Higher Education and Demographic Challenge: The German case

Johannes Balve*

Abstract. It is a well known fact that the majority of European societies are confronted with demographic changes due to declining birthrates. This article tries to broach the issue how lower birth rates and changing demographic structures affect German higher education. While the results are already visible in the German schooling system, effects on higher education have not yet become reality but are expected within the near future. As student enrollment numbers are currently rising, there does not seem to be any pressure to address this issue. However, it is already certain that higher education in Germany will be confronted by declining student enrollment beginning at the latest in 2020. Given these facts it is worth to asking if declining student numbers and a rising educational demand of older persons will change higher education and how should higher education policy respond by strategies and new educational offers. As demographic changes and higher education development correlate in a complex manner there will be the need to consider other influencing factors, particularly the demand for labor force, regional developments, migration and internationalization.

Keywords: Demographic change, higher education development, German higher education

Changes in the demand for higher education

Starting with the expansion period of higher education institutions in the 1970th participation in tertiary education was constantly rising. Beginning in the 1990s entry rates into tertiary education in Germany (33%) were higher than in most other European countries. (OECD, 2008, p.158, Table 5.3) Germany could not keep this leading position in the following years as it did not keep up with the accelerated expansion of tertiary education which took place in most industrialized countries. In 2005, German participation rates for universities of 36% were already far below the OECD average and even though passing the 40% border in 2010 (OECD, 2012, p.348, Chart C3.1.), they are still fairly low compared with other industrialized countries. So, for international observers it might be surprising to hear current debates on how to surmount upcoming student masses. Indeed, enrollment numbers in tertiary education have risen significantly in 2012/2013. A reason was that the last strong age cohort of the

* Research Fellow, School of International Studies, Kanazawa University, Japan, e-mail: jblv1@t-online.de

baby boomer generation finished secondary education. Other reasons were doubled graduation cohorts due to a reduction of the upper secondary schooling period and the abolition of mandatory military service. These effects came along with structural changes in the schooling system supporting the rising proportion of upper secondary graduates among graduates of all schooling types (BMBF, 2012, D7, pp.95-97).

These developments caused by changes in educational structures could conceal the growing demographic imbalance between older and younger generations. But it is evident that the numbers of participants in primary and secondary education are going to decline and that this development continues. Therefore, forecasts of future enrollment numbers in higher education expect a decreasing participation rate. Due to the aforementioned accumulation effects that support participation in tertiary education, student numbers in tertiary education will significantly fall in the years after 2020. Until 2025 they are expected to fall by about 14%, however with regional differences (Kultusministerkonferenz, 2013, p.8, p.11).

The interesting question is how this development is related to the scenario of demographic change in an aging society and what the responsibilities for higher education are facing the challenges of demographic change. First the issues of the labor markets, the educational demands of an innovative industry as well as the general demands of knowledge societies are discussed.

Labor markets and knowledge society

The lack of skilled labor force is a general problem in highly industrialized countries with an aging demographic structure. Young cohorts entering the educational system are shrinking while older retired cohorts will grow (Wolf, 2008, Chap.5 pp.74-76). Facing this problem international organizations like the OECD have always demanded an increased investment in higher education to promote participation rates in order to increase academic output that is needed by highly developed industries.

Participation rates in German higher education, as mentioned before, are fairly low compared with other industrialized countries, in particular in academic fields which are most relevant for labor markets. In the so called Mathematics, Informatics, Natural Sciences and Technology (MINT) professions the current lack of academic labor force of 46,000 persons will grow until 2016 according to forecasts up to 53,000 (Anger, Demary, Koppel & Plünnecke, 2013). After 2023 the additional demand that cannot be covered by academic output is expected to double (Erdmann & Koppel, 2010). These effects are not only caused by demographic change but also by a low demand for studies in engineering and natural sciences among young people and high drop-out rates in the last decade (Anger *et al*., 2013).

There is another challenge caused by demographic change. With the declining number of university graduates innovation flow from university to the labor market slows down. Consequently, it is up to the older age cohorts to participate in educational programs to update knowledge requested by

the demands of innovation-oriented and knowledge-based industries. This request to strengthen further education during the work life is accompanied by demands for promoting lifelong learning. The demographic future scenarios show a shrinking working population confronted with a growing population of retired seniors (Statistisches Bundsamt, Ed., 2009). In 2008, 34 seniors (65 and older) counted for 100 persons in working age (from 20 to 65). After 2020 this relationship will change, so forecasts expect finally in 2060, 65 seniors counting for 100 persons in working age. Demographic change claims a new concept for education not being restricted to a limited age. Further education contributes to the demands of innovative industries and the knowledge society. In order to adapt to this future reality, the European Union defined a new task for higher education institutions. In 2003 the European ministers of education decided to support efforts in European higher education for making lifelong learning a reality (European Ministers of Education, 2003).

Public finance of higher education

Given the fact that the relatively low participation in higher education, observed within the last decade, did not have favorable effects on the described scenario, it will be necessary to ask: what are the reasons. Focusing only on individual factors, like low motivation to study natural sciences and engineering, would not give a sufficient explanation. It has to be taken into consideration that the admission to numerous study programs is restricted in Germany ("Numerus Clausus"). The restriction depends on the ratio of applicants to open capacity in highly desired majors. Higher education managers have been complaining for years that public finance – most German universities are state universities – is not sufficient to enlarge capacities according to the need. It was a paradigm of German higher education politics in the last decade to adapt public funding always to a minimum of required capacities, not realizing the growing demand of potential students. Selection procedures had the regulating function of handling the growing number of applicants waiting for entrance into higher education. Unsuccessful or rejected applicants who did not accept long waiting periods for enrolment decided either to pursue a vocational training or to study the subject of their choice in a neighbor country – for instance in Austria, Switzerland, the Netherlands or some Eastern European countries. There they could expect less competition for enrolment.

Confronted with a constantly growing demand for enrolment in higher education a joint initiative of federal and state ministries ("Hochschulpakt") in 2007 was launched to shoulder the challenges by additional funds. Even though a second agreement in 2009 ("Hochschulpakt II") increased the amount, the financial support is today not regarded as sufficient. So, German higher education researchers are expecting that in the year 2015 a foreseen number of 36,000 additional master students cannot be financed (Berthold, Gabriel, Herdin & von Stuckrad, 2013). Another scenario is anticipating an accumulated financial lack of admission for 200,000 additional masters students until 2020 (FIBS, 2013). Already in 2007, when the additional funding programs were established, researchers had

warned not to underestimate the financial needs for the coming years (Müller-Böling, 2008) and not to miss the last chance for qualifying an adequate number of young persons to meet the postulated challenges of the knowledge society (Müller-Böling, 2008 p.69; Berthold, 2007, pp.17-19; Balve, 2007, pp.64-66). Nevertheless, the strategy of higher education politics was to ignore the expected student mountain ("Studentenberg") (Keller, 2008). Today it becomes evident that not only the demand for enrolment in higher education had been underestimated but also the desire of undergraduate (bachelor) students to continue as graduate students in master courses.

However, there were also various attempts to improve the framework for promoting the participation in higher education. In order to strengthen the financial base of higher education institutions, some federal states (notably Bavaria, Baden-Wuerttemberg, Hesse, Lower Saxony, Northrhine-Westphalia) gave their universities the right to impose tuition fees. On the other hand the initiative of a study grant program should support the motivation to enter higher education. Both initiatives were not successful. The relatively low tuition fees were not able to improve significantly the financial base for enlarging capacity. But notably the protest of a student lobby caused the failure of this new policy. Most federal states have already abolished tuition fees, the other states intend to do so until 2014. Also the initiative for additional aid by a broad grant program had not been successful. However, there remains the older model of study loans for financially disadvantaged persons ("BaFöG"). Some researchers expect a new financial source by savings in the schooling sector as a consequence of demographic change (Prognos, 2007). As school enrollment figures are going to decline generally in Germany – in some federal states (Brandenburg, Mecklenburg-Vorpommern) for more than 30% until 2020 – those savings could be used for new investment in the educational sector – possibly in higher education.

The challenge of high graduation rates

New definitions of performance in higher education are output oriented. Therefore, graduation rates are considered an indicator of quality in higher education. Debates on how to increase graduation rates are particularly crucial in highly industrialized countries with an aging demographic structure. Facing declining student numbers in the near future, societal demand for a well performing higher education system is going to be an issue in Germany. In order to avoid low survival rates in higher education, dropout reasons have to be analyzed and strategies have to be developed with the goal of retaining students at university until graduation. In surveys on German higher education several dropout reasons, particularly in the crucial field of engineering studies (Derboven & Winker, 2010, pp.25-28; Gensch & Kliegl, 2011) were identified: the absence of well structured and transparent curricula; the overload of learning duties; unsatisfying study organization; the absence of personal contact, mentoring and guidance; the lack of motivation caused by selection processes during the study; deficits in teaching performance; and a lack of integration into academic culture.

Analyses of recent higher education figures also brought up results regarding study organization and structure. One result of these studies was that dropouts happen mostly during the first years of study. So the dropout rate in bachelor programs is much higher than in master or diploma programs (Heublein, Schmelzer & Sommer, 2012). This fact nourishes critics against the implementation process of the new European study system demanded by the Bologna reforms. Adapting the new structure, the traditional 4-6 year study programs ("Diplom", "Magister", "Staatsexamen") at German universities were just divided in two parts. The hasty implementation was often realized without much emphasis on new organizational frameworks or efforts in new curricula development (Balve, 2012, p.85). One negative effect was that the student work load had been increased significantly, another that selection processes in an early stage became necessary in order to manage the admission to the limited master programs. Both factors had an unfavorable impact on survival rates.

Regional differences, mobility and migration

In Germany there are regional differences in demographic development, particularly between the Eastern and the Western federal states. After reunification, particularly during the period from 1993-1995, birthrates in Eastern German countries dropped rapidly to a historical minimum of 0.8 children per woman, with the consequence that for years enrollment rates in the Eastern regions were lower than in the Western parts of Germany. The demographic imbalance between Eastern and Western Germany was rather increased by a strong out-migration of young people from Eastern to Western federal states (Hamm, Seitz & Werding, 2008). Higher education policy makers hoped that the decline of the young population in the East could also have a positive impact as it would compensate under-capacities of universities in the West. The restructuring of Eastern German universities should attract applicants from Western Germany. However, significant migration streams of students from the West to the East couldn't be observed (Müller-Böling, 2008) yet. Besides this East-West imbalance there do exist other regional differences, *e.g.* between rural regions and metropolitan areas. Particularly middle sized cities are suffering from population decline in Eastern federal states (Hamm *et al*., 2008). There are various initiatives of federal governments to respond to these developments. The federal state of Saxony for instance supports cooperation and diversification in higher education in order to strengthen excellence in teaching and research and to attract potential students by providing interesting study programs. Particularly universities in rural areas need regionalization strategies. They need to develop regional centers of excellence or strengthen cooperation with regional stakeholders with regard to regional infrastructure, public services and industries. On the policy level proposals are being discussed in order to promote student migration amongst federal states. A financial equalization agreement among the federal states should bind countries to provide financing the study of outgoing students (Keller, 2008, p.226) following the motto "money has to follow the student".

In the near future, after 2020, student mobility within Germany will be dominated by competition.

Then, also universities in Western countries will be confronted with declining enrolment numbers. One factor in demographic scenarios is immigration and international student mobility. Although immigration plays a role for the demographic development in Germany there have been distinctive changes in migration numbers within the last decades. Hence, also future developments are difficult to predict. Today about one fifth of the German population has a migration background. Facing demographic problems various proposals had been made to stimulate qualified immigration according to the needs of society and labor markets (Angenendt, 2012). At least, past migration processes could not stimulate the demand for higher education. In comparison with other industrialized countries Germany has one of the lowest participation rates of foreign born citizens in tertiary education (OECD 2008, p.248, Table 9.2). Internationalization is a keyword of the strategies in Germany higher education institutions and organizations and was boosted by European mobility programs ("Erasmus"). The proportion of international students enrolled at German universities however did not increase significantly during the last ten years and alternates around 8.5% (DAAD, Ed., 2012, p.iii). Nevertheless, studying in Germany is still considered to be attractive, especially because of non existing or very low tuition fees. But internationalization does not seem to be a solution for demographic problems as far as international students often do not plan to stay in Germany. Germany does not fail to attract skilled foreigners, just as shown by recent migration of young skilled Spanish and Greek workers. However, it fails to keep them in the country. According to the migration report of the OECD more than half of this migration group left Germany within one year. This fact corresponds with the reality of the migrant population who lives in Germany permanently. Having grown up with a low educational background these migrants are less integrated into German society and their children are often losers in the educational system (Quenzel & Hurrelmann, 2011). The recent OECD study on educational skills (OECD, 2013) confirmed a large educational gap between native and foreign born citizens in Germany.

Conclusions

It is evident that Germany is an ageing society while impacts of demographic change on higher education are still not visible. However, they can be anticipated in German regions where enrollment rates are relatively low. Many of those regions are in the federal states of Eastern Germany (Mecklenburg-Vorpommern, Sachsen-Anhalt, Thüringen), but there are also some in the Western part (*e.g.* Schleswig-Holstein).

At least after 2020 demographic change will challenge higher education in most parts of Germany. Then, the development of higher education will depend on today's political decisions promoting attractiveness of tertiary education for the last strong young age cohorts. Opening higher education within the remaining time frame means to lowering entry barriers and increasing capacity which is not possible without a significant increase of funding. Especially the transition from undergraduate

(Bachelor) to graduate (Master) studies should be promoted at least when enrollment numbers are going to fall.

Facing the expected decline of student numbers, the German schooling system should encourage and support educational careers for the less educated population, particularly for persons with migration background. Policies of integration should reduce selection processes which are still dominating the educational system (Angenendt, 2012, p.43).

With respect to the recruitment of national as well as international students, quality in higher education, particularly in teaching and guidance of students, will become an overall issue. Quality improvement of organization and curricula development will be necessary in order to make studies more attractive and to prevent dropouts. Strategies of cooperation and diversification will become necessary for higher education institutions facing an increasing competition. As demographic changes will also cause regional differences in the labor markets (Nutz, 2006), strategies of regionalization have to be developed.

The expected change of population structure towards a higher proportion of older generations will force German universities to open their gates for non-traditional students and offer educational programs for labor force. Therefore, diversification of further educational offers will gain importance. Germany has a long tradition of vocational training known as the dual system ("duales System"). It is a combination of education and apprenticeship. This system as well as the programs offered by universities of applied sciences ("Fachhochschulen") could be models for merging professional training with higher education. However, the main challenge will be to stimulate the demand for further education in Germany. An increased awareness of the advantages of lifelong learning will be necessary (Miersch, 2012, pp.279-280). If the existing barriers between different educational systems disappear and new transition paths are developed, additional educational offers will have a chance to promote professional careers. This could also help to bridge the demand of labor markets emerging from the demographic gap. For higher education institutions diversification opens study programs to new target groups and could be a strategy to survive in an aging society.

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