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Article

English-medium instruction in European higher education: Measurement validity and the state of play in 2023/2024

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Notwithstanding the wide consensus that English-medium instruction (EMI) in European higher education has grown explosively since the turn of the century (Wächter, B., and Maiworm, F. 2014. *English-taught programmes in European higher education: The state of play in 2014*. Bonn: Lemmens), there has been little research which addresses issues related to operationalizing EMI, nor has a pan-European update on EMI figures been given since 2013. This study fills these gaps by (1) applying a measurement validity process (Adcock and Collier 2001) to operationalizing and measuring EMI and (2) applying the resultant framework to up-to-date figures on the state-of-play of EMI in European higher education in the academic year 2023/2024. A total of 24,043 ETPs were identified in 2023/24, compared to 8,089 in 2013, showing approximately three-fold growth over the decade. Geographically, our modern data shows that EMI is practiced more widely in 2023/2024, no longer as concentrated in Northern Europe. EMI is mostly practiced at the master's level; and the most popular disciplines are 'business and management', 'engineering and technology' and 'computer science and IT'. We discuss the theoretical and methodological implications for future research operationalizing and measuring EMI growth.

Introduction

Studies on the growth of English-medium instruction (EMI) in European higher education have reported significant growth since the turn of the century. The number of English-taught degree programmes (ETPs) in the European Higher Education Area (EHEA) reportedly rose from 725 in

2001 to 8,089 in 2013 (Maiworm and Wächter 2002; Wächter and Maiworm 2014), more than a ten-fold increase. A study on bachelor's ETPs noted up to fifty-fold growth between 2009 and 2017 (Neghina and Sandström 2017). In the European context, ETPs are defined here as programmes offered by higher education institutions at ISCED (International Standard Classification of Education) levels 5 and above.

Country-level studies have also shown EMI growth. For instance, Türkiye saw a four-fold increase in English-medium programmes from 1999 to 2019 (Yuksel, Altay and Curle 2022) and in Italy, 74% of surveyed HEIs offered EMI in 2012, which grew to 85% in 2015 (Broggini and Costa 2017). Additionally, there is a notable north-south divide within Europe, with northern countries offering more EMI than southern ones (Hultgren, Jensen and Dimova 2015). This includes Scandinavian countries and the Netherlands leading the way (Wächter and Maiworm 2014). In particular, the Netherlands has been offering EMI since the 1980s (Wilkinson and Gabriëls 2021 with 29% of bachelor's degrees and 75% of master's degrees taught exclusively in English by 2022 (VSNU 2023). Explanations for the growth of EMI include the Bologna Process, marketization, and internationalization (Macaro 2018). More recently, neoliberally predicated 'steering at a distance' reforms have been identified as a driver (Hultgren *et al.* 2023; Wingrove *et al.* 2024). While these studies are useful for measuring the presence and growth of EMI, issues related to accuracy and operationalization remain, which we will now address.

While EMI is reported to have grown since the turn of the century, the extent of this growth may be exaggerated. Wächter and Maiworm (2014, p.131) caution that their study's claim of a 'ten-fold increase' between 2001 and 2013 might be overstated due to undercounting in 2001. This discrepancy arose because their collection technique improved in the final study, combining survey data with data from Study Portals, an online portal of ETPs, unlike earlier years which relied upon survey data only. Similarly, the 'fifty-fold growth' claim between 2009 and 2017 (Sandström and Neghina 2017) also used Study Portals data and is likely inflated, as Study Portals was founded in 2009 and would not have been able to capture all European higher education institutions within the first few years of operation. The observed growth from 2009 to 2017 was thus partly due to the company's expanding reach. A more accurate estimate suggests an eight-fold increase in English-taught bachelor's programs during this period, based on a comparison with Wächter and Maiworm's (2008) survey data. Furthermore, these growth claims concern raw numbers and don't account for overall higher education growth. Therefore, claims about EMI growth can be partially attributed to: (1) improved data collection techniques, (2) the growth of the company that collects data on ETPs, and (3) general higher education growth, all of which obscure the true extent of EMI in European higher education.

Prior research has operationalized EMI via English-taught degree programmes (ETPs). However, there has been a lack of criticality concerning the use of this measure, what it captures, and how it is limited. For instance, the shift from collecting data via surveys to collecting data via an online portal is not inconsequential. Missingness in survey data is due to nonresponse and can generally be assumed to be random, whereas missingness in an online portal is due to institutions not actively advertising programmes, which may miss English-medium programmes targeted to local students. Moreover, ETPs vary in size and it is possible that universities might increase EMI by expanding student numbers within existing programmes rather than creating new ones. A related issue is that ETPs have been standardized in different ways. This includes: the percentage of institutions offering ETPs (Wächter and Maiworm 2014; Broggini and Costa 2017), ETPs as a percentage of total programmes (Wächter and Maiworm 2014), and ETPs per capita (Hultgren, Jensen and Dimova 2015). However, no studies standardized ETPs to student numbers, which would be a more accurate measure of higher education size. In summary, ETPs are a convenient measure, which have yet to be critically assessed in terms of measurement validity, which we aim for in this paper.

Beyond issues of accuracy and operationalization, no comprehensive pan-European study has been conducted since Wächter and Maiworm's (2014) update on 2013 data. Moreover, the last decade has seen major disruptive events in Europe, such as Brexit, the migrant crisis, the

COVID-19 pandemic, and the war in Ukraine. Consequently, we lack a clear picture of the current state of EMI in European higher education, its geographic distribution, division by study level and academic discipline, and change over the last ten years.

To address these issues, we apply a measurement validity process to EMI and apply the resultant framework to Study Portals' data from the 2023/2024 academic year. Our framework improves measurement validity, which previous literature has insufficiently addressed. Thus, our study aims to be more reflective, rigorous, and transparent in analysing EMI's presence and growth in European higher education, informing future global EMI studies. We use data from the European Tertiary Education Register (ETER; Lepori *et al.* 2023) to contextualize EMI spread relative to the size of higher education systems and standardize ETPs to student numbers using Eurostat (2023a) data.

This paper is structured as follows. We begin by outlining the framework for measurement validity: how we move from concept (EMI) to measurement (ETPs), covering the extent to which ETPs capture the sociolinguistic phenomenon of EMI. We then present results from three perspectives: (1) how widely EMI is practiced throughout higher education institutions in Europe in the academic year 2023/2024 and how this has changed since 2013; (2) the numbers of ETPs in terms of degree levels in 2023/2024; and (3) the numbers of ETPs in terms of disciplinary categories in 2023/2024.

To give a brief overview of the main findings, this study applies a measurement validity framework to analyse English-medium instruction (EMI) in European higher education, identifying approximately a three-fold increase in English-taught programs (ETPs) from 2013 to 2023/2024, which far outpaces the growth in tertiary education enrolment. EMI is now a pan-European phenomenon, with significant growth in South West and Central East Europe, while traditionally leading regions, such as the Nordic Countries and Central West Europe, maintain their dominance. 'Business and management' emerges as the most represented discipline in EMI, though further investigation is needed to clarify disciplinary trends due to data limitations.

Method: concept and measurement of English-medium instruction

In this section, we consider how we can move from the concept to the measurement of EMI. We propose that whilst there has been much progress in the theoretical conceptualizations of EMI (e.g. Dafouz and Smit 2020; Macaro 2022; Richards and Pun 2023), issues concerning operationalization have not been addressed, which we aim for here.

We use a measurement validity process for this analysis to move from concept to measurement (Adcock and Collier 2001). This process involves four stages: (1) defining **background concept(s)**, (2) adopting a **systematised concept**, (3) identifying **indicators**, and (4) reporting **scores for cases**. Stages 1-3 comprise the method in this study and stage 4 is the results. Therefore, we cover stages 1-3 in this section, applying the measurement validity process to EMI. It is only by going through this process that we can have clarity over how EMI is defined and operationalized. In the following paragraph, we elaborate on the process before applying it to EMI in the remainder of the method.

Stage one, background concepts, concerns defining the "broad constellation of meanings" associated with a concept (Adcock and Collier 2001, p.531). It is first important to spell out the myriad terms within the field, which may overlap or even contradict each other. Stage two, the systematized concept, concerns the specific conceptual formulation for the current study, clarifying which definition we use and delineating relevant cases. In other words, we have to address any pre-existing conceptual issues and settle on a coherent definition before proceeding. Stage three, indicators, concerns identifying relevant indicators which validly measure the systematized concept. This stage could also be referred to as 'measures' and is complemented by the preceding stage, as a clearly defined systematized concept enables valid measurements. However, whilst indicators are identified, this stage stops short of reporting numerical data for

specific cases. Stage four, scores from cases, concerns these numerical data, which are reported in various studies. In our study, 'stage four' is covered in the results section, reporting numerical figures on EMI in European higher education in the academic year 2023/2024. The remainder of the method applies stages 1-3 to English-medium instruction and the whole process is summarised in Figure 1.

Background concepts

Our field includes a growing range of acronyms for language instruction and education: English as the medium of instruction (EMI), English-medium education in multilingual university settings (EMEMUS), content-language integrated learning (CLIL), English for academic/specific purposes (EAP/ESP), English as a foreign language (EFL), and more. In this section, we outline these

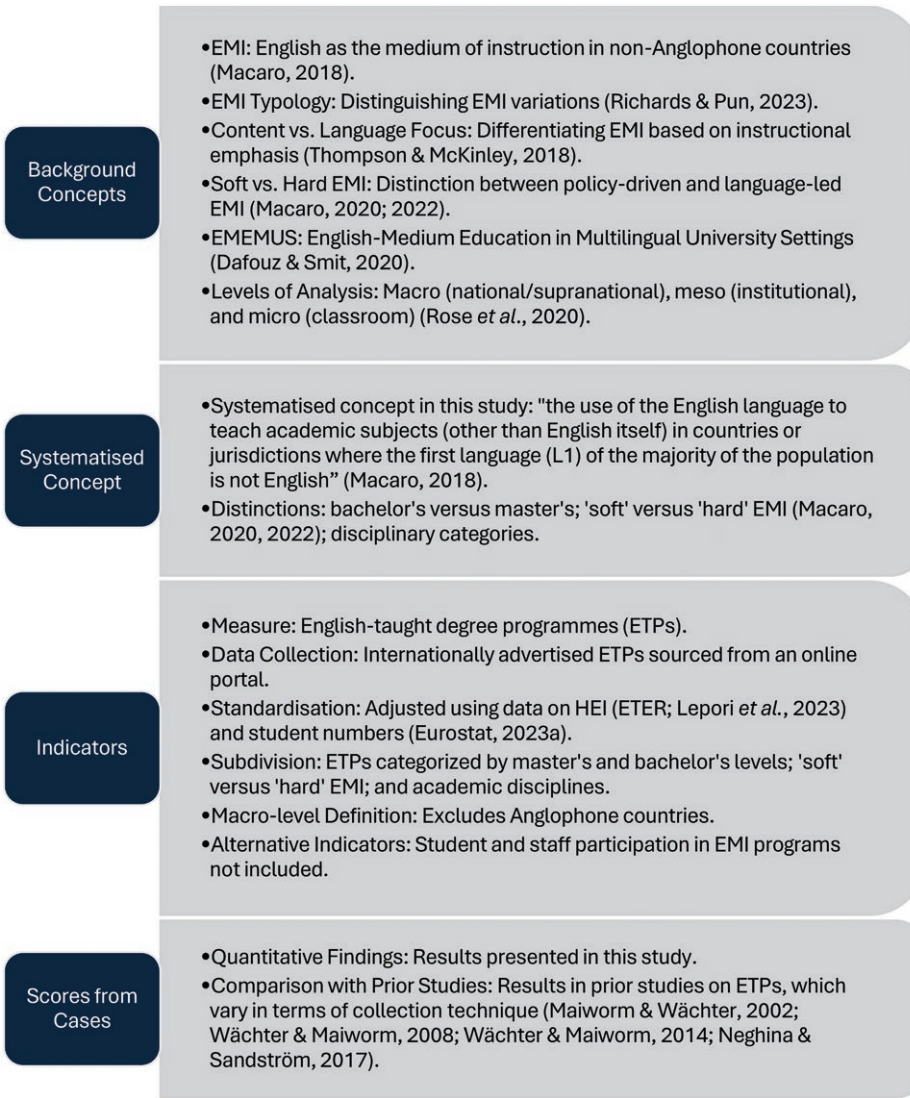

Figure 1 Framework for the Concept and Measurement of EMI. Adapted from Adcock and Collier (2001).

terms and their boundaries, identifying which cases they include or exclude, before defining our systematized concept in the following section. This analysis focuses on EMI, the concept under consideration.

Definitions of EMI vary across flexible criteria (Smit 2023), with recent efforts towards a clear typology based on goals and approaches (Richards and Pun 2023). We focus on criteria that may include or exclude types of EMI, such as the relationship to English language education. This is often depicted as a continuum, with a focus on content at one end and language at the other (Thompson and McKinley 2018). EMI, at the extreme content-focussed end, excludes cases with a language focus, and purists may also exclude CLIL, which appears between the two extremes.

Within content-based EMI, a further division exists: 'soft EMI' versus 'hard EMI' (Macaro 2020, 2022). This is distinct from Biglan's (1973) soft/hard pure/applied disciplines. Soft EMI refers to subjects where English is intrinsic, like TESOL, Anglophone literature, and translation (Macaro 2022). Macaro (2022) notes that soft EMI arises from language-led decisions, while hard EMI, applied to other subjects, is policy-led. Hard EMI narrows the definition of EMI to exclude these intrinsically English content areas.

Geographic location is another important consideration that sets boundaries. The oft-cited definition of EMI, 'the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language (L1) of the majority of the population is not English' (Macaro 2018), excludes Anglophone countries like the United Kingdom, the United States, Canada, New Zealand, and Australia. This mirrors the rationale for excluding language-based instruction and 'soft EMI' subjects, as there is no clear policy-led decision to teach in English in Anglophone countries.

Some scholars have problematized these strict geographical boundaries by highlighting multilingual university settings in Anglophone countries (Pecorari and Malmström 2018; Dafouz and Gray 2022; Hüttner and Baker 2023). In these contexts, while English may be the L1, the university environment is multilingual, resembling EMI in non-Anglophone countries. This more flexible perspective is captured by EMEMUS, English-Medium Education in Multilingual University Settings (Dafouz and Smit 2020).

In defining EMI, additional categories and continua can be considered, including partial versus full EMI (Yuksel, Altay and Curle 2022), curriculum models (Richards and Pun 2023), and education level. While EMI research typically focuses on tertiary education, pre-tertiary education can also be considered EMI (Smit 2023). Establishing a systematized concept of EMI requires settling on a definition and explaining the boundaries, which we aim for in the following section.

Systematized concept

We adopt Macaro's (2018) definition for our systematized concept: the use of English to teach academic subjects in countries where the L1 of the majority is not English. The focus of our study is tertiary-level education in Europe and excludes the United Kingdom and Ireland due to the L1 status of English. In terms of academic disciplines, we exclude 'focus on language' courses such as EAP and EFL. Moreover, we accept that opinion may vary over a preference for 'soft EMI' versus 'hard EMI'. Therefore we adopt the broader definition which allows the inclusion of 'soft EMI' subjects; however, in relevant parts of the analysis we present results both with and without soft EMI subjects. These differing 'scores from cases' can help us reflect on our concept and measurement.

We acknowledge that our definition, with geographical restrictions, may *under-represent* the full scale of EMI if one considers EMEMUS to be a genuine expression of the same phenomenon, but not limited to non-Anglophone countries. Therefore, our systematized concept concerns the state of play of tertiary-level EMI in non-Anglophone Europe in the academic year 2023/2024.

Indicators

In this section, we discuss the operationalization of our systematized concept: **English-taught degree programmes (ETPs)**. We assess how effectively our operationalization captures the concept, its limitations, and potential overlaps, and consider an alternative. Prior research has used

ETPs to operationalize EMI (Maiworm and Wächter 2002; Wächter and Maiworm 2008, 2014; Neghina and Sandström 2017), enabling comparisons with historical data.

ETPs operate at the meso-level, counting programmes within institutions, while EMI is at the root a sociolinguistic phenomenon at the micro-level within the classroom. From a quantitative perspective, measuring spoken and written English words within the instructional context would provide the highest degree of granularity. This would differentiate more monolingual classes from those with greater degrees of translanguaging. However, collecting data at such a minute scale is impractical for large-scale multinational studies.

Therefore, we propose that ETPs serve as a meso-level indicator encompassing the micro-level sociolinguistic phenomenon of EMI. Each ETP represents a variety of lectures, seminars, and modules within an institution, each with varying degrees of EMI. For our purposes, we treat each programme as a single unit, without splitting hairs over 'partial EMI programmes' by removing them or adjusting their counts. We accept that there is a variable volume of EMI within each programme, which may stem from unobserved features, such as curriculum design, translanguaging, and instructional hours.

The collection technique for ETPs should be addressed. Previous studies have measured ETPs using either survey data or *internationally advertised* data on online portals. Both methods can suffer from under-counting, but online portals offer advantages such as maintaining up-to-date information and avoiding issues with invalid or outdated email addresses, a noted issue in prior survey-data research (Wächter and Maiworm 2014, p. 41). This is a particular problem for a state of play article as an outdated list would miss *new* ETPs. Additionally, a centralized portal ensures a standard measure across Europe, strengthening comparability compared to country-level databases with varying collection techniques and definitions of EMI.

For transparency, the limitations of using internationally advertised programmes should be addressed. One issue is that whilst missingness in survey data may be 'missing at random' (MAR); missingness in an online portal may be 'missing not at random' (MNAR). We may be missing programmes that are oriented towards local markets rather than international markets and we are unable to observe this orientation. This missingness may also correlate with other features of the programmes, such as level or academic discipline.

A second limitation is the lack of data on the total number of degree programmes, making it challenging to assess EMI relative to higher education overall. To address this, we standardize the number of ETPs in two ways: first, by comparing the number of EMI-practising higher education institutions (HEIs) to the total number of HEIs within a country; and second, by standardizing the number of ETPs to student numbers. We obtain HEI data from the European Tertiary Education Register (ETER; Lepori *et al*. 2023), a comprehensive HEI database, and we obtain student numbers from Eurostat (2023a). As our measure of ETPs concerns programmes commencing in the academic year 2023/2024, we standardize this to new entrants, rather than total student numbers.

To give more details on ETER and Eurostat, ETER is a comprehensive database that provides detailed information on HEIs across Europe. It includes data on nearly 3,500 HEIs from about 40 European countries, covering aspects such as institutional characteristics, geographical information, student and graduate numbers, staff details, financial information, and research activities. Eurostat, the statistical office of the European Union, is responsible for publishing high-quality Europe-wide statistics and indicators that allow for comparisons between countries and regions. It provides data on various topics, including education, economy, population, and more. In the context of this study, Eurostat offers statistics on student enrolments and new entrants in higher education, which are essential for standardizing the number of ETPs relative to student numbers.

We can consider whether ETPs capture anything outside themselves other than EMI. We argue that our measure directly captures EMI and may imply the presence of English communication in noninstructional speech events in the university, such as administration and socializing outside the classroom. Moreover, ETPs often imply the presence of pre-sessional and in-sessional EAP courses. We argue that EAP courses are a secondary phenomenon that exist in order to provide language support for students attending ETPs.

An alternative measure to ETPs could be student participation in EMI programmes. This measure could account for universities increasing EMI by enlarging class sizes instead of adding programmes. However, data on student participation in EMI programmes is currently unavailable to our knowledge.

Scores from cases

The final step of the measurement validity process concerns scores from cases, which we present in the remainder of this article. We present results concerning the number of ETPs commencing in the academic year 2023/2024. We reflect on these findings in our conclusion, considering the ways in which they inform our concept and measurement. In particular, we can consider the different scores for 'soft EMI' versus 'hard EMI', what our different methods of standardization can tell us, and how our results compare to prior studies.

Results: the picture in Europe in the academic year 2023/2024

Proportion of higher education institutions offering EMI

In the results, we present data from three perspectives: (1) HEIs which offer EMI in 2023/2024 and how this has changed since 2013; (2) ETPs by degree level; and (3) ETPs by disciplinary category. This section covers the first perspective.

This section presents data on the number and percentage of HEIs offering English-taught degree programmes (ETPs) at the bachelor's or master's level for the academic year 2023/2024, grouped by region and ordered by HEI count. We ward off one potential criticism that many HEIs will offer at least one ETP as there is a subject-intrinsic reason to teach subjects such as TESOL and Anglophone literature in English—known as 'soft EMI' programmes (Macaro 2020, 2022). To address this, we include a column showing the percentage of HEIs offering only 'hard EMI' programmes. Using subdisciplines listed in Table 1's footnote, we removed programmes associated with 'soft EMI' for this column. This is a generous catchment, including subjects like international business and linguistics, which could be considered borderline. As can be seen, excluding 'soft EMI' has minimal impact, with 48% of European HEIs practicing all forms of EMI, compared to 46.5% if 'soft EMI' is excluded.

Table 1 includes data from Wächter and Maiworm (2014) on the percentage of HEIs which offered EMI in 2013, enabling comparisons with 2023 data. To enable region-level comparisons between datasets, weighted averages for Wächter and Maiworm's country-level data, based on HEI count in their sample, are in bold in the 'EMI in 2013 (%)' column. Across the EHEA, EMI adoption increased from 26.9% of HEIs in 2013 to 48% in 2023, a growth of 21.1 percentage points. In approximate terms, a quarter of European HEIs offered EMI in 2013, which doubled to half 2023.

In the Nordic countries, EMI levels were consistently high, with approximately 60% of HEIs practicing EMI in both 2013 and 2023. However, this region experienced minimal growth, only 1.3 percentage points, suggesting stagnation. Individually, Finland, Sweden, Denmark, and Norway saw *decreases* in the share of HEIs offering EMI, while Iceland experienced an increase. This suggests that the Nordic countries may have reached or even surpassed peak EMI, which appears to be around 60% of HEIs offering EMI.

Central West Europe experienced growth in EMI adoption, increasing by 9.9 percentage points from 44.5% in 2013 to 54.4% in 2023. This region, comprising EMI-leading countries like the Netherlands, Germany, and Austria, has historically maintained high levels of EMI. Among countries with at least 100 HEIs, the Netherlands leads in EMI adoption, with 75% of HEIs offering at least one ETP. Switzerland saw the highest increase in the share of HEIs offering EMI, rising by 21.1 percentage points. However, Belgium stands out as an outlier, with lower EMI levels and a decrease in adoption over the past decade.

Central East Europe experienced significant growth in EMI adoption, increasing by 27 percentage points over the last decade, from 19.9% in 2013 to 46.9% in 2023. This transitioned the region from a low-EMI to a medium-EMI region, trailing Central West Europe and the Nordic Countries

Table 1. EMI versus non-EMI HEIs in the EHEA in the academic year 2023/2024.

Country	Total HEIs	EMI HEIs	EMI (%)	Hard EMI[1] only (%)	EMI in 2013[2] (%)	Change 2013–2023/24
Nordic Countries	**247**	**153**	**61.9**	**59.9**	**60.6**	**1.3**
Finland	65	52	80.0	80.0	83.3	–3.3
Sweden	65	48	73.8	73.8	81.0	–7.2
Denmark	54	24	44.4	42.6	48.0	–3.6
Norway	51	20	39.2	35.3	41.1	–1.9
Iceland	12	9	75.0	58.3	50.0	25
Central West Europe	**1,087**	**591**	**54.4**	**52.4**	**44.5**	**9.9**
Germany	589	334	56.7	54.2	43.3	13.4
Belgium	177	42	23.7	22.6	29.2	–5.5
Netherlands	116	87	75.0	73.3	65.0	10
Austria	108	61	56.5	56.5	46.6	9.9
Switzerland	86	60	69.8	67.4	48.7	21.1
Luxembourg	8	5	62.5	62.5	n.d.	–
Liechtenstein	3	2	66.7	66.7	n.d.	–
Central East Europe	**414**	**194**	**46.9**	**45.9**	**19.9**	**27.0**
Poland	298	109	36.6	35.9	17.8	18.8
Slovakia	39	16	41.0	41.0	21.2	19.8
Czechia	35	31	88.6	88.6	27.8	60.8
Hungary	33	29	87.9	84.8	35.2	52.7
Slovenia	9	9	100.0	88.9	8.6	91.4
South West Europe	**920**	**461**	**50.1**	**48.9**	**17.2**	**32.9**
France	345	172	49.9	48.4	16.1	33.8
Italy	294	134	45.6	44.9	19.8	25.8
Spain	162	112	69.1	66.7	20.3	48.8
Portugal	119	43	36.1	36.1	14.3	21.8
South East Europe	**679**	**214**	**31.5**	**30.0**	**18.3**	**13.2**
Turkey	254	87	34.3	31.1	17.3	17
Romania	106	30	28.3	26.4	16.9	11.4

Table 1. Continued

Country	Total HEIs	EMI HEIs	EMI (%)	Hard EMI[1] only (%)	EMI in 2013[2] (%)	Change 2013–2023/24
Greece	69	34	49.3	49.3	19.0	30.3
Bulgaria	60	13	21.7	21.7	16.3	5.4
Croatia	48	16	33.3	33.3	6.9	26.4
Serbia	44	7	15.9	15.9	n.d.	–
Albania	41	1	2.4	2.4	n.d.	–
Cyprus	39	24	61.5	61.5	47.8	13.7
N. Macedonia	18	2	11.1	11.1	n.d.	–
Baltic Countries	**125**	**54**	**43.2**	**43.2**	**38.7**	**4.5**
Lithuania	51	28	54.9	54.9	48.8	6.1
Latvia	51	18	35.3	35.3	33.3	2
Estonia	23	8	34.8	34.8	30.4	4.4
EHEA	**3,472**	**1667**	**48.0**	**46.5**	**26.9**	**21.1**

1 Excluding subdisciplinary categories related to: "ESL", "International Business", "Linguistics", "Literature", "Teaching English", "Translation and Interpreting", "Languages", "Language Studies".
2 Data: Wächter and Maiworm (2014). The weighted average is based on the number of HEIs in their sample.

by 7.5 and 15 percentage points, respectively. Poland, the largest country in the region, doubled the share of HEIs which practice EMI, while Czechia and Hungary both saw growth of over 50 percentage points. Overall, Central East Europe has become a high-growth region, now nearing the European average.

Similarly, South West Europe saw explosive EMI growth over the last decade, from 17.2% in 2013 to 50.1% in 2023. This contrast is most stark concerning Spain, effectively seeing 3.5-fold growth from 20.3% of HEIs offering EMI to 69.1%. The growth in France and Italy has brought these two countries close to the European average, whereas Portugal lagged behind. Similar to Central East Europe we can describe South West Europe as a medium-EMI region (with the exception of Portugal) which has shown high growth over the last ten years.

In South East Europe we see some EMI growth but not as much as in South West Europe or Central East Europe. South East Europe grew from 18.3% of HEIs offering EMI to 31.5%, growing 13.2 percentage points. Greece grew the most in this region, reaching 49.3% of HEIs offering EMI. With the exception of Cyprus and Greece, we can describe this region as a low-EMI region with the lowest region-level average in the dataset. However, if trends continue South East Europe may catch up with other regions in the future.

In the Baltic countries, we see growth of 4.5 percentage points from 38.7% in 2013 to 43.2% in 2023. Compared to the European averages, this puts the Baltic countries slightly above average in 2013, but below average in 2023, with relatively slow growth. We can describe the Baltic Countries as a medium-low EMI region.

A few key conclusions can be drawn. First, the north-south rift in EMI in European higher education appears to have evaporated (Figure 2). The divide, if any, is East-West, with the Baltic Countries and South East Europe behind the Europe average. However, the overall picture shows that EMI is now a pan-European phenomenon with approximately half of all HEIs offering EMI.

The high-EMI regions are the Nordic Countries and Central West Europe. While the Nordic countries have maintained their lead, there are indications that EMI growth may have plateaued. Over the last decade, South West Europe and Central East Europe have emerged as high-growth regions, currently approximating the European average. The Baltic countries and South East Europe (with some exceptions) typically have fewer HEIs offering EMI but have still seen growth over the last ten years. It is yet to be seen whether they will eventually catch up with the current European average of approximately half of all HEIs offering EMI.

ETPs by study level

This section presents results on the number of English-taught degree programmes divided by academic level: bachelor's and master's. Whilst in the last section we could see how widespread EMI was through higher education systems, in the current section we get a perspective on the volume of EMI in terms of programme numbers. In Tables 2 and 3, we present the total number of ETPs commencing in the academic year 2023/2024 at each level; the number of new entrants at that level from Eurostat; and then the number of commencing ETPs per 1000 new entrants. Figures 3 and 4 visualize these data with blue dots representing HEIs which do not offer any ETPs on Study Portals and green circles representing those that do, scaled to the number of programmes. These visualizations enable us to see where the greatest numbers of programmes are concentrated.

Table 2 shows the total number of commencing bachelor's ETPs in 2023/2024. Across all countries in our dataset, there are a total of 6,718 programmes compared to 3,615,706 new entrants at the bachelor's level. The European average is 1.9 BA ETPs per 1000 new entrants.

The Nordic countries are above the European average, which coheres with our previous data that the Nordic countries are typically high-EMI regions. However, in the case of bachelor's ETPs, this appears to be primarily driven by Finland with 5.2 ETPs per 1000 students. The other Nordic countries are below the European average. These data also reveal the sense of scale of EMI in the Nordic countries compared to the rest of Europe. Taken together, the Nordic countries offer 440 BA ETPs in total, which is fewer than Germany (536), the Netherlands (773), Spain (669), and Turkey (1197); and equal to Poland (440).

The picture in Central West Europe is close to the European average with 2.1 bachelor's ETPs per 1000 students. There is a contrast here with the Netherlands, Austria, and Switzerland

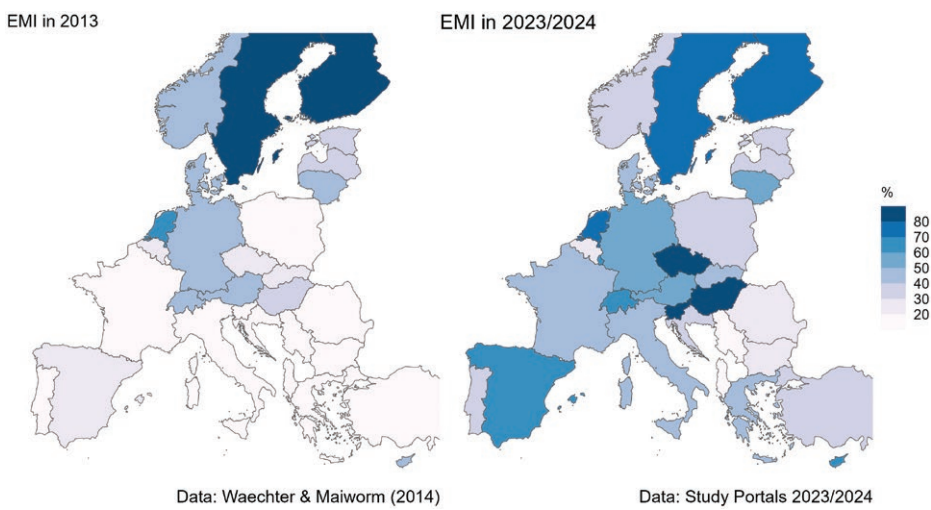

Figure 2 Percentage of HEIs which offer at least one ETP in 2013 and 2023/2024.

Table 2. Total number of English-taught bachelor's degree programmes in 2023/2024.

Country	Total HEIs	BA ETPs	BA Students[1]	ETPs per 1000 students
Nordic Countries	**247**	**440**	**199,039**	**2.2**
Finland	65	238	45,865	5.2
Sweden	65	96	56,356	1.7
Denmark	54	79	49,711	1.6
Norway	51	25	43,733	0.6
Iceland	12	2	3,374	0.6
Central West Europe	**1,087**	**1,738**	**820,070**	**2.1**
Germany	589	536	473,941	1.1
Belgium	177	106	97,266	1.1
Netherlands	116	773	143,619	5.4
Austria	108	111	42,168	2.6
Switzerland	86	189	61,957	3.1
Luxembourg	8	23	1,029	22.4
Liechtenstein	3	0	90	0.0
Central East Europe	**414**	**975**	**348,247**	**2.8**
Poland	298	440	199,168	2.2
Slovakia	39	84	30,348	2.8
Czechia	35	228	65,678	3.5
Hungary	33	204	37,871	5.4
Slovenia	9	19	15,182	1.3
South West Europe	**920**	**1,299**	**1,223,939**	**1.1**
France	345	162	592,105	0.3
Italy	294	282	314,702	0.9
Spain	162	669	240,481	2.8
Portugal	119	186	76,651	2.4
South East Europe	**679**	**1,883**	**982,953**	**1.9**
Turkey	254	1,197	674,279	1.8
Romania	106	111	105,265	1.1
Greece	69	109	66,555	1.6
Bulgaria	60	51	40,889	1.2
Croatia	48	40	26,619	1.5
Serbia	44	61	n.d.	-
Albania	41	8	50,020	1.2
Cyprus	39	302	6,382	47.3

Table 2. Continued

Country	Total HEIs	BA ETPs	BA Students[1]	ETPs per 1000 students
North Macedonia	18	4	12,944	0.3
Baltic Countries	**125**	**383**	**41,458**	**9.2**
Lithuania	51	283	20,214	14.0
Latvia	51	82	15,157	5.4
Estonia	23	18	6,087	3.0
EHEA	**3,472**	**6,718**	**3,615,706**	**1.9**

1 The latest available data on new entrants in 2022 from Eurostat (2023a).

offering above-average ETPs per 1000 students and Germany and Belgium being below average. In terms of raw numbers, the Netherlands, despite its size, offers the highest number of BA ETPs in the dataset (773) second only to a much larger country, Turkey.

In Central East Europe there is evidence that the region may be embracing EMI at the bachelor's level to a greater extent than other regions with an average of 2.8 BA ETPs per 1000 students. All countries in this region, with the exception of Slovenia, have above-average ETPs per 1000 students. This is particularly the case for Hungary and Czechia with 5.4 and 3.5 ETPs per 1000 students, respectively.

In South West Europe there is a divide between France and Italy compared to Spain and Portugal. Spain and Portugal are both clearly above the European average; whereas France and Italy are far below. This is despite identifying South West Europe as a medium-EMI region in the previous section.

In South East Europe the average number of BA ETPs per 1000 students is the same as the European average at 1.9. However, when we look at individual countries, it becomes clear this region is below average, distorted by one country: Cyprus. The official languages of Cyprus are Greek and Turkish.

However, Cyprus conducts much of its higher education in English. In our data, Cyprus offers 47.3 BA ETPs per 1000 students, the highest ratio in the dataset, which pulls the regional average up. In this region, we also see the country that offers the largest number of BA ETPs in the dataset, Turkey, at 1197 ETPs. However, this is marginally below the European average when standardized to the number of new entrants.

Taken as a region, the Baltic countries are an outlier in this set, offering 9.2 BA ETPs per 1000 students. This is the highest out of every region in the set. This is surprising as this region was identified as low-EMI in the previous section. However, we should keep in mind that total BA ETPs ($n = 6{,}718$) make up just above a quarter of total ETPs ($n = 24{,}043$) in Europe. Considering this, perhaps a further distinction could be made concerning the "Introduction of EMI" criterion in Richards and Pun's (2023) typology, dividing 'late EMI' (higher education) into undergraduate and postgraduate.

Table 3 shows the total number of commencing master's ETPs in 2023/2024. Across all countries in our dataset, there are a total of 17,325 programmes compared to 1,897,534 new entrants at the master's level. The European average is 9.1 MA ETPs per 1000 students.

When these data are compared to BA ETPs, it becomes clear that EMI is primarily a master's level phenomenon. 1.9 BA ETPs are offered per 1000 new entrants at the bachelor's level compared to 9.2 MA ETPs per new entrants at the master's level. This is greater than a four-fold difference. As such, by focussing on master's degrees, this section can highlight the main countries and regions where EMI is currently being practiced, in terms of both raw numbers and standardized to new entrants. Comparisons are made between regions and to data on bachelor's programmes.

Table 3. Total number of English-taught master's degree programmes in 2023/2024.

Country	Total HEIs	MA ETPs	MA Students[1]	ETPs per 1000 students
Nordic Countries	**247**	**1,976**	**117,384**	**16.8**
Finland	65	388	13,853	28.0
Sweden	65	1,011	45,048	22.4
Denmark	54	362	26,887	13.5
Norway	51	163	29,512	5.5
Iceland	12	52	2,084	25.0
Central West Europe	**1,087**	**6,777**	**462,066**	**14.7**
Germany	589	2,645	281,609	9.4
Belgium	177	645	50,761	12.7
Netherlands	116	2,025	64,229	31.5
Austria	108	594	34,951	17.0
Switzerland	86	720	29,569	24.3
Luxembourg	8	142	861	164.9
Liechtenstein	3	6	86	69.8
Central East Europe	**414**	**1,648**	**215,849**	**7.6**
Poland	298	683	135,081	5.1
Slovakia	39	90	18,160	5.0
Czechia	35	444	34,853	12.7
Hungary	33	389	20,488	19.0
Slovenia	9	42	7,267	5.8
South West Europe	**920**	**4,184**	**717,494**	**5.8**
France	345	1,283	337,658	3.8
Italy	294	1,368	201,476	6.8
Spain	162	1,019	132,315	7.7
Portugal	119	514	46,045	11.2
South East Europe	**679**	**2,188**	**365,597**	**6.0**
Turkey	254	1,300	187,659	6.9
Romania	106	193	69,374	2.8
Greece	69	159	30,963	5.1
Bulgaria	60	88	24,803	3.5
Croatia	48	72	18,442	3.9
Serbia	44	94	n.d.	-
Albania	41	3	20,356	4.6
Cyprus	39	277	10,173	27.2

Table 3. Continued

Country	Total HEIs	MA ETPs	MA Students[1]	ETPs per 1000 students
North Macedonia	18	2	3,827	0.5
Baltic Countries	**125**	**552**	**19,144**	**28.8**
Lithuania	51	344	8,219	41.9
Latvia	51	126	6,958	18.1
Estonia	23	82	3,967	20.7
EHEA	**3472**	**17,325**	**1,897,534**	**9.1**

1 The latest available data on new entrants in 2022 from Eurostat (2023a).

In the Nordic countries, 1,976 MA ETPs are offered with 16.8 MA ETPs per 1000 students. Similar to bachelor's ETPs, Finland appears to be leading the way in this region in terms of student-programme ratio. However, the greatest number are offered by Sweden, which offers 1,011 MA ETPs in total. This is quite a stark difference from BA ETPs, with Sweden offering only 96. Moreover, we can now see Norway as a potential outlier in the region, offering only 0.6 BA ETPs per 1,000 students and 5.5 MA ETPs per 1,000 students.

In Central West Europe we can now see a clearer picture of the extent of EMI practice in the region. In our previous data, Central West Europe was comparable to the European average in terms of the percentage of HEIs that offer EMI. However, when we consider the number of MA ETPs, Central West Europe appears to be leading the way. In particular, the Netherlands offers a staggering number of MA ETPs for a country of its size, with 2,025 in total (31.5 per 1,000 new entrants). This number is greater than the whole of Central East Europe (1,708) and the whole of the Nordic Countries (1,976) and almost as many as the whole of South East Europe (2,188). Germany offers the greatest number in the dataset, with 2,645 MA ETPs in total. However, this is close to the European average when we consider student numbers with 9.4 per 1,000 new entrants.

In Central East Europe 1,648 MA ETPs are offered in total for 215,849 new entrants, which works out to 7.6 MA ETPs per 1,000 students. Interestingly, this region was above the European average for BA ETPs per 1,000 students but is below average for MA ETPs per 1000 students. Whilst EMI is still practised more at the master's level than the bachelor's level in this region, it appears that the contrast between undergraduate and postgraduate EMI is not as stark in Central East Europe compared to the rest of Europe. In particular, Poland, the largest country in the region, offers 440 BA ETPs compared to 683 MA ETPs. In terms of student-programme ratios, this is 2.2 BA ETPs per 1,000 students compared to 5.1 MA ETPs per 1,000 students.

Both South West Europe and South East Europe have the lowest numbers of MA ETPs per 1,000 students. In the case of South West Europe this nuances our finding that this is a high growth region, as was suggested by Table 1, concerning the percentage of HEIs which offer EMI. While now we estimate that 50.1% of HEIs offer EMI in this region, up from 17.2%, it appears that these changes are not reflected as starkly in the number of MA ETPs which are offered, with only 5.8 MA ETPs per 1000 students, well below the European average. Our data suggests that EMI in South West Europe is *wide* but not *deep*.

This also appears to be the case with South East Europe, although EMI has not spread quite as widely. Interestingly, Turkey, the largest country in this region, offers only slightly more MA ETPs (1,300) compared to BA ETPs (1,197). Similar to Central East Europe, there is evidence that Turkey is more willing to conduct EMI at the bachelor's level compared to other countries. It would be interesting to see further data on the students attending these courses and if they are local or international.

If EMI in South West Europe is practiced widely but not deeply, the Baltic Countries are the opposite: with a smaller percentage of HEIs offering EMI, but with 28.8 MA ETPs offered per 1000 students, the highest region-level average. This is particularly the case with Lithuania, offering 41.9 MA ETPs per 1,000 students, greater than any of the Nordic Countries. This is interesting as the Baltic countries share some characteristics of neighbouring regions: embracing undergraduate EMI to a greater extent like Central East Europe; and offering a high number of MA ETPs per 1,000 students similar to the Nordic Countries.

ETPs divided by academic disciplines

In this section, we first present results on the most popular academic disciplines and subdisciplines across the EHEA in the academic year 2023/2024 (Table 4). Space concerns restrict us to displaying pooled data for the EHEA, rather than breaking down the distribution of disciplinary categories across countries and regions. However, further studies may wish to track the spread of EMI across countries in terms of discipline and level.

Table 4 presents data on the numbers of bachelor's level and master's level ETPs for each of the 14 disciplinary categories in our data; and the top three subdisciplines for each discipline. We limited the display to the top 3 due to the fact that there are 252 subdisciplinary categories in our data. Moreover, we display the primary disciplinary category and primary subdisciplinary category for each programme. Programmes can have secondary disciplinary categories and multiple subdisciplinary categories, which we limit to one for each programme to avoid duplication. We also present data on each category as a percentage of the total number of ETPs.

As can be seen in Table 4, the most popular disciplinary category is 'business and management' comprising 27.4% of the total, followed by 'engineering and technology' (14.7%), 'computer

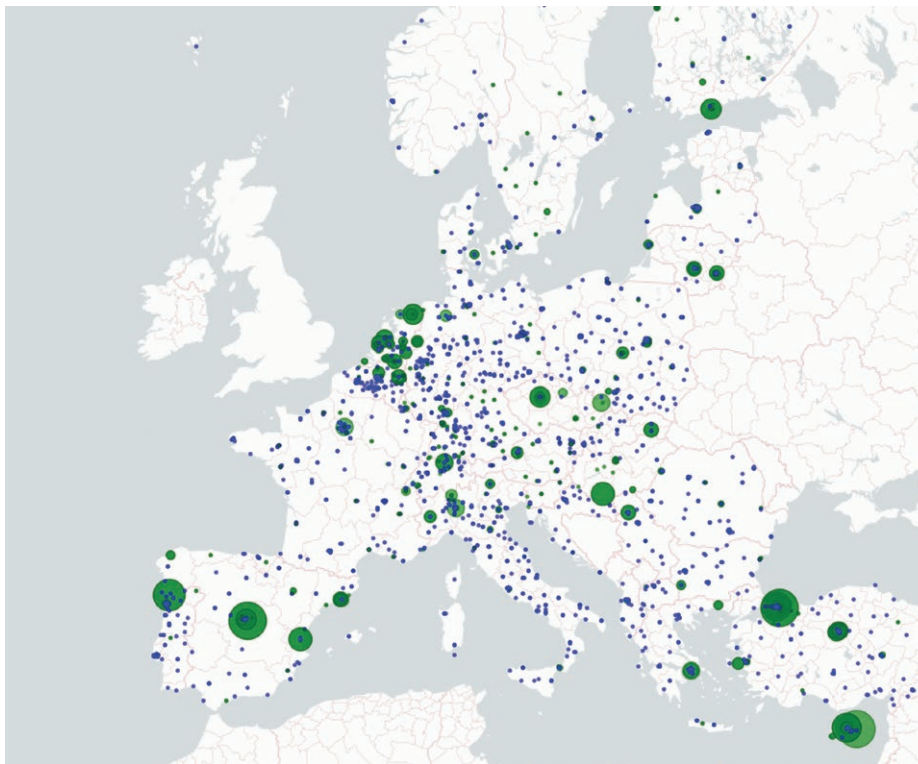

Figure 3 Bachelor's ETPs in the EHEA 2023/24.

science and IT' (10.6%) and in fourth and fifth place are 'art, design, and architecture' (8.1%) and 'humanities' (7.5%) which, if we group them together, make up 15.6% of the total. Perhaps surprisingly, both 'natural sciences and mathematics' (6%) and 'social sciences' (5%) are less represented than the humanities. At the bottom of the table, we find 'hospitality, leisure, and sport' and 'journalism and media'.

One limitation of these findings is that, whilst we can standardize ETPs to the size of education systems and student enrolment, we lack data on non-EMI programmes and therefore cannot draw conclusions on whether certain disciplines tend towards EMI or non-EMI. However, we can speculate that perhaps the reason for the high numbers of ETPs in 'business and management' and 'engineering and technology' is due to these disciplines marketing themselves to international students with internationalised career pathways. Disciplinary areas concerning the humanities may be lower down on the list as, with the exception of Anglophone literature, studies of specific countries' histories and culture may be best conducted in the local language. This division of disciplines is practiced in pre-tertiary EMI in countries outside Europe, such as Brunei, which uses a bilingual system: English is used for mathematics and science and Malay for arts and culture (Kirkpatrick and Liddicoat 2019). There may be a similar self-selection going on in European higher education, with disciplines with an international focus leaning towards EMI and those with a local focus tending towards local languages. It would be interesting to compare the current findings with national-level data on the relative balance of disciplines, if it is available.

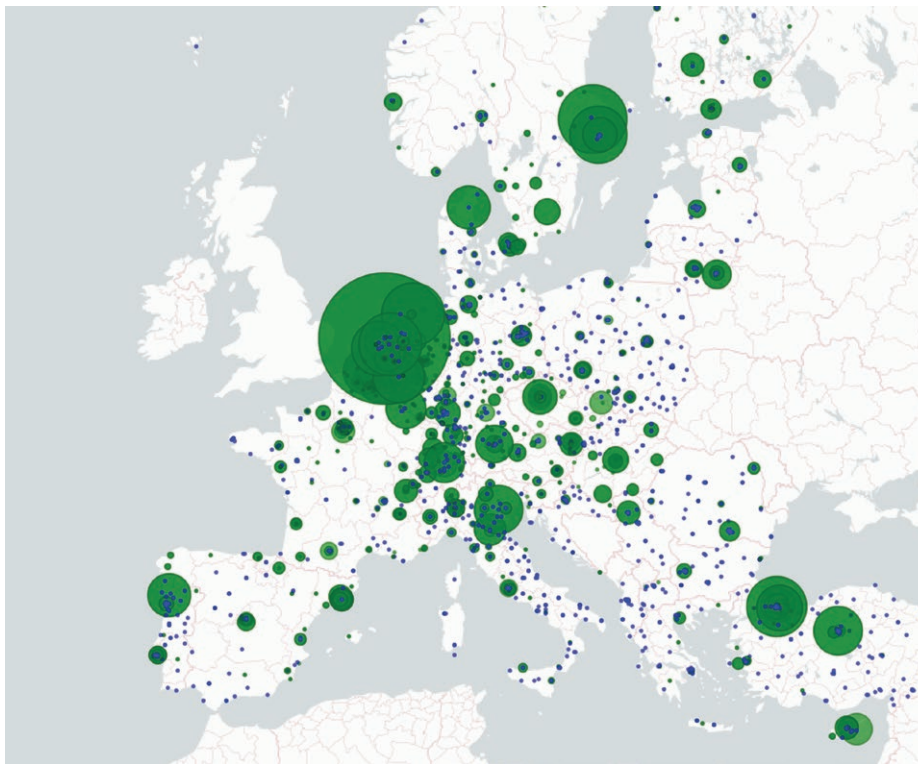

Figure 4 Master's ETPs in the EHEA 2023/24.

Conclusion

This study applied a measurement validity framework (Adcock and Collier 2001) to English-medium instruction (EMI) and utilized it to describe EMI in European higher education in the academic year 2023/2024. This application of measurement validity to EMI is a methodological contribution with potential implications for future studies worldwide.

A total of 24,043 ETPs were identified, with 6,718 at the bachelor's level and 17,325 at the master's level. Compared to 2013, when 8,089 ETPs were identified, this marks a 197.2% increase, or approximately a three-fold increase over the ten-year period. In contrast, Eurostat (2023b) reports a 7.7% increase in tertiary education enrolment from 2013 to 2022. Thus, EMI grew roughly 25 times faster than higher education enrolment over the same period. It is yet to be seen whether EMI growth will continue at this pace or whether we will eventually reach peak EMI, as appears to be the case in some countries.

Our analysis revealed that EMI has become a pan-European phenomenon in 2023/2024, no longer concentrated in central and northern Europe. South West Europe and Central East Europe have emerged as high-growth regions, transitioning from low-EMI to medium-EMI status in terms of the share of HEIs that offer EMI. Central West Europe and the Nordic Countries remain high-EMI regions, led by countries like the Netherlands and Sweden. While South East Europe and the Baltic Countries typically have lower EMI levels, they have still shown growth. Future studies could explore ongoing trends, potential EMI ceilings, and whether low-EMI countries and regions will catch up to the current European average of approximately half of all HEIs offering EMI.

Our findings show that EMI is a master's level phenomenon across Europe. Regions leading in EMI spread (% of HEIs offering EMI) also led in ETP volume, notably the Nordic Countries and Central West Europe. However, this alignment was less consistent at the bachelor's level. Some regions, like Central East Europe, the Baltic Countries, and Turkey, showed relatively high levels of bachelor's level EMI despite lower rankings in overall EMI spread and MA ETP volume.

Concerning academic disciplines, we found that over a quarter of all ETPs concerned 'business and management', followed by 'engineering and technology' and 'computer science and IT'. However, these data are constrained by Study Portals' classification system, which differs from other academic taxonomies. Moreover, we lack data on total programme numbers, so it is unclear to what extent certain disciplines tend towards EMI or non-EMI. Nonetheless, these findings provide a useful basis for future comparisons with country-level data.

We can now reflect on our study and discuss theoretical and methodological implications for research which measures EMI, and implications for policy and practice in European higher education. One of the major challenges underlying this research is the availability of data on EMI practices. As such, researchers have to rely upon convenient measures, e.g. advertised programmes. However, we suggest a greater degree of criticality concerning these measures in the future. We applied a measurement validity framework (Adcock and Collier 2001) to EMI to facilitate a systematic operationalization process. Differing definitions of EMI, collection techniques, delineations at the macro- or meso-level, and within-category subdivisions should be considered and made explicit when measuring EMI and comparing findings between studies.

For instance, our study may downplay the current status of EMI in Europe as our systematized concept made a distinction at the macro-level, removing Anglophone countries. If one considers English-medium education in multilingual university settings in Anglophone countries to 'count' as EMI, then our data ignores this phenomenon. Moreover, our measure is drawn from an online portal, which may miss ETPs from universities that are not advertising their programmes internationally. Whilst missing data is a problem for all quantitative studies, this missingness may not be random—missing programmes from institutions that target EMI at local students. In other words, some may argue that this study captures EMI of a certain type: internationally-oriented EMI in non-Anglophone countries. Comparisons between our study and future studies should account for these differences.

Table 4. Number of English-taught degree programmes divided by academic disciplines and subdisciplines in the EHEA in the academic year 2023/2024.

Discipline and top 3 subdisciplines	BA ETPs	MA ETPs	Total	ETPs (%)
Business and Management	**1,925**	**4,674**	**6,599**	**27.4%**
Management Studies	497	828	1,325	5.5%
International Business	346	355	701	2.9%
Finance	179	499	678	2.8%
Other	903	2,992	3,895	16.2%
Engineering & Technology	**987**	**2,542**	**3,529**	**14.7%**
General Engineering & Technology	261	605	866	3.6%
Mechanical Engineering	122	250	372	1.5%
Materials Science & Engineering	72	293	365	1.5%
Other	532	1,394	1,926	8.1%
Computer Science and IT	**642**	**1,895**	**2,537**	**10.6%**
Software Engineering	188	297	485	2.0%
Informatics andInformation Technology	129	331	460	1.9%
Web Technologies and Cloud Computing	74	241	315	1.3%
Other	251	1,026	1,277	5.4%
Arts, Design and Architecture	**738**	**1,208**	**1,946**	**8.1%**
Visual Arts	165	195	360	1.5%
Urban Planning	36	217	253	1.1%
Design	64	125	189	0.8%
Other	473	671	1,144	4.7%
Humanities	**575**	**1,239**	**1,814**	**7.5%**
Linguistics	83	287	370	1.5%
Literature	145	223	368	1.5%
Philosophy and Ethics	72	165	237	1.0%
Other	275	564	839	3.5%
Natural Sciences and Mathematics	**244**	**1,199**	**1,443**	**6.0%**
Physics	50	269	319	1.3%

Table 4. Continued

Discipline and top 3 subdisciplines	BA ETPs	MA ETPs	Total	ETPs (%)
Molecular Sciences	20	162	182	0.8%
Mathematics	42	122	164	0.7%
Other	132	646	778	3.2%
Medicine and Health	**358**	**866**	**1,224**	**5.1%**
Public Health	91	198	289	1.2%
Human Medicine	105	174	279	1.2%
Health Sciences	12	125	137	0.6%
Other	150	369	519	2.1%
Social Sciences	**336**	**873**	**1,209**	**5.0%**
Political Science	82	196	278	1.2%
Sociology	73	172	245	1.0%
Economics	49	91	140	0.6%
Other	132	414	546	2.2%
Environmental Studies and Earth Sciences	**93**	**840**	**933**	**3.9%**
Environmental Sciences	24	198	222	0.9%
Sustainable Development	8	192	200	0.8%
Geology	17	85	102	0.4%
Other	44	365	409	1.8%
Applied Sciences and Professions	**199**	**485**	**684**	**2.8%**
Food Sciences	55	159	214	0.9%
Fashion, Textiles and Luxury Goods	80	129	209	0.9%
Social Work	34	81	115	0.5%
Other	30	116	146	0.5%
Education and Training	**249**	**374**	**623**	**2.6%**
Teaching	64	70	134	0.6%
Education	29	57	86	0.4%
Educational Research	4	74	78	0.3%
Other	152	173	325	1.3%

Table 4. Continued

Discipline and top 3 subdisciplines	BA ETPs	MA ETPs	Total	ETPs (%)
Law	**134**	**451**	**585**	**2.4%**
Master of Laws (LLM)	0	137	137	0.6%
Public Law	25	90	115	0.5%
International Law	39	76	115	0.5%
Other	70	148	218	0.8%
Agriculture and Forestry	**77**	**379**	**456**	**1.9%**
Agriculture	30	119	149	0.6%
Marine Studies	12	104	116	0.5%
Animal Sciences	26	57	83	0.3%
Other	9	99	108	0.5%
Hospitality, Leisure and Sports	**93**	**209**	**302**	**1.3%**
Sports Sciences	22	121	143	0.6%
Tourism & Leisure	65	70	135	0.6%
Sports Management	1	13	14	0.1%
Other	5	5	10	0.0%
Journalism and Media	**68**	**91**	**159**	**0.7%**
Media Studies & Mass Media	22	57	79	0.3%
Public Relations	23	18	41	0.2%
Journalism	13	6	19	0.1%
Other	10	10	20	0.1%

Methodologically, we suggest that when measuring the spread of EMI (% of HEIs that offer EMI), a comprehensive database should be used to avoid selection bias. This is an issue with the Broginni and Costa (2017, p. 242) study, which excluded 'higher education institutions without the title of *university*'. Their study found that EMI grew from 74% to 85% of the 78 HEIs in their sample between 2012 and 2015. In comparison, our study identified 134 EMI-offering institutions out of 294 (45.6%). Therefore, EMI was stated to be abnormally high in the Broginni and Costa (2017) study as their sample undercounted and potentially selected for larger or more-established HEIs, which resulted in overstating the percentage of HEIs that offered EMI. Furthermore, when standardizing the number of ETPs, in lieu of total programme numbers, ETPs can be standardized to student numbers. We opted for new entrants rather than students enrolled due to measuring commencing ETPs rather than concurrently running ETPs.

Further, the use of a measurement validity framework enables us to reflect upon how our 'scores from cases' inform concept and measurement. We had a theoretical reason to

distinguish between 'soft EMI' and 'hard EMI' when measuring the presence of EMI within institutions. We found that in fact this made little difference to overall numbers: the bulk of EMI we identified could be put in the 'hard EMI' category. Moreover, large numerical differences were found between undergraduate EMI and postgraduate EMI. This suggests it may be worth distinguishing between undergraduate and postgraduate EMI in the typology of EMI (Richards and Pun 2023).

This study's findings have significant implications for policy and institutional strategy in European higher education. The rapid growth of EMI highlights the need for policies that ensure sustainable, effective, and ethical applications of EMI. While EMI has proven a powerful tool for internationalization and academic collaboration, its rapid growth raises ethical concerns, including the risk of domain loss in local languages and marginalizing non-English speaking staff and students. Policymakers and institutions must navigate these challenges carefully, ensuring that EMI is practiced in a way that reaps the rewards of internationalization whilst respecting local languages and enabling equitable access to higher education for all students.

Beyond tracking the presence and growth of EMI in higher education, we point future studies to research that engages with *why* EMI is spreading (Hultgren *et al.* 2023; Wingrove *et al.* 2024). This could be expanded to investigating the 'demand-side' of EMI, student origins and mobility, and push and pull factors. These studies could expand beyond Europe to outer and expanding countries as well as other levels of education and may enable us to make predictions about where EMI is likely to grow next.

Notes on Contributors

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