

Report on Panel 3: Student drop-out

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Student drop-out is a known phenomenon in the engineering sciences that remains to worry faculty, industry, society, and students themselves. In mechanical and electrical engineering more than 50% of the students drop out at German universities and even so more than 30% at universities of applied sciences. Nevertheless, the problem is far from being fully understood. For example, the drop-out rate at Danish universities is about half that of the German figures. At many universities measures are taken to enhance students' success. In this workshop participants discuss their experiences and share ideas to advance the field of engineering education.

As a starting point participants use a clicker system to answer the question: What is a high drop-out rate? It turns out that there is no common concept of a high drop-out rate. Answers are almost evenly distributed between "6%" and "more than 50%", with a peak in the range "20% to 25%". Political will and governmental plans influence our view of a high drop-out rate as does the culture of the subject. Therefore participants are asked whether a high drop-out rate is necessary in the engineering sciences for maintaining the high quality of an engineering education. Most people disagree, however, almost as many think that there is some necessity.

If it comes to the term "drop-out", no consensus exists about the definition: some associate it with a student who spends a month or a year at an institution and then leaves it without a degree. Others call someone a drop-out who leaves the university but still receives a degree somewhere else, let alone even other explanations. A common understanding is necessary for communication: In the following we refer to a drop-out as someone who has studied a certain time (say at least one semester), and then leaves university without a degree.

Asking the audience who is responsible for student drop-out responses are evenly distributed upon "the student", "the teachers", and "the university". Obviously, the majority of the participants feel an obligation of the institution and its representatives to make it possible for students to finish their studies successfully. In the following we discuss: Which measures prevent a student from dropping out? How can they be encouraged? And: What role can teaching staff and the rest of the organization play in preventing students from dropping out?

Every teacher experiences the inequality that teaching is not equal to learning. Students do only make progress if they work on tasks which challenge them and for which they feel motivated (C.f. Steen Larsen, The Ultimate Formula). A number of initiatives have been tried out: Improving the faculty-student ratio, starting a mentoring system, strengthening student coordinators, quality assurance, doing projects right from the beginning, maintaining a student counseling program, offering an entrance exam, pre-study courses in mathematics, additional courses to support learning

during the first year and during the summer break. Also, it may be helpful, if high-school students visit university beforehand to get a realistic view upon studying.

The most important factor seems to be that teachers care about their students and view them as persons – not just matriculation numbers. Are they interested in their students' progress in learning? Close interaction with students who have a high risk of dropping out prevents them from doing so. Study-technique courses, exam training, a student mentoring scheme and student networks can be accompanying measures. The university management should support lecturers in developing their empathy for students.

Political incentives govern faculty engagement, be it by allocating money according to passed ECTS or extra money for graduates, be it to put an extended focus on research which may inhibit efforts in teaching and learning.

There is a recent initiative by the VDMA – German Engineering Federation – called campus for engineers ("Maschinenhaus"). In the light of demographic figures industry is very much interested in well-trained engineers. More than 55% of companies expect that the number of engineers needed will rise. Engineers are very successful to reach positions in middle and top management. The VDMA identifies four main reasons for drop-out: Financial reasons, performance, motivational reasons, and new orientation in terms of occupation.

A survey that involved more than 60% of German universities and universities of applied sciences revealed that only 2/3 set goals for academic success of students, and that only every other department has the impression that the executive board takes quality management for studies and teaching seriously. Often, no standards and no monitoring exist. Professors agree with „responsibility for success is with the student“ (51%), and also „if students invested more time, we would not need quality management (46%). One third of faculty is convinced: „academic standards can only be secured through high requirements for exams“, and one quarter endorses the quote „Quality management keeps from work.“

Thus, the VDMA makes the following suggestions: Current ways of assistance to students need to be changed. Student-oriented teaching and learning help to handle diversity. A student biography at university should be understood as an educational process. Teaching and learning should be pursued with the same professionalism as other research areas. Quality management needs to be introduced. Mediating communication and procedures at universities should be fostered. General requirements need to be addressed. Admission plays an important role. Take time for traditions and attitudes to change!

The next steps envisaged are a toolbox, which contains a collection of best practice measures, and the rollout of the program. A network of actively participating institutions will be started. VDMA sponsors an award "Maschinenhaus" worth 100.000 €. A communication strategy supports the total effort. In summary: Young people from all kinds of different social classes, cultures, and schools should have open access to the field of engineering. To reach this goal

- focus on student orientation for building up competencies

- concentrate on the educational process during the whole tenure at university
- welcome diversity and use it for learning
- build up a quality management system for good teaching and learning

Participants of the panel feel that there are no silver bullets to handle drop-out. However, they strongly encourage the following conclusions:

- We need to lower the drop-out rates while maintaining the high quality of an engineering education.
- We lack a consistent definition of drop-out and a system to measure it.
- We need to motivate teachers and students, avoid social isolation, learn how to learn, foster student self-organization and, most importantly, bring the topic to the attention of teaching staff.
- We need service oriented universities.
- Get the teachers to care about their students!

References:

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