

Daniel Wagner-Schuster

# What ETER tells us about subject specialisation in European higher education

## Highlights

- The core of the European higher education landscape, for both education and research, is composed of generalist institutions.
- The rationale for and characteristics of specialised institutions differ substantially between countries, depending on specific national conditions.
- Private specialised institutions often focus on Social Sciences and Business and Law, public specialised institutions often cover Humanities and Arts and Engineering.

The Herfindahl Index measures to which degree institutions are specialised: i.e. an index number of 1 indicates that all students study in the same field, whereas an index number closer to 0 indicates that student numbers are more equally distributed over different fields of study (see page 4 for more information). Using this index, we can differentiate between three different groups of HEIs in Europe:

- Generalist institutions (Herfindahl Index below 0.3). These institutions offer education in a wide range of fields at the same time.
- Focused institutions (Herfindahl Index between 0.3 and 0.7). In focused higher education institutions, at least half of the students are enrolled in just one field, but there is also a significant number of students (at least 18%) in other fields.
- Specialised institutions (Herfindahl Index above 0.7). In specialised institutions, most of the students (more than 82%) are enrolled in one field of education. Most specialised institutions are mono-sectoral institutions, offering only one subject.

Figure 1 gives an overview of the distribution of the level of specialisation in European higher education institutions.

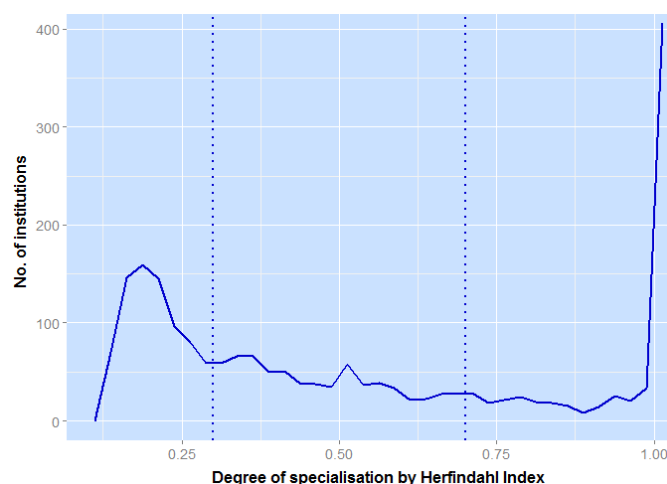


Figure 1. Distribution of HEIs by level of specialisation

Data for 2,072 HEIs included in ETER (year 2013/2014)

## Specialisation in higher education

The EU's agenda for modernising higher education highlights the need for wide diversity of higher education institutions (HEIs). Evidence from ETER shows that while some systems in Europe, e.g. Spain, Ireland and Belgium-Flanders, have a large number of generalist institutions, providing many subjects at the same time, others, e.g. Italy, the Czech Republic and Estonia, have chosen an approach with more specialised institutions. There are good reasons for both approaches, as each institution must pursue excellence in line with its mission and strategic priorities. Specialised institutions are commonly known as significant providers of professionally-oriented education, able to target the needs of the market and of students. At the same time, these institutions are often very small, which may lead to issues of critical mass, since impact, research performance and visibility seem to be easier to achieve for larger institutions, which also tend to be at the top of research-based rankings.

## The domination of generalist institutions

The ETER dataset provides a picture of how the higher education landscape in Europe has developed with respect to subject specialisation, offering insights about differentiation over time. Figure 2 shows that generalist institutions dominated the first founding period of higher education institutions. Institutions for humanities and theology, followed by institutions specialised in arts and music and technical institutions, started to emerge only slowly. A number of institutions for arts and music were founded in the 17th century, while in the 18th century, the number of HEIs for technical and natural sciences started to increase following the industrial revolution. Institutions specialised in education, business, law, management and social sciences are the youngest institutions that are beginning to spread significantly in the second half of the 20th century.

As outlined before, European HEIs can be divided in three groups: generalist, focused and specialised HEIs. While the number of HEIs in these groups is similar, Table 1 shows that generalist institutions comprise more than 70% of undergraduate students (ISCED 5-7) and academic staff, and more than 80% of PhD graduates (ISCED 8). Thus, both for education and research, the core of the European higher education system is dominated by generalist institutions.

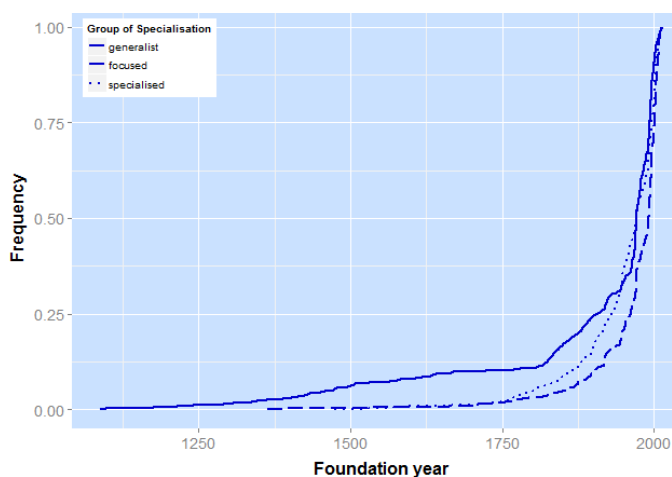


Figure 2. Differentiation in higher education over time

Degree of specialisation	No. of HEIs	Total students ISCED 5-7	Total PhD graduates (ISCED 8)	Academic staff (FTE)
Generalist	756	11,530,374	100,364	701,436
Focused	680	3,453,579	16,635	177,190
Specialised	636	999,706	4,834	69,597
<b>Total</b>	<b>2,072</b>	<b>15,983,659</b>	<b>121,830</b>	<b>948,943</b>

Table 1. Number of HEIs, students and staff by level of subject specialisation

A closer look at the European higher education landscape shows that many of the generalist institutions are found in the university sector. On the contrary, universities of applied sciences and other institutions (which include schools and colleges of arts, music or theology) are far more likely not to be generalist institutions, but to be focused or specialised (see Figure 3).

## The emergence of specialised institutions

Specialised institutions, which account for a considerable number of higher education institutions in Europe (see Table 1), have developed for a variety of reasons and in response to different factors. For example, specialised institutions are significant producers of professionally-oriented higher education in many countries. Recent developments show that the process of shifting at least part of these activities to the tertiary sector is still in progress, which further increases the volume of educational activities and thus the relevance of specialised institutions. While many specialised HEIs have developed within the public sector, private specialised institutions have also emerged in order to cover niche markets in higher education and target market needs.

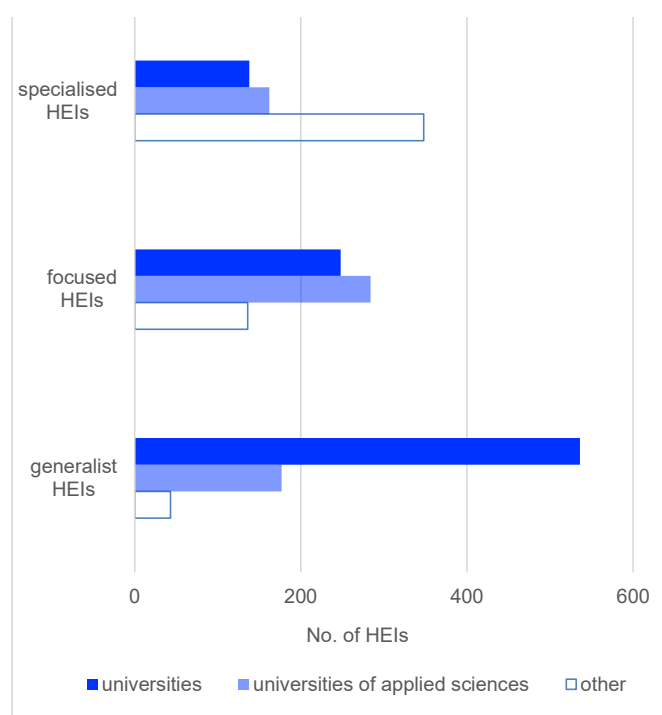
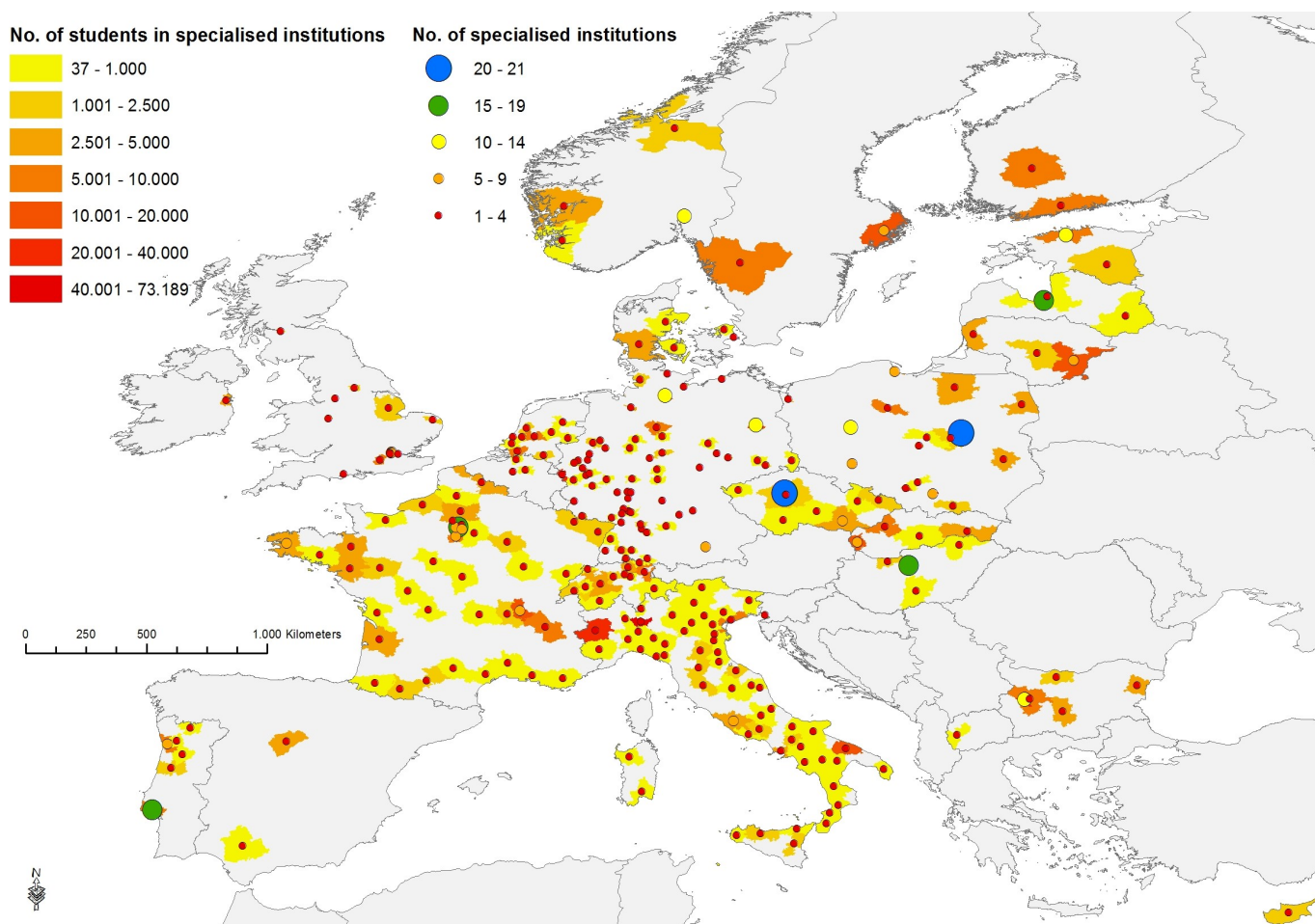


Figure 3. Degree of specialisation by type of HEI



**Figure 4.** No. of specialised institutions and their enrolled students

## Who are the specialists?

ETER data indicate that specialised institutions can be found in all classes of higher education institutions, depending on the country. While in a number of countries specialised institutions are mostly public (e.g. Denmark, Sweden, Finland), in other countries they are mainly found in the private sector (e.g. Czech Republic, Cyprus, Spain). In some countries with universities of applied sciences (UAS), specialisation is offered within this sector (Cyprus, Belgium-Flanders). A few countries offer specialisation mostly in universities (e.g. Bulgaria, Spain, Iceland), while in others specialisation takes place outside universities and UAS, i.e. in schools of music, arts, theology, education etc. (e.g. Switzerland, Italy, France, Ireland).

In Italy, specialised institutions are nearly 100% public, with a large number of institutions in Arts and Humanities and some very large technical institutions. Estonia on the other hand has a balanced distribution between private and public specialised HEIs, but here the specialised institutions can mostly be found among universities of applied sciences. A third country, the Czech Republic, shows a completely different picture: specialised institutions are mostly private and 27 of 38 specialised HEIs (including more than 90% of all students in specialised HEIs) are focused on Social Sciences, which shows that nearly all students in specialised HEIs are found within one subject.

There is also a large difference among the subjects offered in specialised institutions within Europe. Most specialised institutions offer Arts and Humanities (35%), Engineering (16%), Business and Law (12%) and Social Sciences (12%). In terms of student coverage, Engineering and Social Sciences (each enrolling 24% of all students) are the most relevant subjects in specialised institutions, followed by Business and Law (17%) and Arts and Humanities (15%).

Private specialised institutions (relying on tuition fees and usually market focused) often offer Social Sciences and Business and Law. In contrast, many public specialised HEIs cover Arts and Humanities and Engineering.

## Where are the specialists?

The numbers and shares of specialised institutions within national higher education systems in Europe are highly heterogeneous. As shown by Figure 4, Germany, France and Italy have a large number of specialised institutions. The map also shows high numbers of specialised HEIs clustered in some regions—e.g. Warsaw, Paris and Prague—while in other regions a small number of HEIs (or even one single institution) enrol a large number of students (e.g. the Polytechnic Universities of Milan and Turin or the BI - Norwegian School of Management in Oslo).

## ETER in a nutshell

The European Tertiary Education Register (ETER) database provides a core set of data on a subset of educational institutions delivering degrees at the tertiary level. ETER is a project funded by the European Commission's Directorate General for Education and Culture in close collaboration with EUROSTAT and with the National Statistical Authorities in the participating countries.

ETER provides information on more than 2,465 HEIs in 32 countries for the years 2011 to 2013; data are available for all EU-28 countries, except the French speaking part of Belgium, Slovenia and Romania, and also for the former Yugoslav Republic of Macedonia, Iceland, Liechtenstein, Norway, Serbia and Switzerland. ETER provides the following information on HEIs:

- Descriptors identify the HEIs and their official status and provide information on foundation and history.
- Geographical information localise HEIs in terms of region, city and geographical coordinates and provides information on multi-location campuses.
- Staff data categorises HEI personnel by academic and non-academic; for academic staff, information is provided on gender, nationality, scientific field, and the number of full professors.
- Numbers of students and graduates broken down by educational level (diploma, bachelor, master), field, gender, nationality and mobility.
- Financial data includes total revenues and their breakdown between core and third party funding, as well as student fees and the composition of expenditures.
- R&D activities include the number of PhD students and graduates, as well as the volume of R&D expenditures.

Most ETER data can be downloaded from the project website ([www.eter-project.com](http://www.eter-project.com)) and used for analytical purposes, making ETER a truly common resource for policy-makers, administrators and scholars. A small portion of ETER data is available only for research purposes under the signature of a non-disclosure agreement.

## Measuring subject specialisation

For subject classification, ETER adopts the 2013 version of the EURO-STAT-UNESCO classification of fields of education and training (ISCED-F -2013) as shown in the table below.

Code	Name
00	General programmes and qualifications
01	Education
02	Humanities and Arts
03	Social sciences
04	Business and Law
05	Natural sciences, mathematics and statistics
06	Information and communication technologies
07	Engineering, manufacturing and construction
08	Agriculture, forestry, fisheries and veterinary
09	Health and welfare
10	Services

**Table 2.** ISCED-F 2013 codes and fields

Similar to Rossi (2009), the Herfindahl Index (Herfindahl, 1982) was used to analyse the subject specialisation of higher education institutions in Europe. In this process, the share of undergraduate students per field of education was used to calculate a measure for specialisation. The index is computed as follows:

$$Herfindahl = \frac{1}{n^2} * \sum_{j=1}^{11} n_j^2$$

where  $n_j^2$  is the number of students in field  $j$  and  $n$  is the total number of students for that level within the HEI. The index runs from 1, when all students are in the same field, to 0.09 when the students are equally distributed across fields. The Index enables the differentiation of three groups of HEIs: generalist institutions (HF-Index < 0.3), where no subject can have more than 53% of all students enrolled, focused HEIs (HF-Index between 0.3 and 0.7), where one dominant field enrolls at least half of the students, but other fields account for a substantial share of students and specialised institutions (HF-Index > 0.7), where at least 82% of all students are enrolled in one single field.

Due to lack of data, Austria, Croatia and Serbia had to be excluded from the analyses. While the data for France, Slovakia (both from 2012), the former Yugoslav Republic of Macedonia and Luxembourg (each from 2011) originate from the first two years of data collection, all other data relate to the academic year 2013/2014.

## Key references

- Lepori, B., Probst, C. & Baschung, L. (2010). Patterns of subject mix of higher education institutions: a first empirical analysis from the AQUAMETH database. *Minerva*, 48(1), 73-99.
- Rossi, F. (2009). Increased Competition and Diversity in Higher Education: An Empirical Analysis of the Italian University System. *Higher Education Policy*, 22, 389-413.