

Higher Education Institutions as Key Actors in the Global Competition for Engineering Talent

- Germany in International Comparison -

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INTRODUCTION

In order to prevent the predicted shortage of highly qualified labour in technical professions, Germany and other industrialized nations show increasing interest in strategies of controlled immigration, one being the recruitment of foreign students: Many European countries are seizing the opportunity to attract international students to support their labour market after graduating from their universities [1].

In Germany, the legal conditions for working in the country as foreigners have become more relaxed during the last decade. Especially for international students from third countries, the latest developments in legal regulations have simplified a transition from German universities to companies in international comparison [13]. Additionally, fundamental changes were undertaken in the German higher education system during the past 20 years to make it more attractive for international students. Since the General Agreement on Trade in Services (GATS) and the implementation of bachelor's and master's degrees throughout the European Union via the Bologna Process, the recognition of foreign degrees has become much easier. By offering international study programs in technical subjects and natural sciences, German universities are trying to attract international students who have already obtained a

bachelor's degree in their home country and who might decide to stay in Germany after graduating.

This paper describes the latest legal developments regarding foreign students in Germany. Furthermore, it considers the political and economic influence on the German higher education system. With a special focus on academic migration in engineering education, it aims to analyse the position of Germany within the global movements of educational mobility. It deals with the implementation of international study programs in technical disciplines and evaluates whether the German endeavours to attract international talent are successful.

1. MEETING THE LABOUR SHORTAGE WITH STRATEGIES FOR HIGHLY QUALIFIED IMMIGRATION

Germany and its fellow industrialized nations are predicted to be facing a shortage of highly qualified labour in the not too distant future. One of the reasons for this shortage of skills is seen to be the upcoming demographic change, as more people are retiring while less are born and growing up to enter the future labour market. At the same time, continuing technological progress and economic growth are about to call for an adequately increasing number of highly qualified workers [2; 3]. Another problem for Germany is the emigration of highly educated, often young people who move to Switzerland, Austria or the United States of America. Again, this loss could be absorbed by attracting highly qualified immigrants [4].

On a global scale, when it comes to recruiting international talent, the member states of the European Union find themselves in competition not only with each other, but also with highly industrialized, technology-oriented third countries. Especially in comparison with the USA, the European Union's share of highly qualified immigration is rather small [5].

2. ATTRACTING AND RETAINING INTERNATIONAL STUDENTS

As part of their approaches to increase the immigration of highly educated employees, Germany and further EU countries are starting to recognize the potential of keeping foreign students in the country to join their workforces after graduation [6]. In the much sought-after natural sciences and technological disciplines, the EU is currently working on strategies to connect higher education institutions and work markets. Another goal is to attract international researchers to improve its position in the global competition, especially against the United States [1].

From the viewpoint of employers, foreign students after graduation are ideally not only equipped with a university degree, but also with cultural and language skills acquired in the host country. Preferably, they have gained first work experience during their studies and are directly available for the host country's work market after their graduation [7; 8].

On a macroeconomic level, the costs and returns of educating international students at domestic universities are another important aspect: As German public universities do not charge tuition fees, the money invested in the higher education of foreigners can only be regained if those students stay in Germany at least a few years to generate tax incomes [9].

3. LEGAL DEVELOPMENTS

The latest developments in the legal framework for highly qualified foreigners and international students in Germany represent a strong increase of political interest in attracting these target groups.

After the guest-worker policy in the course of the economic growth during the 1950s and 1960s, a general recruitment ban for workers from third countries has been valid in Germany since 1973. In 2000, however, German migration politics began to focus on covering economic demands by passing special regulations for highly qualified foreigners. A famous example was the Green Card initiative which was directed at recruiting foreign IT professionals [2].

In October 2007, the access regulation for university graduates was passed by the German Minister for Labour and Social Affairs, which facilitated the conditions for foreign students and certain immigrants from the new EU member states. For employees in the fields of mechanical and automotive engineering from the new member states (who did not yet benefit from the freedom of movement for workers within the EU) and for third country residents who graduated from a German university, the regulation allows for the priority review to be dropped [10]; [11]. This means that for job applicants from these two target groups, the German Federal Employment Agency does no longer check whether there are German employees that might fill the vacant position. However, the employment has to be according to the foreign applicant's qualifications and his or her salary has to be at least as high as that of German workers in the same field.

Apart from the abolition of the priority examination, the options for extending the residence permit have been systematically improved for foreign graduates of German universities. After successfully completing a degree programme, international graduates from a German higher education institution used to be granted a one-year period in order to find an adequate employment in Germany [12]. With the most recent changes in the Residence Act in August 2012, international graduates can now prolong this period by 6 months, adding up to a total of 18 months to search for a job in Germany.

Compared to other EU countries, the legal possibilities for international students to enter the German labour market are rather favourable. Especially with regard to the period of time granted for the job search, since fellow EU nations such as Finland or Austria allow foreign students only six months to apply for a residence permit. However, the German restrictions are comparatively strict when it comes to the consideration of the kind of work, as it has to match the graduate's qualifications. In Finland, for example, international students can apply for a residence permit with any sort of employment [13].

4. INTERNATIONALIZATION OF THE GERMAN HIGHER EDUCATION SYSTEM

When it comes to attracting international students as highly qualified workers for the German labour market, higher education institutions are in a key position [7]. Along with the development of legal regulations, the German higher education system has undergone a series of structural changes during the past 20 years. The General Agreement on Trade in Services (GATS) in 1995 liberalized the global exchange of services, which also affected the higher education sector. With the nowadays almost complete implementation of bachelor's and master's degrees in consequence of the Bologna reform, German higher education institutions increasingly opened up to the global competition for talent.

In the 1990s, a political discussion had started in Germany about the international attractiveness of its universities. One of the gravest disadvantages of the former system was that the courses foreign students had taken at their home universities often could not be satisfyingly transferred into the German system if they came to absolve part of their studies in Germany. The amendment to the Framework Act for Higher Education in 1998 marked the starting point of fundamental changes to the system: It opened the possibility for introducing the two-stage model of study programmes including bachelor's and master's degrees according to the Anglo-American example. For a simplified transfer of courses and exams taken at different universities, a credit point system was introduced [14].

5. IMPLEMENTATION OF INTERNATIONAL STUDY PROGRAMMES

Facing the above mentioned competition for international talent, the implementation of new, international study programmes was another part of the higher education reform. New courses of studies were supposed to be explicitly designed for the requirements of foreign students, considering teaching language and offers for orientation and support during their studies in Germany [15]. Such internationally-oriented degree programmes were supported by the German government and enthusiastically implemented by the higher education institutions, especially on the

master level. Currently, the German Academic Exchange Service (DAAD) has more than 800 international master and 140 bachelor programmes in its database [16].

In this database, no less than 245 international master programmes appear when the discipline “engineering” is selected. The largest share of them is taught entirely in English, while several others use German as a second teaching language. Right from the beginning, the engineering disciplines were strongly represented in the process of implementing study programmes for international students. A reason for this is considered to be a wish on the part of these subjects to increase their student numbers, which were and still are relatively low among German students if compared to other disciplines. Another beneficial factor for the implementation was that especially the technical disciplines in Germany capitalize on a high international reputation [17]. The impact of these changes in the higher education system with regard to attracting international talent as a potential answer to the predicted labour shortage will be explored in the following sections.

6. GERMANY’S POSITION WITHIN GLOBAL STUDENT MOBILITY

The legal enhancements described above were directed at international students and at highly qualified foreign workers in shortage occupations alike. However, it seems to be the target group of international students that is most successfully attracted by the improvements in German migration politics and in the German higher education system: Latest OECD findings show that the largest share of highly qualified immigration in Germany during the last years has been due to international students [8].

In international comparison, Germany ranks among the top three destination countries for global student mobility after the USA and Great Britain [18]. The total number of *Bildungsausländer* among foreign students in Germany (non-nationals who acquired their entrance qualification for higher education abroad) has doubled since 1997, to reach a total number of about 200,000 in 2014. Their share of all students enrolled in Germany has increased during this time from 7.0% up to 9.5%. Consequently, the number of foreign graduates has risen as well. Half of the approximately 30,000 foreign students who graduated in Germany in 2013 stated that they wished to stay to work in Germany at least for several years [19].

An investigation into the student numbers from third countries who studied in Germany between 2005 and 2013 showed that, in 2014, actually 54.1 percent (about 100,000 people) are still living in the country, while 26,700 of them are already working [13].

7. SPECIFICS OF INTERNATIONAL STUDENTS IN GERMAN ENGINEERING DISCIPLINES

With a share of 25%, engineering sciences belong to the most popular disciplines chosen by foreign students in Germany [20]. In addition, Germany is one of the countries that attract the largest share of all globally mobile engineering students worldwide [21]. Furthermore, the percentage of engineering students among all foreign students in Germany is higher (24.8%) than the percentage of engineering students among all German students (19.8%) and the technical disciplines show the greatest difference profile of all subject groups [7].

With regard to the characteristics of international students in Germany, it is noteworthy that students from developing countries tend to study technical disciplines or natural sciences while students from industrialized countries prefer cultural or language studies. Moreover, a gender-specific choice of subjects can be observed: Similar to the distribution among German students, male foreign students in Germany choose mostly engineering disciplines (36% of all foreign students from developing countries, 27% from industrialized nations), while female students prefer philological or cultural studies (36% from developing countries, 44% from industrialized countries) [14]. Foreign students in German engineering disciplines are comparatively often matriculated in master’s programmes, while international students of other disciplines have larger shares in bachelor’s (humanities) or PhD

programmes (natural sciences). Regarding their national background, the largest groups of foreign engineering students are from East-Asian or Asian countries (each with a share of 40%) [20].

A disadvantage of this distribution of nationalities among engineering students might be that especially students from Asian regions rather do not tend to stay in Germany after studying here, at least not in a long-term perspective [13].

8. INTERNATIONAL REPUTATION OF GERMAN ENGINEERING EDUCATION

When it comes to the specifics of student migration in the engineering disciplines, it is noteworthy as well that the German reputation in this field plays an important role in attracting foreign students: While 61% of all international students state that the reputation Germany as a high tech country has influenced their decision for studying abroad, 85% of the foreign students in engineering name this as a reason [20]. These findings correlate with the previously mentioned expectations of the higher education institutions which played a role in the implementation of international study programmes in engineering.

A good impression of the strong reputation of a German engineering qualification worldwide is given in a statement from British experts on international connection in higher education who compare it with those from the world's top-ranking universities:

"Occasionally, such arrangements [for mutual recognition of degrees obtained abroad] are superfluous simply because the qualifications obtained are so well-known and respected: every international employer knows, or thinks they know, the worth of a degree from Harvard Law School, a doctorate from Oxford or Cambridge, a German engineering qualification, or a degree from the École Polytechnique." [21].

CONCLUSIONS AND OUTLOOK

This paper has taken a closer look at the developments in legal regulations for highly qualified foreigners and international students and at the internationalization of higher education in Germany. It can surely be stated that those changes are rather favourable for attracting international talent. Relatively relaxed conditions and a broad offer of international study programmes invite large numbers of students from third countries not only to study in Germany, but to stay on to work there after graduation. Especially in the engineering disciplines, Germany benefits from its reputation for technical subjects.

However, in order to attract international talent for the German labour market, the legal conditions for working in the country as a foreigner after graduating from a German university could be further simplified. With regard to international students in engineering disciplines, more diversity regarding gender and national background could be pursued. While there is a beneficial international reputation, the higher education institutions in Germany hold the key position in the global competition for talent. It is their task to secure and further promote their reputation by assuring the quality of its educational offers to students from all over the world [22].

For future investigations, it would be interesting to consider in greater detail the student's motives for academic migration. Further analyses might be directed at intentions of working in the host country after graduation and define whether such objectives affect the selection of destination countries for studying abroad.

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