

Spanish lecturers' beliefs about English medium instruction: STEM versus Humanities.

Hanne Roothoof

*Department of Human Sciences and Education, Public University of Navarre, Pamplona,
Spain*

hanne.roothoof@unavarra.es

More and more European universities are implementing English Medium Instruction (EMI) programmes, but such policies tend to be top-down and pay insufficient attention to contextual factors such as the degree of internationalisation of the universities involved, or the actual subject taught and the perceived role of English in that subject. To understand such contexts better, it is essential to listen to the voices of the professionals actually involved in the transition to EMI, namely the lecturers themselves. This study focuses specifically on EMI lecturers' beliefs in the Spanish context, and uses narrative frames to contrast the views of STEM and Humanities lecturers. In line with previous research, most of the 59 lecturers who completed our narrative frame indicated that they focused on content and not on language. Some differences in opinion between STEM and Humanities lecturers were found, especially with regard to changes in teaching style and L1 use. More Humanities teachers than STEM teachers felt that they had changed their teaching style. Humanities teachers also imposed stricter controls on L1 use, although overall attitudes to L1 use appeared to be determined more by other issues, such as the presence of international students, than by the actual subject in question.

Keywords: English Medium Instruction (EMI); lecturer beliefs; teacher cognition; higher education

Introduction

Recently, universities all over the world have dramatically increased the number of English Medium Instruction (EMI) programmes on offer (Macaro et al. 2018), as part of their internationalization strategy, in order to secure participation in Erasmus exchanges, attract international students, and also to respond to a demand from local students (Wächter and Maiworm 2014). Such programmes usually appear to be implemented top-down, without considering the points of view of lecturers (Macaro et al. 2018). It is nonetheless very important to look at lecturers' attitudes and beliefs, since there is a potential influence of teacher cognition on classroom practice (e.g. Borg 2003). Moreover, since beliefs are context dependent, it is necessary to include the views of participants in a wide variety of national and local contexts. So far, a number of studies have investigated the beliefs of EMI lecturers, for instance Airey (2012) in Sweden, Unterberger (2014) in Austria or Hu and Lei (2014), in China. Dafouz et al. (2016) compared the beliefs of a small group of lecturers (n=13) in Finland, Austria and Spain. One of these authors' findings was that the Spanish context differed considerably from the Finnish and Austrian ones in that most students in EMI classes were local, Spanish students. This creates a somewhat artificial situation of a Spanish speaking lecturer teaching a subject in English for a Spanish speaking audience (see also Dafouz and Camacho-Miñano 2016).

Apart from such contrasts between countries, we can expect to find differences in how EMI is implemented and carried out even at the level of different faculties or courses. Some studies have shown that disciplinary differences influence teachers' beliefs, both in secondary school (Blomberg et al. 2011; Grossman and Stodolsky 1995) and at the

university level (Neumann 2001). In EMI contexts, there are some indications that lecturers in more numerically-based subjects are less concerned with language issues than lecturers of arts or humanities (Dearden and Macaro 2016). However, research on EMI lecturers' beliefs has rarely taken into account the possible impact of the lecturers' subject on their attitudes. Finding out more about how EMI lecturers in different disciplinary fields conceptualise their role can be useful for policy makers and teacher trainers. Airey et al. (2017) already made a call for EMI policies to take disciplinary differences into account. Further insights into this would also be valuable for teacher trainers, so that they can be aware of the specific needs and prior beliefs of lecturers in different fields. In order to provide a more detailed picture of how lecturers in different subjects view EMI in a specific context, i.e. Spain, the present study made use of narrative frames to uncover the beliefs of 59 lecturers, including 36 STEM teachers and 23 Humanities teachers.

Literature Review

Teachers' beliefs

Research on the complex system of beliefs, knowledge and attitudes of teachers, also known as teacher cognition, is gaining importance, not least because of the potential influence of beliefs on teaching practices (Borg 2003). Skott (2015, 19) defines teachers' beliefs as "individual, subjectively true, value-laden mental constructs that are the relatively stable results of substantial social experiences and that have significant impact on one's interpretations of and contributions to classroom practice". While some studies show that beliefs predict practice quite well (Jensen 2001; Ng and Farrell 2003), others have found mismatches between what teachers believe and what they do in the classroom

(Basturkmen, Loewen and Ellis 2004; Phipps and Borg 2009; Roothoof 2014). Several factors could explain such a mismatch: contextual factors such as school policies and curriculum mandates, but also internal factors such as teachers' knowledge and self-awareness (Buehl and Beck 2015). Teachers' beliefs may also interfere with teacher training and development, since they have sometimes been found to be resistant to change (Kagan 1992).

EMI lecturers' beliefs

Studies on EMI lecturers' beliefs have mainly used interviews and/or questionnaires to investigate how university lecturers feel about teaching in English (e.g. Airey 2012; Ball and Lindsay 2013; Dafouz et al. 2016). A recurrent finding from this research is that most EMI lecturers do not see themselves as responsible for their students' language learning, but position themselves strictly as content teachers (Aguilar 2015; Aguilar and Rodriguez 2012; Airey 2012; Dafouz et al. 2016, Unterberger 2014).

A related question concerns teaching methodology: should the EMI lecture be the same as the class in the L1, or should teachers change their pedagogical approach when they change the language? Helm and Guarda (2015) found that most lecturers who completed a needs analysis before taking a development course on EMI expressed a desire to learn more about teaching methodology, and another study by this team suggests that changing the language of instruction may lead lecturers to reflect on the way they teach, and even to change their style of teaching (Guarda and Helm 2016).

On the other hand, 5 of the 8 interviewed lecturers at an Austrian university in Tatzl's (2011) study stated that they see no difference in teaching through English or through the L1, but some differences in teaching style were reported by the other three,

such as using more repetition, summarising the main points in German (the students' L1), using fewer anecdotes or jokes, including different media in the lectures and applying innovating teaching methods (Tatzl 2011). In a similar study by Airey (2011), focusing on 18 Swedish lecturers, participants also mentioned the feeling that they could be less flexible in English and resort to fewer examples or humorous remarks.

Whether or not institutions think it is desirable, research indicates that code-switching and mother tongue use are present in EMI settings (Costa 2012; Jiang et al. 2016; Tarnopolsky and Goodman 2014). However, so far few studies on EMI lecturers' beliefs have attempted to find out lecturers' motivations for switching to the L1, and how this varies across disciplines. One of the few studies to investigate this issue is Karakas (2016), who found that while some lecturers at Turkish universities believe they should stick to their universities' rules and avoid the first language, others see benefits in occasional mother tongue use, such as making sure students understand the content and students with lower proficiency in English are not treated unfairly. Apart from the university policy, other reasons for only using English in class given by these lecturers were: the need to master English for future career opportunities and international students attending the lectures (Karakas 2016).

Disciplinary differences and EMI

A number of studies have found evidence of the influence of the subject matter or discipline on teachers' beliefs about various aspects of teaching and learning. In a secondary school context, Grossman and Stodolsky (1995, 5) suggested that "high school teachers belong to distinctive subject subcultures [which] are characterized by differing beliefs, norms, and practices". In a study with pre-service secondary teachers majoring either in science or humanities, Blomberg et al. (2011) found differences in the way teachers from different subjects analysed videotaped lessons. Patterson et al. (2016) also

looked at pre-service and in-service primary and secondary teachers from disciplines which they categorized as Arts, Humanities, Basic Skills, Physical and STEM, to study their attitudes to intelligence. The authors found that STEM teachers were more likely to view good performance as being based on ability, while Humanities teachers tended to view good performance as being linked to effort.

At the tertiary level, Neumann (2001) reviews a body of research focusing on disciplinary differences and how they relate to teaching and learning. The author uses the categorization of disciplines proposed by Biglan (1973, as cited in Neumann 2001), which includes hard pure fields (such as physics), hard applied fields (such as engineering), soft pure (humanities) and soft applied (e.g. education, business studies). Some of the differences between the fields discussed by Neumann (2001) are related to preparation time (soft pure lecturers spend the most time preparing for their classes), research supervision (which is more clearly integrated with lecturers' own research in hard pure and hard applied fields) and an emphasis on different values (hard disciplines focus more on facts and concepts, while soft disciplines are more focused on promoting thinking skills). Focusing on the students rather than the lecturers, May and Casazza (2012) found that students with a "hard" major such as mathematics or engineering suffered from more stress than students with a "soft" major such as history or business studies. It is possible that the perceived degree of difficulty of a subject influences both students and lecturers, which could cause lecturers of more challenging subject matter to pay more attention to content than language.

Kuteeva and Airey (2014) used a slightly different model to categorize disciplines in their study of the impact of the way knowledge is viewed on the discourse used in different fields. They distinguished between natural science, with a hierarchical knowledge structure, social sciences, in which different theories compete with each other,

and humanities, where knowledge is more horizontal in that various points of view can exist alongside each other. According to Kuteeva and Airey (2014), the effect of disciplines on language use is that natural science subjects tend to rely on a shared terminology, while in the humanities “language serves as the means to construct knowledge and is therefore used in a more flexible and creative manner” (Kuteeva and Airey 2014, 538). Kuteeva and Airey (2014) surveyed a substantial number of lecturers and students at a Swedish university to ask them about the role of English in their subjects and whether or not they thought it would be a good idea to introduce EMI in their disciplines. They found differences between science and humanities teachers’ views, with the science teachers accepting the omnipresence of English in their fields, while the humanities teachers had a more ambiguous attitude to the use of English, emphasizing the importance of language for meaning creation in their disciplines.

Another study which has looked at disciplinary differences in relation to EMI is Sawir (2011), who builds on the distinction between soft and hard disciplines discussed above to investigate Australian lecturers’ beliefs about dealing with international students and internationalisation. Even though the Australian context is not directly comparable to other EMI contexts, since lecturers teach in English by default and thus do not have to change their language of instruction, the need to accommodate international students arguably poses similar challenges to Australian lecturers and EMI lecturers in other parts of the world. Sawir (2011) found that lecturers from faculties teaching soft disciplines (arts, economics) more often believed in a need to adapt their teaching style in response to the presence of international students, compared to lecturers from faculties teaching hard disciplines (engineering, science).

As mentioned in the Introduction, there is a dearth of research on EMI lecturers’ beliefs which takes into account the possible influence of the subject matter they teach.

Therefore, the present study focuses on two groups of lecturers, STEM and Humanities, with the aim of finding out what EMI means to these lecturers. In other words, how do these lecturers view EMI methodology? Do they see it as a distinct way of teaching, or do they simply see it as teaching exactly the same content, in the same way, but in a different language? Related to EMI as a methodology, questions can be asked about which focus to adopt (content, language, or both), which teaching methods should be used (for instance, more student-centred ones) and which language or languages can be used in EMI.

Thus, the main research question underlying this study is:

What are Spanish EMI lecturers' beliefs about EMI methodology, and is there a difference between Humanities and STEM lecturers?

This question can be divided into three sub-questions:

- RQ1. Do EMI lecturers focus on content and/or language?
- RQ2. Do EMI lecturers change their methodology when teaching in English?
- RQ3. Do EMI lecturers believe in an English-only-policy or do they think other languages can be used in EMI lectures?

Methodology

In contrast to previous research relying on interviews, we decided to use narrative frames to obtain testimonies from EMI teachers. These are more open-ended than interviews or traditional questionnaires and they encourage participants to reflect on their answers from their own point of view. Narrative frames have been used in educational research to make personal experiences accessible and allow participants' voices to be heard (Cresswell 2005; Murray 2009).

Design and piloting of narrative frames

For this study, we designed a narrative frame based on findings by Hellekjaer (2007), Hellekjaer and Westergaard (2002), Dafouz and Núñez (2009), and issues identified in Doiz et al. (2013) and Wächter and Maiworm (2014).

Apart from information about when they started teaching in English and how they feel about the experience, the narrative frame addresses the three aspects of EMI methodology which this study focuses on: whether or not lecturers have changed their teaching style, if they focus on content and/or language and if they believe Spanish, the students' and lecturers' L1, can be used in EMI classes.

After designing the narrative frame, we piloted it with 5 lecturers at one of the universities. One of the researchers was present while the participants completed the frame, to determine whether all questions were correctly understood and the prompts elicited sufficiently long responses. It turned out that the prompts were clear and that the frames were a good instrument for eliciting participants' views.

Data analysis

In order to analyse the data obtained from the narrative frames, we made use of thematic analysis (Braun and Clarke 2006) and colour coding (Zacharias 2012). For instance, for the data about lecturers' views on the use of the L1, we identified three categories: "ok", "not ok" and "it depends". As will be clarified in the results section, the "it depends" category refers to lecturers who believe the L1 is allowed in some cases, but not in others. We also calculated percentages to be able to study the relative importance of emerging themes and to be able to compare different groups of participants (for instance depending on the subject area they teach). The analysis was performed by the author, while a second rater coded part of the data and interrater reliability was found to be 95%.

Participants

All participants were contacted through the researchers' professional networks and agreed to take part in the study. Even though we attempted to include participants from different universities, different disciplines and with varying years of experience, we cannot rule out a certain bias in their selection. A snowball effect occurred and we were able to reach a total of 59 participants. There were 37 male and 22 female lecturers, their ages ranged from 27 to 57 and their mean age was 42. Their experience with EMI ranged from only 2 months to 17 years (5 years on average). Most of the participants (29) started learning English in primary school, between the ages of 6 and 12. Nine started later, in secondary school, while 5 started between the ages of 3 and 5. Eight participants stated they started learning English when they were 18 or older, and finally eight did not mention a precise age. Unfortunately we have no information about the English level of the participants.

Table 1 gives an overview of the participants, grouped according to university and subject area. As can be seen, most of the respondents come from two universities in Navarre (32 vs. 20) and only 7 come from other Spanish universities in Aragón and Cataluña. The participants taught a large range of disciplines, such as engineering, economics, medicine, communication or sociology. To make comparison easier, we divided the disciplines into two groups: STEM and Humanities, basing ourselves on the distinction between hard and soft disciplines which was also made by Sawir (2011) and Neumann (2001).

	<i>STEM</i>	<i>Humanities</i>	Total
Navarra 1	20	12	32
Navarra 2	12	8	20
Aragón	3	2	5
Cataluña	1	1	2
Total	36	23	59

Table 1. Participants grouped by university and discipline

Results

Focus on content and/or language

When asked whether they mainly focused on content, language or both, the vast majority of both STEM and Humanities lecturers indicated content was the main aim of EMI, even though slightly more Humanities lecturers stated that they focused both on content and language (see Figure 1). The arguments used to support their position were also very similar in both disciplinary groups, as can be seen in Table 2. Eight STEM lecturers compared to 5 Humanities lecturers simply stated that teaching content was their main goal, since students need to learn the content in order to get their degree.

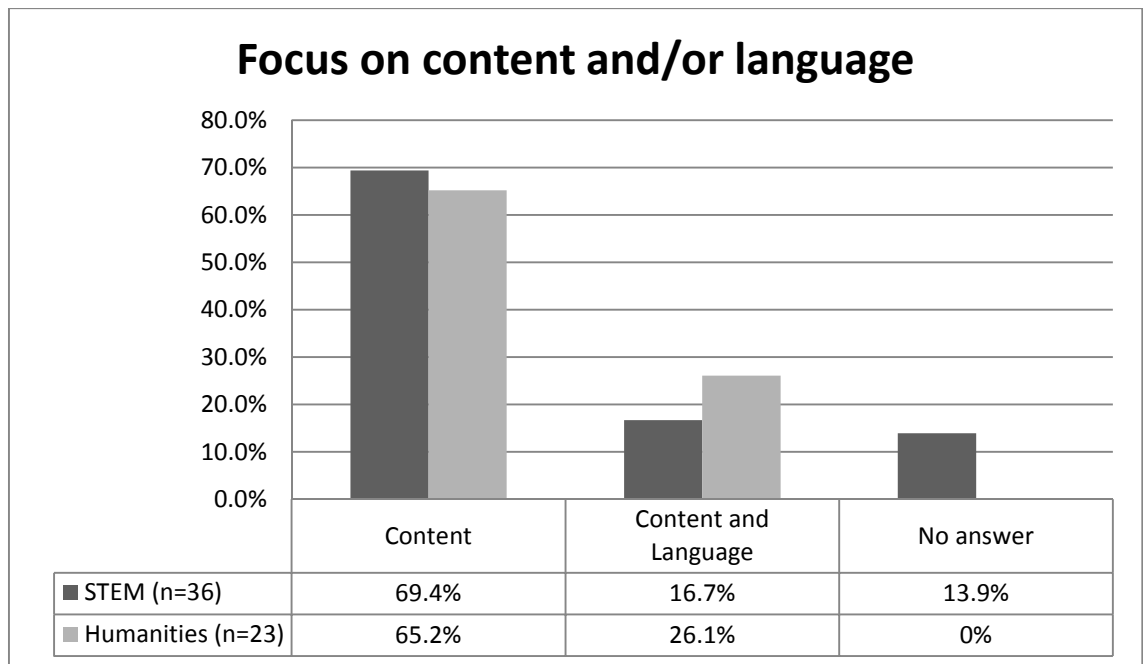


Figure 1. Focus on content and/or language

(1) My role as an EMI teacher is to help the students learn content, because they are here to become doctors. (STEM)

(2) My role as an EMI teacher is to help the students learn content, because that's my job. (Humanities)

A similar number of STEM and Humanities teachers (4 in each group) also mentioned that language in EMI is learned implicitly, since it is mainly a tool for learning (See Table 2).

(3) My role as an EMI teacher is to help the students learn content, because English is a means to an end and not an end in itself. (Humanities)

(4) My role as an EMI teacher is to help the students learn content because at the end I am evaluating their knowledge in the concrete subject. However, I help them learning English implicitly. (STEM)

As Table 2 shows, four STEM teachers and three Humanities teachers moreover

explained that they should focus on content because they are not English teachers. Finally, in each group there was one lecturer who explained that the aim of EMI is not to teach English, since students are expected to already have a good level of English when entering the programme.

	STEM		Humanities	
Content is the goal	8/36	22.2%	5/23	21.7%
Language is a tool	4/36	11.1%	4/23	17.4%
Not an English teacher	4/36	11.1%	3/23	13%
Students should already know English	1/36	2.7%	1/23	4.3%

Table 2. Reasons for focusing on content in EMI

(5) My role as an EMI teacher is to help the students learn content, because I don't think I should teach them English language. First of all, because it is assume [sic] that if they have chosen the English group, then they have a very good level. And secondly because I am a mathematician and not an English teacher, so I don't have the skills to adequately train the students in the use of the English language. (STEM)

As Figure 1 shows, only 16.7% of STEM lecturers versus 26.1% of Humanities lecturers opted for “content and language” as their focus. Two examples of lecturers who believe in focusing on both aspects are given below. However, example (7) indicates that “language”, for this lecturer seems to be mainly related to vocabulary, or “content related expressions”.

(6) Content and language, because the students have to learn my subject in an international context dominated by textbooks in English. (STEM)

(7) Content and language, although I think content should come first. Language learning should consist primarily in content related expressions. Students should already be competent in the use of English. (STEM)

It is noteworthy that five of the 12 lecturers who chose “content and language” came from the same university, which offered training on CLIL methodology to their EMI lecturers. These lecturers were clearly influenced by the training they had received, as they used terminology such as “scaffolding”:

(8) change my style of teaching:-Scaffolding for the new vocabulary is not needed in Spanish. (STEM)

When references to language are made, they seem to be restricted to terminology and vocabulary (as in examples 7 and 8). Only two lecturers displayed a wider understanding of language in EMI, and these were both Humanities lecturers. The lecturer in example 9 refers to “reasoning typical of philosophical subjects”, while in example 10 the lecturer mentions “social sciences discourse”.

*(9) My role as an EMI teacher is to help the students learn content and language, because they learn the terms and **the way of reasoning typical of philosophical subjects** simultaneously (Humanities). (bold type added)*

*(10) I clearly tell them not to rely on me as an ESOL teacher. I do my best to use English as a Lingua Franca and I share with them available tools for grammar revision but I do not teach language. For sure I teach academic standard of the language through **social sciences discourse** (Humanities). (bold type added)*

Changes to teaching methods in EMI

With regard to possible changes in teaching style as a result of EMI, Figure 2 shows that a clear majority of Humanities lecturers (60.9%), teaching subjects that are more

language-based, indicate a change in methodology, while in the group of STEM lecturers there were slightly more participants (44.4%) who stated they had changed their way of teaching, than those who stated they had not changed (38.9%).

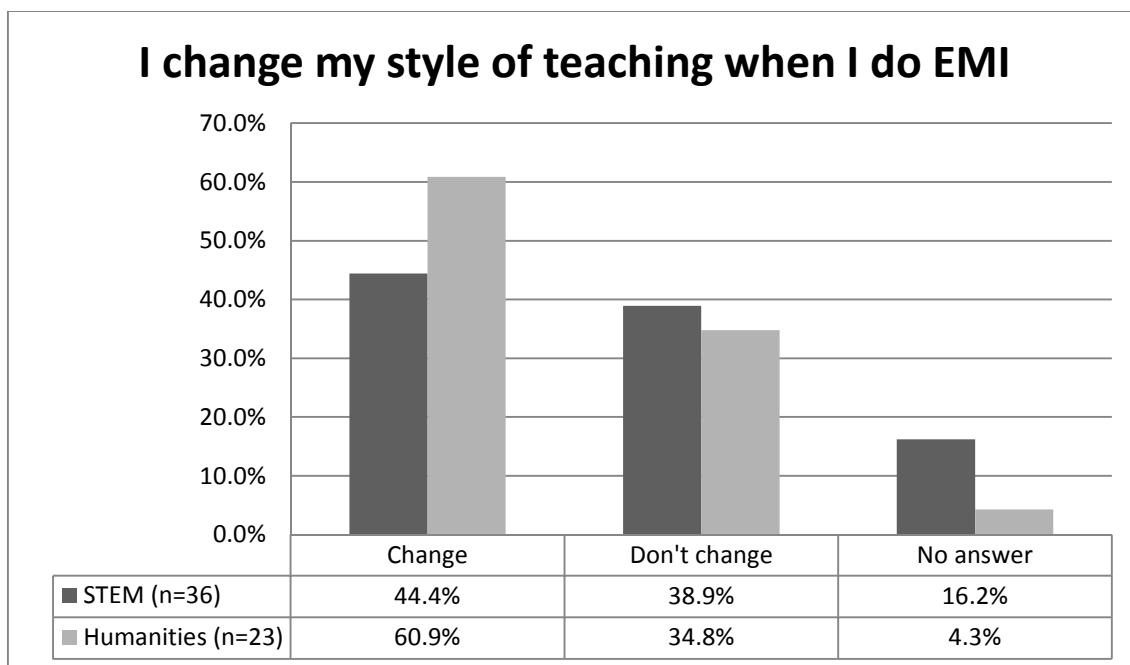


Figure 2. Change in teaching style

When explaining why they had not changed their style of teaching, lecturers tended to refer to the need to teach the same content in different languages, as in example 11:

(11) I think I do not change my style of teaching when I do EMI. Indeed I teach the same subjects in English and in Spanish, and I explain exactly the same things in both classes every week. The materials are the same and the time I dedicate to each of them is the same. (STEM)

Only one STEM lecturer stated that he had not changed his methodology because he felt that language did not play an important role in his subject, which was computer science.

(12) Not changes the way I am teaching [sic], language is not crucial to work the contents (in my case). (STEM)

In the case of those who had experienced changes in teaching style, we identified three themes, as shown in Table 3, that can be considered as more negative, since they

are related to covering less content (see example 13), a slower delivery (see example 13) and a feeling that EMI is “less natural” (see example 14).

(13) I cover less content than in the Spanish group; I go slowly, I first think in Spanish and translate it to English. (STEM)

(14) I digress less, use less examples, anecdotes... and it is more difficult for me to interact with them. (STEM)

	STEM		Humanities	
Cover less content	2/36	5.6%	2/23	8.7%
More repetition/more slowly	2/36	5.6%	2/23	8.7%
Less natural	3/36	8.3%	2/23	8.7%
More direct	1/36	2.7%	3/23	13%
Better materials/methods	5/36	13.9%	3/23	13%
Videos and images	5/36	13.9%	3/23	13%

Table 3. Changes in teaching style

The other three themes in Table 3 appear to be more positive changes: a more direct style (see example 15), better materials or methods (see examples 16 and 17) and the use of videos and images (see example 17). Table 3 shows that those themes were roughly equally divided among Humanities and STEM lecturers.

(15) I think I change my style of teaching when I do EMI. My classes are clearer, more schematic. More visual. (Humanities)

(16) I can use better means (the quality of the available books in English is much better than in Spanish). (STEM)

(17) I tend to use videos more frequently, and make them available so that the students can watch them several times; I tend to “invert” the class more frequently (...); I use images, pictures, gestures... to complement my voice. (Humanities)

Beliefs about language use in EMI lectures

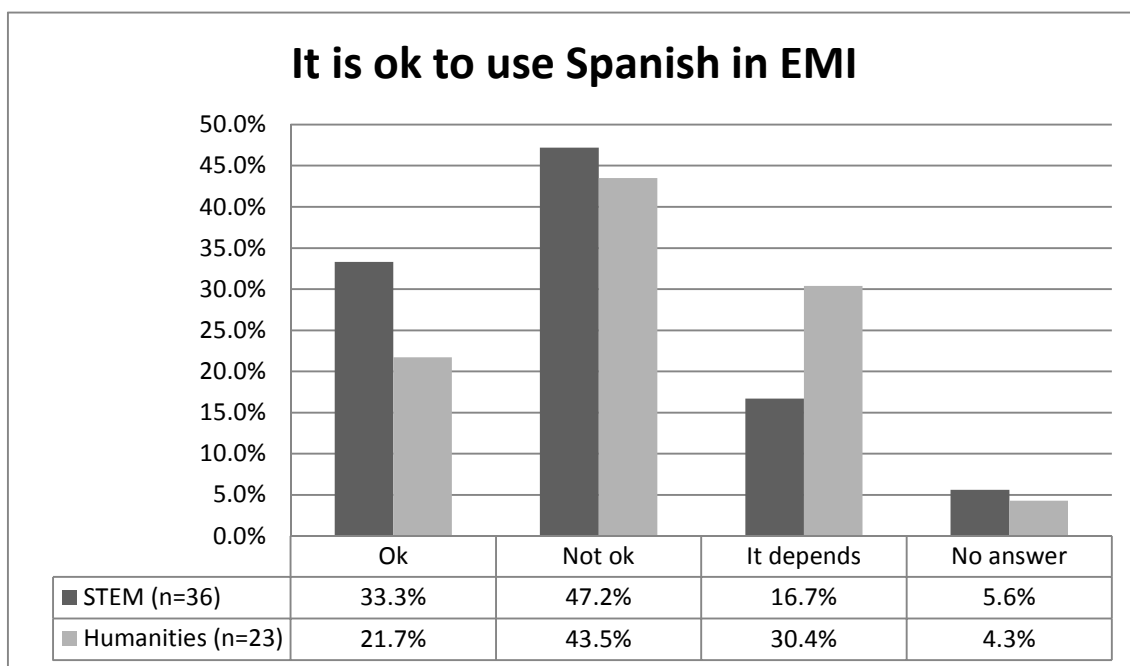


Figure 3. Lecturers' beliefs about L1 use in EMI

When asked whether they thought it was okay to use Spanish in EMI classes, nearly half of the STEM and Humanities lecturers (47.2% versus 43.5%) answered Spanish was not allowed (see Figure 3). Figure 3 shows that slightly more STEM lecturers allowed for L1 use (33.3% versus 21.7%), and a larger group of Humanities lecturers was unsure about this issue, saying that it depends on the situation (30.4% versus 16.7%). Table 4 shows that the most common justification for not allowing L1 use is the idea that EMI by definition means everything needs to be in English, both for STEM and Humanities lecturers. Whether or not there was a university or faculty policy which regulates language use in EMI is not clear, but in most cases there did not seem to be such a document and it depended on the interpretation of the lecturers.

(18) It is not ok to use Spanish in EMI classes because the teaching/learning experience is entirely in English, including office hours, exams, e-mails, etc.

(STEM)

Another justification for only using English is the presence of international students, which was referred to by 3 STEM and 3 Humanities lecturers (see Table 4).

(19) It is not ok to use Spanish in EMI classes because I have students from other countries whose language is not Spanish. (Humanities)

Three of the STEM lecturers (see Table 4) moreover felt they needed to make sure their Spanish students made an effort to use English, and they thought that allowing some Spanish would be counterproductive to this aim.

(20) I'd rather not use Spanish in EMI. Otherwise students may resort to using Spanish instead of making the effort of finding a way to express themselves in English. (STEM)

As figure 3 shows, more STEM lecturers than Humanities lecturers would allow the use of Spanish, and the justification for this was usually that they wanted to ensure all students understood the content (see Table 4).

(21) It is ok to use Spanish in EMI classes because sometimes the students do not understand what you are telling and, finally, our objective is to transmit our knowledge. (STEM)

In the category “it depends”, there were some lecturers who believed that Spanish should only be allowed in certain cases, for instance to translate key terms. Others made a distinction between using English in theory class and Spanish in practice classes, or outside class during office hours. As shown in Figure 3, nearly twice as many Humanities lecturers than STEM teachers made such distinctions about L1 use.

(22) It is not ok to use Spanish in EMI classes because it will become very quickly a Spanglish course. I use Spanish only to introduce a few concepts, or to differentiate the false friends that appear in Physics in these two languages. (STEM)

(23) *It is ok to use Spanish in EMI classes – well, not in the class, but after the class, or in the practical classes when I have to answer their questions and help them, the students prefer it if they can talk in Spanish. (Humanities)*

	STEM		Humanities	
International students	3/36	8.3%	3/23	13%
EMI is in English	7/36	19.5%	6/23	26.1%
If allowed, students will use Spanish all the time	3/36	8.3%	0/23	0%
One language at a time	1/36	2.7%	2/23	8.7%
Ensure understanding of content	12/36	33.3%	5/23	21.7%
Local issues in Spanish	1/36	2.7%	0/23	0%

Table 4. Reasons for (not) allowing L1 use in EMI

Discussion

This study comparing Humanities and STEM lecturers' beliefs about EMI methodology in Spain partly confirms previous studies. First of all, the vast majority of both STEM and Humanities teachers in our sample stated that their main focus is on content and not on language, in agreement with the Spanish engineering lecturers in Aguilar (2015), with the Swedish physics lecturers in Airey (2012) and the Austrian business studies lecturers in Unterberger (2014). Interestingly, it appears teacher training can influence lecturers' beliefs about the focus of EMI classes, since the 5 teachers in our sample who had attended training on CLIL at their university all claimed to focus on both content and language. However, we need to keep in mind that these are teachers' stated beliefs and that our sample only includes 5 teachers from this specific university, so more research on the influence of training on EMI teachers' beliefs and practices would be useful. One worrying finding is that the concept of language for most lecturers, even those that claimed to focus on content and language simultaneously, seemed to be restricted to vocabulary and terminology. Only two Humanities lecturers in our sample appeared to be aware of the idea of disciplinary literacy, which Airey et al. (2017) believe should be

the goal of EMI.

With regard to the second research question, whether or not EMI entails a change in teaching methods and styles, the results are not as clear-cut as for the first research question about the focus on content or language. A greater percentage of Humanities lecturers explained that they had changed their style of teaching (60.9% versus 44.4% of STEM lecturers), which is in line with Sawir's (2011) findings in the Australian context. The reason for this difference may partly lie in smaller reliance on language in some STEM subjects, but more research is needed to confirm this claim. While Guarda and Helm (2016) found that several EMI lecturers at one university in the north of Italy reported having changed the way they teach, by becoming more student centred or using technology, this change occurred after having attended a training course on methodology. Most of the lecturers in the current study had not received specific training on EMI or CLIL methodology, with the exception of the 5 lecturers from Aragón (see Results). Nonetheless, changing the language of instruction appears to have led to some change in practice for half of the lecturers questioned. It needs to be stressed that these reported changes were not always considered as positive by the lecturers (12 can be classified as negative versus 21 positive changes). As also found in other studies, a few lecturers noted that they were able to cover less content in their EMI classes (Dafouz et al. 2007; Hahl 2014). Another change which can be considered negative is increased repetition, which was also mentioned by some of the lecturers in Tatzl's (2011) study. A third negative change in teaching style was the feeling of some lecturers that they could be less natural or spontaneous when teaching in English. Both Tatzl (2011) and Airey (2011) also found that EMI lecturers felt they could tell fewer anecdotes or jokes. However, our lecturers generally noticed more positive than negative changes. As in Guarda and Helm (2016), several of the Spanish lecturers in this study stated they used innovative methods and

technologies such as videos. Despite the finding that there were considerably more Humanities teachers who had adapted their methodology, the ways in which lecturers claimed to have changed were similar for STEM and Humanities lecturers.

Turning to the discussion of L1 use in EMI classes, we noted that the majority of respondents in both disciplinary groups supported an English-only policy in their classes. On the other hand, about one third of STEM lecturers expressed the belief that L1 use is allowed in EMI, and about one third of Humanities lecturers allowed for L1 use in certain cases, for example in practice classes as opposed to theory classes. This questions Dafouz et al.'s (2016) finding that Spanish lecturers tend to display a stronger adherence to an English-only policy than Finnish or Austrian ones, possibly because the last two contexts have more experience with international students and show greater flexibility towards the use of multiple languages. Dafouz et al.'s (2016) results were based on a much smaller number of Spanish participants (i.e. 5 Economics lecturers), which might explain why the present study has found a more permissive attitude towards the L1 on the part of some Spanish lecturers, especially those teaching hard disciplines. Nonetheless, the majority of lecturers in our sample stated that they would either not allow the L1, or that they would only permit its use in exceptional cases. With regard to the reasons for allowing or banning L1 use in EMI, some of the Turkish lecturers in Karakas' (2016) study also referred to the use of the mother tongue to ensure understanding, as several of our Spanish lecturers did. On the other hand, a recurrent argument against L1 use in our study was the presence of international students, which also confirms findings by Karakas (2016). At the Turkish universities in Karakas' (2016) study, an English-only policy was imposed on the lecturers. In the present study, too, there is a suggestion of top-down control mechanisms in action: some lecturers also explained that they could not use the L1 because their faculty had told them everything needed to be in English.

While this study thus indicates that differences in attitudes about teaching methods and L1 use may be related to the type of subject taught, more research is needed to confirm whether this is indeed the case and to uncover the reasons for such differences.

Conclusion

This study is one of the few investigations into the impact of disciplinary differences on EMI lecturers' beliefs. Even though there were no apparent differences with regard to the focus of EMI (content and/or language), considerably more Humanities lecturers than STEM lecturers indicated they had changed their style of teaching, which supports findings about Australian lecturers' responses to international students (Sawir 2011). There were also some differences with regard to L1 use: there were more STEM teachers who said they allowed Spanish, while at the same time a greater percentage of Humanities teachers stated the use of Spanish depended on a number of factors or was sometimes admissible. It would be useful to conduct further research contrasting different disciplines, to confirm that there are indeed differences in the interpretation and implementation of EMI and to uncover the reasons for these differences. Although the STEM/Humanities distinction proved useful for our initial study, we believe that future research needs to look at the linguistic demands of specific subjects. Even within the broad fields of STEM or Humanities, or within one faculty, individual subjects can pose different challenges for lecturers and students. Future research could investigate whether there are differences between subjects which are more demanding, either from a linguistic or a cognitive point of view, and those that are less so (see for instance Coyle 2012). Further studies could also take into account the students' point of view, to find out if students from different disciplines have different expectations and beliefs about EMI, or are influenced by different long-term values or ambitions.

Funding

This paper reports on research funded through the Cambridge English Funded Research Programme, Round Eight, 2017–2018

References

- Aguilar, M. 2015. "Engineering Lecturers' Views on CLIL and EMI." *International Journal of Bilingual Education and Bilingualism* 20 (6): 722-735.
- Aguilar, M., and R. Rodríguez. 2012. "Lecturer and Student Perceptions on CLIL at a Spanish University." *International Journal of Bilingual Education and Bilingualism* 15 (2): 183-197.
- Airey, J. 2011. "Talking About Teaching in English: Swedish University Lecturers' Experiences of Changing Teaching Language." *Ibérica* 22: 35–54.
- Airey, J. 2012. "'I Don't Teach Language': The Linguistic Attitudes of Physics Lecturers in Sweden." *AILA Review* 25: 64-79.
- Airey, J., K.M. Lauridsen, A. Räsänen, L. Salö, and V. Schwach. 2017. "The Expansion of English-medium Instruction in the Nordic Countries: Can Top-down University Language Policies Encourage Bottom-up Disciplinary Literacy Goals?" *Higher Education* 73: 561-576.
- Ball, P., and D. Lindsay. 2013. "Language Demands and Support for English-medium Instruction in Tertiary Education. Learning from a Specific Context." In *English-Medium Instruction at Universities: Global Challenges*, edited by A. Doiz, D. Lasagabaster and J.M. Sierra, 44-64. Bristol: Multilingual Matters.

- Basturkmen, H., S. Loewen, and R. Ellis. 2004. "Teachers' Stated Beliefs About Incidental Focus On Form And Their Classroom Practices." *Applied Linguistics* 25 (2): 243-272.
- Blomberg, G., K. Stürmer, and T. Seidel. 2011. "How Pre-service Teachers Observe Teaching on Video: Effects of Viewers' Teaching Subjects and the Subject of the Video." *Teaching and Teacher Education* 27: 1131-1140.
- Borg, S. 2003. "Teacher Cognition in Language Teaching: A Review of Research on What Language Teachers Think, Know, Believe and Do." *Language Teaching* 36 (2): 81-109.
- Braun, V., and V. Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3 (2): 77-101.
- Buehl, M., and J. Beck. 2015. "The Relationship between Teachers' Beliefs and Teachers' Practices." In *International Handbook of Research on Teacher Beliefs*, edited by H. Fives and M. Gill, 66-84. NY: Routledge.
- Costa, F. 2012. "Focus on Form in ICLHE Lectures in Italy: Evidence from English-medium Science Lectures by Native Speakers of Italian." *AILA Review* 25 (1): 30-47.
- Coyle, D. 2012. "Towards a Re-conceptualization of the MFL Curriculum." In *Teaching Modern Foreign Languages in Secondary Schools*, edited by A. Swarbrick, 156-172. NY: Routledge.
- Cresswell, J. W. 2005. *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research*. Upper Saddle River: Pearson.

- Dafouz, E., and M. M. Camacho-Miñano. 2016. "Exploring the Impact of English-medium Instruction on University Student Academic Achievement: The Case of Accounting." *English for Specific Purposes* 44: 57-67.
- Dafouz, E., J. Hüttner, and U. Smit. 2016. "University Teachers' Beliefs of Language and Content Integration in English-medium Education in Multilingual University Settings." In *Conceptualising Integration in Content and Language Integrated Learning and Multilingual Education*, edited by T. Nikula, E. Dafouz, P. Moore, and U. Smit, 124-143. Bristol: Multilingual Matters.
- Dafouz, E., and B. Núñez. 2009. "Content and Language Integrated Learning in Tertiary Education: Devising a New Learning Landscape." In *Content and Language Integrated Learning across Educational Levels: Experiences from Primary, Secondary and Tertiary Contexts*, edited by E. Dafouz and M. Guerrini, 101-112. London: Richmond.
- Dafouz, E., B. Núñez, C. Sancho, and D. Foran. 2007. "Integrating CLIL at the Tertiary Level: Teachers' and Students' reactions." In *Diverse Contexts – Converging Goals. CLIL in Europe*, edited by D. Marsh and D. Wolff, 91-101. Frankfurt: Peter Lang.
- Dearden, J. and E. Macaro. 2016. "Higher Education Teachers' Attitudes towards English: A Three Country Comparison." *Studies in Second Language Learning and Teaching* 6 (2), 3–34.
- Doiz, A., D. Lasagabaster, and J.M. Sierra. 2013. *English-Medium Instruction at Universities: Global Challenges*. Bristol: Multilingual Matters.
- Grossman, P.L., and S.S. Stodolsky. 1995. "Content as Context: The Role of School Subjects in Secondary School Teaching." *Educational Researcher* 24 (8): 5-11.

- Guarda, M., and F. Helm. 2016. "‘I Have Discovered New Teaching Pathways’: The Link Between Language Shift and Teaching Practice." *International Journal of Bilingual Education and Bilingualism*, 1–17.
- Hahl, K., H. Järvinen, and K. Juuti. 2014. "Accommodating to English-medium Instruction in Teacher Education in Finland." *International Journal of Applied Linguistics* 26 (3): 291-310.
- Hellekjaer, G. O. 2007. "The Implementation of Undergraduate Level English-medium Programs in Norway: An Explorative Case Study. In *Researching Content and Language Integration in Higher Education*, edited by R. Wilkinson and V. Zegers, 68-81. Nijmegen: Valkhof Pers.
- Hellekjaer, G., and M. Westergaard. 2002. "An Exploratory Survey of Content Learning Through English at Scandinavian Universities. In *Acta didactica* 3, edited by A. Simensen, Oslo: Unipub.
- Helm, F., and M. Guarda. 2015. "‘Improvisation is not Allowed in a Second Language’: A Survey of Italian Lecturers’ Concerns about Teaching Their Subjects through English." *CercleS* 5 (2): 353-373.
- Hu, G., and J. Lei. 2014. "English-medium Instruction in Chinese Higher Education: A Case Study." *Higher Education* 67, 551-567.
- Jensen, M. T. 2001. *Corrective Feedback to Spoken Errors in Adult ESL Classrooms*. Unpublished doctoral dissertation. Monash University.
- Jiang L., L. J. Zhang, and S. May. 2016. "Implementing English-medium Instruction (EMI) in China: Teachers’ Practices and Perceptions, and Students’ Learning Motivation and Needs." *International Journal of Bilingual Education and Bilingualism* 22 (2): 107-119, DOI: [10.1080/13670050.2016.1231166](https://doi.org/10.1080/13670050.2016.1231166)
- Kagan, D. 1992. "Implications of Research on Teacher Belief." *Educational Psychologist* 27 (1): 65-90.

- Karakas, A. 2016. "Turkish Lecturers' Views on the Place of Mother Tongue in the Teaching of Content Courses through English medium." *Asian Englishes* 18 (3): 242-257.
- Kuteeva, M., and J. Airey. 2014. "Disciplinary Differences in the Use of English in Higher Education: Reflections on Recent Language Policy Developments." *Higher Education* 67: 533-549.
- Macaro, E., S. Curle, J. Pun., and J. An. 2018. "A Systematic Review of English-medium Instruction in Higher Education." *Language Teaching* 51 (1): 36-76.
- May, R.W., and S.P. Casazza. 2012. "Academic Major as a Perceived Stress Indicator: Extending Stress Management Intervention." *College Student Journal* 46 (2): 264-273.
- Murray, G. 2009. "Narrative Enquiry." In *Qualitative Research in Applied Linguistics: A Practical Introduction*, edited by J. Heigham and R. A. Croker, Basingstoke: Palgrave Macmillan.
- Neumann, R. 2001. "Disciplinary Differences and University Teaching." *Studies in Higher Education* 26 (2): 135-146.
- Ng, E. K. J., and T.S.C. Farrell. 2003. "Do Teachers' Beliefs of Grammar Teaching Match their Classroom Practices? A Singapore Case Study." In *English in Singapore: Research on Grammar*, edited by D. Deterding, A. Brown and E. Low, 128-137. Singapore: McGraw Hill.

- Patterson, M.M., N. Kravchenko, L. Chen-Bouck, and J.A. Kelley. 2016. "General and Domain-specific Beliefs about Intelligence, Ability, and Effort among Preservice and Practicing Teachers." *Teaching and Teacher Education* 59: 180-190.
- Phipps, S., and S. Borg. 2009. "Exploring Tensions between Teachers' Grammar Teaching Beliefs and Practices." *System* 37: 380-390.
- Roothoof, H. 2014. "The Relationship between Adult EFL Teachers' Oral Feedback Practices and Their Beliefs." *System* 46: 65-79.
- Sawir, E. 2011. "Academic Staff Response to International Students and Internationalising the Curriculum: The Impact of Disciplinary Differences." *International Journal for Academic Development* 16 (1): 45-57.
- Skott, J. 2015. "The Promises, Problems and Prospects of Research on Teachers' Beliefs." In *International Handbook of Research on Teachers' Beliefs*, edited by H. Fives and M.G. Gill, 13-30. New York, London: Routledge.
- Tarnopolsky, O. B., and B. A. Goodman. 2014. "The Ecology of Language in Classrooms at a University in Eastern Ukraine." *Language and Education* 28 (4): 383-396.
- Tatzl, D. 2011. "English-medium Masters' Programmes at an Austrian University of Applied Sciences: Attitudes, Experiences and Challenges." *Journal of English for Academic Purposes* 10: 252-270.
- Unterberger, B. 2014. *English-medium Degree Programmes in Austrian Tertiary Business Studies: Policies and Programme Design*. Vienna: University of Vienna Doctoral dissertation.

Wächter, B., and F. Maiworm. 2014. *English-taught Programmes in European Higher Education. The State of Play in 2014*. Bonn: Lemmens.

Zacharias, N.T. 2012. *Qualitative Research Methods for Second Language Education: A Coursebook*. Cambridge: Cambridge Scholars Publishing.

