

# ACTIVE STUDENT CARE – LOWERING STUDENT DROPOUT

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## ABSTRACT

The article describes different actions that have been taken at the Engineering college of Aarhus in order to reduce the drop-out rate. The actions include brush-up math course, study techniques, exam training, networks of minority students, but most important conversations with students and students mentoring scheme. The actions were identified and evaluated by interviewing key stake holders like teachers and student counsellors.

## KEYWORDS

Drop-out, student retention, success factors.

## INTRODUCTION

Education is a driving factor of the modern society. The US Census Bureau [1] has found that a person with a graduate or professional degree earn more than three times as much as a person with less than a high school degree. Jobs for persons without a degree are furthermore being exported from the western world; during the latest financial crisis, more than 200.000 production jobs have been laid down in Denmark. As a consequence of this, the political agenda is that we need to educate more young people. In Denmark, the government has the goal that at least 50 percent of all young must have passed tertiary education in 2015 [2]. There are two types of challenges with this: getting enough students interested in taking a degree (e.g. in the US only 40% enrol in a ternary education) and the students who started should finish with a degree.

There is currently much interest in students' success in higher education [3]. The National Audit office found an increase in the number of students dropping out from higher education in England. The interesting question is naturally why this happened. Many different answers were given; most of the answers included the underlying assumption that it was the students fault. As Thomas [4] writes "*it is too easy and somewhat irresponsible to 'blame' new students constituencies for the small increase in early withdraws from HE; such a response lets the HEIs and the HE sector in general off the hook*" (p. 424). In this article we will describe what we as an institution do to lower the students drop-out.

This article addresses the challenge of lowering the student drop-out by describing different methods that have been successful in. This is done by interviewing central  
Proceedings of the 7th International CDIO Conference, Technical University of Denmark, Copenhagen, June 20 - 23, 2011

actors about their view on initiatives by the engineering college on student drop-out; what is done, what is the most important and what is missing.

## RELATED WORK

Traditionally there has been much focus on predictors of success. A substantial amount of research has been conducted to identify general variables that predict the success of students aiming for an engineering degree. The variables investigated encompass gender, parents' educational level, performance in prior courses, emotional factors, the application of a consistent memory model, and ACT/SAT scores to name a few. ACT is formerly known as the American College Test. An American, nation-wide college entrance exam. It assesses high school students' general educational development and their ability to complete college-level work. It is a multiple-choice test that covers four skill areas: English, mathematics, reading, and science. The Writing Test, which is optional, measures skill in planning and writing a short essay. SAT (formerly known as the Scholastic Aptitude Test and Scholastic Assessment Test) is a standardized reasoning test taken by United States high school students applying for college. It covers two areas – verbal and mathematics.

Along the line of success factors, Besterfield-Sacre et al. [5] have developed the Pittsburgh Freshman Engineering Attitude Survey to look for cognitive, affective, and psychomotor variables to determine which ones were significant predictors of persistence.

Moller-Wong and Eide [6] had the same idea as Besterfield-Sacre et al. Their study “was targeted to accomplish several objectives. First, we had to design and assemble a data base that would allow for individual tracking of students. Once a complete profile of our students population had been assembled, it was possible to identify accurately a range of descriptive variables. Next, using the established data base we developed a retention analysis tool that would statistically suggest and identify students who are potentially at risk of attrition.” (p.7). They had a four level success scale (low, modest, commendable, high) and tested their model against students who enrolled in 1990. They found that; based on their definitions of the four categories, that their model correctly placed 74% of the students.

Felder et al [7] compares performance of students taught in classes where the courses made extensive use of active and cooperative learning and a variety of other techniques designed to address a broad spectrum of learning styles. They concluded that the students from the classes with active learning “*outperformed the comparison group on a number of measures, including retention and graduation in chemical engineering, and many more of the graduates in this group chose to pursue advanced study in the field*” (p. 469)

In general, the findings are very mixed and it is indeed hard to draw any general conclusions from these studies; in some cases a few variables predicts a lot while in other cases the same variables has no prediction power. It seems like there is a grooving acceptance of the fact, that learning is very complex and it is not possible to predict it with a few measurements. Consequently, this article does not offer general conclusions but describes activities we have found useful.

## **DATA COLLECTION**

Data for this study was collected by semi-structured interviews with two teachers, the central student counsellor, a student counsellor for three specific study programmes and the head of quality development. Each of the interview lasted about half an hour. They were audio recorded and notes taken. The notes were used as pointers into the audio recorded interviews.

In a later study, we will include students and their view on the actions taken, but for this study we did only use information given by the students who choose to stop (they are asked to fill in a form about the reason for their choice); this information was only used as background information by the interviewed persons, nor as a primary source of information.

## **ENTERING ENGINEERING EDUCATION**

Many authors focus on the first days of a student's new university life. In general, they all agree that it is one of the most influential periods in relation to retention. Leese [8] did a study focusing on the critical first days and weeks when the students need to fit in to their new environment. She found that *"Perceptions about their transition varied, but most of the students expressed concern about the perceived need to be an independent learner. Students stated that they needed more structured activities on campus to encourage them to fit in, and more support from academic staff, with clear instructions about what was expected"*.

In 1997, less than half of the students entering an engineering program actually graduated. According to Besterfield-Sacre et al [9] more than half of the drop-out occurs in the first year. As they note *"Clearly, the freshman year is critical for both academic success and retention of engineering students"* (p. 139). Besterfield-Sacre et al's findings are backed up by LeBold and Ward [10] who indicated the best predictors of engineering persistence were the first and second semester college grades and cumulative GPA.

This naturally calls for initiatives that can help students figure out what engineering really is prior to entering an engineering programme, so that they can be more prepared on what they actually will experience. Furthermore, initiatives aimed at freshmen seem to have a better ROI (return on investment) than initiatives later in the study program.

## **CONCRETE ACTIONS**

This paragraph will describe the actual actions taken at the engineering college of Aarhus to help students graduate with a degree.

In general we have two different types of drop-out: qualified and unqualified. The qualified drop-out are students who for some reason or other find out that engineering is not for them, and start on another programme. In general we find this type of drop-out non-problematic since they (hopefully) will get another degree, and thereby contribute to the government's plan for at least 50 % of youth getting a degree. The other group – the unqualified drop-out – are students who want to become an engineer but leave our Proceedings of the 7th International CDIO Conference, Technical University of Denmark, Copenhagen, June 20 - 23, 2011

programme anyway. We ask all our students terminating their study prior to graduation to tell us the reason why, almost all do. Based on that, we can see that more than 75% of the drop-out is of type qualified.

### **Prior to entering the engineering program**

Both teachers and students counsellors focus a lot on preparing the students. This means that the students should have a clear view on what they can expect of the daily students life if they choose to start.

#### *High school students visit*

In Denmark high school students in their final year before entering their bachelors programme, can visit their preferred higher education institution for three days. In Aarhus, we offer three different practices: building and building design, ICT, electrical and health technology, mechanical and Bioprocess Technology. The students will experience presentations and practical exercises, meet students and teachers, experience the learning environment, and will get a good feel for what an engineer's work is.

#### *Math brush-up*

Some of our students have been away from the educational system for several years before entering. Many of these students have a little “rusty” knowledge of Math so we offer these students (and others who wants it) one week of math brush-up, where they will focus on reinforcing the math learnt in high school.

### **During the engineering program**

During the three and a half year students study at the engineering college, there are several initiatives to help students stay in their study program. It is – however – important to note that the majority of students do very well and do not need extra care apart from the design of their courses. As one of the interviewed persons expressed it “*it is important to remember that most of our students do very well and do not need help to pass the exams and graduate*”

#### *Initiatives for all students*

A few initiatives are for all students. Participation is not mandatory, but the student counsellors keep track of who participates and contact students who do not participate.

#### *Study technique course*

One of the problems students often report when they change from secondary to tertiary education is the amount of individual work. In general, we expect the students to be able to figure out by themselves how they need to prepare before any given lecture. This change in work habits is difficult for some students and we offer all the possibility to learn how to structure their work week.

### *Formal conversations between the student and a student counsellor*

In the middle of the first semester, all students are invited to a 10 minutes talk with a student counsellor. The talk is focused on the students experience with his or her “life” at the institution for the first, important weeks. The meeting have an agenda, but the most important thing is to find out if we as an institution can help the students to “stay on track”. For some of the study programmes, it is possible to change from one to another during the first semester; the conversation also helps the students do decide if she wants to change study program.

### *Initiatives for select groups of students*

As written above, most of the students do not need to use the initiatives. We have some initiatives that are elective for students and some specially targeted at select groups of students.

### *Exam training*

Exams at university level can be a challenge for some students. They have, in their elementary school and high school, meet most of th types of exams that we have, but it is still a challenge to structure much more material and present it in a coherent and understandable way. To help students perform well during exams, we offer exam training courses, where the students learn techniques to handle exams. These include simple things like preparing an outline for possible exam questions and presentation techniques.

### *Student mentoring scheme*

Student mentor scheme is offered to all new students at the beginning of their studies in the various fields of study. It can often be difficult to imagine how best to handle the transition from school to study, from trainee to independent student. A mentor can help the mentee to gain greater awareness of

- his future life as a student at Engineering College
- the subject-related choices
- an overview of the study
- the possible new city where you live

A student mentor is a student at the 2nd-7th semester studying at the same line as his mentees. The student mentor have before first meeting with his mentee, attended a specially arranged student mentoring course in communication, conflict resolution and group management. The mentor gets the course and mentor program credited with 2.5 ECTS credits and will therefore appear on the academic qualifications. The Student Mentor Scheme extends over the first month of first semester.

The mentor typically has a group of 5-6 mentees. Meeting frequency generally depends on the needs of the individual groups, but typically the groups meet at least five times during the semester. There is a relationship of trust between the mentor and the mentees, and the mentees can, in principle, ask tehir mentor about everything regarding their study.

### *Close interaction with students who have a high risk of drop-out*

The student administration and student counsellors have a close collaboration. When the administration finds out that a student failed an exam (or did not show up for the exam), they tell this to the students counsellor, who make contact to the student and ask if there are problems that the counsellor can help with. In some cases it is just because the student was unlucky and will pass the exam next time. In some cases there are more serious problems involved, and the counsellor can find initiatives that help the student come back onboard. One example is an agreement between the counsellor and the student to send the counsellor a monthly report on his/her progress. Other examples are pedagogical support if the student have special needs.

### *Networks of "minority students" for example women in ICT, mothers, dyslexic*

All of the interviewed persons find it very important that the students feel included in one or more group of students. Consequently, the engineering college arrange networks of students who have a difficult time due to external element. This includes students who have babies, women in very male dominated study programs and dyslexic students. By setting up these networks, the students do not feel alone and sees that other students have the same problems but succeed.

## **EVALUATION**

All of the interviewed persons agree that the most important element in keeping students from dropping out is that the teachers care about the students. The students must feel that the lecturers respect them and have a genuine interest in their success. Consequently, one of the most important assignments for the director of studies is to motivate and support lecturers in developing their empathy for students.

When asked about what he finds the most important element contributing to students' success, the head of quality insurance mentions the ongoing work with learning goals. It is not the learning goals by themselves that is important, but the shift in mindset from a focus on course content to what is really is that the students should learn. Consequently, a continues focus on the learning goals will not only help the teachers focus on what to teach, but hopefully also help the students with succeeding their study.

The student counsellors have "an open door" so that students who need to talk just can walk in. However, it can be difficult to visit a counsellor for the first time. Therefore the formal conversations between a student and a counsellor not only have the goal of spotting specific problems, but also to get all students to know the students counsellor. All of the counsellors believe that these formal conversations help a lot to the knowledge of them.

When asked about what more can be done to lower the dropout rate, none of the interviewed persons have comprehensive new ideas, In general they all feel that it is a balance between on one hand taking care of the students and on the other to help the students become independent. One of the interviewed persons suggests that it could be positive to have a day where the lecturers and students collaborate on something not within the field of study but something else. The rationale should be to build up better social relations between the students and the lecturers.

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## CONCLUSION

Teachers tend to talk about good and bad students or good and bad classes [11]. At the engineering college, we did have a large variety in the percentage of students dropping out from semester to semester, but in the last four years the percentage of students dropping out have been much more stable (but with a steady decline). We believe that the result of all the efforts we have put into our active student care has much to do with this.

All of the interviewed persons stress the importance of teachers caring about the students. As one of the teachers said "*the most important action is that we view the students as persons – not student-numbers*". This is the same view on students as the organization tries to promote: "*View the student as a junior employee; be a role-model*". The conclusion here echoes the conclusion of Thomas [4]: "*if students feel that staff believe in them, and care about the outcomes of their studying, they seem to gain both self-confidence and motivation, and their work improves.*" (p. 432)

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### **Biographical Information**

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