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Data Atlas for the German Higher Education System – Quick Information on „Subject Preferences“

The preferences of first-year students based on subject groups and counties/urban districts for the academic year 2006

Summary

Subject-related differences play an important role in higher education politics and higher education management. This study analyses the preferences of German first year students for particular subject groups and suggests hypotheses about the extent to which subject preference is related to study programme offers, work places and the traditional characteristics of a region. Conclusions for higher education planning as well as for higher education marketing can be drawn from this analysis.

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1 Background and aim of the analysis

With the *Data Atlas for the German Higher Education System*, CHE Consult is providing for the first time for Germany comprehensive data about the catchment area structures of higher education institutions (HEIs), the competitive situations between HEIs, the migrational behaviour and subject preferences of first-year students as well as further information based on counties and urban districts. This information supports the concept of regionally-differentiated strategies of the higher education policies of regions and *Länder* and enables geomarketing concepts to be developed for individual HEIs and academic locations.

This analysis highlights the different subject preferences within Germany as a basis for, for example, subject-related initiatives by the Länder (MINT programmes) and/or the functionally- and regionally- specific marketing planning of HEIs as part of their student recruitment activities.

2 Purpose of the study, status and source of data

The aim of the analysis is to provide a Germany-wide illustration of the shares of first year students in subject groups based on the official statistics of the native region. “Native regions” are the counties and urban districts where first year students have acquired their high education entrance qualification. The study shows only the subject preferences of German first year students and students with a German education.

The analysis only takes into account those students who are in their first academic semester and on the basis of the type of entrance qualification, to the county or urban district where the entrance qualification was acquired and to the subject group (first degree) selected in the academic year 2006. For the purposes of this analysis, the academic year is a combination of the summer term 2006 and the winter term 2006/2007. The type of entrance qualification analysed covers three groups (general higher education entrance qualification, specific general higher education entrance qualification and advanced technical college entrance qualification), which are considered jointly here. The assignment of subjects to the subject groups follows those of the official statistics. Because of small sample sizes or an almost equal distribution of preferences across the whole of Germany, the following subjects are not represented in the groups: sports, human medicine, agriculture, forestry, nutritional science, veterinary medicine and art.

This analysis gives the territorial status as of 31 December 2006. The calculations that have been made, the illustrations that have been drawn up and the analyses that have been carried out are based on a special analysis of the student register of the Federal Statistical Office 2007.

3 Methodology

The shares of first-year students in a subject group from the total number of first-year students in the county or urban district considered were calculated on the basis of the sets of data mentioned above.

The resulting percentages were then divided up into five value classes (see figure 1). Ensuring equal distribution in terms of subjects, i.e. each class contains the same number of cases (counties or urban districts) was a key criterion for forming the classes).

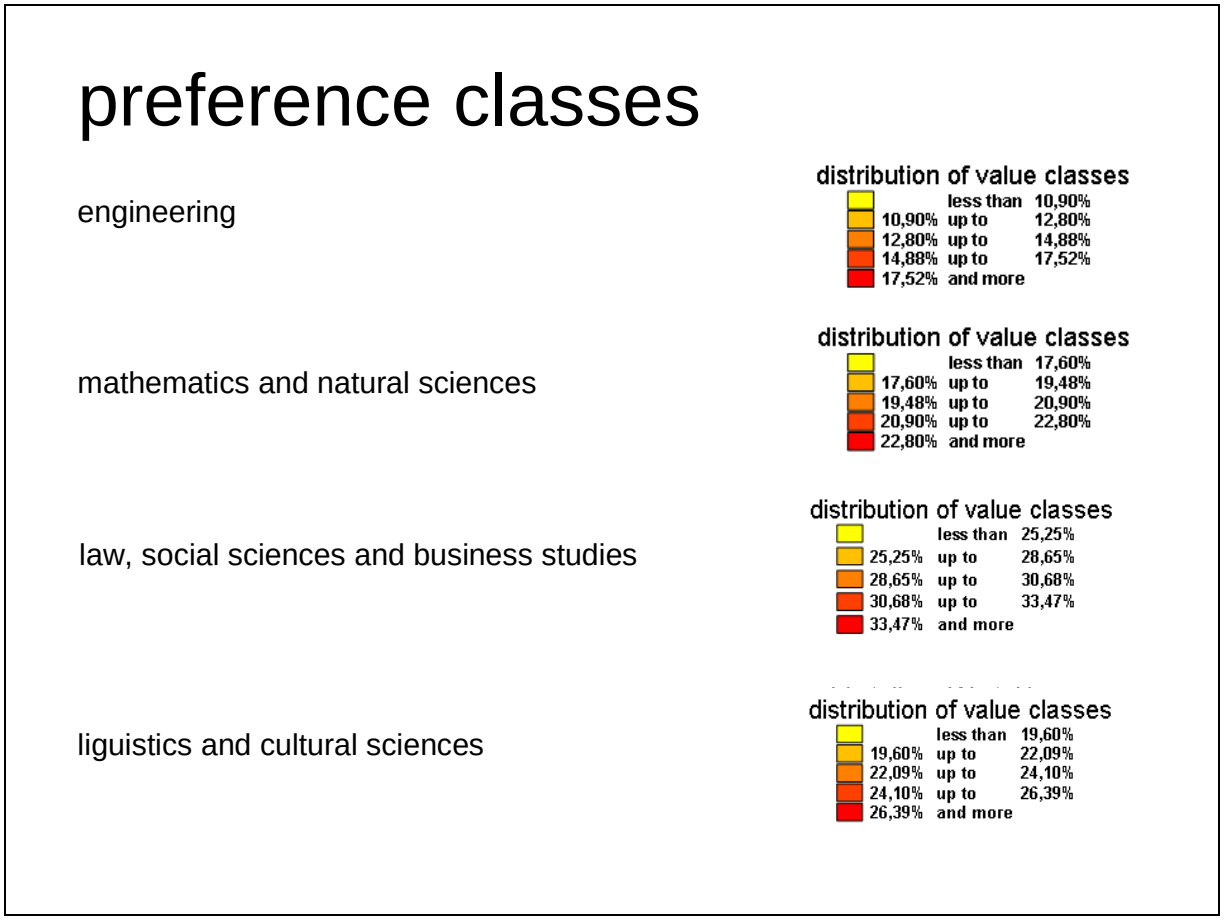

Figure 1: Subject preference classes/ -limits applied (2006)

It is therefore possible to identify within one subject group those regions with a high preference for the subject examined among first years student who have acquired their higher education entrance qualification in the respective region. The procedure selected means that it is not possible to make a direct comparison between subject groups.

In the following illustrations, deep red indicates high preference and light yellow indicates low preference.

4 Results

4.1 Mathematics and natural sciences

First-year students with a distinct (= high) preference for mathematics and/or natural sciences were found, generally speaking, in the south and west of Germany.

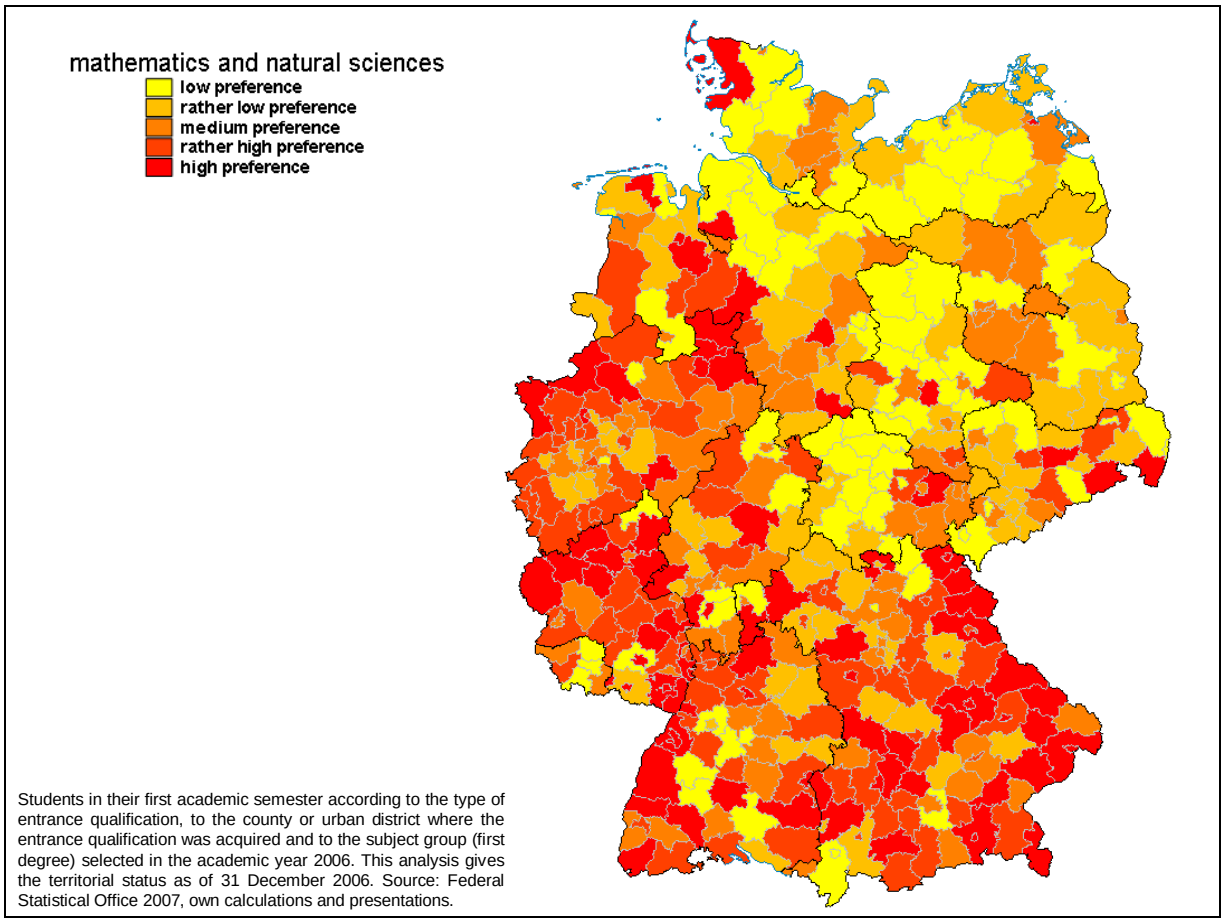

Figure 2: Subject preferences of first-year students in mathematics and natural sciences (2006)

In terms of individual German *Länder*, it is mainly in Bavaria, Baden-Württemberg, Rhineland-Palatinate, North Rhine-Westphalia and Hesse where, when compared with the national average, the region is almost fully covered by a high preference for mathematics and natural sciences subjects among their first-year students. An extraordinarily low preference for this subject group can be noted in Mecklenburg-Western Pomerania, Berlin and Brandenburg.

In addition, some individual regions stand out for having a distinct preference among their first-year students for mathematics and natural science subjects. These include the county of Nordfriesland in Schleswig-Holstein, the counties and urban districts of Osterode in Lower Saxony, Halle/Saale in Saxony-Anhalt and in and around Dresden in Saxony. With respect to the conditions for the formation of preferences, the below average preference for this subject

group in the counties of the Black Forest (Mittlerer Schwarzwald) and the Swabian Mountains (Schwäbische Alb) in Baden-Württemberg is very instructive.

4.2 Linguistics and cultural sciences

We found first year students with a distinct (= high) preference for linguistics and/or cultural sciences in general terms in the west of Germany, although Thuringia and Baden-Württemberg, each of which shows opposing trends, do not fit into this picture entirely. Lower Saxony in particular shows very different structures.

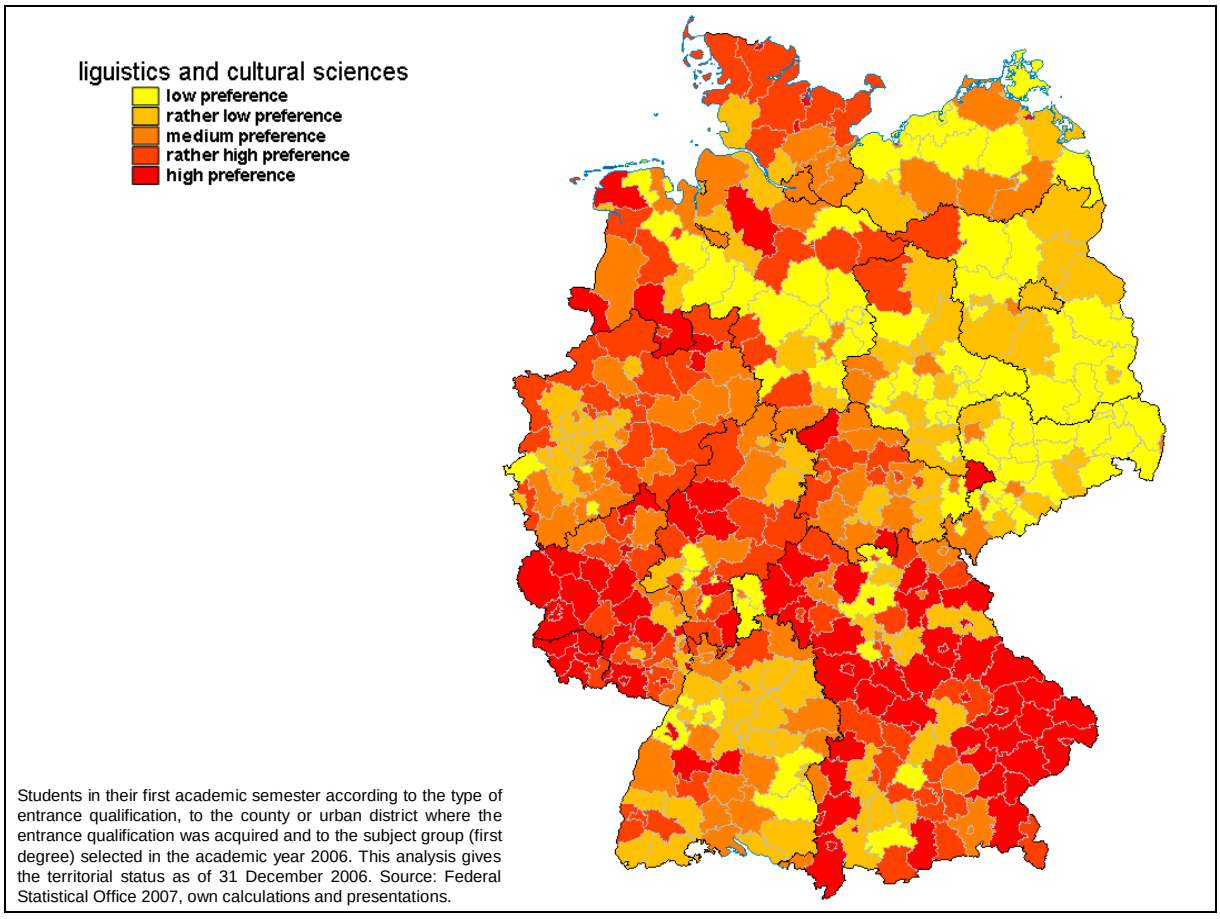

Figure 3: Subject preferences of first-year students in linguistics / cultural sciences (2006)

With respect to individual German *Länder*, it is mainly in Bavaria, Saarland, Rhineland-Palatinate, North Rhine-Westphalia and Hesse, as well as (with reservations) Schleswig-Holstein and Thuringia where the region is almost fully covered by a high preference for linguistics and cultural sciences among their first-year students. An extraordinarily low preference for this subject group can be noted in Saxony, Berlin and Brandenburg.

In addition, some individual regions stand out for having a distinct subject preference among their first-year students for linguistics and cultural sciences subjects. These include the counties of Leipzig, Freiberg and counties in Western Lower Saxony, the Emsland and along an axis reaching from Bremen via Hamburg to Lüneburger Heide.

4.3 Law, business studies and social sciences

First year students with a distinct (= high) preference for law, business studies and social sciences were found, generally speaking, in the north of Germany with only some individual spots in *Länder* in the south of Germany.

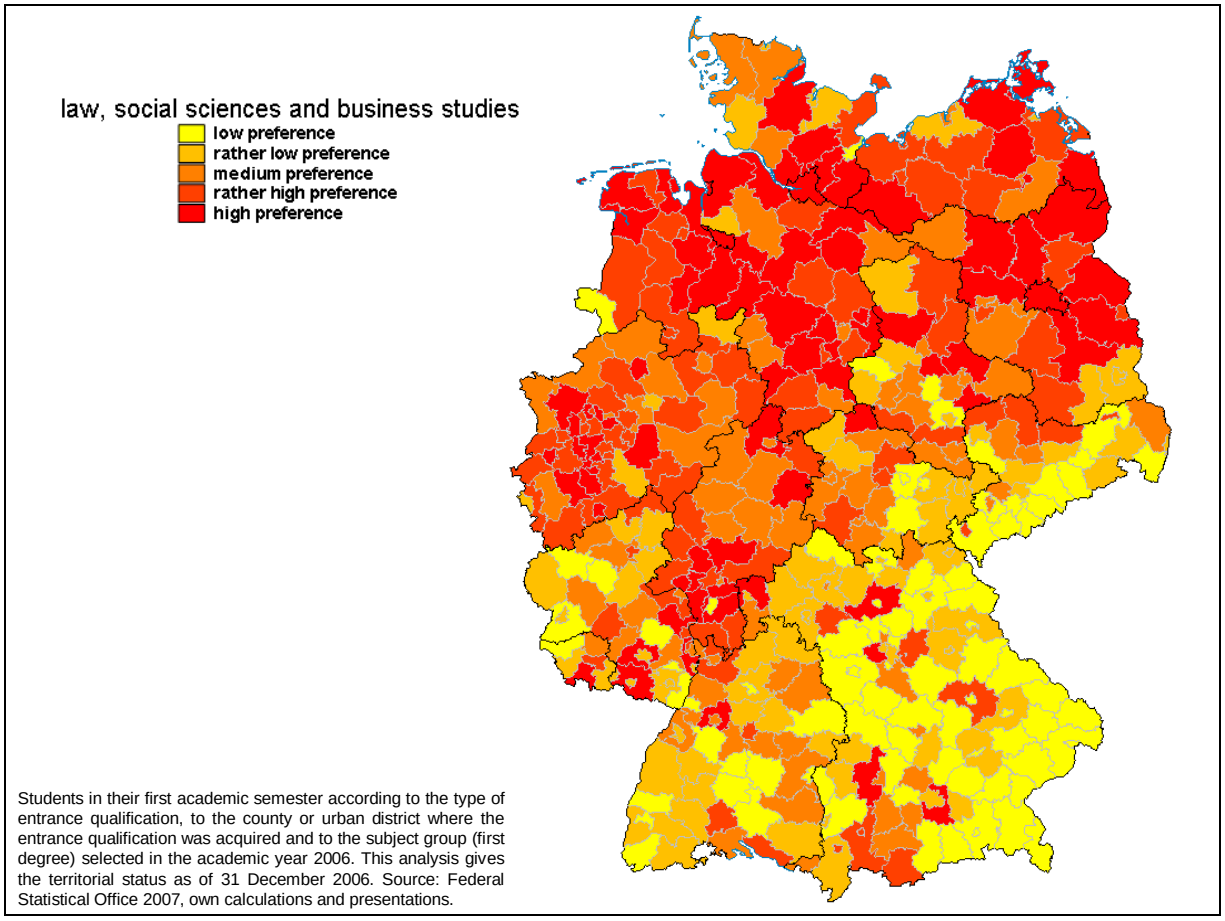

Figure 4: Subject preferences of first-year students in law, business studies and social sciences (2006)

With respect to individual German *Länder*, it seems to be mainly in Schleswig-Holstein, Mecklenburg-Western Pomerania, Bremen Hamburg, Berlin, Lower Saxony, Brandenburg, North Rhine-Westphalia and Hesse where the region is almost fully covered by a high preference for law, business studies and social sciences subjects among their first-year students. An extraordinarily low preference for this subject group can be noted in Saxony, Bavaria and Baden-Württemberg.

In addition, some individual regions stand out with a distinct preference among their first-year students for law, business studies and social sciences subjects. These include Saarbrücken or the urban district of Plauen and, in contrast to the general trend, a large number of counties in Bavaria and Baden-Württemberg (usually in the areas around the major university locations).

4.4 Engineering

First-year students with a distinct (= high) preference for engineering can be found in general terms in the east and south of Germany, but they are rare in the west of Germany, however.

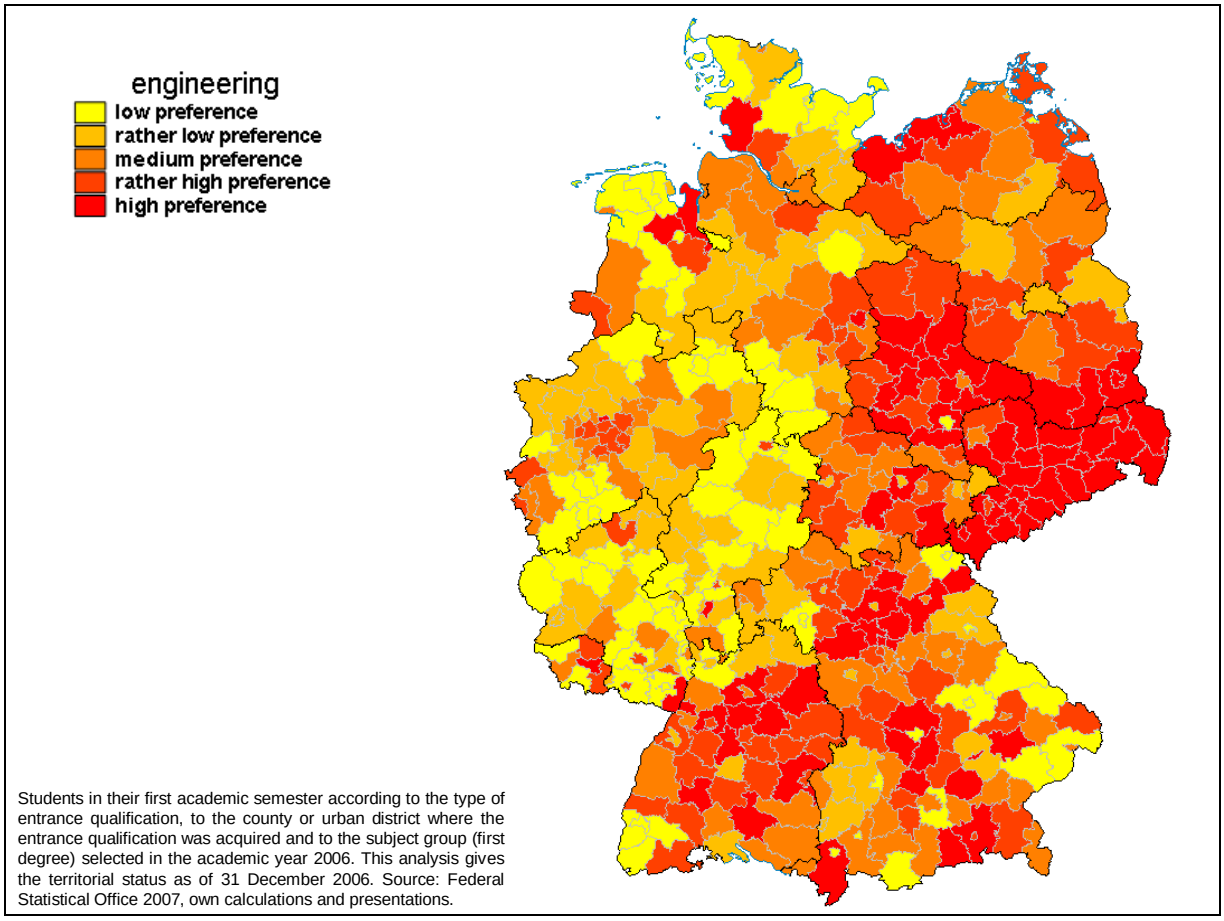

Figure 5: Subject preferences of first-year students in engineering (2006)

With respect to individual German *Länder*, it seem to be mainly in Mecklenburg-Western Pomerania, Brandenburg, Saxony-Anhalt, Saxony, Thuringia, Bavaria and Baden-Württemberg where the region is almost fully covered by a high preference for engineering among their first-year students. An extraordinarily low preference for this subject group can be noted in Hesse and Rhineland-Palatinate.

In addition, some individual regions stand out with a distinct subject preference among their first year students for engineering. These include Aachen, Wismar, key parts of the Ruhr district and around Bremen and Oldenburg.

5 Interpretation and conclusions

The graphics and explanations above make the existence of regional disparities clear. But they do not yet say anything about the causes of the findings or about the conclusions for higher education politics and higher education management. These analyses and figures suggest only approaches for the formation of hypotheses about the conditions behind the evolution of subject preferences, which is discussed in the following paragraph.

Regarding the causal factors for the regional differences in subject preferences, there are clearly three supply and demand-related factors that produce the differences. This becomes particularly transparent if we take a closer look at the distribution of first-year students of engineering.

A significantly high preference can therefore be noted, if

- (i) there has traditionally been (or it re-emerged after German reunification) a medium-sized economy heavily dominated by industry, mostly in large parts of Saxony and Baden-Württemberg,
- (ii) there has traditionally been a high preference for subjects related to engineering, and this in addition (or in particular) goes beyond the sex of the students taking up these subjects, mainly in large parts of the new German *Länder*,
- (iii) there is a clearly noticeable offer, or even a tendency towards an exclusive offer, of these subjects, which becomes particularly clear if we look at the technologically-oriented academic locations of Saxony, Baden-Württemberg or the Ruhr district, but is also visible in the surrounding areas of technologically-oriented colleges such as Hochschule Wismar in Mecklenburg-Western Pomerania, RWTH Aachen in North Rhine-Westfalia and as well as Universität and Hochschule Bremen and Fachhochschule Oldenburg/Ostfriesland/Wilhelmshaven and spreading out to the neighbouring counties.

So there are seemingly three factors producing subject-related demand:

- (i) an existing and noticeable study programme offer in the region,
- (ii) regionally existing and/or noticeably positive career perspectives and
- (iii) supporting factors such as family background or educational tradition (e.g. continuing the educational tradition of the parents).

Information technology could be cited as the contrasting example to this idea of regionally-varying subject preferences as it enjoys almost equal distribution in terms of subject preference across Germany. This corresponds to the existing study offer which almost covers the country as well as the job opportunities that are both visible nationwide and possibly valued equally positively across the country. This study offer can therefore interpreted similarly to the engineering example mentioned above. An additional aspect is the fact that information technology is a relatively young and very dynamic (with respect to its application) scientific discipline that will hardly ever develop traditional stimuli.

This leads to three conclusions for higher education politics:

- The regional economy indirectly forms the subject preferences of first year students via its structure that can be perceived regionally and with it also the regional demand for certain subjects.
- This way of conditioning subject preferences does however also depend on persistency, i.e. the long-term nature of specific regional structures of economy.
- If regional subject offers influence the formation of subject preferences, then retaining the respective study programme offers at HEIs of the region is one way of arousing more interest for so-called MINT subjects.
- It would be counterproductive then, in this sense, to increase the capacities in all subjects.
- The suspected correlation between subject preference and the regional structure of economy, job opportunities and traditional patterns also indicates that systematic stimulation of the demand for MINT subjects can not only be sparked by schools and HEIs. Instead, it is the idea of integrated concepts between business development, regional development planning and programmes of education politics that seems to promise success.

With respect to student recruitment and the marketing of HEIs, this means that there are basically two different strategic approaches, each of which suggests different concepts and measures:

- Within the context of student recruitment based on data, HEIs can develop and conduct measures that are tailor-made for the specific preferences of a region in order to open up the region and the persons qualified for entrance into higher education to the market of “appropriate” subject preferences.
- However, against the background of strongly differing subject preferences in the crucial catchment areas, HEIs can develop and carry out targeted measures to generate the matching preferences using strong reasoning.

Precisely in the region of the academic location, integrated concepts of business development and the stimulation of subject-specific demand seem to be adequate and promising. This will probably not lead to success in the short term, as subject preferences cannot only be determined by strong reasoning but an almost “practical proximity” to the relevant subjects and particularly their content must also be produced and visible. HEIs, for example, could send successful alumni to the schools of their region as “ambassadors” or run medium-term projects at schools together with businesses in the region.

On the other hand, HEIs could orientate student recruitment towards more distant regions with a similarly high subject preference, but they have to consider different thresholds and aspects, for example overcoming obstacles to mobility, conducting competition analyses and defining and adjacent USPs have to be formulated as precisely as possible (i.e. with respect to the economic structure).

Neither of the strategic approaches offers alternative options but they complement each other. HEIs need to analyse the region and its surroundings precisely in order to be able to develop their own strategies for their particular situation. Each HEI will have to decide for itself the best way forward.

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Gütersloh, 6th October 2008

