

Models of EMI pedagogies: at the interface of language use and interaction

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THE PROFILES OF ENGLISH MEDIUM INSTRUCTION TEACHERS IN HIGHER EDUCATION

ABSTRACT

The global growth of English Medium Instruction (EMI) in higher education and international mobility of faculty and students necessitates that we better understand commonalities of teachers in these emerging contexts. This paper reports on a survey of 461 EMI university lecturers from more than eight countries in an attempt to discern the various profiles of EMI teachers at an international level. Data explored teachers' disciplines, age, experience, professional development, teaching contexts, and the role of English proficiency in their professional capacity. Results revealed statistically significant differences in profiles according to the disciplines and country of residence of the teachers. For example, teachers in the Natural Sciences and those in Spain were more likely to report having opportunities for teacher training and EMI certification.

Key words: English Medium Instruction; Higher Education; Profiling Teachers

INTRODUCTION

There is now an impressive body of research literature on English Medium Instruction (EMI) in Higher Education (HE), including stakeholder beliefs (Tan, 2011; Fortanet-Gómez, 2012), classroom interaction (Chen, Han & Wright, 2020; Kunioshi et al., 2016), and an emerging focus on academic outcomes (Karimi, Lotfi, & Biria, 2019; Tatzl & Messnarz, 2013). Given the global scale of the phenomenon of EMI, there is an unavoidable diversity of policy and practice, potentially a welcome situation given the complexity of the different contexts in which EMI is being promoted. Consequently much of the research published to date has focused at the national or single institutional level. However, given that internationalisation promotes movement of faculty and students, there is also a need to identify any common denominators. It is therefore the aim of the current research to provide a profile of EMI teachers at an international level. We begin with a brief description of the phenomenon of EMI itself.

Growth of EMI

The vast majority of research reports and books on EMI in HE begin by headlining its rapid growth. In Europe, Wächter and Maiwarm (2014) calculated that EMI programmes increased from 725 in 2001, to 8,089 in 2014. Sandström and Neghina (2017) exploring the European Higher Education Area identified 2900 undergraduate programmes representing 27% of the total number of EMI programmes, the remaining 73% being at Masters level.

In the Asia-Pacific geographical area, Fenton-Smith, Humphries & Walkinshaw (2017), report that English as a medium of teaching and learning rather than as an ‘object’ of instruction is increasing at a rate whereby EMI is soon to become the norm rather than the exception. Similar reports are found in the Middle East (e.g. Rogier, 2012) and in specific countries such as Turkey (Sert 2008; Kirkgoz 2009; Author 2), or China (Author 3 et al., 2020). Although less well documented, there is anecdotal evidence of growth in Latin America but this is more recent and starting from a much lower base (Author 1 et al; British Council, 2015).

The principal driver for this growth is internationalization of HE which manifests itself in institutional attempts to attract international students and faculty, for prestige reasons (e.g. university rankings) and to increase institutional revenue. Another force propelling growth of EMI is student mobility. Over seven million students are expected to be studying away from their home country by 2025 (Coleman 2006). Thus classrooms are increasingly populated by students with mixed first languages (L1s) thereby necessitating the use of English for teaching.

Defining English Medium Instruction

Given the range of the EMI phenomenon and the multiple contexts in which it is being introduced and developed, the construct itself is not easy to define. Consequently we adopt the following definition of EMI in full knowledge that its components are open to challenge (see, for example, Pecorari and Malstrom, 2018):

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. (Author 1)

A particular component of the definition that we focus on is the notion of ‘academic subjects, other than English itself’. We explore whether it is clear, in all contexts, which subjects fall into the category of EMI and by implication which teachers are EMI teachers.

One way to consider this is to scan research articles investigating various topics related to EMI to see if they identify which academic subject/discipline the participants (teachers/students) belong to. We analysed a dataset of 83 EMI studies reviewed in Author et al (2018) (see Table 1) and found the most commonly mentioned subject was Engineering (n = 23), followed by Business Administration and Management (n = 21). Physics (including electronics) was mentioned 15 times, and Economics 13 times. It should be noted that some studies gave broad disciplines (e.g. Science; Social Science; Humanities) so Table 1 only provides information from studies in which specific subjects were mentioned. Of course, one caveat of this survey is that it only gives an indication of the kinds of subjects being taught through EMI as reflected in what subjects have been researched and published, which may not be truly reflective of EMI in practice.

[INSERT TABLE 1]

From this, it would appear that the above definition, which eliminates the teaching and learning of the English language itself, is supported by much of EMI published research— that is, subjects such as English Literature are not designated as EMI subjects. However, we would argue, at a purely theoretical level, there are grey areas. For example is ‘Applied Linguistics’ an ‘academic subject other than English itself’? Clearly it is a subject whose primary aim is for students to develop the

knowledge and understanding of how linguistic phenomena may create “real-world problems” (Brumfit 1997:93) . As such, Applied Linguistics is not about teaching the English language. Moreover it is, in principle, possible to teach Applied Linguistics without the *use* of English. However, if the topic within Applied Linguistics is ‘second language acquisition’ in general and acquisition of ‘English as a second language’ in particular, then avoiding reference to the English language will become increasingly impossible. This is apart from the fact that so many applied linguistics journals are written in English, a situation which, incidentally, also pertains to Physics or Medical journals.

If teaching and learning on an Applied Linguistics course creates a grey area for EMI, then what about a TESOL course? Again, the fundamental objective of this kind of course is not to teach the students the English language but *how* to teach it. Can, therefore, TESOL courses be taught (almost) entirely through the medium of a non-English L1? We would argue probably not.

A final example pertains to support courses for EMI subjects taught by English Language specialists, such as the English for Specific Purposes (ESP) support that an English language specialist might give a group of students studying Economics through EMI. Clearly this would be ‘English language teaching’, so these teachers could not be defined as EMI teachers even though they might be involved in ensuring the success of the Economics EMI programme. In previous literature it is not always clear on what basis certain subjects are being included under the EMI umbrella. For example, in Galloway et al. (2017) more than half of the teachers from whom attitudes to EMI were elicited were teaching English and the students who expressed their views included those studying English Literature, English Education and TESOL (p. 14).

These ‘grey areas’ create a situation in which it is perhaps best to think of EMI subjects as ‘total EMI subjects’ and ‘quasi EMI subjects’ (or ‘hard EMI’ and ‘soft EMI’) with the defining characteristic being that the former (e.g. Physics, Medicine, Engineering, Economics, History of Art) can, in principle, be taught perfectly well in a non-English L1, whereas with the latter group (Applied Linguistics, Second Language Acquisition, TESOL), non ‘use’ of English becomes increasingly difficult the more the subject is linked to the English language.

The above discussion, which we have not previously encountered, forms the basis of some of the data reported in this paper which aimed to find out what kinds of teachers considered themselves to be EMI teachers. Another issue raised by our definition, is the level of teachers’ language proficiency required to teach a subject ‘through English’. That is, do we have a recognised accepted level, as required by universities? Furthermore are EMI teachers identified or appointed to teach through English by virtue of their capability in English? These questions are important, not least because several studies have uncovered concerns that some EMI teachers lack sufficient proficiency to confidently interact with their students in English (Yassin et.al., 2010; Tan, 2011).

The problem of ‘language proficiency’ in an EMI context

Previous research on EMI teacher beliefs (e.g. Yuan, Chen & Peng, 2020; Mansor, Badarudin & Mat, 2011) has rarely discussed conceptualisations of ‘sufficient proficiency to teach EMI’. Does one mean by ‘proficiency’ knowledge of the technical vocabulary specific to a discipline, or confidence with the kind of academic vocabulary to be found in most disciplines (the kind taught on English for Academic Purposes courses)? Or by proficiency do teachers mean confidence with the language needed to

explain to (potentially struggling) EMI students the in-depth meaning of a concept in their subject (see Author 1 for a fuller discussion)?

European university programme directors were asked about the proficiency of EMI teachers in their institutions (Wächter & Maiworm 2014) and generally conceived them to have a sufficiently high level of proficiency to teach EMI. However, it is not clear from the study what type of proficiency was being referred to. Werther et al. (2014) investigated the English language 'skills' of Danish university teachers on a scale of 1-6 (6 being the highest). The majority of lecturers reported experiencing few or no problems with regard to their language skills, with a mean self-rating at around 4.7. We should note that this study was conducted at the Copenhagen Business School – where presumably there is a heavy focus on international business which in turn requires high levels of English. Nevertheless the authors report that:

“respondents indicate that teaching through English is more of a problem than most people dare to openly admit and reluctance to do so springs from a tacit assumption on the part of management that all faculty are capable of English-Medium Instruction” (p. 453).

Most university teachers in a study (Borg, 2016) set in the Kurdish Region of Iraq reported concerns regarding their poor spoken English resulting in difficulty in communicating concepts to their students. Some claimed that they had to teach themselves prior to teaching their students.

There is some suggestion in the research literature that younger lecturers are more 'proficient' in English (Jensen and Thøgersen, 2011) than their older counterparts but apart from that study, to our knowledge, the age profile of EMI teachers has not been investigated. This is an interesting avenue to explore: if the majority of EMI teachers are young, this may suggest that they are being chosen (or are feeling confident to volunteer) to teach through English because of their competence in the language rather than their level of experience in the subject. In Jensen and Thøgersen's (2011) study the respondents appeared to be interpreting 'the necessary skills' for EMI as meaning more than simply General English proficiency grades.

The term 'aptitude or competence' was adopted by Fortanet-Gómez (2012) in her survey of 78 content teachers in Spain to find out their potential to teach through EMI in relation to its introduction in one institution. Only 51.9% believed they knew English well enough to teach whereas 76.9% believed they knew English well enough to speak at a conference, and 88.9% felt confident enough to read literature in their discipline. This suggests that teaching students on EMI programmes requires a different kind of 'proficiency' in English but what the components of that proficiency are (or that aptitude or competence) is as yet undefined at any national level, let alone any international level where student and lecturer mobility would suggest a benchmark might be valuable.

At Copenhagen University a step was taken towards establishing EMI teacher competence benchmarks beyond General English proficiency, as reported by Dimova and Kling (2015) and by Kling and Staehr (2011), through the Test of Oral English Proficiency of Academic Staff (TOEPAS). There, although a great deal of importance is still attributed to vocabulary, grammar, pronunciation and fluency, the EMI teacher's interaction skills are also evaluated as operationalised through a short sequence of peer teaching.

Cambridge Assessment (<http://www.cambridgeenglish.org/teaching-english/teaching-qualifications/certificate-in-emi-skills/>) offers an “online qualification for academics who teach and work in the medium of English” – offering a certificate which is “at proficient to expert” levels. With this certificate, the website claims, EMI teachers will be “able to use a wider range of strategies to engage students”. The website does not give access to what those strategies are, how they relate to a notion of competence to teach through EMI, nor the research evidence upon which those competencies might be based.

Given the diversity of EMI implementation across the world our overarching aim was therefore to try to ascertain whether any kind of coherent profile of the EMI teacher exists across contexts and what might be the variables in which these profiles diverge.

RESEARCH QUESTIONS

In delineating our central aim to ascertain the profiles of EMI teachers, our investigation was underpinned by six research questions:

1. What are the broad disciplines most represented by EMI teachers in HE?
2. What is the age and experience profile of EMI teachers in HE?
3. Are EMI teachers more likely to be teaching undergraduates or postgraduates?
4. How do EMI teachers conceptualise ‘English Proficiency’?
5. Are there any noticeable differences to the above questions according to the discipline of the respondents?
6. Are there any noticeable differences to the above questions according to the country of residence of the respondents?

METHOD

Obtaining data about educational practices at an international level is a challenge and this is manifested by the relative lack of multi-national research reports on EMI currently available, with most research papers providing data at the single institutional level. As EMI research has been criticised for being thus far heavily skewed in its focus on Europe, comparisons which might provide the most interesting insights should ideally be more global in coverage. Our aim was to partially fill this gap by reaching at least seven different countries in diverse geographical areas through the help of our network of academics in those countries.

We adopted an essentially quantitative research design to match the broad picture we were trying to capture by developing an online questionnaire. As this was a relatively new area of enquiry, we adopted a grounded approach to develop the instrument by first carrying out a series of pilot interviews in two countries, Turkey and China. We focused questions on themes such as attendance at professional development courses, the notion of English proficiency/competence to teach EMI, the importance of certification, and so on. We then designed and further piloted the questionnaire based on the responses we obtained. The final survey instrument consisted of 25 closed questions (with various types of scales), plus some open-ended questions (available as supplementary

material). As this instrument asked questions beyond the scope of the current study we will limit ourselves to reporting on those aspects of the data directly related to the above research questions.

The problems associated with online questionnaires are well documented (Iwaniec, 2020). We aimed to overcome some of these, such as a lack of engagement with them by respondents or lack of control over the sample, by not making the instrument freely available online. The questionnaire was instead made available via our contacts in eight countries informing potential respondents who then obtained a website URL via the contacts. The countries we targeted were: Brazil, China, Italy, Japan, Mexico, Spain, Turkey, United Arab Emirates (UAE). Despite our efforts, we received a low response from Brazil and UAE.

The next challenge, given the multifarious nature of EMI subjects described above, was to ensure that potential respondents were clear about our definition of EMI. As part of the introductory pages of the instrument (and just after the ethical information and consent instruments demanded by our own institution), we provided the following examples of EMI teachers in addition to the definition:

- Teaching Engineering through the medium of English in Turkey
- Teaching Business Studies through the medium of English in Spain
- Teaching Geography through the medium of English in China
- Teaching Medicine through the medium of English in Saudi Arabia.

We also provided a definition of 'Certification' as 'An official qualification given to an individual which provides evidence of a competence to teach a particular subject and in a particular way'.

By the time of instrument closure we had obtained 604 responses. On inspection, we noted that under the question 'what subject or subjects do you teach', 141 respondents had written 'English' or 'English language' or 'General English' suggesting that they had not read the information at the beginning of the survey, and were thus eliminated. Nevertheless, included in the sample were teachers who taught quasi-EMI subjects such as applied linguistics, translation studies and English teacher preparation programmes, leading to a final sample of 463 valid responses (5 from Brazil, 133 from China, 30 from Italy, 20 from Japan, 34 from Mexico, 151 from Spain, 51 from Turkey, and 39 from other countries; Table 2). These were then entered into SPSS (version 21) for analysis. The dataset is the same as the one used for Author 1 et al. Although some of the data we report here overlaps to a small extent with that study, it attempts to answer different research questions and provides additional perspectives on EMI teacher profiles.

[INSERT TABLE 2]

Because we wanted to ascertain which broad categories of disciplines were being represented we recoded the different subjects into broad disciplines as follows:

- Mathematical Sciences
- Natural Sciences
- Medical Sciences
- Social Sciences
- Humanities

- Humanities with a Language Focus

Two of the authors of this paper carried out an interrater reliability check by coding them separately into these six disciplines. Cohen's kappa was calculated to determine agreement, and a good level of agreement found, $\kappa = .880$ (95% CI, .847 to .913), $p < .001$. As we can see from Table 3, and in view of the above issue related to which subjects are EMI subjects, we divided the humanities category into 'Humanities' and 'Humanities with a language focus' in order to better capture 'softer' and 'harder' forms of EMI in the data.

We coded the qualitative data (i.e. the answers to the open ended questions) via a number of rounds of qualitative content analysis. Qualitative content analysis refers to an "analytical method used for the subjective interpretation" of qualitative data, and is "concerned with providing a comprehensive and nuanced description of the data" (Selvi, 2020, p. 442). A deductive approach was taken to extract the requisite data from the open-ended questionnaire responses as it pertained to each of the research questions. A deductive approach was deemed appropriate as the main purpose of the qualitative data analysis was to add supplementary support and further depth of understanding to the main quantitative data, rather than to explore the data for emergent themes. Data were accordingly categorised to mentions of: disciplines; age/experience; level of teaching; EMI certification; and conceptualisations of English Proficiency.

FINDINGS

Teachers' profile by discipline

The first research question sought to explore which disciplines were most likely to be offered through EMI. Table 3 provides this information. As we can see about one-third of teachers (33.5%) taught subjects in the Social Sciences, and 20.5% of teachers taught in the Natural Sciences. The Humanities (8.2%) and Medical Sciences (6.7%) were least represented.

[INSERT TABLE 3]

In the qualitative data little mention was made regarding disciplines, with four responses regarding subject differences. One teacher responded that approaches needed to differ according to discipline "because every [one] is different", whereas another responded that it was "quite possible to teach any subject using a variety of methods". One respondent in the Humanities stated that if "you teach in humanities you can immediately feel the difference" in pedagogy due to students' limited vocabulary knowledge. This response indicated that teacher saw the humanities as being far more reliant on language to communicate disciplinary content. Another respondent from the 'Humanities with language focus' stated that faculty was treated separately from other EMI faculties and university requirements because we "belong to the English Department, so there is no point in that. We all know English". This response further cements the notion that some teachers and universities

may not position those working in fields closely aligned with English language as a form of EMI, regarding them as exempt from regulations that apply to other EMI teachers.

Teachers' profile by age and experience

Our second research question asked if there was any pattern in teacher age and experience profile. As we can see from Table 4, no obvious pattern emerges that younger teachers are more represented in EMI teaching roles. Even if we assume that teachers under the age of 30 can obtain teaching posts, 5.2% does not indicate any inclination or favouritism for EMI for this age group – and the rest are well spread over the age range. We also note that (Table 5) the majority of respondents were either about to start teaching through EMI or had only taught through EMI for less than 5 years, suggesting that while some teachers had been teaching their subject for some time, they had converted to EMI relatively recently. In the qualitative data, the participants did not directly mention age in any of their open-ended responses. When experience was mentioned, it was in relation to EMI qualifications, which is discussed next.

[INSERT TABLES 4 & 5]

Teachers' profile by certification and professional development

We asked whether the institution offered certification of competence to teach through the medium of English. The results revealed that half (47.2%, $n = 218$) said their institution did not, 23.3% ($n = 108$) reported that they did, while a surprising 29.4% ($n = 136$) said they didn't know. This uncertainty was also found in the qualitative data, with one teacher stating "I believe our university has many undergraduate courses taught through EMI, but I am not sure if the teachers are given a certification". Some of the respondents stated that while their universities did not offer certification, it "would be so good" or they "preferred" to have such a system in place. Another stated that notion of certification was unfamiliar to them, writing "I don't know exactly what does it mean "certification for EMI teachers", echoing another respondent who wrote: "I am not sure whether my institution's certification is the kind of process meant by this question, [as] it is just an internal validation of our English language skills."

As indicated in the above excerpt, there was a conflation of EMI certification and certification of English proficiency in the qualitative data, with a majority of responses referring to language test requirements for EMI teachers. As one teacher stated "I just provided them [my university] with a copy of my Cambridge proficiency title and that was enough." Others mentioned needing to provide universities with established tests such as TOEFL, IELTS, and Cambridge Certificates, deemed suitable by the university to teach on EMI courses. When CEFR was mentioned, eight teachers stated that a C1 level was needed (as assessed by a body such as the British Council), but a further four respondents stated that a B2 level was deemed sufficient by their department. However, a number of responses indicated that language proficiency requirements could be waived under certain circumstances, such as one university that required "at least a certified C1 level" unless a teacher could show they had "written and defended [their] PhD thesis in an English-speaking University". We return (below) to this issue of the connection between being qualified to teach through EMI and the type of language proficiency needed to effectively do so.

Some teachers provided details on internally-run accreditation systems such as the Test of Performance for Teaching at University level through the medium of English, mentioned by five respondents. However, in these responses, it appeared that many of the internal systems tended to focus on testing English language proficiency, explained by one teacher as "an internal validation of

our English language skills”. Moreover, these internal accreditations could be waived by showing external language proficiency scores or experience (e.g. obtaining a PhD from an English-speaking country). One respondent stated that their university waived accreditation requirements if teachers “had taught at least 100 hours in an English-speaking country”. Another respondent explained that the requirement to prove language proficiency could even be waived: “It is a kind of... messy. If you teach a course in English for three years, then my university ‘awards’ you with a B2 in English in case you don't have any official certification”. Thus, the qualitative data pointed to a situation that was far more complex than the quantitative data suggested. We would conclude that the 23.3% who indicated their universities provided EMI accreditation is in fact much smaller, because the bulk of these certification systems were only language proficiency checks without any evaluation of teaching practices.

We then asked if they had taken part in professional development courses or in-service training. A majority ($n = 283$, 61.4%) said that they had not, while 38.4 % ($n = 178$) said they had engaged in some form of training. In the qualitative data, some respondents gave further detail on received training, appearing to derive from both external and internal in-service sources. Externally, a few teachers mentioned workshops and seminars run by visiting academics from English-speaking universities, or run through the British Council, (e.g. the British Council project “English for Universities”). A larger proportion of responses gave details on regular, internal, in-service seminars provided by their universities, such as the Department of Education at one university offering “anually two or three training courses to teach content through English”. Another example from the qualitative data was a claim that: “The university gives every year courses of different levels and subjects in order to help us improving our lectures in English”. Others mentioned one-off in-service training sessions such as a “5-hour seminar about EMI and CLIL approaches”. Many of these explanations were qualified by statements that “it [was] not mandatory to take them”. In some cases, teachers could make use of training abroad opportunities, such as one respondent who mentioned attending “a course in the University of Edinburgh to learn about [CLIL] methodology, for 5 days” as part of “a collaboration between my University and Edinburgh”. Pre-service training was mentioned infrequently in the data, with one respondent claiming, “Pre-service courses do not exist here!”. When mentioned, pre-service training tended not to be EMI-specific. Examples included having taken mandatory courses to teach as doctoral students in the US, or induction modules when first starting work at the university to improve general teaching practices, or the use of educational technology like Blackboard.

Teachers’ profile by teaching context

Next we asked whether respondents were teaching undergraduates, postgraduates or both (Table 6). The purpose was not to ascertain whether EMI was being offered more at the undergraduate (UG) or postgraduate (PG) level because clearly this would entail the institution having equal numbers of both levels. Rather it was to continue to build up the profiles of these EMI teachers: were they more likely to be teaching undergraduates through English or postgraduates? Most teachers were engaged in undergraduate teaching, either teaching only undergraduate students (56.2%) or both undergraduate and postgraduate students (35.8%). This profile was supported in the qualitative data, where undergraduate courses were explicitly mentioned by respondents (e.g. “our university has many undergraduate courses taught through EMI”), but there was no explicit signposting of postgraduate teaching.

[INSERT TABLE 6]

Teachers' conceptualisations of 'English proficiency'

Next we asked how EMI teachers conceptualised 'English Proficiency.' Specifically, we were interested in whether EMI teachers perceived a difference in the English proficiency needed to teach courses in English compared to the proficiency needed to present at conferences, which might be considered a common professional activity. The majority (78%) believed that there was a difference in the English proficiency needed for these two activities. Of course, this does not tell us the nature of the differences or whether one activity was perceived to be relatively more difficult. Open-ended responses indicated that the biggest difference when teaching centred on a need to communicate ideas to a student body of varying degrees of proficiency and subject knowledge, which was not a concern at conferences. One teacher described a need to "adapt to students' proficiency" and "to make comprehension checks". Another, who had done their masters and doctoral studies in Ireland stated that although their level of English (self-reported as C2) was very good in terms of disciplinary knowledge, they found "it difficult to express certain concepts and ideas to students with a A2/B1 level". One teacher stated they needed to adopt "a more careful and measured use of English" when teaching, and another stated that "when you are teaching to the group of people with a different level of knowledge, then you have to an extra mile to transfer knowledge." Thus, while the quantitative responses indicated that a majority of teachers see a difference in language proficiency needed in conferences compared to teaching, the qualitative results indicated the main root of this difference was to communicate to a less knowledgeable and often less proficient listener, necessitating a change in pedagogical approach. This raises the question as to whether these beliefs were anchored in an understanding of the different types of proficiency needed in order to communicate more effectively with their students and thereby facilitate better content understanding by them.

Teacher profile differences by discipline

We explored the above issues regarding teacher profile by the different disciplines. No significant differences were found with respect to teachers' age, level of students taught (e.g. undergraduate or postgraduate), or perceptions of English proficiency (e.g. need for teaching v. conference presentation). However, differences between disciplines were found with respect to EMI experience and qualification.

A one-way ANOVA with discipline as the independent variable found significant differences with respect to teaching experience in English (Welch's $F(5, 145.589) = 16.129, p < .001$). Post hoc comparisons (Tukey tests) indicated that teachers from the humanities with a language focus ($M = 2.11, SD = 0.92$) had more experience teaching their subject through English than teachers in the mathematical sciences ($M = 0.93, SD = 0.68; p < .001$), natural sciences ($M = 1.20, SD = 0.99; p < .001$), medical sciences ($M = 1.19, SD = 0.75, p < .001$), social sciences ($M = 1.35, SD = 0.92; p < .001$), and humanities ($M = 1.47, SD = 0.95; p = .006$). In addition, teachers in the mathematical sciences were also found to have less experience than teachers in the social sciences ($p = .014$) and humanities ($p = 0.32$).

Regarding qualification by discipline, a Pearson's chi-square revealed significant differences according to institutional certification to teach through English (Pearson Chi-Square = 29.227; $df =$

10; $p = 0.001$) and participation in pre- or in-service training for EMI (Pearson Chi-Square = 23.856; $df = 5$; $p < 0.001$). Teachers in the natural sciences were more likely than teachers in other disciplines to report that their institution already had EMI certification and that they had participated in pre- or in-service training for EMI, and teachers in the humanities with a language focus were less likely to report institutional certification or participation in EMI training compared to other disciplines.

Teacher profile differences by country

We investigated these same questions regarding EMI teacher profiles according to country of residence. Significant differences were found between countries for every issue investigated: age, certification, training, experience, level of students taught, and perceptions of English proficiency. Each variable is discussed below.

Table 7 shows the participants' average age by country. On average, teachers in Italy, Spain, and Japan were older than teachers in Turkey, Mexico, and China. These differences in age by country were found to be statistically significant according to a one-way ANOVA (Welch's $F(6, 109.005) = 17.958$, $p < .001$). Post hoc Tukey tests indicated that teachers from Italy and Spain were older than teachers in Turkey, Mexico, and China as well as teachers in other countries, and teachers in Japan were older than teachers in China and other countries (Table 8).

[INSERT TABLES 7 & 8]

In addition to age, differences in teaching experience by country were examined. A one-way ANOVA revealed significant differences in teaching experience in English by country (Welch's $F(6, 107.481) = 5.594$, $p < .001$). Post hoc comparisons (Tukey tests) indicated that teachers from Mexico ($M = 2.21$, $SD = 0.978$) had more experience teaching in English than teachers in other countries: China ($M = 1.26$, $SD = 0.968$; $p < .001$), Italy ($M = 1.47$, $SD = 0.973$; $p = .026$), Japan ($M = 1.20$, $SD = 0.951$; $p = .003$), Spain ($M = 1.36$, $SD = 0.787$; $p < .001$), Turkey ($M = 1.53$, $SD = 1.120$; $p = .018$), and Other ($M = 1.02$, $SD = 0.927$; $p < .001$). As such, although teachers in Italy and Spain were found to be older than participants from other countries, they did not necessarily have more experience teaching through EMI. This suggested a relatively recent switch to EMI for these teachers. Teachers in Mexico were also more likely to teach humanities with a language focus, which might contribute to their experience, if language-related subjects are more likely to have a longer history of being taught through English.

In terms of certification and training, a Pearson's chi-square revealed significant differences according to institutional certification (Pearson Chi-Square = 91.327; $df = 12$; $p < 0.001$) and participation in pre- or in-service training (Pearson Chi-Square = 44.491; $df = 6$; $p < 0.001$) by country of residence. Teachers in Spain were more likely to respond that their institution already offered EMI certification and that they had participated in EMI training, compared to teachers in other countries. Teachers in China and Japan were more likely to state that their institution **did not** offer EMI certification, and teachers in Turkey were more likely to state that they did not know. Teachers from Mexico and Turkey were less likely to have participated in EMI training, compared to teachers in other countries.

Next, we examined whether there were any differences in the level of students taught. A Pearson's chi-square revealed significant differences (Pearson Chi-Square = 58.133; df = 12; $p < 0.001$). Teachers in Mexico and Spain were more likely to teach undergraduates only, whereas teachers in China, Italy, and Turkey were more likely to teach both undergraduates and postgraduates; teachers in Italy were also more likely to teach postgraduates only. Finally, a Pearson's chi-square revealed significant differences in teachers' perceptions of English proficiency by country (Pearson Chi-Square = 30.034; df = 12; $p = 0.003$). Teachers in China were more likely to agree and teachers from Turkey more likely to disagree that different types of English proficiency were required for conferences than for teaching; teachers in Turkey were also more likely to report that they were unsure about a difference in the English proficiency required for these activities.

These findings with respect to differences according to country suggest that the profiles of EMI teachers vary considerably across contexts, just as EMI policy and implementation has been found to vary across country context.

Summary of Findings

The findings of the survey can be summarised as follows:

1. The Social Sciences and Natural Sciences were the disciplines most represented by EMI teachers in HE. Medical Sciences and the Humanities were the least represented.
2. No clear pattern was found with respect to age although teachers were relatively inexperienced teaching in English: 61% had less than 5 years EMI teaching experience.
3. The EMI teachers were more likely to be teaching undergraduates than postgraduates. About one-third of teachers were teaching both (35%).
4. EMI teachers believed that the English proficiency needed to teach is different from that needed to give a conference presentation although we were not able to ascertain the extent of their understanding of the implications of the different proficiencies required
5. Significant differences between disciplines were found with respect to:
 - a. Institutional EMI certification: natural sciences **more** likely to report that their institution already had EMI certification and the humanities with a language focus **less** likely than other disciplines.
 - b. Participation in pre-/in-service training for EMI, with natural sciences **more** likely and the humanities **less** likely to report that they had participated.
 - c. Experience teaching EMI: humanities with a language focus having more teaching experience than all other disciplines, thereby adding to the notion outlined earlier of a difference between 'soft EMI' and 'hard EMI' subjects.
6. Noticeable differences were found with respect to the above questions according to the respondents' country of residence:
 - a. Age: teachers in Italy and Spain were found to be older than teachers in Turkey, Mexico, and China.

- b. Institutional qualification: teachers in Spain were more likely to state that their institution **did** offer EMI certification and teachers in China and Japan that their institution **did not** already offer EMI certification.
- c. Participation in pre- or in-service training in EMI: Teachers from Spain were **more** likely and teachers from Mexico and Turkey were **less** likely to have participated.
- d. Experience teaching in English: teachers from Mexico had more experience than teachers from other countries.
- e. Level of students: Teachers in Mexico and Spain were more likely to teach only undergraduates, whereas teachers in China, Italy, and Turkey were more likely to teach both levels.
- f. Perceptions of English proficiency: Teachers from China were more likely to agree and teachers from Turkey more likely to disagree that different types of English proficiency were required for conferences versus for teaching.

DISCUSSION AND CONCLUSION

Our study sought to contribute to the building of the international profiles of the EMI teachers and this report adds to findings already published in Author 1 et al (2020). Perhaps the most striking finding is that the Natural Sciences and Social Sciences were most represented by the responding teachers. These subjects match the disciplines and subjects most found in the 83 previous studies that we examined where Engineering, Physics, Economics and Business Studies featured prominently. It is not surprising that these subjects have switched to EMI given their international reach and the possibility of job mobility and career prospects for students that globalisation has created. We should also note that Medical Sciences (five mentions in the 83 previous studies) were among the least represented in our study. We should consider the possible reasons for this. On the one hand, the vast majority of medical research in international journals is published in English – requiring medical students to be able to access this material. On the other, medical students (if they are planning to stay and practice in their locality) need to communicate with future patients in their L1, and have the requisite medical terminology in their L1 to do so. It is not surprising that history (Humanities) was rarely taught in English given the probability that a history of the home country would be included and that there might be opposition to it being taught in English. This also matches the few studies of EMI (Dafouz, Camacho, & Urquia, 2014; Karakaş, 2015) in previous reports that focused, or at least included, the teaching of history. It is also of note that there was a statistical difference in terms of participation in professional development with natural sciences more likely than humanities to have done so. Perhaps then, the notion is not justified that ‘the hard sciences’ have less to worry about when it comes to the language used for teaching (Author 1).

The finding that there was no age bias among the sample can be considered alongside a study set in a Scandinavian university (Jensen & Thøgersen, 2011) which found that younger teachers were more in favour of EMI than older ones. However, it is not clear from their sample of 1131 returned questionnaires how many respondents were in the younger age bracket. Nonetheless the correlation between age and attitude towards teaching through EMI is an interesting one and needs further research.

Somewhat surprisingly, the majority of respondents were teaching undergraduates rather than postgraduates, although one third were teaching both. Studies carried out in the European HE context described earlier strongly suggested an emphasis of EMI at the postgraduate level. Our more global data provides greater emphasis on undergraduates. This finding might reflect the possibility that our instrument tapped into many non-European institutions which had much larger numbers of undergraduates than postgraduates. In these non-European contexts (as one reviewer pointed out) the language of instruction may be dictated more at the national level than the individual institutional level. Indeed in contexts such as Japan, some researchers have noted that “the drive for EMI normally comes from policymakers, HE administrators and university leaders, often in response to government initiatives” (Aizawa & McKinley, 2020: 33), in an aim to produce globally competitive domestic graduates. This is compared to Europe, where EMI originally dominated postgraduate degrees due, in part, to stakeholder efforts to increase the use of English as the dominant language of academic research. (compare for example EMI HE policies in China and Japan with the absence of policies in European countries such as Italy or Germany)

If our findings can be considered representative of the global situation then there is even greater need for professional development and certification of EMI teachers given that a) undergraduates may be at a lower level of English proficiency and b) they are likely to be taught in larger groups than postgraduates, thus making the need for greater individually targeted attention and support necessary (see Author 1 et al). This attention will be dependent on which model of EMI an institution has adopted: language support from language specialists or the expectations that the EMI content teachers themselves should provide language support. This possibly explains why natural sciences respondents were more likely to report that their institution had certification than humanities (with a language focus) respondents, implying that the latter perhaps ‘had no need for certification’. Yet the majority of respondents regardless of discipline believed that their pedagogy had to change in order for effective student learning to take place. It would therefore be questionable whether the majority of humanities teachers have already acquired the necessary skills to teach students whose English may be to varying degrees insufficient for learning.

We also found differences by country. We know that Spain has contributed quite high levels of resources to EMI (and more generally bilingual education). This may explain why more teachers from that country than any other said their institution offered certification. However, differences by country are more difficult to comment on with confidence given the reduction in the numbers of respondents when one does this. Moreover, we accept that there is an imbalance in the number of respondents per country and therefore our findings in this respect have to be considered with some caution. Whether the European respondents reporting higher levels of participation in development and certification reflects the wider population or whether there was some sample bias in our research (e.g. due to its online characteristic) it is difficult to say. It may well represent one of the limitations of this research. Another limitation was that we did not ask the participants to self-rate their English language proficiency thereby providing us with an additional variable.

To conclude, our study attempted to provide additional evidence regarding the profiles of EMI teachers in HE across the non-anglophone world. Undoubtedly these profiles will continue to remain heterogenous because of the different contexts in which EMI is taking place and we are not arguing

in favour of mass standardisation. Nevertheless greater standardisation in the areas of professional development (see for example the numerous EMI studies calling for greater student contributions in classroom interaction REFS) might be beneficial in enabling transition for student between institutions in different countries. Furthermore the variation described herein may be of benefit to future research. Using factors such as discipline, phase of education, age and length of experience, amount of professional development, as independent variables when researching classroom interaction, language support, or educational outcomes, may be fruitful directions for future research to take.

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Table 1 Survey of 83 studies in Higher Education: subjects mentioned as being taught through the medium of English (N.B. most studies mention more than one subject)

Subject mentioned	Number of mentions
Accounting/Finance	3
Agriculture	3
Biology	4
Business administration/management	21
Chemistry	8
Communication Sciences	3
Computer Programming/Information Technology	4
Construction & Land Use	1
Economics	13
Education	3
Engineering	23
Environment studies	1
Health Care	1
History	2

International Relations	1
Law	4
Linguistics	1
Maritime Studies	1
Mathematics	5
Medicine	5
Nursing	3
Pharmacy	1
Physics/Electronics	15
Politics	3
Psychology	3
Textiles/Materials	2
Veterinary science	1
TOTAL	135

Table 2: Participants' country of residence

	Frequency	Percent
China	133	28.7
Italy	30	6.5
Japan	20	4.3
Mexico	34	7.3
Spain	151	32.6
Turkey	51	11.0
Other	44	9.5
Total	463	100.0

Table 3: The different disciplines in which EMI was being used.

	Frequency	Percent
Mathematical Sciences	68	14.7
Natural Sciences	95	20.5
Medical Sciences	31	6.7
Social Sciences	155	33.5
Humanities	38	8.2
Humanities with language focus	76	16.4
Total	463	100.0

Table 4: Age of EMI teachers

	Frequency	Percent
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20-29 years of age	24	5.2
30-39 years of age	171	37.0
40-49 years of age	163	35.3
50 or above	104	22.5
Total	462	100.0

Table 5: Experience teaching through English

	Frequency	Percent
About to start	80	17.6
Less than 5 years	197	43.4
At least 5 years but less than 10 years	99	21.8
10 years or more	78	17.2
Total	454	100.0

Table 6: What level students do you teach?

	Frequency	Percent
UG only	246	56.2
PG only	35	8.0
Both UG & PG	157	35.8
Total	438	100.0

Table 7: Mean age of teachers by country

	Frequency	Mean	Std. Deviation
Italy	30	44.3	6.26
Spain	150	41.0	8.17
Japan	20	40.5	7.59
Turkey	51	35.7	9.00
Mexico	34	34.7	9.92
China	133	34.4	6.79
Other	44	33.2	8.00

Table 8: p value for Tukey's HSD test comparing teachers' age by country of residence

	Italy	Spain	Japan	Turkey	Mexico	China	Other
Italy	--	p=.347	p=.628	p<.001***	p<.001***	p<.001***	p<.001***
Spain		--	p=1.000	p=.001***	p=.001***	p<.001***	p<.001***
Japan			--	p=.240	p=.126	p=.024*	p=.011*
Turkey				--	p=.998	p=.962	p=.719
Mexico					--	p=1.000	p=1.000
China						--	p=.970
Other							--

*significant at <0.05 ; ***significant at ≤ 0.001