaro, Curle, An, Pun & Dearden, 2018: p. 37) has been expanding at an unprecedented pace on a global scope, particularly for the last two decades. This exponential growth has undoubtedly been mirrored with a plethora of EMI research conducted in a wide range of topics (Macaro, 2018: p. 3). Yet, despite the bulk of studies yielded in a wide range of topics in the field of EMI research, the amount of empirical research in classroom discourse, particularly on how it is delivered, is quite scarce (Dearden, 2014: p. 2; Macaro et al., 2018: p. 36). Whereas the role of the classroom-based investigation into the EMI implementation is of paramount importance in order to gain insights into teaching quality and learning achievements. Besides, the existence of a number of deep concerns reflected from teachers and students as the key stakeholders regarding the delivery of lectures in EMI unfolds the need for more research to be conducted on a practical basis.

As a consequence of a considerable amount of research drawn from students' self-reported concerns and challenges as regards their English-taught classes (e.g., Evans & Morrison, 2011; Dafouz, Camacho, & Urquia, 2014; Hellekjaer, 2010), it is a widely-held fact that students have great difficulty understanding their classes. The issue was mostly attributed to their low English proficiency of them, yet the level of teachers' classroom discourses adopted to deliver their classes, more specifically their fine-tuning the output levels according to students' levels is another key factor to be taken into account for the establishment of comprehensibility (Dearden & Akıncıoğlu, 2016: p. 6). Furthermore, some research literature gathered from students' self-reported challenges in understanding their teachers unveils that students are deeply concerned about their lectures due to the presence of lexically and syntactically dense and unknown structures (e.g., Hellekjaer, 2010).

It is of prime importance to note at this point that previous studies conducted hitherto in this sense have often investigated EMI teachers' proficiency levels based on their actual performance, missing to address their fine-tuning the output levels according to students' levels as noted above (Dearden & Akıncıoğlu, 2016: p. 6). Whereas accommodation strategy, a very popular communication strategy adopted by native speakers or more proficient speakers making their language easier to enable better grasp of knowledge by non-native speakers, acts a very propelling force in students' performance. Known to all, since content subjects are taught through language in EMI, the grasp of disciplinary knowledge depends upon the ability to comprehend the language used. With this respect, having considered the students' language-related challenges understanding teachers' language, it is deemed that teachers' language performance is of paramount importance to help students cross the linguistic barriers, and thereby gaining success in the phenomenon (Doiz, Lasabagastar, & Sierra, 2013: p. 217).

To that end, the current research aims to conduct lexical and linguistic analyses of EMI lecturers' verbal classroom discourses by examining a set of discursive components drawn from a computational text analysis tool, *Coh-Metrix*. Furthermore, it also aims to compare the EMI lecturers' verbal classroom discourses at division and context level, pursuing the question of to what extent, if any, EMI lecturers' verbal classroom discourses vary in terms of the above-mentioned set of components depending on the division and context that they deliver their classes.

CHAPTER I

1. INTRODUCTION

This chapter presents a brief background to the research along with the other sections portraying the core rationale of the thesis as problem statement, significance and purpose of the research, and research questions. Furthermore, operational definitions emphasized throughout the research are offered in the last part.

1.1. BACKGROUND TO THE RESEARCH

In the increasingly globalized world, the unprecedented hegemony of English as the lingua franca of international communication has inextricably generated a considerable impact on many multidimensional aspects e.g., technology, science, business, tourism, and education (Crystal, 2003: p. 11; Graddol, 2006: p. 87; Kachru, 1986: p. 143; Swales, 1990: p. xi), yet its impact on education has indisputably been the most critical one inasmuch as it is the most sensitive domain serving for language (Karakaş, 2016: p. 1). With this respect, the incorporation of English into the language policies has been of urgent necessity for non-English speaking countries in order to be able to keep pace with the great challenge posed by globalization that is palpable virtually in any domain. In this vein, the English language has, for long years and even still, been adopted as a foreign language (EFL) or second language (ESL) in many educational settings worldwide, both of which represent the twin traditions of English language teaching (ELT) dating back to 19th century (Graddol, 2006: p. 85). However, in parallel with the globalization and internationalization movements being realized via "the Englishization of the education" (Hultgren, Gregersen, & Thøgersen, 2014: p. 2; Kirkpatrick, 2011: p. 212), the rapidly evolving developments have emerged in the pedagogic practices, curricula, and models, and hence English has undergone a major transformational change shifting from being taught as a foreign language (EFL)

to becoming an important educational tool to teach academic subjects (Briggs, Dearden, & Macaro, 2018: p. 2; Dearden, 2014: p. 4; Karakaş, 2016: p. 1; Rose, Curle, Aizawa & Thompson, 2019: p. 1). With this respect, a number of related trends and teaching approaches have emerged to meet the needs of global English (for in-depth information, see Airey, 2016: p. 95; Cenoz, 2015: p. 10; Dafouz, 2017: p. 170; Graddol, 2006: p. 81, Smit & Dafouz, 2012: p. 1).

English-medium instruction (EMI), as an ever-burgeoning global trend, no doubt, has come to the forefront as one of the most prominent and recent endeavors. As defined by Macaro et al. (2018), it is "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language (L1) of the majority of the population is not English" (p. 19). It is a research-proven fact that EMI, "a rapidly growing global phenomenon" (Dearden, 2014: p. 2) has been witnessing a rapid increase in all phases of education and educational settings across the globe (Coleman, 2006: p. 4; Doiz, Lasagabaster, & Sierra, 2013: p. 16 ; Earls, 2016: p. 3; Fenton-Smith, Humphries & Walkinshaw, 2017: p. 2), particularly in HE due to the internationalization and marketization endeavors of universities driven by economically, socio-culturally and politically-oriented motives. Many HE institutions across the world have rushed to catch up with the global trend of adopting English as the medium of instruction in order to "gain a global status" (Coleman, 2006: p. 4) in the market and hence captured a very sharp rise in the number of academic programmes offered in English (with full or partial). Predictably and indisputably, the drastic explosion of the phenomenon has echoed the ongoing research literature, and a considerable amount of research in a wide spectrum of topics has been conducted in the field of EMI research, particularly after the millennium, with the aim of gaining insights into the global phenomenon developing at such a remarkable speed (Macaro, 2018: p. 3). However, the EMI research field dominated by stakeholders' perceptions and attitudes (Macaro, 2018: p. 52) has also suffered from the lacuna of research in classroom discourse, especially for exhibiting the actual kind of classroom practice (Macaro et al., 2018: p. 1). Bearing in mind the fact that the swift increase of the implementation has raised some concerns in relation to the quality of the implementation, and effective teaching and learning endeavor, classroom discourse

research has become a matter of urgent need in order to be able to attain closer understanding into the problems faced on the implementation.

1.2. STATEMENT OF THE PROBLEM

"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" (Dearden, 2014: p. 4).

Being addressed in the above-mentioned definition, in the implementation of EMI, the delivery of content is maintained through the medium of language and more importantly, the language utilized to deliver content is, most presumably, neither students' native language nor that of teachers. With this respect, the emergence of a number of deep concerns and language-oriented challenges from the sides of both students and teachers - as the key participants or stakeholders - is not a coincidence, even indispensable. In the light of a considerable amount of research conducted by many researchers and commentators in this vein (e.g., Kirkgöz, 2014; West et al., 2015), it is widely held that EMI students, despite being aware of the linguistically- and instrumentally-oriented benefits of studying in English-taught programmes (Bozdoğan & Karlıdağ, 2013: p. 89; Byun et al., 2010: p. 435: Khan, 2013: p. 25; Kirkgöz, 2005: p. 104) have difficulties understanding the classes when taught in English. This great challenge they face was often attributed to their inadequate general English proficiency levels (Başıbek et al., 2014: p. 5; Borg, 2016: p. 6; Cho, 2012: p. 23; Doiz, Lasagabaster & Sierra, 2011: p. 35), limited vocabulary knowledge (Dearden, Macaro, & Akincioglu, 2016: p. 54) or general linguistic deficiencies (Airey, 2011: p. 35).

Putting the student-oriented reasons aside, another key aspect worth considering at this juncture is, no doubt, lecturers' language performances. First and foremost, the role of teacher discourse in a classroom setting (for in-depth information, see Cazden, 1986; Walsh, 2006) is of paramount importance since it possesses such a propelling force to establish an effective learning environment touching on different kinds of student learning (Nystrand, 2006: p. 393). Considering the nature of EMI provision

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where content is taught through language, it is not wrong to assert that the role of teacher verbal discourse in EMI is certainly much more significant in that students have to learn the content-specific subjects which they may already have trouble understanding, through a language they again have trouble comprehending. With this respect, the language performances of EMI lecturers as content specialists in essence comes as a matter of crucial factor for the establishment of an effective learning environment as well as the maintenance of quality teaching and learning (Khan, 2018: p. 67) by catering for students' mastery of content-specific knowledge and thereby gaining success in EMI provision. Besides all, according to the research results on students' self-reported challenges as regards their English-medium classes (e.g., Evans & Green, 2007: p. 10, Hellekjaer, 2010: p. 51), unknown words and complex structures in their lecturers' discourses come at the forefront of the barriers to their successful learning, which could indicate the substantial role of classroom discourse levels adopted by EMI lecturers to deliver their classes, for the reason that lecturers' ability to calibrate their language according to students' English language levels is of paramount importance to cater for an effective content learning. Yet, as asserted by Dearden and Akıncıoğlu (2016: p. 6) in their seminal report, the issue of "lecturers' matching their language input with students' language levels and ability to understand" has not been much on the agenda before. The bulk of research conducted hitherto on EMI lecturers in this sense has focused on their actual proficiency levels (e.g., a threshold level required, being certificated to give a lecture, etc.) in relation to their linguistic competence, rather than their fine-tuning the output levels according to students' levels.

All in all, considering the lacuna in the research field as well as students' linguistic challenges in comprehending their classes, the need for more investigation into the lecturers' language performances comes to the fore.

1.3. SIGNIFICANCE AND PURPOSE OF THE RESEARCH

Gaining currency through the increasing globalization and internationalization of HE, EMI has been expanding dramatically on a global scope (Coleman, 2006: p. 4; Dafouz & Guerrini, 2009: p. x; Doiz, Lasagabaster, & Sierra, 2013: p. 5; Macaro et al., 2018: p. 36; Wächter & Maiworm, 2014: p. 50). The drastic expansion of EMI has inextricably placed upon it as "a booming and ever-burgeoning field of research" in the growing body of literature, and a considerable amount of research has been carried out in order to gain deeper insights into the phenomenon. Yet, despite the bulk of studies yielded in a wide spectrum of topics, as put forward by Macaro et al. (2018: p. 36) in their systematic review of EMI in HE, the number of classroom discourse studies exhibiting the actual kind of practice in the field of EMI research is quite limited (e.g., Dafouz, Nunez, & Sancho, 2007; Sánchez-García, 2019). Whereas classroom-based investigation into the implementation is of paramount importance in order to gain deeper insights into teaching quality and learning achievements for such a dramatically increasing phenomenon. Besides, it is widely held that the continued exponential growth of EMI as a relatively new phenomenon has brought some key concerns, particularly revolving around teachers and students' practices as the key stakeholders that could have high potential to impede the successful implementation (Aizawa & Rose, 2018: p. 2; O'Dowd, 2018: p. 2). In this vein, this may account for why the majority of studies in EMI research hitherto have been dominated surrounding teachers and students (Macaro, 2018: p. 52). Handled within this frame, in order to be able to gain deeper insights into the challenges, the need for more empirical research in classroom discourse, particularly on how it is delivered, as posited by Dearden (2014: p. 2), is a fact beyond dispute. The current research is thus of paramount importance pursuing the intention of casting light on such an underachieved area for the existing EMI research.

As noted in the above-mentioned discussion, the continued growth of EMI has raised some challenges impeding successful operation and gaining success on a practical basis. One of the key challenges concerned in the current research is the fact that EMI students have difficulty understanding their classes when taught in English. Students' proficiency levels are reported to be a deterministic role at this point,

teachers' adopted language levels are another key aspect worth being taken into consideration, especially considering the fact that teachers enjoy a very pivotal and propelling role in classroom discourse for shaping the nature of learning (Walsh, 2006: p. 10) and determining what is learned and how this phenomenon occurs (Wilkinson & Silliman, 2000: p. 337). In the case of EMI though, the issue can be regarded to be much more significant given that - by nature of EMI, content is delivered through a vehicle which is neither students' native language nor that of teachers (Macaro, 2018: p. 71), and students' good mastery of disciplinary knowledge and thereby gaining success depends upon the comprehension of language delivered by lecturers (Doiz, Lasagabastar, & Sierra, 2013: p. 217). Within this frame, since the current research was based on conducting the linguistic and lexical analysis of EMI lecturers' verbal classroom discourses under a set of discursive dynamics, this is another dimension that makes the research important.

Another perspective held in a national scope, having a relatively long history in Turkey, EMI has been implemented in Turkish HE setting for long years (Curle, Yüksel, Soruç, & Altay, 2020: p. 3). Many researchers and commentators have extensively researched the phenomenon in many multidimensional aspects (e.g., Başıbek et al., 2018; Curle et al., 2020; Dearden, Macaro, & Akıncıoğlu, 2010; Karakaş, 2016, 2019; Kirkgöz, 2005, 2009). Yet, it is not wrong to claim that there still needs to be shed light on many more perspectives to gain further insights into such a remarkable and popular phenomenon for Turkey. With respect to this, this research is of prime importance in elucidating at what point we stand as Turkey, in terms of the lexico-syntactic complexity of the classroom discourse levels adopted by Turkish EMI lecturers to disseminate their classes. More specifically, the pursue to respond to the question of to what extent, if any, there is consistency in classroom discourse levels of Turkish EMI lecturers when compared to other EMI lecturers from various contexts across the world, portrays another focal concern underlying this research. Furthermore, as regards this comparison, there has not yet emerged any study, to the best of my knowledge, focusing on the calibration of EMI lecturers' classroom discourse levels in a global context.

Taken all together, given the lacuna in the field of classroom discourse in the existing EMI research as well as the students' challenges in understanding their

teachers' language in EMI classes, the current research aims to conduct a computational lexical and linguistic analysis of EMI lecturers' classroom discourses, in a global context, by examining a certain set of discursive dynamics (lexical diversity, situation model, and syntactic complexity) drawn from a computational text analysis tool, *Coh-Metrix*. Furthermore, it also aims to compare the EMI lecturers' classroom discourses at division and context level, pursuing the question of to what extent, if any, verbal classroom discourses of EMI lecturers differ in terms of the above-mentioned set of dynamics depending on the division and context that they deliver classes. The research was correspondingly centered upon the three chief objectives:

(i) to scrutinize the lecturers' verbal classroom discourses on a set of linguistic and discursive dynamics (lexical diversity, situation model, and syntactic complexity)

(ii) to make comparisons on the lecturers' verbal classroom discourses in terms of these set of dynamics based on the division and context that they deliver classes

(iii) to identify whether there is consistency between the Turkish and foreign EMI lecturers in terms of the above-mentioned set of dynamics

1.4. RESEARCH QUESTIONS

With the purpose of fulfilling the stated purposes of the research, the research questions were accordingly posed as follows:

Research Question 1: Do EMI lecturers in Social Sciences significantly differ from those in Mathematical, Physical and Life Sciences (MPLS) in terms of three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity in their verbal classroom discourses?

Research Question 2: Do Turkish EMI lecturers significantly differ from foreign EMI lecturers in terms of three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity in their verbal classroom discourses?

Research Question 3: Is there a significant relationship between the verbal classroom discourses of Turkish and foreign EMI lecturers concerning three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity?

1.5. OPERATIONAL DEFINITIONS

The operational terms emphasized throughout the research are as follows:

Cohesion: A set of characteristics of an explicit text that play a paramount role in aiding readers mentally connect ideas in the text (Graesser, McNamara, & Louwerse, 2003)

Coherence: All the interactions between linguistic representations and knowledge representations (Graesser et al., 2014)

Coh-Metrix: A theoretically grounded computational linguistics facility that analyzes written and spoken texts on multiple levels of language and discourse representations (Graesser et al., 2014; McNamara, Graesser, McCarthy, & Cai, 2014).

English-medium instruction: The use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English (Macaro et al., 2018)

Lexical diversity: The measurement of how many different words that one uses in a productive language (Johnsson, 2008)

Situation model: A set of mental representations of events, people, and their relations in a text that are extracted from words, clauses, and sentences in a text (Zwaan & Radvansky, 1998)

Syntactic complexity: The range and degree of sophistication of the forms and structures that appear in language production (Ortega, 2003)

CHAPTER II

2. THEORETICAL FRAME AND REVIEW OF RELATED LITERATURE

This chapter aims to cast light on the review of related literature within the theoretical frame. First, the overview of two research fields, English-medium instruction (EMI) and classroom discourse is presented hand in hand with the relevant studies conducted. Next, a computational text analysis tool, namely Coh-Metrix as the chief research tool of the present research, along with the components utilized is succinctly offered by means of the related empirical studies in the field.

2.1. GLOBALIZATION AND ENGLISH LANGUAGE SPREAD

Driven by a multitude of triggering factors on a global scope in history, globalization is a complex phenomenon that has created enormous impacts on socioeconomic, cultural, political, and educational aspects of societies (Block & Cameron, 2002: p. 5; Tsui & Tollefson, 2007: p. 40). Education has undoubtedly come to the scene as the most sensitively affected domain under the sway of globalization given that it serves for language (Karakaş, 2016: p. 1) given the fact that globalization is closely associated with the increasing power and dominance of languages (Kirkgöz, 2009: p. 663), in particular the English language (Crystal, 2000: p. 13). Within this respect, it is a fact beyond dispute that globalization has been a pushing factor behind the emergence, evolvement, and dominance of English as a global language, and thereby gaining as a world language status (Chang, 2006: p. 515).

To illustrate the issue within the scope of historical background, starting its spread with the British colonial expansion in North America, Oceania, West Africa, South Asia, and South America (Fishman, Cooper, & Conrad, 1977: p. 39), English has sustained spreading in an indigenized, institutionalized form (Kachru, 1992: p. 48). In line with the influential events, political, and financial foundations such as the rise

of the United States in the aftermath of World War II, United Nations (1950), and World Bank (1945), English has gradually become prevalent across the globe, and hence functioning a lingua franca for banking, trade, popular media, science and technology, since all these have set the ground for a common language to communicate as an "international language". In a similar vein, Doğançay-Aktuna (1998: p. 25) touches upon the historical expansion of English as follows:

> As a result of sociopolitical and economic events, English began to spread in the non-colonised areas of the world after World War II via careful language planning. It gradually replaced French as the language of international diplomacy to become the lingua franca for trade, banking, tourism, popular media, science and technology. In order to gain access to these information networks, English was integrated into the education systems of many countries, even in officially monolingual areas, e.g., in the Middle East, Far East, and many European nations. (p. 25)

With a reference to what Doğançay-Aktuna (1998) noted in the aforementioned discussion, in order for non-English dominant countries to be able to cope with the global impact of English and keep pace with the rapid changes brought about by globalization evident virtually in all domains, the pursuit of integrating English into their educational and language policies came to the fore. To achieve this, English was taught as a foreign language (EFL) for long years at various levels of education, particularly in HE, and it has been the most studied compulsory subject in non-Anglophone contexts (Karakaş, 2016: p. 1). Yet, as a consequence of the internationalization and marketization movements of HE in the increasingly globalized world, English has undergone a major transformational change shifting from being taught as a foreign language (EFL) to becoming a tool to teach other academic subjects (Dearden, 2015: p. 4; Rose et al., 2019: p. 1; Karakaş, 2016: p. 1). Within this frame, English-medium instruction (EMI) "a growing global phenomenon" has emerged as an outcome of what Graddol (2006: p. 32) called, "the educational revolution" in the world. The following section presents in-depth information on EMI.

2.2. ENGLISH-MEDIUM INSTRUCTION (EMI)

"The use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (Macaro et al., 2018: p. 37).

2.2.1. Theoretical Background

The teaching of English as a foreign and second language, as the twin traditions of ELT dating back to the 19th century, has always, especially following World War II, been an important activity mostly due to the intense demand of immigrants, refugees, and foreign students in English courses in English-speaking countries such as the United Kingdom, the United States, and Canada (Graddol, 2006: p. 71; Richards, 2001: p. 26). However, in parallel with the enormous changes and radical developments in scientific, technical, and economic activities following World War II, the English language gained a new dimension in a way that communication came to the fore. This new commerce- and technology-driven world under the sway of globalization, post-colonization, and capitalism has undoubtedly created that English held a position as an *international language*, responding to the needs of non-native speakers for cross-cultural communication, business doing, and information sharing as a *lingua franca* (Teodorescu, 2010: p. 67). Along with all the emerging developments in technology and economics, as addressed by Kirkgöz and Dikilitaş (2018: p. 3), having own specific reasons and motives for learners of English came into prominence, and this surely created the need of using English as a field-specific knowledge in scientific interactions, occupations, and situations rather than intercultural interactions (Richards, 2001: p. 28). In other words, rather than utilizing as a mode of communication, the need of using as a specific purpose for academic mastery of language was born as a guiding principle, and hence English for Specific Purposes (ESP) emerged as a prominent field (Kirkgöz & Dikilitaş, 2018: p. 3). Over the years, ESP has gone through significant transformations in accordance with the changing approaches and pedagogical practices and responded to the academic and occupational demands needed. Yet over time, it has fallen behind in meeting the

increasing and changing needs of the academic community Moreover, in the increasingly globalized world, the ever-growing significance of English as an academic lingua franca as well as internationalization of HE institutions being realized via "the Englishization of the education" (Hultgren, 2018: p. 91) has inextricably entailed the emergence of a global phenomenon of English-medium instruction (EMI) – an educational system where academic subjects are taught through English. As defined by Macaro et al., (2018), it is "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (p. 37).

2.2.2. EMI as a Booming Global Phenomenon

Based on the abovementioned discussion posed hitherto, it is common knowledge that as a consequence of the economic, demographic, and technological developments worldwide, there has emerged what Graddol (2006: p. 70) calls "an educational revolution". Accordingly, the globalization of universities – the transformation of universities from local or national institutions into global ones that must compete for students, staff, and funding cropped up to keep pace with the new world order (West et al., 2015: p. 35). Needless to say, EMI is predictably the outcome of this unstoppable globalization of HE (Healey, 2008: p. 334) coupled with the burgeoning status of English as 'lingua academica' (Galloway & Rose, 2015; Hult, 2017, as cited in Aizawa & Rose, 2019: p. 1126).

Another propelling force behind the emergence and rapid expansion of EMI is, no doubt, "internationalization movements of HE sector" (Kirkpatrick, 2011: p. 4). Adopting the trend of Englishization of the curriculum (Galloway & McKinley, forthcoming; Rose et al., 2019: p. 1) to achieve internationalization, many HE institutions have been triggered by such motives as the need to gain a global status (Coleman, 2006: p. 4), the rivalry between public and private sectors (Dearden, 2014: p. 3), the need to attract more domestic and international students (Dafouz, 2017: p. 175), the need to have the reputation on the market (Graddol, 2006: p. 77), to draw international students and staff (Kirkpatrick, 2011: p. 5), enhancing the quality and

prestige of educational programmes (Nguyen, Walkinshaw, & Pham, 2017: p. 42), being among the top-ranking universities (Rauhvargers, 2013: p. 20) (please see Karakaş, 2016: p. 2 for a comprehensive list). To that wake, many HE institutions across the world endeavor to internationalize the education they offer by delivering the programmes in English (Ekoç, 2020: p. 231). Besides all, as put forward by Karakaş (2016: p. 2), some other external factors such as the Bologna Declaration (1999) signed by the European Ministers of Education to sustain the European Union education policy that was already debuted by the Erasmus Programme (Macaro, 2018: p. 4) accelerated the growth of EMI facilitating the student and academic staff mobility within the member countries.

In a nutshell, gaining impetus through the globalization and internationalization of HE sector as well as some other triggering factors, the phenomenon of EMI is expanding at a rapid pace on a global scale (see Dafouz & Guerrini, 2009; Macaro et al., 2018; Wächter & Maiworm, 2014). This exponential growth was also mirrored in a recent report conducted by EMI Oxford (The Centre for Research and Development in English Medium Instruction) with the collaboration of British Council to map the size, shape, and general trends of EMI on a global scale; accordingly, there has been a general trend worldwide towards the rapid expansion of EMI provision (Dearden, 2014: p. 2). Similarly, with regard to the drastic expansion of EMI, in his oft-cited book *'English Medium Instruction'* Macaro (2018: p. 1) asserts that EMI has been witnessing such a remarkable spread that it has been far beyond the control of policymakers and educational researchers to document precisely its expansion (Dafouz, Camacho, & Urquia, 2014: p. 226).

The exponential growth of the phenomenon has inextricably echoed the ongoing EMI research with a sudden explosion in the published research (Macaro 2018: p. 3). To accentuate the dramatic rise that has come to the fore, particularly in the last two decades, Macaro (2018) touches upon the issue as follows:

> Before the millennium, comparatively few journal articles were turning their attention to the phenomenon. A systematic search of EMI research, using online tools, carried out between 2015 and 2016 by a team of researchers at the University of Oxford found only 16 before the year 2000 and 299 after the year 2000. (p. 3)

With the intention of shedding light and gaining further insights into such a rapidly growing global phenomenon, many researchers and commentators have extensively researched the field from various contexts such as China (Hu & Lei, 2014; Macaro & Han, 2020; Rose et al., 2019; Zhang, 2018), Turkey (Arik & Arik, 2014; Başıbek et al., 2014; Curle et al., 2020, Dearden, Macaro, & Akıncıoğlu, 2016; Karakaş, 2016, 2019; Kirkgöz, 2009; Sert, 2008), Hong Kong (Zhang, 2018), Japan (Aizawa & Rose, 2018; Rose & McKinley, 2018), Malaysia (Ali, 2013), Spain (Ernesto, Munoz, & Lasagabastar, 2019), Denmark (Jensen & Thøgersen, 2011), Sweden (Malmström, Pecorari, & Gustaffson, 2016), Korea (Byun et al., 2011; Cho, 2012), Pakistan (Khan, 2013).

2.2.3. EMI in the World

In concordance with the dramatically increasing number of HE institutions that offer English-medium education, it is a crystal-clear fact that EMI has intensively been implemented in many various contexts, especially in non-English dominant countries today. Within this frame, for such a relatively new but rapidly growing phenomenon applied in many different contexts, a wide spectrum of issues around the implementation has inextricably come to the fore, each of which has become a deep matter of investigation in the field of EMI research.

As suggested by Karakaş (2016: p. 31) in his doctoral thesis, the issues revolve around in four main perspectives in general: *political and cultural* (e.g., potential threat of English to local culture, loss of national identity, domain loss), *pedagogical* (e.g., learners' comprehension of lectures and teachers, learners' tendency towards content learning, the role of questions in comprehension, learners' constraints, learners' challenges and strategies to cope with the challenges, the comparison of academic success in L1 and L2, learners' and lecturers' views of the effectiveness of EMI, general attitudes and perceptions towards EMI), and *linguistics* (e.g., the impact of EMI on students' English academic vocabulary or overall language proficiency).

In order to gain further insights into these issues, a considerable amount of EMI research has been conducted in many contexts in various geographical regions of the

world such as Asia-Pacific (e.g., China, Japan, Russia, Korea, Malaysia, Pakistan, Turkey) and Europe (e.g., Netherlands, Sweden, Denmark, Spain, Italy) (for a detailed overview on EMI HE research on a global scale, please see Macaro et al., 2018).

The field of EMI research has not been well-documented, to the best of my knowledge, in relation to the linguistic analyses of lecturers' classroom language performances, which is the focal concern of the present research. To that end, in this section, the research investigated in various perspectives and contexts, particularly in the countries or jurisdictions that capture a tremendous growth in its implementation, and documented by prominent researchers in the field shall be succinctly presented below.

Starting from the Asian context, it is of paramount importance to emphasize that top-down policy initiatives has considerably contributed to the exponential growth of EMI in East Asia countries (for a comprehensive study of HE in the Asia Pacific, see Fenton-Smith et al., 2017). For instance, through a set of key national policies to realize internationalization of HE in China (e.g., Project 985, Project 211, Double First-Class Programme, and the Belt and Road Initiative), EMI provision has been growing expeditiously in the Chinese HE context over the last two decades (Rose, McKinley, Xu, & Zhou, 2019: p. 5) experiencing a shift from inward-oriented to outward-oriented (Wu, 2018: p. 1).

In a similar vein, "Top Global University Project" (TGUP) debuted by Japanese Ministry of Education has been the chief driver behind the internationalization movement of HE in Japan which has led to the boom of HE programmes delivered in English (Rose & McKinley, 2018: p. 1). Within this frame, the policies and initiatives held have echoed the research carried out in these contexts, particularly in relation to the effectiveness or possible outcomes of the policies on the implementation.

One of the most-cited researches in the Korean context is the work of Byun et al. (2011: p. 431). In the study investigating the effectiveness of EMI implementation in HE with the help of student surveys, the results revealed that students were aware of EMI's possible and propelling outcomes for improving their English proficiency. However, the enforcement of the policies was a matter of deep concern due to their ignoring the proficiency levels of teachers and students as the key stakeholders.

Similarly, in a very recent study, Aizawa and Rose (2018: p. 1) conducted a study on EMI policy implementation in Japan, and they compared published EMI policy of HE institutions with the reports of EMI professors that were obtained through their in-class experiences. Students' interviews and questionnaires were also utilized to gain further insights into the micro-level practices in the lectures. It was concluded that challenges and affordances faced in EMI implementation were similar and consistent across macro-, meso-, and micro-levels.

In another study in the Japanese context again, Rose and McKinley (2018: p. 111) scrutinized the potential impact of their national project (TGUP) initiated to internationalize HE in Japan on language planning in tertiary education through the NVivo cluster analysis of publicly available documents of universities. The findings indicated that the new policy led to the emergence of a flexible English language education in Japan's HE institutions. In the Chinese context, Zhang (2018: p. 542) carried out a study on EMI national policies and initiatives by means of classroom observations and interviews gathered from three various universities. The findings revealed internationalization set the ground for Chinese students' studying abroad as well as attracting international students.

In a very recent report by EMI Oxford Research Group (Heath Rose, Jim McKinley, Xin Xu, and Sihan Zhou) in collaboration with the British Council in China, it was aimed to map the current EMI provision implemented through macro-, meso-, and micro-level policies as well as gaining future implications in Chinese HE. For this reason, Rose, McKinley, Xu, et al. (2019: p. 1) utilized a three-phase of data collection at three levels of policy implementation with the help of key stakeholders including university deans, heads of programmes, teachers, and students as well as universities' policy-related documents. According to the results, there has been a recent tendency from the bilingual model of EMI to English-only programmes. Furthermore, EMI provision was reported to trigger the internationalization and globalization, quality of teaching, students' talents. Lastly, another most highlighted result was that while there were many regulations focusing on teachers' language ability to teach through EMI, the number of regulations on students' ability to learn via English is relatively scarce.

As regards the European context that is the owner of the most systematic measurements of EMI HE growth (Macaro et al., 2018: p. 47; Galloway, Kriukow, &

Numajiri, 2017: p. 9), a highly sharp rise in the number of English-medium programmes in Europe has been well-documented by Maiworm and Wächter (2002), Wächter and Maiworm (2008, 2014) by means of most recent comprehensive studies mapping EMI endeavor with large-scale surveys. Accordingly, the Netherlands was reported to be the leading country with its highest number in EMI programmes, and this was respectively followed by Germany, Sweden, France and Denmark (Macaro et al., 2018: p. 48).

In the Spanish context in Europe, labeled as the most widely represented country in Macaro et al.'s study (2018: p. 45), Macaro, Munoz, and Lasabagaster (2019: p. 103) carried out a study on EMI teachers in Spanish universities that investigated their beliefs concerning professional development, certification as well as possible competencies they need for an effective course delivery. The findings gathered by means of interviews and questionnaires revealed that there has been an intense demand from the sides of teachers in taking professional development and certification despite the uncertainty regarding their implementations and financing issues.

Malmström, Pecorari, and Gustaffson (2016: p. 45) scrutinized EMI master's students' productive knowledge of English academic vocabulary in a technical university in Sweden that offers all degree programmes at the undergraduate level in EMI. Utilizing the corpus data recruited from both home and international students' first and second year of study texts, the researchers used the academic vocabulary list to investigate the knowledge and development of academic vocabulary by comparing home and international students. The results indicated that both groups of students did not significantly differ from one another regarding any of the measures of vocabulary (e.g., lexical sophistication and diversity). Additionally, lexical development across years of study was reported to be variable and somewhat mixed.

In the Danish context, Jensen and Thøgersen (2011: p. 13) conducted a study, with a focus on the national debate, to investigate the attitudes of Danish university lecturers towards a range of different issues regarding transition, macro as well as micro issues. In the descriptive study where data were collected from the largest university in the country through surveys, the results demonstrate both positive and negative attitudes to EMI and that the attitudes vary depending on lecturer age and proportion of teaching conducted in English. Specifically, younger lecturers and

lecturers with a higher teaching load in English were reported to be more positive towards the increase in EMI.

In a similar vein, another study that gave voice to the opinions of the teaching staff of EMI is the work of Doiz, Lasagabaster and Sierra (2011: p. 345). The aim of the study was to cast light on the impacts of the increasing hegemony of English in tertiary level multilingual education in Spain as well as Basque autonomous community in Spain, with the help of teachers' opinions regarding pedagogical and personal perspectives. Utilizing the data drawn from group discussions of teaching staff, the study was conducted at a multilingual Spanish university where Spanish, Basque, and English were used. According to the findings reported, EMI university lecturers generally reflected their positive attitudes to the multilingual education environment.

2.2.4. EMI in Turkey

Before discussing EMI endeavor in Turkey, I would like to briefly cast light on the place of English as well as the backstage of the foreign-language medium of instruction (FLMI) in the Turkish educational setting from a historical perspective, which set the ground for the emergence of EMI.

After the establishment of the Turkish Republic in 1923, numerous steps under the modernization and Westernization movements predictably enabled the establishment of strong ties with Europe and thereby western languages, especially French and German. However, in concordance with the political issues emerged in the aftermath of the Second World War, European influence began to fade away for Turkey, moving towards the superpower USA of that era (Doğançay- Aktuna, 1984: p. 27). With Turkey's becoming the ally of the USA in the aftermath of Second World War, the first seeds of English in the Turkish educational setting were planted since this alliance began the pervasion of English across the country (Karakaş, 2015: p. 4). As a consequence of the growing impact of the USA's economic and military power in the 1950s, English has gradually enjoyed the superpower to compete with French in Turkey (since French was then the preferred language for diplomacy, education, art

and literature, even medium of instruction in some cases) and kept up its drastic pervasion for long virtually in all domains, particularly in education. Correspondingly, it has, since then, had the privilege of being the most studied compulsory school subject in the Turkish education system (Karakaş, 2015: p. 4; Selvi, 2014: p. 134). More importantly, it has become "the most popular medium of education after Turkish" (Doğançay-Aktuna, 1998, p. 37), particularly in HE (for in-depth discussion for the English language in the Turkish education system, see Selvi, 2014).

To shed light on the history of foreign language as a medium of instruction (FLMI) in the Turkish HE setting, it is not a new phenomenon. The initial attempts to adopt a foreign language as a medium of instruction (MOI) date back to 1773 when the teaching of French was presented in military training institutions, in the Medical School (Mekteb-i Tıbbiye-i Adliye-i Şahane), and later in the School of Political Science (Mekteb-i Mülkiye) (Sarıçoban, 2012, as cited in Selvi, 2014: p. 138). French was then adopted as MOI in order to keep pace with the western innovations especially in medicine (Altay & Erçin, 2019: p. 578). After French was used as MOI for some time, the first attempt to deliver English-medium education in HE setting was initiated by the foundation of Robert College in 1863, the first American school established outside the USA (Minifie, 1998). Robert College, renamed as Boğaziçi University in the aftermath of its handover to the Turkish government in 1971, had the privilege of being the first English-medium institution in Turkish HE context (Karakaş, 2015: p. 5; Kirkgöz, 2005: p. 102). Subsequently, this was followed by the establishment of Middle East Technical University (METU) in 1956 in Ankara. Additionally, METU is of prime importance being the first state-founded English-medium university with the adoption of EMI in all programmes fully. All these initiatives beginning with METU and Boğaziçi University indubitably instigated the private sector as well. In 1984, as the first private-foundation funded EMI university, Bilkent University was gone down in the Turkish EMI HE history. Subsequently, many other state and private universities sustained the global trend of offering the programmes in full or partial EMI.

Spurred by many motives to gain a global status on the international market as in many other non-English speaking countries, Turkey has witnessed a highly rapid expansion of EMI programmes in the HE setting, especially over the last decade (West

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et al., 2015: p. 35). As to the question of what has made EMI so attractive and well-received in the Turkish HE context, first and foremost, it is a consequence of the need to respond to the global impact of English as the language of international communication (Kirkgöz, 2009a: p. 664; Kirkgöz, 2009b: p. 81) as in many other non-English speaking countries.

Known to all, the unprecedented spread of English has created an enormous impact on non-English speaking countries to shape their language policies because they had to cope with a major challenge posed by globalization, the English language (Tsui & Tollefson, 2007, as cited in Kirkgöz, 2009a: p. 663). Put simply, EMI has unequivocally been the natural outcome of the adopted policies with the aim of competing as a non-English country, in the increasingly globalized and internationalized new world. Handled within a deeper frame in the educational context, along with the marketization and internationalization of the HE sector across the globe, there have been manifold attempts from HE institutions in order to raise their international profiles (Galloway & McKinley, forthcoming). Given that internationalization is directly associated with the debut of English-medium HE teaching according to what Marsh and Laitinen (2005: p. 34) put forward, HE institutions across the world have increased the number of EMI programmes with the intention of drawing more international students and staff (Galloway & McKinley, forthcoming). Within this frame, Turkey took some steps such as the official membership to Bologna process in 2001, the launch of new EMI programmes in Turkish-medium universities, and also the foundation of new EMI universities in order to realize this internationalization of HE and thereby being competitive international market (Collins, 2010: p. 100; Karakaş, 2016: p. 3). Overall, all what posed hitherto portrays the core rationale behind the popularity of EMI in the Turkish HE context.

On the other hand, despite receiving great attention and popularity for the realization of internationalization and competitiveness in the global setting (Dearden & Macaro, 2016: p. 460; Wächter & Maiworm, 2014: p. 50), English medium education, rather FLMI, has always been a matter of controversy for Turkey as an officially monolingual country not having a colonial past as well (Curle et al., 2020: p. 1). As noted by Selvi (2014: p. 141), the medium of instruction debate is essentially referring to the anti-English movement. Perceived as a point of division and

polarization in the Turkish educational context (Selvi, 2014: p. 140), EMI inextricably leads to discrepancy among academics, policymakers, legislators, and politicians releasing in favor of and against arguments. Within an overall framework, opponents of EMI have centered their arguments on national concerns proposing that it debilitates the national language (Arslantunalı, 1998: p. 78), leads to dispossess the Turkish language (Aslan, 2017: p. 14), and gives rise to isolation in society (Duman, 1997: p. 25).

All in all, spurred by many above-mentioned motives, EMI has taken the position of a top broadening research field in the literature being investigated by many researchers in the Turkish context (e.g., Atik, 2010; Başıbek et al., 2014; Karakaş, 2016; Kirkgöz, 2005, 2009, 2014; Oktay & Dikilitaş, 2017; Soruç, Dinler, & Griffiths, 2018; Soruç, & Griffiths, 2018; Turhan & Kirkgöz, 2018; Selvi, 2014) in a wide array of research topics.

2.3. CLASSROOM DISCOURSE

Classroom discourse – "the interactions between all the participants that occur throughout a lesson" (Van de Walle, Karp, Lovin, & Bay-Williams, 2014: p. 20) is an essential component of instruction catering for the construction, acquisition, and transmission of knowledge between teachers and students within a classroom community (Hu & Li, 2017: p. 185). More specifically, being regarded essential to teaching and learning in second language classrooms in particular (Walsh, 2006: p. 10), it forms a basis for gaining insights into actual practices in relation to the quality of teaching and learning on a practical basis, since as posited by Wilkinson and Silliman (2000), "to a great extent, the language used by teachers and students in classrooms determines what is learned and how learning takes place" (p. 337).

In this vein, having portrayed the key role of classroom discourse in gaining an effective teaching and learning environment by creating an embracing and supportive setting for all its members (Gonzalez, 2008: p. 90; Sanchez, 2008: p. 55), the pursue of how to encourage and scaffold a classroom community through discourse has long

been a matter of deep investigation in various fields of research (Lloyd, Kolodziej, & Brashears, 2016: p. 291).

2.3.1. Classroom Discourse and EMI

The swift growth of EMI has posed some sort of challenges for students and teachers as the key stakeholders. Considering the nature of the implementation where disciplinary knowledge is transmitted through a language that is neither students' native nor that of teachers (Macaro, 2018: p. 52), the case is evidently clear. Within this frame, bearing in mind the paramount role of classroom discourse in forming an effective teaching and learning endeavor as posed above, it can be profoundly deemed that, in order to be able to attain a close understanding for the problems faced on a practical basis in EMI, there has emerged the need of classroom-based investigation into how the implementation occurs. Yet, as posited by Macaro et al. (2018: p. 1) in their systematic review of EMI in HE, there has existed a lacuna of classroom discourse studies exhibiting the actual practice in the existing body of literature. Whereas considering the multilingual and multicultural context of EMI, it can be deemed that the research in practical basis is of paramount importance to better understand how an effective classroom communication can be facilitated in order to gain a successful operation since second language classrooms cover "a dynamic and complex series of interrelated contexts" where interactions are at central (Walsh, 2006: p. 1).

In the case of EMI, 'to gain success' is directly linked with students' comprehending the course content delivered in English by content lecturers (for more information, see Rose et al., 2018: p. 40), which could indicate the paramount significance of lecturer language performance in classroom discourse. Put specifically, the fact that students experience great challenges in understanding English-offered classes indisputably unveils the importance of lecturers' ability to perform their language in such a way that students could grasp the content knowledge and thereby attain success. It is of prime importance to note at this juncture that while students'

levels are another, maybe even the first, significant dimension to be considered in this sense, yet "lecturers' ability to present information at a comprehensible level" (Dearden & Akıncıoğlu, 2016: p. 6), namely 'rough-tuning their language according to their students' is a highly critical aspect that needs to be considered, particularly when considering the fact that teacher language performance affects different kinds of student learning (Nystrand, 2006: p. 393).

In a nutshell, the overall picture posed hitherto obviously evinces the need and significance of empirical investigation into EMI classroom discourse by mirroring the actual practices of both students and lecturers as the key stakeholders to cater for an effective and successful operation. Notwithstanding the focal concern of this research is essentially on lecturer verbal discourse, student challenges- particularly from the scope of comprehending their lectures- were also placed in order to better understand and provide deeper insights into the role of lecturer language. Hence, the following sections present the relevant literature that existed in EMI research.

2.3.1.1. Key Language-Related Challenges of EMI Students in Understanding Lectures

A considerable amount of research carried out in manifold contexts hitherto (e.g., Bozdoğan & Karlıdağ, 2013; Dafouz et al., 2014; Ellili-Cherif & Alkhateeb, 2015; Evans & Morrison, 2011; Hellekjaer, 2010; Kirkgöz, 2014; Vinke, 1995) have indicated a very common result that students' asserting that they learn course contents more easily when offered in their L1 rather than English due to their lack of English proficiency and vocabulary knowledge. When the existing body of literature was reviewed, it is very possible, virtually in all studies conducted, to encounter the issue of students' insufficient English proficiency drawn from their self-reported beliefs (Macaro et al., 2018: p. 52). In Cho's (2012: p. 156) study in Korea, for instance, students expressed deep concerns about their limited English proficiency and, due to this insufficiency they asserted that they have to cope with comprehension challenges to catch the major points of classes in English. In another study by Ellili-Cherif and Alkhateeb (2015: p. 212) in Qatar, the impact of student English language proficiency

on content learning was explored, and as a consequence of surveying 295 students studying EMI programmes, it was concluded that students gained more content learning during the lectures delivered in their L1 MOI.

In a similar vein, Kang and Park (2005: p. 155) carried out a study in the Korean context again on various levels of students' proficiency (low, intermediate, and high) that were determined through their own assessments. Inferential statistics utilized in the study showed a statistically significant relation between students' levels of proficiency and the degree of trouble they face to comprehend lectures. Concurrent results were also deduced in many other contexts.

Besides, students' claims on their lack of proficiency concur with those of their lecturers, which surely makes the overall picture serious. For example, in a study conducted by Choi (2013: p. 275) in the Korean context, students' low English proficiency levels were reported by their lecturers as the greatest barrier to effective learning, even to 'an access to an EMI programme' (Doiz, Lasagabaster, & Sierra, 2011; Napoli & Sourisseau, 2013, as cited in Macaro et al., 2018: p. 53). In a similar vein, Borg (2016: p. 2) in Iraqi Kurdistan context found out that lecturers are deeply concerned about the low proficiency levels of their students that are only a bit above the elementary level, which is a highly problematic issue for EMI. Concurrent results were also captured in many other contexts as in Rogier's (2012) and Airey's (2011) studies in Arabic and Swish contexts.

Predictably, the insufficient English proficiency and vocabulary knowledge of students are considered one of the most critical obstacles of successful implementation of EMI endeavor (Aizawa & Rose, 2019: p. 1126) given that they pose great barriers to such critical dimensions required for effective learning as taking note from academic papers (Andrade, 2006: p. 139), understanding lectures and lecturers (Hellekjær, 2010: p. 44), understanding lecturer accents (Tange, 2010: p. 137) and thus make content comprehension more challenging. Therefore, the issue, one of the hotly-debated topics dominating EMI research, has been well-documented by many researchers and commentators in the research field hand in hand with the possibly emerging outcomes on EMI success. For example, in the Turkish context as posited by Kirkgöz (2005: p. 101), students' having insufficient vocabulary knowledge was argued as a great challenge in understanding academic texts. Similarly, in Cho's (2012: p. 135) study,

students' lack of proficiency in English gives rise to the limited comprehension of the lectures making their content learning harder. Similar findings were also unveiled in a longitudinal study in Hong Kong, which found out students' language insufficiencies impeded their comprehension of lectures as well as discussions and textbooks (Evans & Morrison, 2011: p. 204). Other language challenges included understanding specialist vocabulary (in reading), speaking clearly and accurately and understanding lecturers' accents.

All in all, it is a well-documented fact that EMI students' insufficient proficiency levels and vocabulary knowledge in the English language pose a number of great challenges that impede effective content learning, which could be directly linked to gaining success on the implementation. Within this respect, the case has inextricably brought to minds, as another key factor to be taken into account, the paramount role of lecturers' delivering their classes at such a level that students could overcome their comprehension challenges and realize effective learning.

2.3.1.2. The Role of Lecturer Verbal Discourse on EMI Implementation

The overall picture exhibited in the abovementioned discussion unveils the fact that student proficiency level is a highly critical aspect for the establishment of an effective and successful operation of EMI. Yet, another aspect to be considered in this vein is, no doubt, the classroom discourse level of lecturers they adopt to deliver their courses. With a reference to this issue, Dearden and Akıncıoğlu (2016) claimed: "… the students' level of English is of course important, but so is the lecturer's ability to present information at a comprehensible level" (p. 6). The case rationally makes much more sense when considering EMI students' deep concerns and great challenges in understanding lectures, due to those stemming from their lecturers' language in particular. To illustrate this, in Hellekjær's (2010: p. 46) study carried out in Norway and Germany, students reflected their deep concerns regarding the lack of comprehension due to unfamiliar and unintelligible words and expressions dominating the lectures.

Despite the fact that the nature of course contents in EMI is, to a great extent, to demand an intellectual and advanced academic language in terms of vocabulary, genre, and complexity of structure (Macaro, 2018: p. 80), it is another indisputable fact that lecturers' ability to calibrate their language levels according to students' English language levels is of paramount importance to cater for an effective content learning. However, the issue of "lecturers' matching their language input with students' language levels and ability to understand" (Dearden & Akıncıoğlu, 2016) has not been much on the agenda before. The bulk of research conducted hitherto on EMI lecturers in this sense has focused on their actual proficiency levels (e.g., certification to give a lecture, a minimum threshold or benchmark required, etc.) regarding their linguistic competence, rather than their fine-tuning the output levels according to students' levels. Whereas the fact that students' effective content learning in EMI is directly adhered to be able to comprehend the language presented by content lecturers in English, and additionally that students' coping with a number of linguistic challenges to comprehend lectures portray, no doubt, the significance of lecturers' ability to adopt such a fine-tuned level of language that was calibrated according to target student level. Furthermore, this surely contributes to attaining new and deeper insights into why and how students face troubles in understanding their lectures according to what Macaro, Dearden and Akıncıoğlu (2016: p. 6) asserted.

Within this frame, the case could be closely associated with what has come to literature "accommodation strategy" (also named communication or discourse strategy) (see Björkman, 2011; Dörnyei & Scott, 1997; Poulisse 1990) in second language research, a very popular communication strategy that native speakers or more proficient speakers are finetuning or calibrating the utterance according to the audience in order to make their language more comprehensible, and thereby to help students achieve learning goals.

From the standpoint of EMI, in the light of all the above-mentioned discussion in relation to the language-oriented challenges students face in understanding English-medium courses, it might be deeply deemed that the existing nature of EMI implementation makes the utilization of the strategy ineluctable (Khan, 2018: p. 65). In this vein, the issue was also mirrored by a study conducted by Tsai and Tsou (2015: p. 399) in the Taiwan context. In the study that investigated EMI lecturers' use of

accommodation strategies focusing on their verbal discourses, the results yielded that lecturers utilized six types of effective accommodation strategies for (i) level of content difficulty, (ii) students' language proficiency, (iii) student feedback and (iiii) teachers' language proficiency.

Some other researchers also scrutinized such strategies, with a highly similar perspective into EMI classroom discourse, based on native-speaker lecturers (e.g., Flowerdew & Miller, 1992, 1996), lecture comprehension strategies (e.g., Flowerdew & Miller, 1996, Flowerdew, Miller, & Li, 2000) and discourse markers and questions (e.g., Dafouz & Nuñez, 2010; Dafouz-Milne & Sánchez García, 2013).

In a study carried out by Flowerdew and Miller (1996: p. 23), for instance, as a follow-up study to Flowerdew and Miller (1992: p. 60) the researchers investigated how native English-speaking lecturers delivered their courses to non-native speaking students. In a similar vein, in a third stage of a longitudinal study, utilizing the previous findings of Flowerdew and Miller (1992, 1996), Flowerdew, Miller, and Li (2000: p. 116) conducted a study with a focus on the investigation into lecturing in English non-native speakers of English students in Hong Kong drawing on the perceptions, problems and strategies of both by non-native speaking students and native–speaking lecturers. The common finding unveiled from all series of ethnographic studies is that lecturers utilized various types of accommodation strategies by modifying their languages in order to help students comprehend the lectures (Miller, 2002, as cited in Sarah, 2013: p. 67).

As regards EMI lecturer discourse, a considerable amount of research has been well documented in the existing body of literature, despite focusing on such other aspects, varying from the scope of the current research: speech rate adopted in L1 and L2 (Thøgersen & Airey, 2011), the use of pragmatic strategies (Björkman, 2011), translation and code-switching (Airey, 2009; Riera & Arévalo, 2013), and different types of questions (Dafouz-Milne & Sánchez García, 2013).

Within another but very related respect, it is a widely-held view that *academic language scaffolding* (see Gibbons, 2002; Walqui, 2006) is a very propelling force in students' performances, especially considering the nature of EMI implementation that fundamentally requires adoption of academic language with such components as

content-specific vocabulary, complex grammatical structures and morphologically dense words (for detailed information, see Cummins, 2003; Goldenberg, 2008; Stahl & Nagy, 2006).

Regarding the issue, Macaro (2018) comes up in his oft-cited book with such an explanation:

> … The nature of the content is likely to be more intellectually demanding and the academic language needed to express and communicate is likely to be more advanced in terms of vocabulary, genre and complexity of structure. (p. 80)

Accordingly, it is not wrong to assume that this intellectually and academically advanced language of the endeavor may well explain students' lack of comprehension due to the intense complex structures and unknown words in their lecturers' verbal discourses based on their own views, which directly portrays the significance of the utilization of academic language scaffolding by EMI lecturers during their classes. With this respect, the study of Yeh (2014: p. 308) which examines EMI students' attitudes to English-taught courses in Taiwan poses a good example as regards the issue. Students' revealing positive comments about their abilities to comprehend the courses were most probably linked to their teachers' utilization of several techniques benefited to assist students to cope with their language-oriented challenges.

In a nutshell, it is a fact beyond dispute that on EMI implementation students' comprehension challenges due to both academic advanced language and intellectual nature of content courses impede successful and effective learning, and this issue has inextricably burdened EMI lecturers' shoulders. Having considered the pivotal and propelling role of lecturer discourse in creating different kinds of student learning (Nystrand, 2006: p.393), it is of prime importance for EMI lecturers to capture a language level in a way that students could grasp the content meaning and realize effective learning that could be achieved via the 'fine-tuning the output language according to target audience' and 'academic language scaffolding'.

2.3.1.3. Disciplinary Differences on EMI Implementation

Disciplinary differences have long been on the research agenda and extensively discussed in the field of general educational research (e.g., Becher 1989; Neumann 2001; Neumann & Becher, 2002, Quinland, 1987; Shulman, 1987), particularly in relation to how and to what degree the nature of teaching varies across disciplines, which is highly critical to gain insights into pedagogic preferences and language practices employed by teachers in a teaching environment. From the scope of EMI, even though the issue has garnered little attention hitherto in the field of EMI research, especially in Europe (Kuteeva & Airey, 2013: p. 3), it has deputed to become one of the recent hotly-debated topics, especially regarding the impact of disciplinary differences on language choice and use on EMI implementation (Dafouz & Smit, 2016; Hyland, 2013; Kuteeva & Airey, 2014)

Prior to reviewing the research literature, it could be of benefit to recall the widely-held categorization of disciplines set by Becher (1989, 1994): hard pure (natural sciences, e.g., chemistry or physics), hard applied (science-based professionals, e.g., engineering), soft pure (humanities and social sciences, e.g., history, anthropology), and soft applied (social professions, e.g., education, management studies). First and foremost, given that each academic discipline reflects its own characteristics, specific language features, set of terminology, conceptual differences, and discourse practices both at the macro-level (e.g., the schematic and rhetorical structure of academic genres) and the micro-level (e.g., lexico-grammatical features, formulaic language) (Kim, Kim, & Kweon, 2018: p. 113; Kuteeva & Airey, 2013: p. 7; Soren, 2013: p. 26), this issue surely will have an influence on teaching performances of teachers, more specifically on the language used by teachers to both communicate and transmit the content knowledge. Furthermore, considering the intensive academic content-dependent nature in the EMI implementation (Macaro, 2018: p. 80), it might be deemed that the influence of academic disciplines on teachers' discourse practices in EMI is highly critical.

The research on the disciplinary differences in EMI has mainly focused on the attitudes to the use of English (e.g., Bolton & Kuteeva, 2012; Jensen et al., 2009; Jensen & Thøgersen, 2011; Pecorari, Shaw, Irvine, & Malmström, 2011). However,

there has existed virtually no study, to the best of my knowledge, which has investigated how disciplinary differences affect teachers' language performances at the micro-level, in particular, linguistic features (e.g., morpho-syntactic dynamics). Therefore, the most relevant research findings in the existing body of literature that could be considered to utilize, in the closest way, in the current research were presented below.

Viewed as prominent research in the related field, Neumann (2001: pp. 135-137) conducted an in-depth review of research findings on disciplinary differences as well as their impacts on teaching and learning. According to the highlighted points, differences regarding teaching and learning across various disciplines revolve around (i) preparation time, (ii) research supervision, and (iii) some other points. For instance, while hard disciplines are based on more facts and concepts, soft disciplines are based on promoting thinking skills. As another important difference discussed in the review was that the most preparation time for classes was needed by soft pure lecturers.

In their study with a focus on language-domain registers, Chung and Nation (2003: p. 103) compared vocabulary usage across various disciplines in applied linguistics in order to see how technical vocabulary usage varies across disciplines. Through the analysis of texts in each discipline, they found out that the number of technical words in hard applied sciences (e.g., anatomy) was much more than those of soft applied sciences (e.g., applied linguistics).

With respect to the impact of academic disciplines on classroom interaction, from the standpoint of students, Lo (2011: p. 93) compared 22 different lessons in a secondary school in Hong Kong in terms of academic disciplines. The results demonstrated that students spoke much longer in humanities classes when compared to science classes. Furthermore, this was interpreted due to the fact that soft sciences are more verbal than hard sciences, and thereby creating more opportunities for student discussion.

In a more recent study carried out by Westbrook & Henriksen (2013: pp. 24-26) that sought to investigate the relationship between various academic disciplines and teaching performance with a pilot study, the researchers scrutinized university lecturers' (non-native speakers at an advanced level) collocational competence in their

discourses with the help of analyzing their vocabulary usages based on various categories. The research findings demonstrated that lecturers of Math as a hard pure science utilized more field-specific collocations compared to other lecturers in other sciences.

Disciplinary differences were also reflected in some other studies, which did not focus on investigating the issue. In Dearden and Macaro's (2016, p. 471-472) study which was normally based on actual teacher beliefs regarding their general proficiency levels, some HE EMI lecturers delivering classes in Positive Sciences asserted that very deep knowledge of the language was not needed for themselves in technical disciplines suggesting that the number of words used in their classes was highly low due to the plethora of formulae dominating their classes. Similar beliefs of teachers lecturing in Positive Sciences were also reflected in their work of Tan and Lan (2011: p. 12) in a secondary context. The beliefs posited by teachers regarding their language use are considered to stem from the fact that natural or hard sciences tend to be based on a shared terminology when compared to soft sciences which rely on the construction of knowledge in a flexible and creative manner as posited by Kuteeva and Airey (2014: p. 538).

2.4. AN AUTOMATED TEXT ANALYSIS TOOL: COH-METRIX

2.4.1. About the Tool

Advances across many disciplines such as *computational linguistics* (Allen, 1995; Jurafsky & Martin, 2000); *discourse processing* (Graesser, Gernsbacher, & Goldman, 2003; Kintsch, 1998) and *corpus linguistics* (Biber, Douglas, Conrad, & Reppen, 1998) have paved the way for the studies that require a much broader analysis of higher-order text components in rhetorical and linguistic style since traditional approaches do not extend beyond word-level for the natural language studies (McCarthy et al., 2007). Within this frame, *Coh-Metrix,* a web-based software text analysis tool, has come at the forefront as the recent popular computational and

statistical technique to measure linguistic and discourse dynamics of the language (Graesser et al., 2004: p. 193).

Coh-Metrix[1] is a computational web-based programme to measure linguistic and discourse representations of written and spoken texts on multiple levels (McNamara et al., 2005; McNamara & Graesser, 2012; McNamara et al., 2014) via a set of principal components each of which is further subdivided into discrete indices.

Harnessing a multilevel framework of discourse comprehension identified at six theoretical levels; words, syntax, text base, situation model, genre, and pragmatic communication level (Grasser & McNamara, 2011: p. 371, Graesser et al., 2004: p. 196), it gauges deeper and surface levels of textual features (Kim & Lim, 2019: p. 455).

The tool covers 108 indices categorized under 11 main components: (1) descriptive statistics (2) text easability (3) referential cohesion (4) latent semantic analysis (LSA) (5) lexical diversity (6) connectives (7) situation model (8) syntactic complexity (9) syntactic pattern density (10) word information and (11) readability

Out of these 11 components, 3 sets of components with their 19 indices in total were chosen for the scope of the current research. These components: (1) lexical diversity, (2) situation model, and (3) syntactic complexity. In the following sections, these components were succinctly presented along with the empirical research in the related literature.

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[1] Coh-Metrix 3.0, which is available for public use over the Internet, it can be freely accessed at http://cohmetrix.com/

2.4.2. Lexical Diversity

Lexical diversity, one of the paramount aspects of vocabulary, is simply the variety of words that one uses in a productive language. Based on the definition posed by Johansson (2008: p. 61), it refers to the number of lexical words used in a text or speech.

Within the theoretical frame, although some researchers (e.g., Arnaud, 1984; Daller, van Hout, & Treffers-Daller, 2003; Wimmer & Altmann, 1999) use lexical diversity and lexical richness interchangeably, some other researchers (e.g., Laufer, 2003; Read, 2000) assert that they are two distinct concepts. Lexical diversity is perceived as referring to the range and breadth of vocabulary knowledge in any piece of language (Malvern, Richards, Chipere, & Duran, 2004: p. 3), rather than the depth of vocabulary knowledge which is related to lexical richness.

With respect to the measurement, it is based on the measurement of how many different words are used with the help of a number of distinctive parameters (Johansson, 2008: p. 1). The rationale here is that the more varied vocabulary a text possesses, the higher lexical diversity is. Predictably, for a text or speech to be highly lexically diverse, possibly different words have to be used with little repetition of the words (Johansson, 2008: p. 62). One of the significant measurements is the ratio of types and tokens (TTR) in a text (Malvern & Richards, 2002: p. 85; Templin, 1957). While each unique word in a text is considered a word type, each instance of this particular word is a token. That is, types refer to the number of different items, tokens indicate the total number of words used (Nation, 2001). However, as posited by Nation and Webb (2011: p. 24), TTP suffers the sensitivity for measuring long texts since as texts get longer, there may have fewer chances for new words to appear. To that wake, another significant measure of lexical diversity proposed by Duran et al. (2004) is *D* measurement.

In relation to the research literature, since research on lexical diversity has essentially focused on its measurement, little attention has been paid to the relationship between lexical diversity and language proficiency (Wang, 2014: p. 68). Nevertheless, overall language proficiency (e.g., Malvern & Richards, 2002; Nation & Webb, 2011), quality of speaking (e.g., Read, 2000; Yu, 2009), and quality of writing (e.g., Engber,

1995; Jarvis, 2002; Yu, 2009) are among the research topics that have received the most scholarly attention.

Overall, a very common result is that lexical proficiency is highly correlated with productive language proficiency, suggesting a higher score on lexical diversity is widely held to be indicative of greater linguistic skills and competence (Avent & Austermann, 2003: p. 397; Ransdell & Wengelin, 2003: p. 22). Put specifically, more proficient language users tend to possess more diverse vocabulary when compared to the ones at a lower proficiency level (Crossley, Salsbury, & McNamara, 2011: p. 561; Ferris, 1994: p. 414) as similarly Read (2000) argued that a more proficient language user is regarded to utilize a larger semantic network than less proficient ones. Additionally, the fact that learners at a higher proficiency level generally possess a more sophisticated vocabulary (Crossley & McNamara, 2009: p. 119) has also been well-documented (see Laufer & Nation, 1995).

In a study conducted by Read and Nation (2006: p. 207), 88 English language users with various oral language proficiency levels in the IELTS speaking test (between 4-8 Band) were compared in terms of their lexical usages. The results indicated that the ones with higher scoring bands yielded a wider range of vocabulary than those in the lower bands in terms of type-token ratio.

Ferris (1994: p. 414) carried out a study to explore lexical aspects of students' writings with the help of a corpus of 160 ESL student essays at four various L1 groups. The groups were classified into two groups as advanced and lower through three different graders' rating the essays. The results revealed that the advanced group utilized a higher level of lexical and syntactic features than the lower group. The result again supports the view that higher language proficiency is strongly correlated with the use of a higher level of lexical and syntactic features.

Another study carried out by Yu (2009: p. 236) examined the impact of lexical diversity on speaking and writing quality. To achieve this, a corpus of 200 compositions and 25 interviews was gathered. The results that were obtained through the measurement *D* demonstrated that lexical diversity is positively and significantly correlated with writing and speaking quality.

In a more recent study, Crossley, Salsbury, and McNamara (2011: p. 561) scrutinized the impact of the lexical indices in predicting the language proficiency of learners. The results demonstrated that as the proficiency levels increased, so did the lexical diversity. Advanced language learners utilized greater lexical diversity than those at the beginner level of proficiency. Put differently in relation to the writing proficiency, lexical variation and length of the essays were also held to be powerful indicators of the quality of L2 writing (Engber, 1995: p. 141; Mellor, 2011: p. 121). To summarize, the utilization of lexical variety at a higher level was concluded as a strong indicator of a language user at a higher proficiency level.

2.4.3. Situation Model

In parallel with the influential developments in the fields of cognitive psychology and discourse processing, the notion of situation model has been much more extensively utilized in language and discourse comprehension receiving great scholarly attention (e.g., Graesser & McNamara, 2011; Graesser, Singer, & Trabasso, 1994; Kintsch, 1998; van Dijk & Kintsch, 1983; Zwaan & Radvansky, 1998). Put simply, it refers to the level of mental representation of a text which goes beyond explicit words and sentences (Graesser & McNamara, 2011: p. 376; van Dijk & Kintsch, 1983; Zwaan & Radvansky, 1998: p. 165). Furthermore, it is comprehenders' mental representations or inferences when activated by a given context and encoded in the conceptual representation (Goldman, Braasch, Wiley, Graesser, & Brodowinska, 2012: p. 360; McNamara & Kintsch, 1996: p. 249; Singer & Leon, 2007: p. 166; Wiley et al., 2009: p. 1089).

The rationale behind situation models is that the set of ideas extracted from words, clauses, and sentences in a text is transformed into the mental representations of events, people, and their relations, and these representations are called situation models (Zwaan, 2001: p. 137). Accordingly, situation models are perceived to be "mental microworlds" rather than the representations of the text itself. Mental representations are of high necessity for gaining a deeper level of text comprehension since the concept is closely associated with language and discourse comprehension as well as memory retrieval in the related field.

From the standpoint of discourse comprehension, the notion could be represented at five dimensions of deep comprehension: causation, intentionality (goals), time, space, and protagonist (people) (Chafe, 1979; Gernsbacher, 1990; Givon, 1992, as cited in Zwaan & Radvansky, 1998: p. 167). Inasmuch as situation models are defined as 'the models of the events', and events principally cover such interrelated components as participants, objects, causes-effects, time, place, plans, goals within itself to facilitate comprehension, a lack of continuity in one or more of the above-mentioned dimensions leads to break in cohesion and cohesion breaks lead to difficulty in comprehension or inference creating (Rapp, van den Broek, McMaster, Kendeou, & Espin, 2007: p. 292; Zwaan & Radvansky, 1998: p. 166). Therefore, connectives, transitional phrases, adverbs and other signaling devices play a substantial role to be able to perpetuate the continuity providing causal, temporal and intentional cohesion (Dowell, Graesser, & Cai, 2016: p. 76; Graesser et al., 2014: p. 345).

With respect to the empirical studies, two studies were found to be most relevant with a focus on language learning and discourse comprehension. Zwaan and Brown (1996: p. 289) explored the impact of language proficiency and comprehension skill on the construction of situation model ability during third grade twelve college students' narrative comprehension sessions on English and French stories. The results that were based on the comparison of the students' verb-clustering task scores in both languages, the students yielded more explanatory inferences and constructed stronger situation models in English than in French. It was also concluded that more skilled comprehenders yielded more explanatory inferences and stronger situation models compared to less skilled comprehenders.

In a similar vein with a focus on language comprehension again, in their very recent study Raudszus, Segers, and Vergoeven (2019: p. 106) investigated the role of text base memory and situation model construction in first and second language reading comprehension. Data were collected from fourth-grade 76 monolingual and 102 bilingual children by means of pathfinder network approach which is based on the evaluation of textbase memory and situation model construction ability through a set of linguistic and cognitive predictors (working memory, nonverbal reasoning, decoding, vocabulary, and grammar). As the other component, reading comprehension

was assessed through a standardized task. The findings indicated neither predictor (decoding, nonverbal reasoning, working memory, textbase memory and situation model building) significantly differ between L1 and L2 readers. Furthermore, while L2 readers were reported to be more efficient decoders than L1 readers, L1 readers dominated in the other cognitive and linguistic components (grammar, vocabulary, and reading comprehension). Lastly, the ability of situation model construction was the component that predicted the reading comprehension at maximum.

2.4.4. Syntactic Complexity

As defined by Skehan (1996: p. 46) "the stage and elaboration of the underlying interlanguage system", syntactic complexity is a key linguistic aspect that could be viewed as a representative of linguistic processing and product (Halliday, 1991). According to the definition posed by Ortega (2003), syntactic complexity (syntactic maturity or linguistic complexity) refers to "the range of forms that surface in language production and the degree of sophistication of such forms" (p. 492).

Within the frame of language learning, the concept is regarded as a paramount construct of language development and proficiency inasmuch as it is closely associated to be an indicator of language proficiency (Jagaiah, 2016: p. 18) posed by Bachman's (1990) conceptual model of learning. Accordingly, more proficient language users tend to create longer sentences with more complex and sophisticated structures (Cooper, 1976: p. 179; Crossley, Weston, McLain-Sullivan, & McNamara, 2011: p. 282; Ferrari, Bouffard, & Rainville, 1998: p. 473; McNamara, Crossley, & McCarthy, 2010: p. 57), as in a similar vein what Foster and Skehan (1996: p. 299) suggested "syntactic complexity at a higher level signifies adopting a greater variety of sentence patterns, or increasingly more elaborate language".

Syntactic complexity has received a great amount of scholar attention in the field of second language learning (Norris & Ortega, 2009: p. 557) since it is widely held to be strongly indicative of L2 proficiency, development, and progress (Bulté & Housen, 2014: p. 43; Polio & Yoon, 2018: p. 2). Therefore, syntactic complexity as a comprehensive field of study has extensively been researched in the existing body of literature by many researchers and commentators (e.g., Foster & Skehan, 1999;

Chandler, 2003; Ellis & Yuan, 2004; Lu, 2011; Wu & Ortega, 2013) under various measurements and aspects (Kuiken et al., 2019: p. 3) in relation to both written and oral proficiency, especially written proficiency (Iwashita, 2006: p. 151).

Cumming et al. (2005: p. 5) investigated the relation between syntactic complexity and various proficiency levels with the help of discourse texts written by various proficiency levels of students. They reported that more proficient learners utilized more complex language in terms of lexical and syntactic complexity as well as accuracy and fluency.

For another study investigating syntactic complexity in relation to proficiency levels, McNamara, Crossley, and McCarthy (2010: p. 57) scrutinized 120 argumentative essays of university students represented at high and low-proficiency levels according to the measurement of two syntactic complexity sub-components on Coh-Metrix. The results demonstrated that high-proficiency essays utilized a greater number of words before the main verbs when compared to low-proficiency essays, which indicates a higher syntactic complexity for high-proficiency essays.

In her seminal research on L2 writing, Ortega (2003: p. 496) explored the relationship between syntactic complexity and various learner proficiency levels by means of a collection of college-level writings. Syntactic complexity was measured with the utilization of six different measures including the mean length of a clause. The analysis findings revealed that may be a statistically significant difference between proficiency level and syntactic complexity if the differences are slightly over a word and the sample is large.

A later study that similarly examined the correlation between English writing proficiency and syntactic complexity as well as some other aspects is the work of Benzehaf (2017: p. 43). According to findings, a strong correlation was observed between the proficiency and complexity. However, Becker (2010: p. 407) conducted a very similar study to explore how syntactic complexity varied based on various proficiency levels. Yet, no significant difference was measured across the levels.

In her study aiming to investigate the relationship between syntactic complexity and oral proficiency, Iwashita (2006: p. 151) conducted a study on L2 Japanese learners at various proficiency levels. The findings revealed that syntactic complexity

that was measured through the length of T-units differed significantly among the high and low proficient learners. The number of dependent and independent clauses yielded by high proficient learners was more than those of low proficient ones.

In a similar vein, Iwashita, Brown, McNamara, and O'Hagan (2008: p. 24) utilized a set of syntactic complexity measures (per T-unit, mean length of utterance, and dependent clause and verb phrase ratio) in order to determine whether syntactic complexity was positively correlated with proficiency levels. Using five different proficiency levels of students' L2 English oral data, they reported that the mean length of utterances was the only measure that is positively correlated with increasing proficiency levels.

The study of Crossley et al. (2011: p. 282) is another study that sought to investigate the components of syntactic complexity across various proficiency levels of students by means of such measurements: the mean number of words before the main verb, the mean number of constituents per word, and the average number of modifiers per noun phrase on a computational tool, Coh-Metrix. The results gained by means of the analysis of 31 student essays found out more proficient students utilized more syntactically sophisticated sentences compared to low proficient ones. Furthermore, all grade levels significantly differed from each other in terms of the average number of modifiers per a noun phrase.

Besides, syntactic complexity has also comparatively been researched in the existing body of literature, particularly for the native and non-native speakers of English. In a comparative study in the Chinese context, Rong-gen (2016: p. 351) carried out Coh-Metrix analyses of two vocational college English textbooks in order to understand the impact of some set of discursive features on students' reading comprehension. According to the main finding of the study, unsurprisingly, while short sentences utilizing more familiar content words and simpler structures facilitate students' comprehension, the texts covering syntactically long and complex structures with intensely modified noun phrases and lexical diversity make their comprehension harder.

Another comparative study again but in the Korean context is Kim and Lin's study (2019: p. 5). With the purpose of diagnosing the corpus-based differences

between Koreans' English writings and their corresponding Google translations, researchers compiled 60 samples of doctoral dissertations in the field of applied linguistics including both Korean and English abstracts. They compared the English abstracts written by authors in the dissertations (human writing) with the English abstracts translated by Google from their corresponding Korean abstracts (machine writing) at five main categories of Coh-Metrix (descriptive statistics, lexical aspects, readability, syntactic complexity, and cohesion). The findings yielded significant differences on (i) syntactic complexity concluding that Google translations used more verbs before main verbs and longer sentences; and (ii) readability revealing that human writings were more readable. Though, lexical aspects were not concluded to significantly differ between the groups.

Azadnia, Lotfi, and Biria (2019: p. 232) in their recent corpus-based research compared the dissertations of Iranian ELT Ph.D. students with those of English natives Ph.D. students in terms of four specific measures including syntactic complexity. To achieve this, they scrutinized 83 text excerpts of Iranian Ph.D. students and 94 text excerpts of English Ph.D. students which were drawn from 10 dissertations for both groups, by utilizing the tool Coh-Metrix. Of the four measures, while there was a significant relationship between two corpora in terms of 'mean number of modifiers' and 'sentence syntax similarity'; 'left embeddedness' and 'minimal edit distance' were only found out to be similar.

CHAPTER III

3. METHODOLOGY

This chapter presents the applied methodology of the research in light of the basic methodological components of research design, context, participants, instruments, data collection, and data analysis. Furthermore, the section of quality criteria is offered in the last section.

3.1. RESEARCH DESIGN

As noted beforehand, the current research principally pursues to conduct lexical and linguistic analyses of EMI lecturers' verbal classroom discourses and then compare them at various levels. Accordingly, the research was centered upon the three chief objectives:

(i) to scrutinize the lecturers' verbal classroom discourses on a set of linguistic and discursive dynamics (lexical diversity, situation model, and syntactic complexity)

(ii) to make comparisons on the lecturers' verbal classroom discourses in terms of these set of dynamics based on the division and context that they deliver classes

(iii) to identify whether there is consistency between Turkish and foreign EMI lecturers in terms of the above-mentioned set of dynamics

With the interest of maximally catering for the objectives set above, it should be noted at first that the thesis was essentially designed as qualitative empirical research inasmuch as it is based on the computational investigation of EMI lecturers' verbal classroom discourses concerning linguistic, syntactic, and textual features by means of an automated text analysis tool, Coh-Metrix, since as posited by Gaskell (2000: p. 349), empirical research methods are often utilized through the application of

observation and experience to research questions posed rather than being grounded in theory alone in order to attain deep insights into patterns, behaviours, contexts, and relationships.

More specifically, a descriptive research design was adopted in the current research since descriptive research aims to describe a phenomenon utilizing qualitative and naturalistic data in its own naturally occurring setting without any intervention or manipulation of variables (Dörnyei, 2007: p. 38; Nassaji, 2019: p. 129). Furthermore, since such research is more concerned with what rather than how or why something happened, (classroom) observation and survey tools are often utilized to gather data, and data generally collected qualitatively is often analyzed quantitatively with the help of statistical analyses in order to gain further relationships, comparisons, and in-depth evaluations (Gall, Gall, & Borg, 2007: p. 488). Correspondingly, the present research is descriptive in nature since it simply focuses on the classroom observation of lecturers under their natural circumstances both in Turkey and abroad context. Additionally as suggested in the above-mentioned rationale, qualitatively collected data were converted into numerical data by the researcher with the help of automated computerized software, Coh-Metrix, subsequently, it was analyzed quantitatively through descriptive and inferential statistics to have elaborate relations and interpretations.

Besides, given that one of the focal concerns of the present research is to make comparisons of EMI lecturers' verbal classroom discourses at various levels, the thesis also follows a comparative research design. As suggested by Bryman (2012: p. 72), comparative research is carried out to compare the relationship of two or more meaningfully cases or situations to comprehend the logic behind social phenomena. Accordingly, in order to better understand whether EMI lecturers' some set of linguistic and lexical dynamics in their verbal discourses vary depending on the teaching context they are involved in as well as academic division they deliver courses for, a comparative research design was utilized.

3.2. SETTING

As the current research principally aims to scrutinize and compare language performances of EMI lecturers from various contexts of the world, with the intention of maximally catering for the research objectives situated in a global setting, lecturers were exerted to be chosen from a possibly wide spectrum of EMI contexts in manifold regions of the world to meet the context diversity by increasing representativeness. Correspondingly, a total of 32 EMI lecturers were recruited from 10 countries: *Russia, Switzerland, China, Netherlands, Germany, Egypt, Israel, Italy,* and *Japan* along with *Turkey.*

3.3. PARTICIPANTS

32 EMI lecturers chosen from 10 various EMI contexts across the world comprise the participants of the research. With respect to the sampling methods employed, two sampling methods were utilized in the current research. First, the lecturers were chosen on the basis of convenience sampling (Dörnyei, 2007: p. 129; Mackey & Gass, 2012: p. 81) according to their accessibility to the researcher to investigate the Turkish and abroad context. Additionally, purposive sampling (Bryman, 2012: p. 418) was adopted to realize the context diversity in a way that lecturers were selected from various universities from Turkey and abroad. Besides, these lecturers were non-native speakers of English and also citizens of the countries they were purposefully chosen from in order to serve for the implementation of EMI. Furthermore, to compare the lecturers' language use at the academic division level, lecturers were recruited from two academic divisions, Social Sciences and MPLS.

As discussed elaborately in Section 1.3, the thesis was principally designed on conducting computational linguistic analyses of the EMI lecturers' verbal classroom discourses in terms of lexico-syntactic and textual dynamics by comparing at two levels: (i) academic division and (ii) teaching context. Therefore, the participants of the research were categorized based on a certain set of labels depending upon the aims set.

To clarify the basic concepts illustrated in Table 1, at the context level, the lecturers were grouped as *Turkish* or *Foreign lecturers* according to their teaching contexts where they deliver their lectures. At the division level, 32 academic disciplines delivered by the lecturers were classified according to the related divisions of the disciplines as *Social Sciences* or *Mathematical, Physical and Life Sciences (MPLS)*. For the categorization of division, the framework for Divisions and Departments by Oxford University (ODDF, University of Oxford, 2020) was referred in order to inhibit the discrepancy on 'course - academic programme - division' classification that differentiates from country to country, university to university. Of four-division categories laid by ODDF (Social Sciences, Medical Sciences, Humanities, and Mathematical, Physical and Life Sciences (MPLS), the data met only two divisions as *Social Sciences* and *MPLS*. For an overall illustration of the participants categorized with all these labels, please see the Table 1.

Tablo 1

Distribution of Participants at Context and Division Levels

Lecturer	Context	Academic Discipline	Division
1		International Nuclear Law	MLPS
2	Russia	Engineering Mechanics	MLPS
3		Nuclear Reactor Physics	MLPS
4		Contemporary Russian Literature	Social Sc.
5	Switzerland	Computing Magic, Art and Science	MLPS
6		Doping, Sports, Organizations and Sciences	Social Sc.
7	China	Discrete Mathematics	MLPS
8		Exploring Psychology's Core Concepts	Social Sc.
9		Econometrics Methods and Applications	MLPS
10	Netherlands	Robot Operating Systems	MLPS
11		Sustainable Food Security	Social Sc.
12	Germany	Software Engineering Essentials	MLPS
13	Egypt	Ancient Egyptian Civilization	Social Sc.
14	Israel	Art and Design in the Digital Age	Social Sc.
15	Italy	Comparative Research Designs and Methods	Social Sc.
16	Japan	Introduction to Animal Ethics	Social Sc.
17		Automatic Control Systems	MLPS
18		Computational Geometry	MLPS
19		General Chemistry	MLPS
20		Set Theory	MLPS
21		General Physics	MLPS
22		Probability and Random Variables	MLPS
23		Quantum Mechanics	MLPS
24	Turkey	Introduction to Modeling and Optimization	MLPS
25		Contemporary Sociology Theory	Social Sc.
26		History of Art and Architecture	Social Sc.
27		Law and Institutions of the European Union	Social Sc.
28		World Mythology	Social Sc.
29		Introduction to Psychology	Social Sc.
30		Contemporary Philosophy	Social Sc.
31		Fundamentals of Entrepreneurship	Social Sc.
32		Developmental Psychology	Social Sc.

Accordingly, the distribution of the participants based on the division and context levels was illustrated in Table 2. As clearly seen, the number of the participants at both levels is 32.

Tablo 2

Descriptive Statistics of Participants at Context and Division Levels

	Turkish	Foreign
Social Sciences	16	16
Mathematical, Physical and Life Sciences (MLPS)	16	16

3.4. INSTRUMENTS

Data collection for the current research encompasses the following research instruments and tools:

- Distance educational platforms in which the EMI courses were drawn in Turkish and abroad context
- A questionnaire applied to some Turkish lecturers to determine which Coh-Metrix categories to be utilized for conducting lexical and linguistic analysis of their verbal classroom discourses
- *Coh-Metrix*, a computational text analysis tool to conduct the lexical and linguistic analyses of the lecturers' verbal classroom discourses

3.4.1. Distance Educational Platforms

A wide range of academic disciplines delivered by EMI lecturers was obtained through the utilization of distance educational platforms as weekly sessions in video/audio formats. All they were subsequently transcribed verbatim.

3.4.2. A Questionnaire to Determine Coh-Metrix Categories

As shall be discussed elaborately in the next section 3.4.4., Coh-Metrix is a computational tool that produces cohesion and coherence metrics for written and spoken texts (see McNamara et al., 2005; McNamara et al., 2014; McNamara & Graesser, 2011). The tool contains a total of 108 indices of linguistic and discourse representations categorized under 11 main components, each of which can be regarded as a separate broad research topic in the related field (e.g., referential cohesion, semantic analysis, syntactic pattern density, syntactic complexity, etc.). To that wake, with the aim of narrowing down the categorical abundance and thereby mapping the frame of the research, a questionnaire was designed to determine what Coh-Metrix categories to be utilized in order to conduct lexical and linguistic analyses of EMI lecturers' verbal classroom discourses in the present research.

In the questionnaire prepared by the researcher in Turkish (via Survey Monkey), a list of 11 Coh-Metrix categories was presented in brief and simple explanations with their subcategories to make abstract notions concrete and thereby facilitate better conceptualization of some technical terms (See Appendix B). It was asked the participants (EMI lecturers as the actual practitioners of the implementation) to rank these 11 categories as a set of dynamics shaping their verbal classroom discourses-from most important to least according to the role they attribute in facilitating student comprehension in English-medium classes.

The questionnaire, after minor revisions obtained from two informed experts with Ph.D. degrees in the field, was sent to some other EMI lecturers in Turkey. During the process, the participants were encouraged to share the link to other EMI lecturers they know in order to realize the "snowball sampling effect" (Baltar & Brunet, 2012), and a total of 31 EMI lectures responded to the questionnaire.

3.4.3. An Automated Text Analysis Tool: Coh-Metrix 3.0

Coh-Metrix, the chief research tool utilized in the present research, is a computational web-based programme to measure linguistic and discourse representations of written and spoken texts on multiple levels (McNamara et al., 2005;

McNamara & Graesser, 2012; McNamara et al., 2014) via a set of principal components each of which is further subdivided into discrete indices (See Appendix A). Harnessing a multilevel framework of discourse comprehension identified at six theoretical levels 'words, syntax, text base, situation model, genre, and pragmatic communication level' (Grasser & McNamara, 201[1]: p. 371), it gauges deeper and surface levels of textual features (Kim & Lim, 2019: p. 20).

The tool covers 108 indices categorized under 11 main components: (1) descriptive statistics (2) text easability (3) referential cohesion (4) latent semantic analysis (LSA) (5) lexical diversity (6) connectives (7) situation model (8) syntactic complexity (9) syntactic pattern density (10) word information and (11) readability

Drawing on the questionnaire results applied to the EMI lecturers as the actual practitioners of the implementation, the mostly rated 3 sets of components with their 19 indices in total were chosen for the current research. These components: (1) lexical diversity, (2) situation model, and (3) syntactic complexity.

Table 3 illustrates the description of the components with their subdivided indices.

Tablo 3

Coh-Metrix Components Employed for the Research

Category	Indices	Description
Lexical Diversity	LDTTRc	Type-token ratio, content word lemmas
	LDTTRa	Type-token ratio, all words
	LDMTLDa	MTLD, all words
	LDVOCDa	VOCD, all words
Situation Model	SMCAUSv	Causal verb incidence
	SMCAUSvp	Causal verbs and causal particles incidence
	SMINTEp	Intentional verbs incidence
	SMCAUSr	Ratio of casual particles to causal verbs
	SMINTEr	Ratio of intentional particles to intentional verbs
	SMCAUSlsa	LSA verb overlap
	SMCAUSwn	WordNet verb overlap
	SMTEMP	Temporal cohesion, tense and aspect repetition, mean
Syntactic Complexity	SYNLE	Left embeddedness, words before main verb, mean
	SYNNP	Number of modifiers per noun phrase, mean
	SYNMEDpos	Minimal Edit Distance, part of speech
	SYNMEDwrd	Minimal Edit Distance, all words
	SYNMEDlem	Minimal Edit Distance, lemmas
	SYNSTRUTa	Sentence syntax similarity, adjacent sentences, mean
	SYNSTRUTt	Sentence syntax similarity, all combinations, across paragraphs, mean

3.4.3.1. Lexical Diversity

Lexical diversity refers to the variety of unique words (types) that occurs in a text in relation to the total number of words (tokens). While each unique word in a text is considered a word type, each instance of this particular word is a token. When the number of word types is equal to the total number of words (tokens), this indicates a maximum lexical diversity since all of the words are different. In that case, it might be deemed that the text is likely to be either very low in cohesion or very short. On the contrary, a low lexical diversity score is held to be indicative of high cohesion as words are used multiple times across the text. Coh-Metrix employs three measurements in lexical diversity: Type-token ratio (TTR), the measure of textual lexical diversity (MTLD), and the measure of vocabulary diversity (VOCD).

Type-token ratio (TTR) (Templin, 1957) measuring content words only simply means the number of types divided by the number of tokens of these words. It is an indication of the comprehensibility of a text as being closely associated with word repeat and decoding within the discourse context. As regards the others, while VOCD is obtained through a computational procedure that fits TTR random samples with ideal TTR curves, MTLD is calculated by the mean length of sequential word strings in a text that maintains a given TTR value.

3.4.3.2. Situation Model

The notion of situation model extensively used in discourse processing and cognitive science refers to the level of mental representation of a text which goes beyond explicit words and sentences (Zwaan & Radvansky, 1998: p. 167). It also refers to the subject matter content that the text describes (Dowell, Graesser, & Cai, 2016: p. 76). More specifically, it could be viewed as comprehenders' mental representations or inferences when activated by a given context and encoded in the conceptual representation (Goldman et al., 2012: p. 360). In a narrative text for instance, the situation model includes the characters, objects, spatial settings, actions, events, processes, plans, thoughts and emotions of characters, and other details about the story. In an informational text, on the other hand, it corresponds to the substantive subject matter (i.e., domain knowledge, topic) (Graesser et al., 2004: p. 196).

Situation model is represented at five dimensions of deep comprehension: causation, intentionality (goals), time, space, and people (Zwaan & Radvansky, 1998: p. 170), and a lack of continuity on one or more of these dimensions results in a break in cohesion and cohesion breaks lead to difficulty in comprehension or inference creating. Hence, connectives, transitional phrases, adverbs, and other signaling devices have a substantial role to provide the continuity. Within this respect, Coh-Metrix measures the situation model by utilizing multiple measurements of causal, temporal, and intentional cohesion via a set of indices (Dowell, Graesser, & Cai, 2016; Graesser et al., 2014).

3.4.3.3. Syntactic Complexity

Theories of syntax ascribe words to part-of-speech categories (e.g., nouns, adjectives, verbs), group words into phrases or constituents (noun-phrases, verb-phrases, prepositional-phrases, clauses) by constructing syntactic tree structures for sentences. Some sentences follow a short and simple syntactic pattern with few, if any, embedded clauses as well as an active voice rather than passive. Syntactically complex sentences though comprise much more embedded clauses with modified phrases, which denotes a heavier load on working memory given the fact that shorter sentences are syntactically easier to process for having few words before the main verb and few words per noun-phrase. Within this frame, the component of syntactic complexity on Coh-Metrix is able to scale texts on such a variety of syntactic dimensions (e.g., the number of words before the main verb, the number of modifiers per noun phrase). It also measures similarity in syntactic structures, "sentence syntax similarity" in terms of being consistent in style and form (Crossley, Greenfield, & McNamara, 2008: p. 476) and calculates "minimal edit distance" (McCarthy, Guess, & McNamara, 2009: p. 23) which is defined as the distance parts of speech, words or lemmas are from one another between consecutive sentences in a text (McNamara et al., 2014: p. 70).

3.5. DATA COLLECTION PROCEDURE

The first step taken for beginning data collection was to reach academic disciplines delivered by EMI lecturers in various academic divisions and EMI contexts across the world. As noted before, the disciplines were exerted to be chosen from a possibly wide spectrum of teaching contexts and academic divisions with the aim of capturing participant diversity in the research. To that end, a number of EMI courses both in Turkey and abroad context were obtained by means of distance educational platforms of many HE institutions due to the Covid-19 pandemic worldwide. It is of prime importance to note at this juncture- as regards the issue of ethical consent- that all the courses collected for the research were obtained through distance educational platforms, which they all are the member of Open Education Consortium[2], and they declare that all the contents utilized as publically open-access data are shared with the

license named "Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International Public License" [3].

Besides, in order to ensure whether the obtained courses are EMI courses, academic programmes to which the courses belong were also checked from the official websites of the universities. After ensuring this, the obtained courses were downloaded as weekly sessions in audio/video formats. In order to have an approximately similar amount of word count for all courses, one or two weeks of each course according to topic continuation were used so that they are similar in length as well.

Following this, all the courses downloaded were transcribed verbatim by the researcher. It should be noted at this point, during the transcription of data, student parts were not included since they do not cater for the aims set in the present research, the focal concern of which is on lecturers. Besides, due to the academic contents of the EMI courses, a number of unknown technical terms were encountered, and they all were also checked in the related academic field to avoid any misspellings in the data.

After the transcription process was completed, the next and last step was to obtain Coh-Metrix results of the lecturers' verbal classroom discourses on a certain set of components (lexical diversity, situation model, and syntactic complexity) depending upon the results of the questionnaire that was administered to some other Turkish EMI lecturers at the very beginning of the process. To that end, the transcribed data for each lecturer were uploaded on Coh-Metrix, and the results of the three principal components were drawn for each transcribed text. All the data derived were ready to conduct quantitative analyses with the help of the software, IBM SPSS 20.0.

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[2] Open Education Consortium is a non-profit, global, members-based network of open education institutions and organizations that create and share Open Educational Resources (OER). For more information, visit https://www.oeconsortium.org/about-oec/

[3] Further information can be accessed at https://creativecommons.org/licenses/by-nc-sa/4.0/legalcode

3.6. DATA ANALYSIS

3.6.1. Normality of Data Set

Before beginning the quantitative analysis process, the first step taken to make the data ready for the analyses was to check the normality of the data set in order to determine how to conduct the statistical analyses (via parametric or non-parametric statistics) since as posited by Kirkgöz and Ünaldı (2012: p. 7), normality is of prime importance to gain statistically significant results and make appropriate inferences, especially for the research with small population. To that end, in order to test whether 32 lecturers were normally distributed in terms of the Coh-Metrix scores on three main components (19 indices with their sub-categories), descriptive statistics were generated on IBM SPSS 20.0, and the test of normality was carried out with the help of a number of parametric statistics (standard deviation, Shapiro-Wilk, skewness, kurtosis, and standard error).

As illustrated in Table 4, neither variable was highly skewed or kurtotic (Tabachnick & Fidell, 2007). Furthermore, the Shapiro-Wilk test results demonstrated that nearly all the variables did not deviate from a normal distribution ($p > .05$). Therefore, all the variables were normally distributed. Accordingly, the data met the assumption of normality in order to proceed with parametric tests.

Tablo 4

Descriptive Statistics on the Assumption of Normality for Coh-Metrix Indices

Indices	*SD*	Skewness	Kurtosis	*SE*	Shapiro-Wilk *p*
Type-token ratio, content word lemmas	.090	.091	-.238	.016	.611
Type-token ratio, all words	.059	.497	.371	.010	.255
MTLD, all words	15.35	.716	-.014	2.714	.140
VOCD, all words	18.13	.144	-.313	3.205	.963
Causal verb incidence	6.537	.137	-.633	1.155	.574
Causal verbs and particles incidence	6.386	.418	.016	1.129	.570
Intentional verbs incidence	5.643	.728	.840	.997	.283
Ratio of casual particles to causal verbs	.522	.646	.015	.092	.042
Ratio of intentional particles to intentional verbs	.815	1.458	3.075	.144	.003
LSA verb overlap	.029	1.579	4.193	.005	.003
WordNet verb overlap	.051	.294	-.914	.009	.328
Temporal cohesion, tense and aspect repetition, mean	.043	-.367	-.473	.007	.536
Left embeddedness, words before main verb, mean	1.137	.505	-.157	.201	.439
Number of modifiers per noun phrase, mean	.161	.196	-.450	.028	.879
Minimal Edit Distance, part of speech	.029	.091	-.167	.005	.847
Minimal Edit Distance, all words	.020	.053	.023	.003	.522
Minimal Edit Distance, lemmas	.020	-.280	.291	.003	.644
Sentence syntax similarity, adjacent sentences, mean	.017	.207	-.823	.003	.571
Sentence syntax similarity, all combinations, across paragraphs, mean	.015	.165	-1.089	.002	.266

3.6.2. Steps Taken to Make the Data Ready for Analyses

On Coh-Metrix, each index is calculated in different value intervals; while some indices (e.g., type-token ratio) are measured between 0-1 only, some other scores (e.g.,

the measure of textual lexical diversity (MTLD) can be calculated between 0-100. Therefore, in order to equalize all values to their percentage values, the values of each category were recalculated by *relative calculation* in such a way that the maximum value in a category is assumed 100, and the other values in that category are proportioned over 100 based on the maximum value. By this means, all values come up in equalized percentages, which is of paramount importance for gaining rational and consistent results.

The second and final step to make the data ready for analyses was to get mean scores of sub-categories for each main Coh-Metrix category (lexical diversity, situation model, and syntactic complexity) by means of the calculation of the *unweighted mean.* In this way, three mean scores for each lecturer (mean of lexical diversity, LDMEAN; mean of situation model; SMMEAN, and mean of syntactic complexity, SYNMEAN) were obtained. The rationale here is to make the data easier and more feasible to interpret results by reducing the number of common indices under each main category.

After these steps were completed, three Coh-Metrix scores for each lecturer (LDMEAN, SMMEAN, and SYNMEAN) were entered on the software IBM SPSS 20.0, and the data were ready for conducting analyses to test the research questions and hypothesis.

It should be noted here again that two colleagues with MA degree with more expertise in statistics were involved in every step of all statistical procedures employed in the research, and all the steps (from calculations to data entry) were double-checked by them.

3.6.3. Statistical Analyses

To investigate the first and second research questions of whether there were any significant differences between the (i) Social Sciences and MPLS EMI lecturers (ii) Turkish and foreign EMI lectures in terms of lexical diversity, situation model, and

syntactic complexity dynamics in their verbal classroom discourses, the tests of multivariate analysis of variance (MANOVA) were carried out.

With respect to the third research question, which could be regarded as the stepwise analysis of the second research question, Pearson correlation was conducted with the aim of investigating the relationship, if any, between the Turkish and foreign lecturers for the components of lexical diversity and situation model which did not significantly differ in MANOVA results.

3.7. QUALITY CRITERIA

Quality consideration has long been a matter of debate for qualitative research (Dörnyei, 2007: p. 55) since the quality criteria utilized in quantitative research (e.g., internal validity, reliability, generalizability, and objectivity) are not appropriate to be applied in qualitative research designs. Within this frame, Lincoln and Guba (1985: p. 301-327) proposed the concept of "trustworthiness" that can be essentially perceived as "a goodness of fit" criterion to meet the term "rigor" used in quantitative research.

As an equivalent of internal validity in quantitative research, credibility refers to the degree to which the researcher represents respondents' views in research (Tobin & Begley, 2004: p. 391). Out of a number of strategies that could be utilized to ensure credibility such as "prolonged engagement, persistent observation, triangulation, and member checking" (Lincoln & Guba, 1985: p. 320; Sim & Sharp, 1998: p. 25), an investigator/analyst triangulation was utilized to fulfill the criterion of credibility by involving two colleagues with MA degrees and more expertise in the field of statistics in the methodological aspects during the research process, particularly for the data entry, conducting analyses as well as interpreting the results.

Dependability and confirmability refer to the aspects of consistency and neutrality respectively. The most applied strategy to establish dependability and confirmability is "an audit trail" (Korstjen & Moser, 2018: p. 122) which is transparently recording and reporting any detail starting from the research process to the reporting the findings. With this aim, in order to establish both criteria, audit trail

technique was utilized in every step of the research through systematic and detailed coverage, explanations, and notes of methodology and methods applied in the research design, data collection and analysis, etc.

Besides, dependability also refers to the consistency and reliability between the raw data and research findings obtained (Polit et al., 2006; Streubert, 2007, as cited in Moon et al., 2018: p. 1), suggesting the data of the research must offer similar findings and interpretations under different conditions (Elo et al., 2014: p. 2). Within this frame, it should be first noted that the validation of Coh-Metrix, as a theoretically grounded chief research tool utilized in the current research, has been well-documented by means of over 100 published studies (e.g., McNamara, Louwerse, McCarthy, & Graesser, 2010; McNamara et al., 2014). Still, to ensure the dependability criterion was fulfilled, the "external audit" technique was also utilized by allowing an outside researcher to follow, audit, and critique the whole research process (Polit et al., 2006: p. 20) as similarly discussed in the fulfillment of the credibility criterion.

As a counterpart of generalisability or external validity, in order to fulfill the transferability criterion which is characterized as the aspect of applicability (Lincoln & Guba, 1988: p. 315), the principle of providing "thick descriptions" (Polit & Beck, 2010: p. 1452) in every step of the research process was adopted. Accordingly, "full, purposeful, and evidence-based explanations" in relation to the data collection, analysis, participants, and context were provided to enable readers could assess whether the findings of the research can be transferable or applicable to their situations and contexts.

CHAPTER IV

4. FINDINGS

This section presents the analysis results that are structured in line with the research questions.

4.1. THE COMPARISON OF THE LECTURERS' VERBAL CLASSROOM DISCOURSES IN TERMS OF A SET OF LINGUISTIC DISCURSIVE DYNAMICS

The first and second research questions were formed as follows:

Research Question 1: Do EMI lecturers in Social Sciences significantly differ from those in Mathematical, Physical and Life Sciences (MPLS) in terms of three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity in their verbal classroom discourses?

Research Question 2: Do Turkish EMI lecturers significantly differ from foreign EMI lecturers in terms of three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity in their verbal classroom discourses?

For the first and second research questions posed, tests of MANOVA (multivariate analysis of variances) were conducted in order to test whether there were any significant differences in the lecturers' verbal classroom discourses concerning the dynamics of lexical diversity, situation model, and syntactic complexity based on the *division level* (Social Sciences and MPLS) and *context level* (Turkish and Foreign).

At the very beginning of the analysis process, the test of normality was already conducted on item by item before getting the mean scores of sub-categories for each principal Coh-Metrix category (see 3.7.1. Normality of Data Sets, Table 4). In the light

of substantial parameters to be checked for the assumption of normality (Skewness, kurtosis, standard deviation, Shapiro-Wilk), it was ensured that sub-categories showed a normal distribution between the participants and accordingly, the data met assumptions for normality and thereby proceeding via parametric tests. Therefore, for the above-mentioned research questions, one-way MANOVA was carried out.

Furthermore, as clearly illustrated in the descriptive statistics of MANOVA exhibited in Table 5, neither variable was highly skewed or highly kurtotic. Box's Tests of Equality of Covariance Matrices (Box's M) applied as a criterion to check the assumption of homogeneity of covariance across the groups (Stevens, 2002) were also equal for both division level ($p=$ .532) and context level ($p=$ .260). Levene's homogeneity tests, as the other paramount parameter to be checked for the normality, were all non-significant ($p >.05$) for both levels. Therefore, it was ensured again that the data met all assumptions for MANOVA at both levels.

Tablo 5

Descriptive Statistics on the Assumption of Normality for MANOVA for Both Levels

Groups	Skewness	Kurtosis	*SD*	Levene's test[1*]	Levene's test[2**]	Box's test[1*] *p* value	Box's test[2**] *p* value
Lexical diversity	.147	-.789	14.2	.488	.339		
Situation model	.130	-.185	4.34	.679	.886	.532	.260
Syntactic complexity	.376	-.440	4.38	.472	.732		

[*1:] results at division level   [**2:] results at context level

4.1.1. At Division Level

The results of one-way MANOVA for research question 1 indicated that there was a statistically significant difference between the lecturers in Social Sciences and

MPLS. As mentioned earlier, as covariance matrices were concluded to be equal in Box's test (*Box's M value*= 5.719, *F*= .849, *df1*= 6, *df2*= 6520.755, *p*= .532), Wilks' Lambda was selected to interpret the results. Results (*Wilk's Λ*= .462, *F*(3,28)= 10.848, *p*= .000*, partial η^2= .538) indicated that the lecturers' lexical diversity, situation model, and syntactic complexity dynamics (at least one) in their verbal discourses were significantly dependent on which academic division they teach. In other words, lexical diversity, situation model, and syntactic complexity dynamics in EMI lecturers' verbal discourses vary depending on the division they give lectures. Furthermore, the multivariate η^2=.538 indicated that approximately 54% of the multivariate variance of these dependent variables is associated with the division factor.

As seen in Table 6, tests of between-subject results utilized as a follow-up test to determine in terms of which dependent variable(s) the groups differed demonstrated that lexical diversity was the only component that significantly differed between the lecturers at Social Sciences and MPLS (*p*= .000), which demonstrated a large effect size (η^2= .500) (Cohen, 1988).

Tablo 6

The Output of Tests of Between-Subjects Effects at Division Level

Source	Dependent Variable	Sum of Squares	df	F	p	η^2
Model	Lexical diversity	3128.267[a]	1	30.013	.000	.500
	Situation model	37.968[b]	1	2.078	.160	.065
	Syntactic complexity	31.484[c]	1	1.671	.206	.053
Division	Lexical diversity	3128.267	1	30.013	.000	.500
	Situation model	37.968	1	2.078	.160	.065
	Syntactic complexity	31.484	1	1.671	.206	.053

As regards the question of which group dominated in utilizing more lexical variety in their verbal discourses, mean scores of the groups exhibited in Table 7 (*M*=70.40 for Social Sciences, *M*=50.63 for MPLS) indicated that EMI lecturers at the division of Social Sciences utilized more lexical diversity in their verbal discourses while delivering their classes when compared to the lecturers at MPLS division.

Tablo 7

Descriptive Statistics for the Comparison of Lecturers at Division Level

Components	Division	*N*	*M*	*SD*
Lexical diversity	Social Sc.	16	70.40	11.5
	MPLS	16	50.63	8.6
Situation model	Social Sc.	16	60.29	4.2
	MPLS	16	62.47	4.2
Syntactic complexity	Social Sc.	16	80.67	3.9.
	MPLS	16	78.69	4.7

4.1.2. At Context Level

With respect to research question 2 sought to better understand differences, if any, between Turkish and foreign EMI lecturers in terms of lexical diversity, situation model, and syntactic complexity components, the same steps were taken. Bearing in mind the assumption of normality and homogeneity of covariances (*Box's M value*= 8.658, *F*= 1.285, *df1*= 6, *df2*= 6520.755, *p*= .260) were already met, the results of Wilks' Lambda showed that there was a statistically significant difference in lexical diversity, situation model, and syntactic complexity components based on the context where the lecturers deliver their classes (*Wilk's Λ* = .662, *F*(3,28)= 4.757, p = .008*, partial η^2= .338). The multivariate η^2= .338 indicated that approximately 34% of the multivariate variance of the dependent variables is associated with the context factor.

Tablo 8

The Output of Tests of Between-Subjects Effects at Context Level

Source	Dependent Variable	Sum of Squares	*df*	*F*	*p*	η^2
Model	Lexical diversity	676.858[a]	1	3.640	.066	.108
	Situation model	29.180[b]	1	1.572	.220	.050
	Syntactic complexity	195.745[c]	1	14.643	.001	.328
Context	Lexical diversity	676.858	1	3.640	.066	.108
	Situation model	29.180	1	1.572	.220	.050
	Syntactic complexity	195.745	1	14.643	.001	.328

According to the results of tests of between-subjects effects (Table 8), a significant difference was found in the category of *syntactic complexity* (*p*=.01), which indicates Turkish and foreign EMI lecturers differed from one another according to the degree of utilizing the morpho-syntactically complex structures in their verbal discourses. Additionally, partial eta square (partial η^2= .328*)* demonstrated a medium effect size (Cohen, 1988).

Tablo 9

Descriptive Statistics for the Comparison of Lecturers at Context Level

Components	Context	*N*	*M*	*SD*
Lexical diversity	Turkish	16	55.92	15.5
	Foreign	16	65.11	11.3
Situation model	Turkish	16	62.34	3.9
	Foreign	16	60.43	4.6
Syntactic complexity	Turkish	16	77.20	3.8
	Foreign	16	82.15	3.4

As clearly illustrated in the descriptive statistics in Table 9, syntactic complexity mean scores of both groups demonstrated that the foreign lecturers followed morpho-syntactically complex patterns while delivering their EMI classes when compared to the Turkish EMI lecturers (*M*= 77.20 for Turkish lecturers, *M*= 82.15 for foreign lecturers).

4.2. THE RELATIONSHIP BETWEEN THE TURKISH AND FOREIGN LECTURERS IN TERMS OF A SET OF LINGUISTIC DISCURSIVE DYNAMICS

Research Question 3: Is there a significant relationship between the verbal classroom discourses of Turkish and foreign EMI lecturers concerning three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity?

In order to scrutinize any significant relationship, despite not having a significant difference on MANOVA tests, between the verbal classroom discourses of Turkish and foreign EMI lecturers concerning lexical diversity and situation model (except syntactic complexity, since it already significantly differed between the groups), Pearson product-moment correlation was run.

The results of the analysis revealed that there was a strong, positive relationship between the lexical diversity scores of Turkish and foreign lecturers, which was statistically significant ($r = .642$, $N = 32$, $p = .007*$) demonstrating a large effect size (Cohen, 1988). Similarly, situation model is another component that demonstrated a strong, positive and statistically significant relationship between the lecturers ($r = .521$, $N = 32$, $p = .039*$) in medium-large effect size (Cohen, 1988). However, there was no relationship observed concerning the measurement of syntactic complexity between the Turkish and foreign lecturers ($r = .000$, $N = 32$, $p = .999$). Descriptive statistics are also provided in Table 10.

Tablo 10

Descriptive Statistics of Turkish and Foreign Lecturers

	M	*SD*	*N*
Lexical diversity $_{Turkish}$	55.92	15.58	16
Lexical diversity $_{foreign}$	65.11	11.36	16
Situation Model $_{Turkish}$	62.34	3.97	16
Situation Model $_{foreign}$	60.43	4.61	16
Syntactic complexity $_{Turkish}$	77.20	3.86	16
Syntactic complexity $_{foreign}$	82.15	3.43	16

4.3. SUMMARY OF THE FINDINGS

The summary of the most relevant findings reported above is:

1. Lexical diversity is the only component that significantly differed between the lecturers in Social Sciences and those in MPLS. Based on the mean scores of

the groups, the lecturers in Social Sciences have a higher lexical diversity score when compared to the lecturers in MPLS.

2. Syntactic complexity is the only component that significantly differed between the Turkish and foreign lecturers. Based on the mean scores of the groups, the foreign EMI lecturers have a higher syntactic complexity score when compared to the Turkish EMI lecturers.

3. Whereas there is a strong, positive, and statistically significant relationship between the Turkish and foreign EMI lecturers concerning the components of lexical diversity and situation model, no relation is deduced for the component of syntactic complexity.

CHAPTER V

5. DISCUSSION

In this chapter, the findings of the research were discussed and interpreted in light of the relevant previous literature.

5.1. THE COMPARISON OF THE LECTURERS' VERBAL CLASSROOM DISCOURSES IN TERMS OF A SET OF LINGUISTIC DISCURSIVE DYNAMICS

5.1.1. At Division Level

The results of the research indicated that at the division level there was a statistically significant difference between the EMI lecturers only in terms of the lexical diversity in their verbal classroom discourses. Accordingly, EMI lecturers in Social Sciences delivered their classes utilizing much varied lexical items compared to the lecturers in MPLS.

First and foremost, it should be noted that the present finding supports the very common view that, posited by many prominent researchers and commentators in general education research, the nature of teaching varies across disciplines (Becher 1989; Neumann, 2001; Neumann & Becher, 2002, Quinland, 1987; Schulman, 1987). In a similar vein, drawing on another very common view that disciplines in soft sciences tend to utilize verbal expressions, meaning construction, and discussion (Kuuteva & Airey, 2014: p. 7) when compared to hard or natural sciences which rely upon a shared terminology, the finding of the research is again in line with the views posited.

Specifically, in the context of EMI, the finding is consistent with the study conducted by Macaro (2019: p. 11) which revealed that teacher talk varies according

to discipline context since disciplines adopt different languages in terms of terminology and registers. Furthermore, the finding of the current research seems to concur with some other studies which did not primarily focus on investigating but reflecting the issue. To illustrate, in their works of Dearden and Macaro (2016: p. 471-472) and Tan and Lan (2011: p. 1), it was found, through self-reported teacher beliefs, that very deep knowledge of the language is not needed for technical disciplines in hard sciences due to the plethora of formulae and numerical expressions dominating the classes, which is consistent with the present finding of the research. Similarly, the finding could also be accounted for with Macaro's (2018: p. 87) description in his oft-cited book, "… the technical nature of some subjects and the restricted linguistic code needed to teach them".

In a nutshell, given that each academic discipline reflects its own characteristics, specific language features, set of terminology, conceptual differences, and discourse practices both at macro-level (e.g., the schematic and rhetorical structure of academic genres) and micro-level (e.g., lexico-grammatical features, formulaic language) (Kim, Kim, & Kweon, 2018: p. 113; Kuteeva & Airey, 2013: p. 7; Soren, 2013: p. 26), the dissimilarity of the intrinsic natures of the disciplines in each division unveils the core rationale that underlies the finding of the research.

5.1.2. At Context Level

The current research found out that there was a statistically significant difference between the Turkish and foreign EMI lecturers' verbal classroom discourses concerning syntactic complexity. Foreign EMI lecturers adopted more lexico-syntactically complex patterns while delivering their classes compared to the Turkish EMI lecturers. Firstly, keeping in mind the fact that the lecturers in the research come from 10 different EMI contexts, the present finding could be accounted for with a wide range of perspectives.

Within a holistic standpoint, the present finding of the research can be considered to stem from the fact that the lecturers come from different first language (L1) backgrounds (each country reflects the nationality of the lecturers as well), especially

when considering the concepts of 'language transfer' (Cook, 2003), 'language distance' (Robinson, 2012), and 'cross-linguistic influence' (Cook, 2003; Jarvis & Pavlenko, 2008; Odlin, 2003) in the fields of linguistics and contemporary second language research.

It is a research-evidenced fact that, for multilingual ones, the linguistic system of L1 has an impact on learning other languages in various levels (phonology, morphology, syntax, semantics, and lexicon, etc.). Furthermore, this effect comes to the fore as a propelling force, especially when the languages are typologically similar since typologically close languages share very similar mentality at many levels (lexis, morpho-syntactic level, semantics, borrowed words, etc.) Furthermore, language similarity is also a propelling force for language transfer. Based on all what posed hitherto, when considering the lecturers' having different L1 backgrounds and that they all may reflect certain syntactic features of their L1s at various levels (word order, pronouns, tenses) during their language performances in English, the finding of the research can be accounted for with the general finding of some cross-linguistic studies in the field (e.g., Gyllstadt, Granfeldt, Bernardini, & Källkvist, 2014: p. 1; Kuiken & Vedder, 2019: p. 1) which found out that syntactic complexity may vary across languages.

More specifically, as noted in the above-mentioned discussion, the syntactic transfer is one of the L1-based aspects, and L1 syntax can be transferred to L2 in both productive and receptive skills (Odlin, 1989, as cited in Popa, 2016: p. 120). Within this frame, in the current research, nearly all of the foreign EMI lecturers' L1s belong to Indo-European language family when compared to Turkish, which belongs to a completely different one (Ural-Altaic). This can be viewed as an indication to why the foreign EMI lecturers tend to use a more syntactically complex language, since they are familiar with the syntax of English as well as it does not lead to a grand problem with comprehension for the students, who share the same L1 as the lecturer. On the other hand, if they are not native speakers of a language which is in the same family as Indo-European languages, they may not favor complex structures, for it can cause communication breakdowns during the lectures.

Put differently within another aspect, the current research did not utilize any data regarding target student English proficiency levels of both groups of the lecturers. Yet,

when the research setting is reviewed, virtually all the countries in the group of foreign EMI lecturers are among the countries having very high, high, or moderate levels of English proficiency (see EF EPI Index[4] on country-based rankings, 2020). Accordingly, it might be deemed that Turkish EMI students may be at lower English proficiency level when compared to those of other EMI students in foreign countries, which may have required the Turkish EMI lecturers to adopt a simpler classroom language at the lexico-syntactic level (by means of some accommodation strategies) since the lecturers' classroom verbal discourses in the current research are based on their fine-tuned or calibrated language performances according to the target audience. The finding, if handled within this frame, may be in line with the work of Tsai and Tsou (2015: p. 1) which investigated EMI lecturers' utilization of accommodation strategies based on their verbal discourses and revealed that the lecturers utilized some types of accommodation strategies with the aim of helping students cross linguistic barriers due to their low English language proficiency. Besides, despite not in EMI context, it also supports the follow-up works conducted by Flowerdew and Miller (1992: p. 60, 1996: p. 23) as well as Flowerdew, Miller, and Li (2000: p. 116) which revealed that lecturers utilized various types of accommodation strategies by modifying their languages in order to help students comprehend the lectures.

In a similar vein, the data in the current research, as noted before, is based on the fine-tuned classroom language performances of the lecturers, and there was no data utilized regarding their actual proficiency levels. However, keeping the countries of

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[4] The Education First English Proficiency Index (EF EPI) is a very popular standardized test that aims to measure a country's level of English proficiency. The report is available at https://www.ef.com/wwen/epi/

the groups of foreign EMI lecturers in mind again, foreign EMI lecturers may have a higher proficiency level of English than those of Turkish EMI lecturers based on the above-mentioned report on country-ranking statistics. If handled within this standpoint, the present finding of the research may be in line with the findings of some previous studies (e.g., McCutchen et al., 1994, Crossley, Weston, McLain Sullivan, & McNamara, 2011; McNamara, Graesser, McCarthy, & Cai, 2014) which support that more proficient and advanced language users tend to create more complex structures with long and embedded clauses.

With respect to the third research question which is again based on the comparison of the Turkish and foreign EMI lecturers in terms of exploring the relationship, the results indicated that whereas there was a strong, positive, and statistically significant relationship between the Turkish and foreign EMI lecturers concerning lexical diversity and situation model components, no relation was deduced for syntactic complexity. Bearing in mind the research lacuna in the field which is based on the comparison of classroom discourse in terms of a set of linguistic features at the micro-level, this finding may be considered to emerge from the equal distribution of academic disciplines (Social Sciences=8, MPLS= 8 for both groups) in both groups. That is to say, inasmuch as academic disciplines were equally distributed between the Turkish and foreign EMI lecturers, this may have led for lexical diversity and situation model components of their verbal classroom discourses to reflect similar results due to similar intrinsic course contents.

CONCLUSION

In this chapter, the summary of the research is presented. Besides, the findings unveiled from the research are interpreted based on the research questions. Furthermore, this chapter touches upon the limitations of the research hand in hand with the pedagogical implications. Finally, suggestions for further research are provided.

SUMMARY OF THE RESEARCH

The present research chiefly pursued to conduct, in a global context, the computational lexical and linguistic analyses of the EMI lecturers' verbal classroom discourses based on a certain set of discursive dynamics (lexical diversity, situation model, and syntactic complexity). Correspondingly, it was designed (i) to scrutinize the lecturers' verbal classroom discourses on some linguistic and discursive dynamics, (ii) to make comparisons on the lecturers' verbal classroom discourses in terms of these set of dynamics based on the division and context that they deliver classes, and (iii) to identify whether there is consistency between the Turkish and foreign EMI lecturers in terms of these set of dynamics. To that end, 32 EMI lecturers from different EMI contexts across the world were chosen. Following the lecturers' verbal classroom discourses were transcribed, they were analyzed in terms of the aforementioned components through the utilization of an automated text and discourse analysis tool, *Coh-Metrix*. In the research where data were quantitatively analyzed through the software, IBM SPSS 20.0, three research questions were addressed:

Research Question 1: Do EMI lecturers in Social Sciences significantly differ from those in Mathematical, Physical and Life Sciences (MPLS) in terms of three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity in their verbal classroom discourses?

The results of the current research indicated that at the division level there was a statistically significant difference between the EMI lecturers only in terms of the lexical diversity in their verbal classroom discourses. EMI lecturers at Social Sciences delivered their classes by adopting much lexical variety in their verbal discourses when compared to the lecturers in MPLS.

Put frankly, this is not wrong to claim this was an expected result, particularly when considering the dissimilarity of the intrinsic contents of the disciplines at each division. More specifically, while disciplines in Positive Sciences (e.g., Math, Physics, and Chemistry) are much more tend to utilize numerical expressions, codes, and formulae rather than words, the issue is opposite for the disciplines in Social Sciences that much more rely upon, due to their natures, meaning construction and communication utilizing words, which demonstrates the rationale underlying the finding obtained.

Moreover, when considering it more deeply, the lecturers' relationship throughout their undergraduate and graduate years might have shaped their identities as foreign language English speakers. Those who work in the field of Social Sciences might have been exposed to a more variety of language, thus acquiring a wider range of lexical diversity. Additionally, their communicative competence might have improved due to working on the language itself. Whereas those who work in the field of Positive Sciences might have been strictly limited with and use the related field's terminology frequently. That way, they might have stayed limited and their language use might have become repetitive.

Research Question 2: Do Turkish EMI lecturers significantly differ from foreign EMI lecturers in terms of three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity in their verbal classroom discourses?

The results obtained through the tests of MANOVA revealed that there was a statistically significant difference between the Turkish and foreign EMI lecturers' verbal classroom discourses only in terms of syntactic complexity. Foreign EMI lecturers delivered their lecturers in a more lexico-syntactically complex way when compared to the Turkish EMI lecturers. Furthermore, the significant difference in the lecturers' verbal discourses regarding syntactic complexity was also supported by lexical diversity mean scores of both groups (LDm $_{Turk}$= 55.92, LDm$_{Foreign}$= 65.11) for the reason that lexical diversity is directly associated with syntactic complexity in such a way that a high lexical diversity score is a paramount indicator of a more complex discourse at the syntactic level since a wide variety of words in different parts of speech categories make a language more complex and challenging by loading more cognitive load on comprehenders.

As regards the finding obtained, first, it may be considered to stem from the lecturers' having different first language (L1) backgrounds given the fact that, for multilingual ones, the linguistic system of L1 has an impact on L2 including many aspects, syntactic aspects in particular. Put specifically, in the current research nearly 75% of 16 foreign EMI lecturers' L1s (n=11) belong to the same language family (even same branch for some) with English (Indo-European language family) in contrast with Turkish, the L1 of Turkish EMI lecturers, belonging to a completely different language family than that of English (Ural-Altaic language family). From the standpoint that "typologically similar languages share very similar mentality and cover many common features at cross-linguistic level (e.g., semantics, borrowed words, phonemic and linguistic levels, etc.), the present finding could be interpreted in the sense that this similarity and difference could have posed an impact on the lecturers' way of using English in their verbal classroom discourses in terms of morpho-syntactic features.

Another aspect worth considering is, no doubt, discrepancies or divergences in prerequisites set for EMI lecturers for their admissions to universities in the countries they teach. That is, EMI lecturers' hiring process might be very different depending on the institutions they are working in. Some institutions, for instance, may have set a higher threshold for their general and academic English proficiency levels stipulating many standardized and international tests, and certifications that prove they are really able to be competent enough to deliver an EMI course at a certain high linguistic level, C1 or C2, for instance. On the other hand, some others might not be so strict; instead, they may value the content knowledge and might not be equally strict with the (high) proficiency level of the lecturers.

Besides, not only the required qualifications of the lecturers from different countries and institutions vary, but also the academic levels of universities differ within the very same country. As some universities, in which the EMI lectures are investigated, are listed among the top universities, the academic language proficiency level of the lecturers as well as the students' might be higher. Therefore, this also can be an indication of more lexico-syntactically complex patterns to be adopted in classrooms both by the lecturers and students.

Put differently, since EMI policies adopted at macro-, meso-, and micro -levels differ in each country and even each university within the same country, the result obtained might be interpreted from such perspective as well. More specifically, some countries in the group of foreign EMI lecturers (e.g., Japan, China, Netherlands) have been running many national projects to enhance the applicability of EMI. Correspondingly, motivated and spurred by national initiations at the macro level, many institutions endeavor to support their teaching staff on EMI with a focus on a range of considerations, from general language and teaching skills (e.g., linguistic and pronunciation skills, pedagogical needs, etc.) to other physical and suprasegmental features (e.g., body language, intonation, oral presentation skills, etc.) to gain success on the implementation. Within this frame, such triggering policies which differ in all the countries and HE institutions could be regarded as an indication of why various language performances emerge at various linguistic levels, rather lexico-syntactic level.

Additionally, when the EMI contexts in the current research are reviewed, nearly all the countries (except Egypt) in the group of foreign EMI lecturers are among the countries that have very high, high, or moderate proficiency levels of English when compared to Turkey that is among the countries having low proficiency based on very popular global reports of country-rankings. Considering the fact that student proficiency level is a key factor determining the language level of a teacher in classroom discourse, both groups of lecturers' having students at various general proficiency levels of English should be another aspect that was considered for the present finding to emerge, for the reason that the audience targeted by the lecturers differ from country to country, which would justify the variety in their proficiency levels. Within this frame, students at a lower level of English proficiency in Turkey might have required the Turkish EMI lecturers to follow simpler morpho-syntactic patterns in their classroom discourses through the utilization of some accommodation strategies (e.g., familiar words, short and simple sentences, etc.) in order to fine-tune their speech according to their target audience.

Research Question 3: Is there a significant relationship between the verbal classroom discourses of Turkish and foreign EMI lecturers concerning three Coh-Metrix components: (i) lexical diversity, (ii) situation model, and (iii) syntactic complexity?

The findings unveiled from the Pearson product-moment correlation analysis indicated that lexical diversity and situation model dynamics, which did not significantly differ between the Turkish and foreign EMI lecturers according to the MANOVA analyses, were strongly, positively, and significantly correlated between the Turkish and foreign EMI lecturers.

It should be noted, at first, all the remarks posed for the previous research question might be also valid for this research question since it is again based on the investigation of the Turkish and foreign EMI lecturers. However, some other several interpretations could be put on the issue as well. First and simply, this finding may be considered to emerge from the academic disciplines were equally distributed in both groups (Social Sciences=8, MPLS= 8), which could be an indication of why their

discourses reflect similar number of words utilized in terms of lexical variety as well as similar cohesive and coherent aspects to construct situation model representations in their languages.

Put differently in an elaborate scope, in parallel with the increasing globalization that has gained impetus in the latter decade of the 20th century as a consequence of many activities such as the fall of communism, political and economic migration, increased mobility, ever-burgeoning media technologies, and digital discourse, many teaching staff have been endeavoring to gain global identities. This evolving global reality has thus been a motive to be competent to use English as "a lingua franca" or "an international language of communication", hence gaining a global identity. Considering the rationale behind this motivation, it has been only natural for scholars-including lecturers- to develop a similar language use including very common aspects at linguistic, lexical, and discursive levels, despite teaching in different contexts and divisions.

LIMITATIONS OF THE RESEARCH

Several limitations emerged in the current research. First, the research setting, despite encompassing manifold contexts, is limited to only 10 EMI contexts that cover 32 lecturers in total. This limited number of the participants can be considered as a limitation since it may pose a threat to the generalizability of the results.

Another limitation concerning the research is the lack of data regarding students' proficiency levels of English in all 10 EMI contexts where the lecturers deliver their classes. Whereas students' proficiency levels of English are a very paramount factor to be taken into account while analyzing the lecturers' classroom language performances since the lecturers are, most presumably, considered to fine-tune their utterance according to their target audience.

With respect to the lecturers, the focal concern of the research, there are many factors to be taken into consideration that are unknown but predicted to affect their language performances (e.g., age, educational experience, actual proficiency level, multilingualism issue, teaching background, individual differences, etc.); therefore,

the findings of the research should be interpreted with caution bearing these lacking factors in mind. Based on all what posed hitherto, the findings of the current research must be interpreted cautiously in the light of all the above-mentioned limitations.

PEDAGOGICAL IMPLICATIONS

The findings unveiled from the current research present noteworthy pedagogical implications. To begin with, the present research yielded that EMI lecturers' language performances vary based on the context they are involved in as well as the academic disciplines they teach. Within this respect, EMI lecturers must be aware of the context- and discipline-dependent factors while performing their classes and trying to cope with language-related problems emerged. Besides, for researchers and commentators, it would be suggested to keep the context- and discipline-dependent factors in mind while conducting and interpreting research in the related fields. This might be quite beneficial especially when considering the lacuna in this field of EMI research.

Notwithstanding this research did not utilize any data concerning students' proficiency levels, it is a research-evidenced fact that students- due to their insufficient English proficiency- have to cope with great challenges to understand their lectures on the EMI implementation. Within this frame, considering the paramount role of the lecturers' language performances in facilitating student comprehension, it would be suggested that EMI lecturers be conscious of proficiency levels of their target audience and accommodate their language, if need, to help students' cross-linguistic barriers and gain achievement on the lectures.

Within the national perspective, having a relatively long history in the Turkish education system, EMI has been witnessing an exponential growth in Turkish HE. Within this perspective, the current research, since based on the comparison of Turkish EMI with the other EMI contexts in the world, may provide deeper and valuable insights into the actual status of the Turkish EMI lecturers in terms of their language performances concerning lexico-snytactic, cohesive and coherent aspects. Therefore, the findings unveiled from the current research may be applied to scrutinize and revise

the policies adopted in Turkey -if need- at macro, meso, and micro levels in order to establish the quality of teaching and attain success on the endeavor.

SUGGESTIONS FOR FURTHER RESEARCH

The present research has brought several suggestions for further investigation. First, the research can be reconducted as replication research by expanding the sample size with the involvement of more EMI contexts from other parts of the world. Furthermore, this may provide comprehensive and deeper insights in terms of the generalizability of the findings.

Inasmuch as EMI is a relatively new phenomenon, there has been lacuna in the research field exhibiting the actual kind of practice in classroom discourse. Within this frame, in order to attain a closer understanding of the language-oriented problems faced on EMI implementation in the classroom environment, from the standpoints of both students and lecturers as the key stakeholders, it might be very useful if further research is carried out hand in hand with the involvement of student dimension. Additionally, bearing the classroom discourse in mind, this research was not able to investigate any interaction or communication between lecturers and students. As a result, feedback given by the lecturers; lexical diversity and syntactic complexity of the language they use while giving it remained unanalyzed. Similarly, teacher questions and student questions were not observed which could have changed the results depending on manipulations the teacher imposes to the language directed to the students. Therefore, further research can also be conducted with the involvement of such dimensions to gain deeper perspectives, and the data of the current research can be utilized to achieve all the recommendations posed.

LIST OF REFERENCES

1. *Books*

Allen, James (1995). Natural language understanding. Pearson.

Airey, John (2016). EAP, EMI or CLIL? In Ed Ken Hyland. The routledge handbook of English for Academic purposes. London: Routledge, 95–107.

Bachman, Lyle F. (1990). Fundamental considerations in language testing. Oxford University Press.

Biber, Douglas, Susan Conrad, Randi Reppen (1998). Corpus linguistics: Investigating language structure and use. Cambridge University Press.

Block, David, Deborah Cameron. In Eds David Block, Deborah Cameron (2002). Globalization and language teaching. London: Routledge.

Bryman, Alan (2012). Socail reserach methods. New York: Oxfor University Press

Cohen, Jacob (1988). Statistical Power Analysis for the Behavioral Sciences. Hillsdale (NJ): Lawrence Erlbaum Associates.

Cook, Vivian (2003). Effects of the second language on the first. Clevedon, UK: Multilingual Matters.

Crystal, David (2000). Language death. Ernst Klett Sprachen.

Crystal, David (2003). English as a global language. Ernst Klett Sprachen.

Cummins, Jim (2003). Bilingual education: Basic principles. Multilingual Matters, 56-66.

Dafouz, Emma (2017). English-medium instruction in multilingual university settings. In Ed Peter Garrett. The routledge handbook of language awareness, New York: Routledge, 170–185.

Dafouz, Emma, Begona Núñez (2010). Metadiscursive devices in university lectures: A contrastive analysis of L1 and L2 teacher performance. In Eds Christiane Dalton-Puffer, Tarja Nikula, Ute Smit. Language use and language learning in CLIL classrooms. Amsterdam/Philadelphia: John Benjamins, 213-231.

Doiz, Aintzane, David Lasagabaster, Juan Manuel Sierra (2013). English-medium instruction at universities: Global challenges. In Eds Aintzane Doiz, David Lasagabaster, Juan Manuel Sierra. Multilingual Matters: Bristol.

Dörnyei, Zoltan (2007). Research methods in applied linguistics. Oxford: Oxford University Press.

Earls, Clive W. (2016). Evolving agendas in European English-medium higher education: Interculturality, multilingualism and language policy. Springer.

Fenton-Smith, Ben, Pamela Humphries, Ian Walkinshaw (2017). EMI: Issues and challenges in Asia-Pacific Higher Education. Cham: Springer.

Fishman, Joshua A., Robert L. Cooper, Andrew W. Conrad (1977). The spread of English: The sociology of English as an additional language. Newbury House Publications

Gall, Meredith D., Joyce P. Gall, Walter R. Borg (2007). Educational research: An introduction (8th ed.). Boston: Pearson

Galloway, Nicola, Heath Rose (2015). Introducing global Englishes. Routledge.

Gibbons, Pauline (2002). Scaffolding language, scaffolding learning. Portsmouth, NH: Heinemann.

Gonzalez, Josué M. (2008). Encyclopedia of bilingual education. In Ed Josué M. Gonzalez. Los Angeles, CA: Sage.

Graddol, David (2006). English next. London: British Council.

Graesser, Atrhur. C., Morton Ann Gernsbacher, Susan R. Goldman (2003). Handbook of discourse processes. In Eds Arthur C. Graesser, Morton Ann Gernsbacher, Susan R. Goldman. Routledge.

Gyllstadt, Henrik, Jonas Granfeldt, Petra Bernardini et al. (2014). Linguistic correlates to communicative proficiency levels of the CEFR: The case of syntactic complexity in written L2 English, L3 French and L4 Italian. In Eds L. Roberts, I. Vedder, J. Hulstijn. Amsterdam: John Benjamins. 1–30

Hultgren, Anna Kristina, Frans Gregersen, Jacob Thøgersen (2014). English in Nordic universities: Ideologies and Practices. In Eds Anna Kristina Hultgren, Frans Gregersen, Jacob Thøgersen. Amsterdam: Benjamins

Jarvis, Scott, Aneta Pavlenko (2008). Cross-linguistic influence in language and cognition. New York: Routledge

Kachru, Braj B. (1986). The alchemy of English: The spread, functions, and models of non-native Englishes. University of Illinois Press.

Kintsch, Walter (1998). Comprehension: A paradigm for cognition. Cambridge: Cambridge University Press.

Lincoln, Yvonna S., Egon G. Guba (1985). Naturalistic inquiry. Beverly Hills, CA: Sage.

Macaro, Ernesto (2018). English medium instruction. Oxford: Oxford University Press.

Maiworm, Friedhelm, Bernd Wächter (2002). English-language-taught degree programmes in European higher education: Trends and success factors. Bonn: Lemmens.

Mackey, Alison, Susan M. Gass (2012). Research methods in second language acquisition: A practical guide. Chichester: Wiley-Blackwell.

Malvern, David, Brian Richards, Ngoni Chipere et al. (2004). Lexical diversity and language development. New York: Palgrave Macmillan.

McNamara, Danielle S., Arthur C. Graesser, Philip M. McCarthy et al. (2014). Automated evaluation of text and discourse with Coh-Metrix. Cambridge, MA: Cambridge University Press.

Nation, Ian SP, Stuart A. Webb (2011). Researching and analysing vocabulary. Boston, MA: Heinle, Cengage Learning.

Nation, Paul (2001). Learning vocabulary in another language. Cambridge, UK: Cambridge University Press.

Nguyen, Houng. T., Ian Walkinshaw, Hiep H. Pham (2017). EMI programs in a Vietnamese university: Language, pedagogy and policy issues. In English medium instruction in higher education in Asia-Pacific. Springer, Cham. 37-52

Odlin, Terence (2003). Crosslinguistic influence. In Eds Catherine Doughty, Michael Long. The handbook of second language acquisition. Oxford, UK: Blackwell, 436–486.

Poulisse, Nanda (1990). The use of compensatory strategies by Dutch learners of English. Berlin: Mouton de Gruijter.

Read, John (2000). Assessing vocabulary. Cambridge, UK: Cambridge University Press.

Richards, Jack. C. (2001). Curriculum development in language teaching. Ernst Klett Sprachen.

Singer, Murray, John Leon (2007). Psychological studies of higher language processes: Behavioral and empirical approaches. In Eds Franz Schmalhofer, Charles Perfetti. Higher level language processes in the brain: Inference and comprehension processes. Mahwah, NJ.

Swales, John. (1990). Genre analysis: English in academic and research settings. Cambridge University Press.

Stahl, Steven A., Nagy William (2006). The literacy teaching series. Teaching word meanings. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Tabachnick, BarbaraG., Linda S. Fidell (2007). Experimental designs using ANOVA. Belmont, CA: Thomson/Brooks/Cole.

Templin, Mildred C. (1957). Certain language skills in children: Their development and interrelationships. Minneapolis, MN: The University of Minnesota Press.

Tsui, Amy B., James W. Tollefson, (2007). "Language policy and the construction of national cultural identity". In Eds Amy B. Tsui, James W. Tollefson. Language policy and the construction of national cultural identity. Language policy, culture, and identity in Asian contexts. London: Lawrence Erlbaum Associates, 1-21.

van Dijk, Teun Adrianus, Walter Kintsch (1983). Strategies of discourse comprehension. New York: Academic Press.

Van de Walle, John, Karen Karp, LouAnn Lovin et al. (2014). Teaching student-centered mathematics: Developmentally appropriate instruction for grades. Boston, MA: Pearson.

Walsh, Steve (2006). Investigating classroom discourse. Routledge.

Wächter, Bernd, Friedhelm Maiworm (2008). English-taught programmes in European higher education: The picture in 2007. Bonn: Lemmens Medien.

Wächter, Bernd, Friedhelm Maiworm (2014). English-taught programmes in European higher education: The state of play in 2014. In Eds Bernd Wächter, Friedhelm Maiworm. Lemmens Medien GmbH.

Westbrook, Peter Nils, Birgit Henriksen (2011). Bridging the linguistic and affective gaps - the impact of a short, tailor-made language course on a Danish university lecturer's ability to lecture with confidence in English. In Eds Rita Cancino, Lotte Dam, Kirsten Jæger. Policies, principles, practices: New directions in foreign language education in the era of educational globalization. Newcastle upon Tyne, UK: Cambridge Scholars Press.

2. *Articles, Papers, Other Printed Publications*

Airey, John (2011). "Talking about teaching in English: Swedish university lecturers' experiences of changing teaching language". Ib´erica, 22, 35–54.

Altay, Mehmet, Nalan Erçin (2019). "Uncovering the reflections of English medium instruction in Engineering graduates' career". Sakarya University Journal of Education, 10(3), 577-588.

Andrade, Maureen Snow (2006). "International students in English-speaking universities: adjustment factors". Journal of Research in International Education, 5(2), 131–154.

Arslantunalı, Mustafa (1998). Education in yabancı dil: There are çok problems [Education in English: There are many problems]. Anadilinde çocuk olmak: Yabancı dilde eğitim [To be a hild in mother-tongue: Education in Foreign Language, 4, 74-76.

Aizawa, Ikuya, Heath Rose (2019). "An analysis of Japan's English as medium of instruction initiatives within higher education: The gap between meso-level policy and micro-level practice". Higher Education, 77(6), 1125-1142.

Ali, Nor Liza (2013). The changing paradigm in language planning: English-medium instruction policy at the tertiary level in Malaysia. Current Issues in Language Planning 14, 73–92.

Arik, Beril. T., Engin Arik (2014). "The role and status of English in Turkish higher education". English Today, 30(4), 5.

Atik, Evrim (2010). Perceptions of students towards English medium instruction at tertiary level: The case of a Turkish private university. Unpublished master's thesis, Middle East Technical University, Ankara.

Avent, Jan, Shannon Austermann (2003). "Reciprocal scaffolding: A context for communication treatment in aphasia". Aphasiology, 17(4), 397-404.

Azadnia, Masoud, Ahmad Reza Lotfi, Reza Biria. (2019). "A study of syntactic complexity via Coh-Metrix: Similarities and differences of Ph.D. dissertations written by Iranian university students and English native speakers". Research in English Language Pedagogy, 7(2), 232-254. doi: 10.30486/relp.2018.663453

Başıbek, Nurcihan, Mustafa Dolmacı, Ceyda, Cengiz et al. (2014). "Lecturers' perceptions of English medium instruction at engineering departments of higher education: A study on partial English medium instruction at some state universities in Turkey". Procedia-Social and Behavioral Sciences, 116, 1819-1825.

Becker, Anthony (2010). "Distinguishing linguistic and discourse features in ESL students' written performance". Modern Journal of Applied Linguistics, 2(5), 406-424.

Benzehaf, Bouchaib (2017). "Comparing learners' general proficiency levels with their writing productive ability: How correlated are they?". Eurasian Journal of Applied Linguistics, 3(2), 43-58.

Björkman, Beyza. (2011). "Pragmatic strategies in English as an academic lingua franca: Ways of achieving communicative effectiveness?" Journal of Pragmatics, 43(4), 950-964.

Bolton, Kinsgley, Maria Kuteeva (2012). "English as an academic language at a Swedish university: Parallel language use and the "threat" of English". Journal of Multilingual and Multicultural Development, 33(5), 429–447.

Borg, Simon (2016). English medium instruction in Iraqi Kurdistan: London: British Council.

Borg, Simon (2016). English medium instruction in Iraqi Kurdistan. London: British Council. Retrieved from http://www.teachingenglish.org.uk/article/english-medium-instruction-iraqi-kurdistanperspectives-

Bozdoğan, Derya, Buket Karlıdağ (2013). "A case of CLIL practice in the Turkish context: Lending an ear to students". Asian EFL Journal, 15(4), 89-110.

Bulté, Bram, Alex Housen (2014). "Conceptualizing and measuring short-term changes in L2 writing complexity". Journal of Second Language Writing, 26, 42-65.

Byun, Kiyong, Huijong Chu, Kim Minjung et al. (2011). "English-medium teaching in Korean higher education: Policy debates and reality". Higher Education, 62(4), 431-449.

Briggs, Jessica. G., Julie Dearden, Ernesto Macaro (2018). "English medium instruction: Comparing teacher beliefs in secondary and tertiary education". Studies in Second Language Learning and Teaching, 8(3), 25-35.

Cazden, Courtney. B. (1986). "Language in the classroom". Annual Review of Applied Linguistics, 7, 18-33.

Cenoz, Junez (2015). "Content-based instruction and content and language integrated learning: The same or different?". Language, culture and curriculum, 28(1), 8-24.

Chandler, Jean (2003). "The efficacy of various kinds of error feedback for improvement in the accuracy and fluency of L2 student writing." Journal of Second Language Writing 12(3), 267-296.

Chung, Teresa Mihva, Paul Nation (2003). "Technical vocabulary in specialised texts. Reading in a Foreign Language, 15(2), 103–116.

Chang, Junyue (2006). "Globalization and English in Chinese higher education". World Englishes, 25(3/4), 513-525.

Cho, Dong Wan. (2012). "English-medium instruction in the university context of Korea: Tradeoff between teaching outcomes and media-initiated university ranking". Journal of Asia TEFL, 9(4) 135-163.

Choi, Soo Joung (2013). "Issues and challenges in offering English-medium instruction: A close examination of the classroom experiences of professors." Studies in English Language & Literature, 39(2), 275-306.

Coleman, James. A. (2006). "English-medium teaching in European higher education". Language teaching, 39(1), 1-14.

Collins, Ayse Bas (2010). "English-medium higher education: Dilemma and problems." Eurasian Journal of Educational Research, 10(39), 97-110.

Cooper, Thomas C. (1976). "Measuring written syntactic patterns of second language learners of German." The Journal of Educational Research, 69(5),176-183.

Crossley, Scott A., Danielle S. McNamara (2009). "Computational assessment of lexical differences in L1 and L2 writing." Journal of Second Language Writing 18(2), 119-135.

Crossley, Scott A., Jennifer L. Weston, Susan T. McLain-Sullivan et al. (2011). "The development of writing proficiency as a function of grade level: A linguistic analysis". Written Communication, 28(3), 282-311.

Crossley, Scott A., Jerry Greenfield, Danielle S. McNamara (2008). "Assessing text readability using cognitively based indices". TESOL Quarterly 42(3), 475-493.

Crossley, Scott Andrew, Tom Salsbury, Danielle S. McNamara et al. (2011). "Predicting lexical proficiency in language learner texts using computational indices". Language Testing, 28(4), 561-580.

Cumming, Alister, Robert Kantor, Kyoko Baba et al. (2005). "Differences in written discourse in independent and integrated prototype tasks for next generation". TOEFL". Assessing Writing, 10(1), 5-43.

Curle, Samantha, Doğan Yuksel, Adem Soruç et al. (2020). "Predictors of English medium instruction academic success: English proficiency versus first language medium". System, 95

Daller, Helmut, Roeland Van Hout, Jeanine Treffers-Daller (2003). "Lexical richness in the spontaneous speech of bilinguals." Applied linguistics 24(2), 197-222.

Dafouz, Emma, Begona Nunez, Carmen Sancho (2007). "Analysing stance in a CLIL university context: Non-native speaker use of personal pronouns and modal verbs". International Journal of Bilingual Education and Bilingualism, 10(5), 647–662.

Dafouz, Emma, Mar Camacho, Elena Urquia (2014). "Surely they can't do as well: A comparison of business students' academic performance in English-medium and Spanish-as-first-language-medium programmes". Language and Education, 28(3), 223–236.

Dafouz Emma, Davinia Sánchez García (2013). "'Does everybody understand?' Teacher questions across disciplines in English mediated university lectures: An exploratory study". Language Value, 5(1), 129-151.

Dearden, Julie (2014). English as a medium of instruction-a growing global phenomenon. British Council,

Dearden, Julie, Ernesto Macaro, Mustafa Akincioglu (2016). "English medium instruction in universities: A collaborative experiment in Turkey". Studies in English Language Teaching, 4(1), 51-76.

Dearden, Julie, Ernesto Macaro (2016). "Higher education teachers' attitudes towards English medium instruction: A three-country comparison". Studies in Second Language Learning and Teaching, 6(3), 455-486.

Dearden, Julie, Mustafa Akincioglu (2016). EMI in Turkish universities: Collaborative planning and student voices.

Dogancay-Aktuna, Seran (1998). The spread of English in Turkey and its current sociolinguistic profile. Journal of Multilingual and Multicultural Development, 19(1), 24-39.

Doiz, Aintzane, David Lasagabaster, Juan M. Sierra (2011). "Internationalisation, multilingualism and English-medium instruction". World Englishes, 30(3), 345-359.

Dowell, Nia M., Arthur C. Graesser, Zhiqiang Cai (2016). "Language and discourse analysis with Coh-Metrix: Applications from educational material to learning environments at scale". Journal of Learning Analytics, 3(3), 72-95.

Dörnyei, Zoltán, Mary Lee Scott (1997). "Communication strategies in a second language: Definitions and taxonomies". Language Learning, 47(1), 173-210.

Ekoç, Arzu (2020). "English Medium Instruction (EMI) from the perspectives of students at a technical university in Turkey". Journal of Further and Higher Education, 44(2), 231-243.

Ellili-Cherif, Maha, Haitham Alkhateeb (2015). College students' attitude toward the medium of instruction: Arabic versus English dilemma. Universal Journal of Educational Research, 3(3), 207-215.

Ellis, Rod, Fangyuan Yuan (2004). "The effects of planning on fluency, complexity, and accuracy in second language narrative writing." Studies in Second Language Acquisition, 26(1), 59-84.

Elo, Satu, Maria Kääriäinen, Outi Kanste et al. (2014). "Qualitative content analysis: A focus on trustworthiness". SAGE Open, 4(1), 1-10.

Engber, Cheryl A. (1995). "The relationship of lexical proficiency to the quality of ESL compositions". Journal of Second Language Writing, 4(2), 139-155.

Eser, Oktay, Kenan Dikilitaş (2017). "Learners' Perceptions of Translation in English as the Medium of Instruction (EMI) at University Level". Journal of Education and Practice, 8(8), 124-129.

Evans, Stephen, Bruce Morrison (2011). Meeting the challenges of English-medium higher education: The first-year experience in Hong Kong. English for Specific Purposes, 30(3), 198-208.

Evans, Stephen, Christopher Green (2007). "Why EAP is necessary: A survey of Hong Kong tertiary students". Journal of English for Academic Purposes, 6(1), 3-17.

Ferrari, Michel, Thérèse Bouffard, Line Rainville (1998). "What makes a good writer? Differences in good and poor writers' self-regulation of writing". Instructional Science, 26(6), 473-488.

Ferris, Dana R. (1994). "Lexical and syntactic features of ESL writing by students at different levels of L2 proficiency". TESOL Quarterly 28(2), 414-420.

Flowerdew, John, Lindsay Miller (1992). "Student perceptions, problems and strategies in second language lecture comprehension". *RELC Journal,* 23(2), 60-80.

Flowerdew, John, Lindsay Miller (1996). "Lecturer perceptions, problems and strategies in second language lectures". RELC Journal, 21(1), 23-60.

Flowerdew, John, Lindsay Miller (2000). "Chinese lectures' perceptions, problems and strategies in lecturing in English to Chinese-speaking students". RELC Journal, 31(1), 116-137.

Foster, Pauline, Peter Skehan (1996). "The influence of planning and task type on second language performance." Studies in Second Language Acquisition 18(3), 299-323.

Galloway, Nicola Jaroslaw Kriukow, Takuya Numajiri (2017). "Internationalisation, higher education and the growing demand for English: An investigation into the English medium of instruction (EMI) movement in China and Japan". ELT Research Papers, 17(2), 25-35.

Goldenberg, Claude (2008). "Teaching English language learners: What the research does-and does not-say". ESED 5234-Master List, 27.

Goldman, Susan Braasch, Jennifer Wiley, Arthur C. Graesser et al. (2012). "Comprehending and learning from internet sources: Processing patterns of better and poorer learners". Reading Research Quarterly, 47(4), 356–381.

Graesser, Arthur C., Danielle S. McNamara (2011). "Computational analyses of multilevel discourse comprehension". Topics in Cognitive Science. 3(2), 371-398

Graesser, Arthur C., Danielle S. McNamara, Max M. Louwerse et al. (2004). "Coh-Metrix: Analysis of text on cohesion and language". Behavior Research Methods, Instruments, and Computers, 36(2), 193-202.

Graesser, Arthur C., Murray Singer, Tom Trabasso (1994). "Constructing inferences during narrative text comprehension". Psychological Review, 101, 371–395.

Healey, Nigel M. (2008). "Is higher education in really 'internationalising'?". Higher Education, 55(3), 333-355.

Hellekjaer, Glenn Ole (2010). "Assessing lecture comprehension in Norwegian English-medium higher education". Language Use and Language Learning in CLIL Classrooms, 7, 44-61.

Hu, Guangwei, Jun Lei (2014). "English-medium instruction in Chinese higher education: A case study". Higher Education, 67(5), 551-567.

Hu, Guangwei, Xiuhai Li (2017). "Asking and answering questions in English-medium instruction. English-medium instruction in Chinese universities". Perspectives, iscourse and evaluation, 7, 184-203.

Hultgren, Anna Kristina (2018). "The Englishization of Nordic universities: What do scientists think?". European Journal of Language Policy, 10(1), 77-95.

Iwashita, Noriko (2006). "Syntactic complexity measures and their relation to oral proficiency in Japanese as a foreign language." Language Assessment Quarterly: An International Journal, 3(2), 151-169.

Iwashita, Noriko, Annie Brown, Tim McNamara et al. (2008). "Assessed levels of second language speaking proficiency: How distinct?". Applied Linguistics, 29(1), 24-49.

Jagaiah, Thilagha (2017). Analysis of syntactic complexity and its relationship to writing quality in argumentative essays. Doctoral dissertation, University of Conneticut. Retrieved from https://opencommons.uconn.edu/dissertations/1571

Jarvis, Scott (2002). "Short texts, best-fitting curves and new measures of lexical diversity". Language Testing, 19(1), 57-84.

Jensen, Christian, Jacob Thøgersen (2011). "Danish University lecturers' attitudes towards English as the medium of instruction". Ibérica, Revista de la Asociación Europea de Lenguas para Fines Específicos, 22, 13-33.

Johansson, Victoria (2008). "Lexical diversity and lexical density in speech and writing: a developmental perspective." Lund Working Papers in Linguistics, 53, 61-79.

Kachru, Braj B. (1992). "Models for non-native Englishes. The other tongue". English Cultures, 2, 48-74.

Kang, Soyeon, Hyeson Park (2005). "English as the medium of instruction in Korean engineering education". 응용언어학, 21(1), 155-174.

Karakaş, Ali (2016). Turkish Lecturers' and students' perceptions of English in English-medium instruction universities. Doctoral dissertation, Southampton University, Southampton. Retrieved from https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp / December 02, 2019

Karakaş, Ali (2019). "A critical look at the phenomenon of 'a mixed-up use of turkish and English' in English-medium instruction universities in Turkey". Journal of Higher Education and Science/Yükseköğretim ve Bilim Dergisi, 9(2), 205-215. doi: 10.5961/jhes.2019.322

Khan, Humaira I. (2013). An investigation of two universities' postgraduate students and their teachers' perceptions of policy and practice of English medium of instruction (EMI) in Pakistani universities. Doctoral dissertation, University of Glasgow.

Khan, Sarah. (2018). "Lecturing strategies of non-native EMI lecturers on an International Business programme". Bulletin VALS-ASLA, 107, 65-82.

Kim, Jeongyeon, Eun G. Kim, Soo-Ok Kweon (2018). "Challenges in implementing English-medium instruction: Perspectives of Humanities and Social Sciences professors teaching engineering students". English for Specific Purposes, 51, 111-123.

Kim, Joonkoo, Kyuyun Lim (2019). "A Comparative analysis of Koreans' English writings and Google translations using Coh-Metrix 3.0.". 영어학, 19(3), 452-474.

Kirkgöz, Yasemin, Kenan Dikilitaş (2018). In Eds Yasemin Kırkgöz, Kenan Dikilitaş. Key issues in English for specific purposes in higher education. Springer.

Kirkgöz, Yasemin (2005). "Motivation and student perception of studying in an English-medium university". Dil ve Dilbilimi Çalışmaları Dergisi, 1(1), 101-123.

Kirkgöz, Yasemin (2009a). "Globalization and English language policy in Turkey". Educational policy, 23(5), 663-684.

Kirkgöz, Yasemin (2009b). "Students' and lecturers' perceptions of the effectiveness of foreign language instruction in an English-medium university in Turkey". Teaching in Higher Education, 14(1), 81-93.

Kirkgöz, Yasemin (2014). "Students'perceptions of English language versus Turkish language used as the medium of instruction in higher educatıon in Turkey". Electronic Turkish Studies, 9(12).

Kirkgöz, Yasemin, Ihsan Ünaldi (2012). "Coh-metrix: Introduction and validation of an online tool for text analysis." Çukurova University Faculty of Education Journal 41(2), 1-17.

Kirkpatrick, Andy (2011). "English as an Asian lingua franca and the multilingual model of ELT". Language Teaching, 44(2), 212-224.

Kirkpatrick, Andy (2011). "Internationalization or Englishization: Medium of instruction in today's universities". Hong Kong: Centre for Governance and Citizenship, The Hong Kong Institute of Education.

Korstjens, Irene, Albine Moser (2018) "Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing". European Journal of General Practice, 24(1), 120-124.

Kuiken, Folkert, Ineke Vedder (2019). "Syntactic complexity across proficiency and languages: L2 and L1 writing in Dutch, Italian and Spanish". International Journal of Applied Linguistics 29(2), 192-210.

Kuiken, Folkert, Ineke Vedder, Alex Housen et al. (2019). "Variation in syntactic complexity: Introduction". International Journal of Applied Linguistics, 29(2), 161-170.

Kuteeva, Maria, John Airey (2012). "Disciplinary differences in knowledge structures and their impact on the use of English in Swedish higher education". Retrieved from http://uu.diva-portal.org/smash/record.jsf?pid=diva2:575227

Laufer, Batia (2003). "Vocabulary acquisition in a second language: Do learners really acquire most vocabulary by reading? Some empirical evidence". Canadian Modern Language Review, 59(4), 567-587.

Lloyd, Malinda. H., Nancy. J., Kolodziej, Kathy M. Brashears (2016). "Classroom Discourse: An Essential Component in Building a Classroom Community". School Community Journal, 26(2), 291-304.

Lu, Xiaofei (2011). "A corpus-based evaluation of syntactic complexity measures as indices of college-level ESL writers' language development". TESOL Quarterly 45(1), 36-62.

Macaro, Ernesto, Antonio Jiménez Muñoz, David Lasagabaster (2019). "The importance of certification of English medium instruction teachers in higher education in Spain". Porta Linguarum, 32, 103-118

Macaro, Ernesto, Samantha Curle, Jack Pun et al. (2018). "A systematic review of English medium instruction in higher education". Language Teaching, 51(1), 36-76.

Macaro, Ernesto, Shuangmiao Han (2020). "English medium instruction in China's higher education: teachers' perspectives of competencies, certification and professional development". Journal of Multilingual and Multicultural Development, 41(3), 219-231.

Malvern, David, Brian Richards (2002). "Investigating accommodation in language proficiency interviews using a new measure of lexical diversity". Language Testing, 19(1), 85-104.

McCutchen, Deborah, Amy E. Covill, Hilary Hoyne et al. (1994). "Individual differences in writing: Implications of translating fluency". Journal of Educational Psychology, 86(2), 256.

McNamara, Danielle S., Max M. Louwerse, Philip M. McCarthy et al. (2010). Coh-Metrix: Capturing linguistic features of cohesion. Discourse Processes, 47(4), 292-330.

McNamara, Danielle S., Scott A. Crossley, Philip M. McCarthy (2010). "Linguistic features of writing quality". Written Communication, 27(1), 57-86.

McNamara, Danielle S., Walter Kintsch (1996). "Learning from texts: Effects of prior knowledge and text coherence". Discourse Processes, 22(3), 247–288.

Napoli, Jocelyne, Jocelyne Sourisseau (2013). "L'EMILE est-il appliqué dans l'enseignement supérieur?. Enquêtes sur le site toulousain. Recherche et pratiques pédagogiques en langues de spécialité". Cahiers de l'Apliut, 32(3), 123-143.

Nassaji, Hossein (2015). "Qualitative and descriptive research: Data type versus data analysis." Language Teaching, 19(2), 129-132.

Neumann, Ruth (2001). "Disciplinary differences and university teaching". Studies in Higher Education, 26(1), 15-25.

Neumann, Ruth, Tony Becher (2002). "Teaching and learning in their disciplinary contexts: A conceptual analysis". Studies in Higher Education, 27(4), 405–417.

Norris, John M., Lourdes Ortega (2009). "Towards an organic approach to investigating CAF in instructed SLA: The case of complexity." Applied Linguistics, 30(4), 555-578.

Nystrand, Martin (2006). "Research on the role of classroom discourse as it affects reading comprehension". Research in the Teaching of English, 392-412.

O'Dowd, Robert (2018). "The training and accreditation of teachers for English medium instruction: an overview of practice in European universities". International Journal of Bilingual Education and Bilingualism, 21(5), 553-563.

Ortega, Lourdes (2003). "Syntactic complexity measures and their relationship to L2 proficiency: A research synthesis of college-level L2 writing". Applied Linguistics, 24(4), 492-518.

Pecorari, Diane, Philip Shaw, Aileen Irvine et al. (2011). "English for Academic Purposes at Swedish universities: Teachers objectives and practices". Ibérica: Revista de la Asociación Europea de Lenguas para Fines Específicos (AELFE), 22, 55–78.

Polio, Charlene, Hyung-Jo Yoon (2018). "The reliability and validity of automated tools for examining variation in syntactic complexity across genres". International Journal of Applied Linguistics, 28(1), 165-188.

Polit, Denise F., Cheryl Tatano Beck (2010). "Generalization in quantitative and qualitative research: Myths and strategies". International Journal of Nursing Studies, 47(11), 1451-1458.

Popa, Simona (2016). Language transfer in second language acquisition. Some effects of L1 instruction (Romanian) on L2/L3 learning (Catalan/Spanish). Doctoral dissertation, Universitat de Lleida, Lleida.

Ransdell, Sarah, Åsa Wengelin (2003). "Socioeconomic and sociolinguistic predictors of children's L2 and L1 writing quality". Arobase, 1, 22-29.

Raudszus, Henriette, Eliane Segers, Ludo Verhoeven (2019). Situation model building ability uniquely predicts first and second language reading comprehension." Journal of Neurolinguistics, 50, 106-119.

Rauhvargers, Andrejs. (2013). Global university rankings and their impact: Report II (pp. 21-23). Brussels: European University Association.

Rapp, David N., Paul van den Broek, Kristen L. McMaster et al. (2007). Higher-order comprehension processes in struggling readers: A perspective for research and intervention. Scientific Studies of Reading, 11(4), 289-312.

Read, John, Paul Nation (2006). "An investigation of the lexical dimension of the IELTS speaking test". IELTS Research Reports, 6, 207-231.

Riera, Jorge Braga, Carmen Maiz Arévalo (2013). "CLIL and translation in tertiary education. Revista de Lenguas para Fines Específicos, 19, 29-59.

Rong-gen, Zhang (2016). "A Coh-Metrix analysis of two textbooks: Successful English for vocational colleges and vocational college English". US-China Foreign Language, 351.

Rose, Heath, Jim McKinley (2018). "Japan's English-medium instruction initiatives and the globalization of higher education". Higher Education, 75(1), 111-129.

Rose, Heath, Jim Mckinley, Xin Xu et al. (2020). Investigating policy and implementation of English-medium instruction in higher education institutions in China: A report by EMI Oxford Research Group in collaboration with the British Council in China. Retrieved from https://www.researchgate.net/publication/340528764_Investigating_policy_and _implementation_of_English- medium_instruction_in_higher_education_institutions_in_China_A_report_by _EMI_Oxford_Research_Group_in_collaboration_with_the_British_Council_i n_China

Rose, Heath, Samantha Curle, Ikuyi Aizawa et al. (2019). "What drives success in English medium taught courses?". The interplay between language proficiency, academic skills, and motivation. Studies in Higher Education, 1-13.

Rogier, Dawn (2012). The effects of English-medium instruction on language proficiency of students enrolled in higher education in the UAE. Doctoral dissertation, University of Exeter, United Kingdom. Retrieved from https://ore.exeter.ac.uk/repository/bitstream/handle/10036/4482/RogierD.pdf?s equence=2.

Sanchez, Rebecca M. (2008). "Integrating community in culturally conscientious classrooms". Education Digest, 63(7), 53–57.

Selvi, Ali Fuad (2014). "The medium-of-instruction debate in Turkey: Oscillating between national ideas and bilingual ideals". Current Issues in Language Planning, 15(2), 133-152.

Sert, Nehir (2008). "The language of instruction dilemma in the Turkish context". System, 36, 156-171.

Shulman, Lee (1987). "Knowledge and teaching: Foundations of the new reform". Harvard Educational Review, 57(1), 1–23.

Sim, Julius, Keith Sharp (1988) "A critical appraisal of the role of triangulation in nursing research." International Journal of Nursing Studies 35(1-2), 23-31.

Skehan, Peter (1996). "A framework for the implementation of task-based instruction". Applied Linguistics, 17, 38-62.

Skehan, Peter, Pauline Foster (1999). "The influence of task structure and processing conditions on narrative retellings." Language learning, 49(1), 93-120.

Smit, Ute, Emma Dafouz (2012). "Integrating content and language in higher education: An introduction to English-medium policies, conceptual issues and research practices across Europe". Aila Review, 25(1), 1-12.

Soren, Joyce Kling. (2013). Teacher identity in English-medium instruction: Teacher cognitions from a Danish tertiary education context. Doctoral dissertation,

University of Copenhagen. Copenhagen. Retrieved from https://tel.archives-ouvertes.fr/tel-00863816/document

Soruç, Adem, Carol Griffiths (2018). "English as a medium of instruction: Students' strategies". ELT Journal, 72(1), 38-48.

Tan, May, Ong Saw Lan (2011). "Teaching mathematics and science in English in Malaysian classrooms: The impact of teacher beliefs on classroom practices and student learning". Journal of English for Academic Purposes, 10(1), 5-18.

Tange, Hanne (2010). "Caught in the tower of babel: university lecturers' experiences with internationalisation". Language and Intercultural Communication, 10, 137–149.

Teodorescu, Adriana (2010). "Teaching English for Specific Purposes". Petroleum-Gas University Of Ploiesti Bulletin, Philology Series, 62(2), 67-74.

Tobin, Gerard A., Cecily M. Begley (2004). "Methodological rigour within a qualitative framework". Journal of Advanced Nursing, 48, 388–396.

Thøgersen, Jacob, John Airey (2011). "Lecturing undergraduate science in Danish and in English: A comparison of speaking rate and rhetorical style". English for Specific Purposes, 30(3), 209-221.

Tsai, Yi-Rung, Wenli Tsou (2015). "Accommodation strategies employed by non-native English-mediated instruction (EMI) teachers". The Asia-Pacific Education Researcher, 24(2), 399-407.

Turhan, Burcu, Yasemin Kirkgöz (2018). "Motivation of engineering students and lecturers toward English medium instruction at tertiary level in Turkey". Dil ve Dilbilimi Çalışmaları Dergisi, 14(1), 261-277.

Vinke, Adriana Anthonia (1995). English as the medium of instruction in Dutch engineering education. Doctoral dissertation, Delft University, Delft.

Walqui, Aida (2006). "Scaffolding instruction for English language learners: A conceptual framework." International Journal of Bilingual Education and Bilingualism, 9(2) 159-180.

Wang, Xuan (2014). "The relationship between lexical diversity and EFL writing proficiency". TESOL Quarterly, 9(2), 12-34.

Wiley, Jennifer, Susan Braasch Goldman, Arthur C. Graesser et al. (2009). Source evaluation, comprehension, and learning in Internet science inquiry tasks. American Educational Research Journal, 46(4), 1060-1106.

Wilkinson, Louise. C., Elaine. R. Silliman (2000). "Classroom language and literacy learning". Handbook of Reading Research, 3, 337-360.

Wimmer, Gejza, Gabriel Altmann (1999). "On vocabulary richness". Journal of Quantitative Linguistics 6(1), 1-9.

Wu, Hantian (2018). "Three dimensions of China's 'outwardoriented' higher education internationalization". Higher Education 77(1), 81–96.

Wu, Shu-Ling, Lourdes Ortega (2013). "Measuring global oral proficiency in SLA research: A new elicited imitation test of L2 Chinese". Foreign Language Annals, 46(4), 680-704.

Yeh, Chun-Chun. (2014). "Taiwanese students' experiences and attitudes towards English-medium courses in tertiary education". RELC Journal, 45(3), 305-319.

Yu, Guoxing (2009). "Lexical diversity in writing and speaking task performances". Applied Linguistics, 31, 236–259.

Zhang, Zhiguo (2018). "English-medium instruction policies in China: Internationalisation of higher education". Journal of Multilingual and Multicultural Development, 39(6), 542-555.

Zwaan, Rolf A., Carol M. Brown (1996). The influence of language proficiency and comprehension skill on situation-model construction. Discourse Processes, 21(3) 289-327.

Zwaan, Rolf A., Gabriel A. Radvansky (1998). "Situation models in language comprehension and memory". Psychological Bulletin, 123(2), 162-172.

APPENDICES

APPENDIX A. Example Output of Coh-Metrix Web Tool

Number	Label	Label V2.x	Text	Full description
Descriptive				
1	DESPC	READNP	1	Paragraph count, number of paragraphs
2	DESSC	READNS	356	Sentence count, number of sentences
3	DESWC	READNW	10677	Word count, number of words
4	DESPL	READAPL	356	Paragraph length, number of sentences in a paragraph, mean
5	DESPLd	n/a	0	Paragraph length, number of sentences in a pragraph, standard deviation
6	DESSL	READASL	29.992	Sentence length, number of words, mean
7	DESSLd	n/a	19.748	Sentence length, number of words, standard deviation
8	DESWLsy	READASW	1.367	Word length, number of syllables, mean
9	DESWLsyd	n/a	0.732	Word length, number of syllables, standard deviation
10	DESWLlt	n/a	4.068	Word length, number of letters, mean
11	DESWLltd	n/a	2.276	Word length, number of letters, standard deviation
Text Easability Principle Component Scores				
12	PCNARz	n/a	1.056	Text Easability PC Narrativity, z score
13	PCNARp	n/a	85.310	Text Easability PC Narrativity, percentile
14	PCSYNz	n/a	-0.661	Text Easability PC Syntactic simplicity, z score
15	PCSYNp	n/a	25.460	Text Easability PC Syntactic simplicity, percentile
16	PCCNCz	n/a	-1.053	Text Easability PC Word concreteness, z score
17	PCCNCp	n/a	14.690	Text Easability PC Word concreteness, percentile
18	PCREFz	n/a	2.075	Text Easability PC Referential cohesion, z score
19	PCREFp	n/a	98.080	Text Easability PC Referential cohesion, percentile
20	PCDCz	n/a	2.266	Text Easability PC Deep cohesion, z score
21	PCDCp	n/a	98.810	Text Easability PC Deep cohesion, percentile
22	PCVERBz	n/a	0.236	Text Easability PC Verb cohesion, z score
23	PCVERBp	n/a	59.100	Text Easability PC Verb cohesion, percentile
24	PCCONNz	n/a	-1.358	Text Easability PC Connectivity, z score
25	PCCONNp	n/a	8.850	Text Easability PC Connectivity, percentile

APPENDIX B. The Questionnaire Applied to Lecturers to Determine Coh-Metrix categories

Değerli katılımcı,

Yabancı dilde eğitim alan öğrencilerin dil yetisini geliştirip dersleri daha iyi anlamalarında, öğretmenlerin kullandığı dilde öne çıkan aşağıdaki 11 kategoriyi önem derecelerine göre **1'den (en çok önemli) 11'e kadar (en az önemli)** sıralayınız.

Katkılarınızdan dolayı şimdiden teşekkür ederiz.

1. İSTATİSTİKÎ VERİLER: Konuşmada geçen her türlü rakamsal istatistikî verileri içerir.
Örn: Total paragraf/ cümle/ sözcük sayısı

2. KOLAYLIK: Kullanılan dilin zorluk seviyesinin belirlenmesi ve yapısal/anlamsal tutarlığın ölçülmesidir.
Örn: Genel zorluk seviyesi, somutluk, mantıksal uyum ve sebep-sonuç ilişkisi

3. ANLAM BÜTÜNLÜĞÜ, TUTARLIK: Cümlelerin kendi içindeki ve bütünündeki genel tutarlılığı ile bu tutarlılığı oluşturan her türlü dilbilgisi unsurunu (sözcük, öbek, cümle vb.) inceler.
Örn: Yapısal /anlamsal bütünlük, sözcük tekrarları ve gönderme

4. ANLAM ANALİZİ: Art arda gelen cümlelerin kendi içinde ve konuşmanın tamamıyla ilgili alakalı olması
Örn: Anlamsallık, bütünlük

5. SÖZCÜK ÇEŞİTLİLİĞİ: Kullanılan sözcük türünün çeşitliliği ve her bir sözcüğün ne sıklıkla kullanıldığı ile ilgilidir.

6. BAĞLAÇLAR: Konuşmayı biçim ve anlam yönünden bağlayan unsurlardır.
Örn: Sebep-sonuç, zıtlık, zaman bağlaçları, olumlu/olumsuz bağlaçlar

7. DURUM MODELİ: Kelimelerin anlamlı bir bütün oluşturup dinleyicinin üzerinde oluşturduğu algı, ya da ne derece anlamlı bir etki oluşturduğu ile ilgilidir.

8. SÖZDİZİMSEL KARMAŞIKLIK: Sözcük ve sözcük öbeklerinin diziliminden, uzunluğundan kaynaklanan dilin zorluk seviyesini ifade eder.
Örn: Cümle uzunlukları, basit ve karmaşık cümleler, aktiflik- pasiflik durumu, niteleyiciler

9. SÖZDİZİMSEL YAPI YOĞUNLUĞU: Farklı sözcük türlerinin kullanımı ve bunların konuşmanın zorluk seviyesine ne derece etki ettiği ile ilgilidir.
Örn: Sözcük türleri (isim, fiil, zarf, fiilimsi vs.) oranı, pasif cümle oranı, olumsuz ifadeler

10. SÖZCÜK BİLGİSİ: Konuşmada geçen her bir sözcüğün türünü (isim, fiil, zarf, edat vs.) ve işlevini (içerik vs. işlev) ifade eder.
Örn: İçerik vs. işlev sözcükleri, kullanılan sözcüklerin aşinalığı, genel/kapsayıcı/çok anlamlılık

11. OKUNURLUK/ANLAŞIRLIK: Konuşmanın anlaşırlık seviyesinin bazı istatistikî hesaplamalara göre belirlenmesidir.