

ARTIGOS

Vers une *représentation* des assises d'une théorie du curriculum
Philippe Jonnaert

La manifestación discursiva de la reflexión
Vicenta González
Encarna Atienza
Joan Tomàs Pujolà

Analyzing writing in English-medium instruction at university
Maria Sagrario Salaberri Ramiro
Maria Del Mar Sánchez Pérez

CLIL: The added value to English language teacher education for
young learners
Maria Eliason

Aprofundar a compreensão leitora em português L2 no nível
avançado à luz do QECRL, partindo do Teste Cloze

Angela Filipe Lopes
Fernanda Martins
Marta da Graça L. Castro Pinto

RECLINQUES / NOTAS SOBRE LIVROS

Edward Y. Oshibo
*Pronunciation is in the Brain, not in the Mouth. A Cognitive Approach
to Teaching It*, 2014.
Marta da Graça L. Castro Pinto

Brian Tomlinson (Ed.)
Developing Materials for Language Teaching, Second Edition, 2013.
Shawn Severson

Marta da Graça L. Castro Pinto
A escrita. O papel da universidade na sua construção, 2014.
Isabel Margarida Duarte

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VOL. 6 - ANO 2015

SUMÁRIO

Editorial 5

ARTIGOS

Vers une *reproblématisation* des assises d'une théorie du curriculum 9
Philippe Jonnaert

La manifestación discursiva de la reflexión 29

Vicenta González

Encarna Aienza

Joan Tomàs Pujolà

Analyzing writing in English-medium instruction at university 45

María Sagrario Salaberri Kamito

María Del Mar Sánchez Pérez

CLIL: The added value to English language teacher education for young learners 59

María Ellison

Aprofundar a compreensão leitora em português L2 no nível avançado à luz do QECRL partindo do Teste *Cluze* 71

Angela Filipe Lopes

Fernanda Martins

Maria da Graça L. Castro Pinto

RECENSÕES/NOTAS SOBRE LIVROS

Halward Y. Odisho
Pronunciation is in the Brain, not in the Mouth. A Cognitive Approach to Teaching it 2014 93

Maria da Graça L. Castro Pinto

Brian Tomlinson (Ed.)

Developing Materials for Language Teaching. Second Edition. 2013 101

Shawn Sevenson

Van Dijk, T. comp. 2000a. *El discurso como estructura y proceso. Estudios sobre el discurso I: una introducción multidisciplinaria*. Barcelona: Gedisa.
Van Dijk, T. 2000b. *El discurso como interacción social. Estudios sobre el discurso II: una introducción multidisciplinaria*. Barcelona: Gedisa.

ANALYZING WRITING IN ENGLISH-MEDIUM INSTRUCTION AT UNIVERSITY

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Abstract: The number of bilingual and English-Medium-Instruction (EMI) degree programmes has grown significantly in Spanish universities during the last few years, becoming a new trend within the Bologna system. The implementation of the European Higher Education Area (EHEA) led to changes in Spanish universities, promoting a shift in the teaching methods and enhancing the improvement in quality and international competitiveness pursuing an increase in mobility opportunities and the employability of the European graduates. The command of the English language in specialized university contexts became thus crucial. Research conducted at university level reveals that university students often have difficulty in performing the cognitive and discursive operations involved in the comprehension and production of written texts. These difficulties aggravate when the written performance has to be conducted in a non-native language. The present paper analyses the written production of Chemistry students following an EMI approach at the University of Almería (Spain) from a qualitative perspective. Results show the differences in the performance of certain areas of written language competence, which evidences the need to adopt methodologies that solve the problems and difficulties faced by students in order to help them integrate the global features of the writing ability within their own course contents in a second language.

Keywords: Analysis; writing; English-Medium Instruction; university

1. Introduction

The implementation of bilingual and English-Medium instruction (EMI) programmes in different educational stages has exponentially increased in Spain during the last decade. In recent years, European universities are currently actively engaged in creating opportunities for members to learn foreign languages (Moore 2011), and consequently, a displacement of these bilingual teaching practices to many European and Spanish universities is occurring (Doiz, Lasagabaster & Sierra

2013). The implementation of the European Higher Education Area (EHEA) has led to changes in Spanish universities, which promotes a shift in teaching methods and enhances the improvement in quality and international competitiveness pursuing an increase in mobility opportunities and in the employability of the European graduates. In this sense, the command of a second language and the promotion of multilingualism are essential. The growing need of institutions to attract students from other countries and to strengthen the international profiles to achieve competitive advantage by higher education institutions predicts that this phenomenon has only just begun.

Research conducted at university level reveals that university students often have difficulty in performing the cognitive and discursive operations involved in the comprehension and production of written texts (Atienza & López 1997; Castellani 1998; Carlino 2005; 2007). These difficulties aggravate when this written performance has to be conducted in a non-native language, which is being increasingly demanded of university students participating in bilingual and EMI programmes. According to Carlino (2005), writing is one of the methods to learn, and any subject is composed not only of a set of concepts, but by specific ways of thinking associated with particular forms of writing. Such forms should thus be considered and taught along with the contents of each content field.

Sometimes, university students' problems in writing in a second language (L2) do not differ much from their problems in L1 lectures, basically due to their lack of academic literacy in L1 (Airey & Linder 2006). According to these authors, (...) changing the lecturing language merely accentuates communication problems that are already present in first-language lectures' (2006: 7). On the other hand, not all students develop all aspects of writing ability at the same rate, and, sometimes, there are differences between certain aspects or parameters of the writing competence among students.

The present paper analyses the written production of 67 Chemistry students from the University of Almería (Spain) from a qualitative perspective. Results show the differences in the performance of certain areas of written language competence, which evidences the need to adopt new methods to help students integrate the global features of the writing ability within their own course contents in a second language.

2. Writing at Tertiary Level

Many studies reveal that language competence development in bilingual educational settings is more evident in receptive communicative skills (reading and listening) than in production skills (writing and speaking), maybe due to the fact that less priority is usually given in these contexts to the latter (García 2009). The ideal bilingual programmes are those in which the main objective is the achievement of best possible command of all skills (reading, listening, speaking and writing) in the target language. However, reality shows that this is not always the case, and in contrast to receptive skills, productive skills such as writing are not prioritized and usually stand in a second place.

According to Carlino (2005), encouraging productive (writing) activities among university students is essential to access the specific knowledge and culture of each discipline. Writing is part of the professional and academic work and understanding and developing written texts is the basic and essential way to learn the conceptual contents that students need to acquire. For such purpose, students should acquire the specific *academic literacy*¹ of their discipline.

In an educational university context where knowledge is continuously exchanged, as it is the EHEA, writing performance is constantly growing. For such reason, lecturers need to adopt new strategies in the classroom to help students integrate global features of the language of instruction (Salaberri & Sánchez 2012), and more particularly, the writing competence in a second language within the rest of the course contents.

3. Previous studies on Writing in Bilingual Academic Contexts

Oral language development has been so far at the core of interest for empirical research in bilingual academic contexts. According to Jexenflicker and Dalton-Puffer (2010), this is mainly driven by two main issues: on the one hand, formal education takes place in the oral sphere, which is especially true of its main event namely 'the lesson' (2010: 169). On the other hand, when people talk about the language learning effects of bilingual or EMI approaches it is understood as 'communicative competence' (Dalton-Puffer 2009) in the limited sense of 'oral fluency' (Hüttner 2009). However, writing is a fundamental aspect of language skill and it plays an essential role in the construction of subject-specific competence (e.g. Zwiers 2008; Coetsee-Lachmann 2009). Thus, it should have its place in full appreciation of bilingual and EMI research.

As Jexenflicker and Dalton-Puffer (2010) state that university students need to learn curricular concepts, facts and skills 'not only by rote memorization but by interacting with them in order to make them their own' (2010: 170). Furthermore, tasks such as experiments or cognitive-linguistic manipulation clearly play an important role in such processes of appropriation, and it is evident that writing is an essential form of this kind of manipulation, even if it is not highly exploited in some classroom traditions.

The assumption that teaching content subjects through the medium of English considerably improves the English language skills is undeniable in the research literature, as we will see below. However, the assumption that bilingual teaching and EMI foster all aspects of language competence in equal measure should be treated with caution (Jexenflicker & Dalton-Puffer 2010).

The few studies conducted in Europe regarding the analysis of the written production in bilingual settings have been mainly performed at secondary and upper secondary level and most of them have to do with comparison between students following a Content and Language Integrated Learning (CLIL) approach

¹ Understood by Carlino (2005) as the set of notions and strategies needed to participate in the discursive culture of disciplines, as well as in the test analysis and production activities required to learn in higher education.

and traditional English Language Teaching (ELT).²

Hellekjaer (2004) studied the Academic English reading skills of Norwegian CLIL and non-CLIL students and found the former to be far better equipped for studying through the medium of English at tertiary level.

Haumold (2006) showed that 18-year old Austrian CLIL students reached the required B2 Common European Framework of Reference for Languages (CEFR) level on the written part of the Oxford Placement test significantly more often than their non-CLIL peers, who had followed only the conventional EFL curriculum.

As for lexical learning at secondary level, Sylvén (2004) and Serégely (2008) found significant advantages of CLIL students regarding vocabulary size and range.

Most recent studies have been based on a closely restricted understanding of 'language competence' either given through the adoption of a specific standardised test or via focussing on a specific skill area. Recently, a comprehensive study (Lasagabaster 2008) aimed at implementing a more differentiated and arguably more complete view of foreign language competence in the study of language learning outcomes in CLIL education. This author studied 198 Spanish secondary students (14 - 16 years old) by means of a test battery comprising grammar, listening, speaking and writing. The author concludes that 'CLIL exerts a positive influence on all the language aspects measured' in the study including writing and pronunciation (2008: 36), two areas which other researchers have claimed to be indeterminate or unaffected (e.g. Dalton-Puffer 2008; Varchmin 2008). Test evaluation was carried out through a five-scale matrix consisting of the dimensions content, organisation, vocabulary, language usage and mechanics. The results presented show statistically significant advantages of the CLIL group on all five dimensions.

Other studies are those of Coetzee-Lachmann (2009) and Vollmer, Heine, Trotschke, Coetzee and Küttel (2006), who investigated the subject specific discourse competence of German 10th graders in Geography. In this study, comparisons were made not only along the CLIL-non-CLIL dimension but also between productions in L2 (English) and L1 (German). The results showed considerable deficiencies in academic literacy in both languages in terms of encoding sufficiently complex conceptualizations as well as with regard to the use of subject-specific terminology and style.

The influence of activities experienced in the CLIL content classroom on the writing skills demonstrated becomes palpable if the above-mentioned German studies are compared to another Spanish one (Whittaker & Llinares 2009). In this case, 7th graders were found 'beginning to acquire some of the register features of their discipline' (2009: 234). This may be, according to Jexenflicker & Dalton-Puffer (2010) a direct consequence of the higher emphasis put on writing in Spanish content lessons, in comparison with other European contexts.

In a study conducted by Jexenflicker and Dalton-Puffer (2010) the written

production of 86 upper-secondary engineering students in Austria was analysed in order to determine which of the areas of written language competence profit more and are possibly unaffected by the experience of subject matter teaching in a foreign language. The texts were assessed according to an analytic rating scale including task fulfilment, organisation, grammar and vocabulary. Results show that, in general terms, CLIL students outperformed their EFL-only peers in writing skills. More particularly, the differences found regarding pure linguistic skills (i.e. grammar and vocabulary) were highly significant. Regarding task fulfilment, the CLIL group clearly outperformed their non-CLIL peers by considering and realising the communicative purpose of the text and thus showing a greater pragmatic awareness. As for organisation, the overall difference was smaller and the authors noted that, on the whole, these skills were not very well developed.

A similar study was conducted by Ruiz de Zarobe (2010) in which the author analyses the written competence of two groups of bilingual students that follow two different CLIL programmes and an EFL group (secondary and pre-university). Results show that the CLIL groups score better in relation to the five categories analysed in written production: content, organisation, vocabulary, language usage and mechanics, which led the author to conclude that there is a positive relationship between the amount of exposure through English and written foreign language proficiency.

In light of the findings of some similar studies conducted in Spain (Llinares & Whittaker 2006; Whittaker & Llinares 2009) which show a higher level of proficiency in students' L1 writing, Jexenflicker and Dalton-Puffer (2010) attribute these differences in the findings of such similar studies to the different traditions in the teaching of content-subjects. According to the authors, while in German or Austrian contexts there is a widespread absence of writing in content lessons which leads to a lack of experience with this kind of activity by students, in Spanish contexts there is a higher tradition in the development of writing tasks in content courses. Thus, according to these authors, Spanish CLIL and EMI students are shown to possess more 'adequate subject-specific writing skills in their L1 while their subject-specific L2 writing skills obviously lag behind but are in the process of developing' (2010: 183).

Other studies have been developed in order to analyse the written production of engineering university students from a quantitative perspective (Sánchez & Salaberri 2015), in which the written production of a professional genre type by Engineering university students in a second language (English) at a Spanish university was analyzed.

4. Sample and method

4.1. Context of the study

The present study was carried out at a Spanish university using an EMI approach in higher education courses under the framework of an official Plurilingualism Promotion Plan. The course under analysis is a 6-ECTS Chemistry course taught

² Although most of the literature on written production in bilingual settings currently available belongs to CLIL and ELT settings, it has been included in this paper due to the similarity and relevance to the subject matter.

in English during the academic years 2011-2014 as part of the syllabus of the first academic year of the Degree in Agricultural Engineering. The course was taught by two non-native-English-speaking lecturers and the total number of students was 67 (46 males and 21 females). All students were Spanish native speakers³ with an average age of 20. They recognized to have a pre-intermediate level of English.⁴

4.2. Method for analysis

A specific assignment was provided to students at the end of each course: they had to carry out an experiment task in the laboratory, and finally, a final lab report including all the steps and results obtained during the practice process had to be written in English and handed in assessment. The researchers collected all the reports belonging to the academic years 2011 - 2014 for analysis.

The reports were analysed according to an analytic rating scale (see Appendix A), considering the fact that learners do not necessarily develop all aspects of writing ability at the same rate, resulting in significant differences (e.g. Hughes 2003: 100 - 103), as the results of this study show.

Firstly, an analysis of each student's report according to the four parameters included in the rating scale was performed in order to examine the differences among the students' specific aspects of the writing skills. Secondly, results were compared with their content achievement (academic mark) so that the relationship between the students' performance regarding the different areas of the writing competence and their academic competence could be appreciated.

4.2.1. The rating scale.

The rating scale used to analyse the students' report reflects what the researchers considered to include the most important components of the writing ability. Although different models have been suggested by researchers in the field of writing analysis (e.g. Canale & Swain 1980), there seems to be a consensus that a good writer must have good:

- language competence (i.e. the ability to use the language components correctly);
- textual competence (i.e. the ability to compose texts in a coherent and cohesive way);
- sociolinguistic or pragmatic competence (i.e. the ability to use language in an appropriate way in accordance with the context) (Jexenflicker & Dalton-Puffer 2010).

The rating scale used in this study was an adapted version from Friedl and Auer (2007) (see Appendix A). It consists of four equally-weighted aspects or parameters⁵ of written language competence, i.e. task fulfilment, organisation, grammar and vocabulary. For each category, scores ranged from 0 to 5 were provided.

³ Four students were discarded from the study as they were nearly English-native speakers.

⁴ A preliminary questionnaire was conducted at the beginning of the study and all the students recognized to have studied English only during their basic educational level (primary and secondary education). In Spain, the average level of English after finishing the last year of secondary education ranges from A2 to B1, according to the Common European Framework of Reference for Languages (CEFR).

⁵ In some parameters, some adaptations were made to the original rating scale as they did not exactly suit the purpose of the present analysis.

- Parameter 1 (Task Fulfilment): with regard to this parameter, the reports were analyzed in accordance with the degree to which the points listed in the instructions were covered. More particularly, it was assessed according to the degree of appropriateness in terms of text format, length and register.
- Parameter 2 (Text organization): regarding this parameter, texts were assessed according to the textual competence of the students and the extent to which the communicative purpose of the reports was achieved. In particular, the aspects considered for analysis were: overall structure of the reports, the use of paragraphs as a structure device, the appropriate use of discourse markers and the extent to which the texts were written in a cohesive and coherent way.
- Parameter 3 (Grammar): The aspect addressed by this category was the appropriate use of the morpho-syntax elements according to the particular text type. In particular, the accuracy in which the students used the grammar rules and forms and the variety and complexity of the structures used were assessed.
- Parameter 4 (Vocabulary): as for this category, the appropriate use of the lexico-semantic elements in accordance with the particular text type was analyzed. More particularly, the range of vocabulary, the appropriateness of the words chosen by the students and the formal accuracy and correct spelling was assessed.

5. Results and discussion

Figure 1 shows the results for the analysis of the 67 students' reports in accordance with the four parameters included in the rating scale described above.

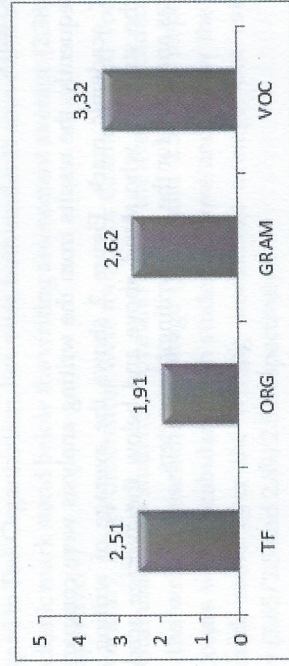


Figure 1: Average score of the writing analysis per area of writing ability

As it can be observed, the average of all reports stands above the average of the parameters considered in the rating scale (2.5/5), except Parameter 2 (Text Organization), which shows a significant difference with regard to the rest, standing far below the average (1.91/2.5). Regarding Parameter 1 (Task Fulfilment), the average of all reports passes closely to the average in the grading scale (2.51/5). With regard to Parameters 3 and 4 (Grammar and Vocabulary), the

average overcomes more significantly the average in the grading scale, especially in Parameter 4 (Vocabulary) (2.62/5 and 3.32/5 respectively).

Results from the writing analysis were compared with their academic mark so that the relationship between the students' performance regarding the different areas of the writing competence and their academic competence could be appreciated.

Before going into the results of this part of the analysis, it should be pointed out that the students' academic mark was awarded by the course lecturers mainly in accordance with content-related aspects (i.e. few language aspects were considered by the lecturers for the assessment).⁶

The average of the academic mark achieved by the students was 6.48, which is considered a 'pass' grade according to the Spanish grading system.⁷ As table 1 shows, out of the 67 students, 41 stand above the average academic mark (61.2%) and 26 got an academic mark lower than the average (38.8%).

	No. of students	Percentage
Above the average academic mark	41	61.2 %
Below the average academic mark	26	38.8 %
Total	67	100 %

Table 1: Number and percentage of students above and below the average academic mark

Subsequently, the results from the writing analysis were compared with the students' academic mark. Figure 2 shows the average of writing assessment among the students who stand above and below the average academic mark which was analyzed for the four writing parameters.

⁶ The lecturers provided the researchers with a rubric containing the following variables for assessment: (1) Relevant information, (2) Use of graphs, tables and figures that facilitate the description of the experiment, (3) Correct primary data and calculations, (4) Correct final results. Each variable was assessed from 1 (lower mark) to 10 (higher mark). Final mark corresponded to the average of the four variables.

⁷ The Spanish grading system in Higher Education level includes the following marks and grades: Fail (0 – 4.99); Pass (5 – 6.99); Good (7.1 – 8.99); Excellent (9 – 9.99); Honor Mention (10).

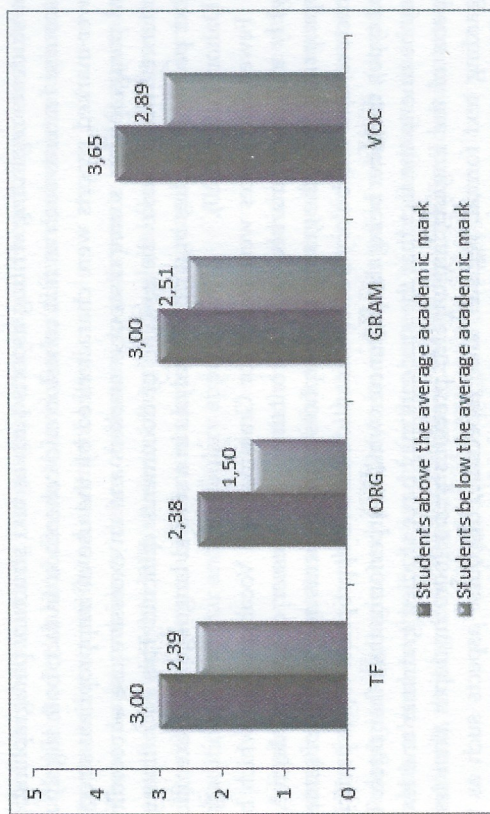


Figure 2: Average score of the writing analysis per area of writing ability among students above and below the average academic mark

As it can be observed, both students above and below the average academic mark stand over the writing assessment average, except for Parameters 1 (Task Fulfilment) and 2 (Text Organization).

Regarding Task Fulfilment, students above the average academic mark got a grade over the writing assessment mark, on average (3/2.50). Students below the average academic mark got a grade below the writing assessment mark, although quite close (2.99/2.5).

With regard to Text Organization, however, both students above and below the average academic mark stand below the writing assessment average (2.38/2.5 and 1.50/2.5, respectively).

On the contrary, fewer differences were found for Grammar and Vocabulary. Regarding Grammar, both students above and below the average academic mark stand over the writing assessment average (3/2.5 and 2.51/2.5, respectively). The same occurs with Vocabulary, both students above and below the average academic mark stand over the writing assessment average, but even more significantly (3.65/2.5 and 2.89/2.5, respectively).

From these results, a relationship between the students' academic performance (content achievement) and their writing competence in a second language can be observed, as well as significant differences among the four aspects analyzed in the writing performance assessment. Those students above the average academic mark stand over the writing assessment average in three of the four parameters analyzed (Parameter 1: Task Fulfilment; Parameter 3: Grammar; and Parameter 4: Vocabulary). This does not occur however with Parameter 2: Text Organization. Generally speaking it can be said that all students show deficiencies in text organization and discourse issues, which reveals a clear unfamiliarity of

the students regarding writing aspects such as text structure paragraphing and discourse features such as text cohesion and coherence. In fact, both highly and lower-marked reports were characterized by the use of inappropriate structure and paragraphing, scarce discourse markers and an excessive use of coordinate sentences which make the reading of documents difficult. This is in line with other previous studies in writing analysis in a second language (e.g. Jexenflicker & Dalton-Puffer 2010).

Fewer differences were found for Grammar and Vocabulary, in which both highly and lower-marked reports contained, to a lesser or greater degree, an appropriate use of the grammar (morpho-syntax elements and variety of sentence structure) and vocabulary (lexico-semantic elements appropriate to the particular text type), the latter being the parameter which outperforms the other three. This may be due to the fact that the students may have studied grammar and lexical aspects of the English language in previous years more in depth than issues regarding text format, register, and, especially, discourse aspects such as text cohesion and coherence, which suggests that less attention to traditional grammar and vocabulary approaches should be paid and further focus on pedagogical approaches based on text and discourse would be necessary for university students taking EMI courses in order to acquire a higher level of written communicative competence.

6. Conclusions

The purpose of this study was to analyse the L2 written production of Spanish higher education students from the field of Engineering, with the aim to examine the differences among the students' specific aspects of the writing skills, as well as to compare the students' content achievement (academic mark) with their writing competence. To do that, a pre-defined rating scale including some of the key components of the writing ability was used.

Results show the differences in the performance of certain areas of written language competence. Generally speaking, students show acceptable results over the average command of grammar and vocabulary issues (both students above and below the average academic mark stand over the writing assessment average) and significant weaknesses in aspects related to text format, register, and especially, on structure and discourse issues (text organisation), the latter being those in which all students got the lowest marks, as also has been reported by previous studies (e.g. Jexenflicker & Dalton-Puffer 2010). It has been observed that most differences regarding a higher and a lower marked written production have to do with textual (structure) and discourse issues. Language at university level should be thus understood as text and discourse, that is, the use of language beyond the sentence.

In line with previous research conducted by Sánchez and Salaberri (2015), there is a relationship between the students' academic performance (content achievement) and their linguistic awareness of the text genre produced in a second language, the higher marked texts being (in terms of content achievement) those

which show a better writing (language) performance. These differences are more remarkable at a textual and discourse level. Fewer differences between higher and lower-marked texts are found at sentence level.

These results provide evidence of the need to incorporate in EMI classrooms new methodologies that help students integrate the global features of the writing ability within their own course contents in a second language, which are far from the traditional grammar and vocabulary approaches.

A limitation to the present study was the small sample of analysis. The size of the sample limits the generalizability of this study. However, this study may serve as a starting point for further research that may result in future improvements in pedagogical strategies and policies to be implemented in a higher education syllabus related to the inclusion of further aspects of the language, and more particularly, writing competence, in different EMI and bilingual academic contexts.

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APPENDIX A

Rating scale used for assessment (adapted from Friedl & Auer 2007)

Task fulfilment: text format, length and register^a

- 5 Task fully achieved; appropriate format, length and register
- 4 Task almost fully achieved, content mostly relevant; mostly appropriate format, length and register
- 3 Task adequately achieved, acceptable format, length and register
- 2 Task achieved only in a limited sense, often inadequate format, length and register
- 1 Task poorly achieved; inadequate format, length and register
- 0 Not enough to evaluate

Organisation: Structure, paragraphing, cohesion and coherence, editing and punctuation

- 5 Clear overall structure, meaningful paragraphing; very good use of connectives, no editing mistakes, conventions of punctuation observed
- 4 Overall structure mostly clear, good paragraphing, good use of connectives,

^a The following aspects of this parameter were discarded as it did not suit the purpose of the present analysis: 'content and relevance'.