



Bundesministerium
für Bildung
und Forschung

Greetings

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Eventpassage, Berlin

- Welcome to “nexus” conference, a project of the German Rectors’ Conference funded by BMBF.
- Conference topic is: “Attracting more students and educating well-trained engineers: sensible ways to advance the field of engineering education” – an important area of great relevance to current public discussions and challenges we face.
- Studies in engineering
 - a) are a core field of study and shape the image of many universities and universities of applied sciences;
 - b) are important to meeting the demand for expertise in key sectors of the economy whose export strength and innovative powers contribute significantly to economic growth and employment security;
 - c) are a worthwhile investment for young people as it promises excellent career opportunities in later professional life;
 - d) are highly demanding and “traditionally” experience a high dropout rate;
 - e) are the topic of passionate debate about the “proper” implementation of the Bologna reforms;
 - f) because of the great significance on a personal, economic and university education policy level, high priority must be granted to creating good study conditions and to ensuring more academic success in this study programme.

- Current figures on enrolment in engineering studies in Germany are encouraging but also signal urgent need for action.
- The number of first-year students enrolled in engineering was about 68,000 in 2007, compared to some 116,000 in 2011 – an increase of 70 per cent that is well above the average rise of 43 per cent! Engineering is currently attracting more than 22 per cent of first-year students, compared to just under 19 per cent five years ago. Studying engineering has apparently become popular again among the young generation. We can attribute this success to the higher education pact. More than 185,000 additional first-year students were enrolled between 2007 and 2010, and not by any means in low-cost subject areas as has often been alleged. We want to forge ahead with these successes. This is why the Federal Government has allocated nearly 5 billion euros for the second phase of the higher education pact from 2011 to 2015.
- Since 2007, the number of students who passed their final exams in engineering has also grown more rapidly than the average for all study subjects – by almost 60 per cent.
- At the same time, the dropout rate in engineering – “traditionally”, if you will – is higher than in most other subjects. In the past decade, the dropout rate was about 20 per cent in the *Diplom* degree course at universities of applied science, and usually between 25 and 30 per cent at universities. In the bachelor’s degree course, the dropout rate (for the graduating class of 2010) among engineering students was 30 per cent at universities of applied sciences, and as high as 48 per cent at universities. In some fields of

engineering, the dropout rate is over 50 per cent. These numbers are cause for concern.

- Universities of applied sciences started adopting the two-cycle degree structure quite a bit earlier and have in the meantime reduced the dropout rate. This may well have been largely a problem related to the transition, which is precisely why wise and swift action is called for.
- Universities must be better prepared to handle the growing diversity of their student body. The differences in existing knowledge and backgrounds require the adoption of a sophisticated approach in the early phase of studies – offering complementary preparatory courses, better counselling services, or the possibility of “studying at different speeds”. In particular, any gaps in mathematics knowledge must be closed at the very beginning of studies so as to ensure academic success later on. In the areas where the switch to a six-semester bachelor’s degree course missed its mark – for example by creating very heavy course loads or administering exams too early and too frequently – adjustments must be made. I should like to cautiously point out that the universities of applied sciences, which have comparatively lower dropout rates, offer more seven- and eight-semester bachelor’s degree programmes than universities do. Could there be a correlation here?
- Universities are in a position to make many changes themselves. The Federal Government is providing support through a range of measures such as the “nexus” project at the German Rectors’ Conference.
- The Quality Pact for Teaching in particular is a means to putting good ideas into practice. The Federal Government has earmarked about 2 billion euros

up until 2020 to improve study conditions and to boost the quality of teaching. This will benefit 186 institutions of higher learning all over Germany, from the research-intensive university that offers a full range of subjects to the university of applied sciences that is regionally oriented.

- Many of the projects funded under the quality pact for teaching focus on engineering studies. They address aspects of
 - a) providing additional teaching staff for smaller study groups and better mentoring services,
 - b) improving university didactical training for teaching staff,
 - c) introducing innovative curricula and new forms of learning, for example by expanding e-Learning and blended learning, increasing practical relevance, increasing research orientation or instituting new, project-based courses.
- I would like to briefly mention two concrete examples:
- The TU Darmstadt has had good experience with its interdisciplinary project week held at the beginning of studies. Professor Hampe will be reporting on this this afternoon. This successful concept will now be extended from the engineering faculty to all the other departments at the university. Additional teaching staff and an innovative syllabus will boost training in mathematics. More tutors will be hired and better qualified to facilitate small-group studying.
- The RWTH Aachen University is drafting new concepts for engineering studies jointly with Ruhr-Universität Bochum and TU Dortmund. The collaborate project ELLI is setting up virtual laboratories and so-called remote labs in which technical experiments can be carried out more effectively, safely and

by the students themselves. Funding has also been intensified to promote mobility for engineering students to study abroad. Additional measures aim to ease the transition from school to engineering studies at university, and to improve the progression from undergraduate to doctoral studies. This should help to boost academic and career success.

- This conference offers many opportunities to discuss the challenges mentioned here, to name examples of what has worked in practice and to exchange experience and ideas for solutions. May you gain many useful ideas and have a successful conference.