



STRATEGY FOR EDUCATION DEVELOPMENT

2020-2024

Introduction

The IT Faculty was established in 2009 as a legacy of the IT University, which was a joint initiative between Chalmers and University of Gothenburg. Since 2010, the IT Faculty consisted of two departments, which complement each other in terms of research and education, allowing the IT Faculty to combine technical and societal challenges related to a wide spectrum of Information Technology.

The field of IT has always evolved rapidly as the pace of technology development is driven by the needs of the society and the fact that software and data become the oil of the new economy. In the last years, this trend was visible in the renaissance of the technology related to Artificial Intelligence (AI). AI was known and popular in the 1990s, but was not widely adopted as the processing power of the computers and the amount of data was not sufficient in the 1990s. Currently, AI is powered by fast access to internet everywhere (5G networks), high computational power (GPUs) and availability of large data sets (Big Data).

The IT Faculty is in the middle of this evolution of the IT area. We are driving the development of new technologies and we contribute to the development of the society that uses these new technologies. When the society evolves that rapidly, we need to understand not only the past but also look into the future trends and understand what kind of challenges we face.

This document describes the strategy for the IT Faculty with the focus on its education. It is a result of a series of workshops conducted with the faculty and students from both departments during the spring of 2019. The strategy spans for the period of four years and is meant to be reviewed once every second year to address new challenges, opportunities and threats.

As a preparation for the working about excellent teachers, we solicited a survey of teachers' motivation in their daily work. We asked questions about the motivators and demotivators. The most important motivators are:

- ability to see how students develop and mature throughout the course and the curriculum,
- teaching the topics which are relevant and interesting to the interests of the teachers,
- positive feedback and discussion from the students, and
- dialog with students as “adults”¹, where the teachers learn from the students

The most important demotivators are:

- observing that the teachers who focus on their own research get rewarded more than teachers who care about the students and education (so-called “tunnel vision”),
- getting unmotivated students, and
- burdensome administration, lack of autonomy and lack of interest from the leadership of the department.

During the workshop, it was clear that our pedagogical efforts, at all career levels, should be aligned with the description of the role of full professors. We recognize the importance of the university as an education-research institution, not only as a research facility. Our primary role is to develop the young generation and thus contribute to the development of the society locally and internationally.

¹ This point was raised by the students who stressed the fact that they would like to have more dialogs during the courses.

During 2018 and 2019, the IT Faculty has undergone two evaluations of its research – RED19 and Chalmers' evaluation of research (for the Department of Computer Science and Engineering). These evaluations provided us with the feedback (excerpt):

- we have several research groups that can be considered to be top 5 in the world
- our students are engaged in our education and are great assets for our research
- we should focus on reviewing our administrative processes as extensive administrative tasks for teachers and researchers seems to be a hinder for the development of the IT Faculty

This feedback is important for the symbiosis between research and teaching, as well as understanding how to engage the researchers to provide even better education for our students.

Framework

The vision behind our strategy is that our students learn best when they interact with excellent, motivated teachers, when they learn content that is relevant for the contemporary society and for markets, when our faculty and students engage in collaborations that inspire them, and finally when they are supported by professional infrastructure at the department, IT Faculty and the university.

Our strategy is organized in a framework where we place these most important elements of the university education in a single framework. The framework, presented in Figure 1, states that these four parts are crucial to focus on the education of our students and to maximize the value of education which the students receive.

Excellent teachers: Teachers are the core part of the strategy and their motivation is the most important factor that helps the students to learn. The purpose of this part is to understand how to keep our teachers motivated and how to stimulate that this motivation spreads to our students.

Motivating content: The content of our education is as important as our faculty. We recognize the fact that we have to develop our curricula constantly to develop students who are sought for at the job market and who can keep on learning (a.k.a. lifelong learning).

Engaging collaboration: The large part of the field of IT is applied and being able to collaborate with companies, the public sector and non-government organizations is crucial in the development of each student. We therefore need to understand and organize ourselves so that we can create collaborations that engage our students and faculty.

Infrastructure: The teachers, the content and collaboration are extremely important for the education, but they need to be supported by the infrastructure – computer rooms, lecture halls, library and self-study facilities are pre-requisites for the education.

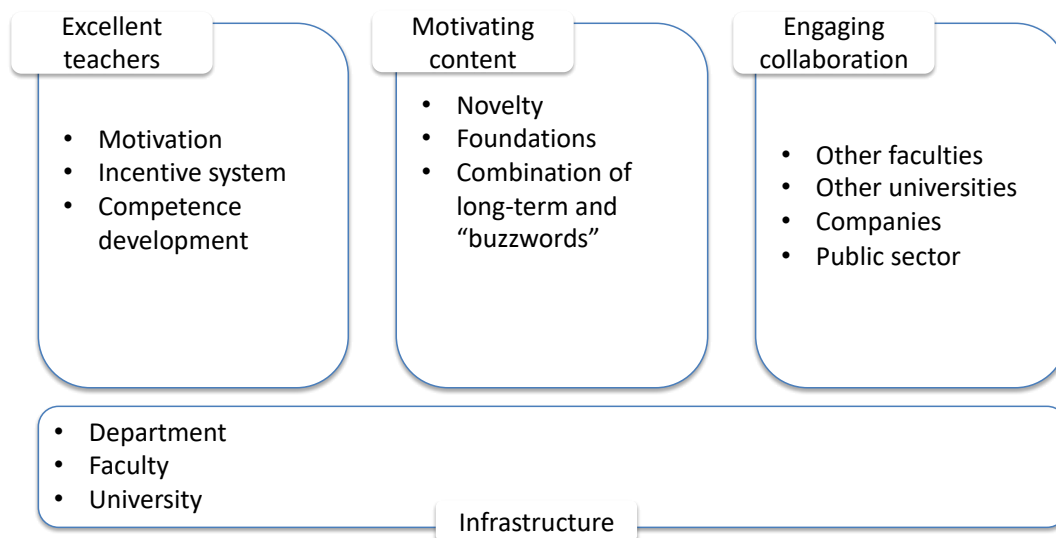


Figure 1. Framework for the education strategy

In this document we describe the IT Faculty’s strategy for each of these elements.

Strategy

Infrastructure

One of the cornerstones of our strategy concerns the infrastructure needed to achieve a great teaching and learning environment. The infrastructure available for the IT Faculty today is over a decade old and, in some facilities, much older. This means that the infrastructure is often not adjusted to the modern ways of working for teachers and students, in particular when it comes to computational infrastructure for Big Data and AI, projectors, active learning rooms, self-study rooms, the library and the power outlets for laptops.

Therefore, our strategy is:

1. *Find rooms for groups and self-study* and open up these rooms for students from both departments at the IT Faculty. We believe that common space for self-study and for group work will enable students to exchange ideas and to collaborate, which is important for their future careers. This kind of informal learning environments are available to students from other faculties already and we believe that they will increase the current and prospective students' motivation to study at campus.
2. *Establish flexible lecture rooms*, similar to ALC (Active Learning Classroom), we need to find ways to utilize our lecture rooms more. We need to be able to use them for other teaching and learning forms than just lectures.
3. *Find efficient ways of working with new software and GDPR*. We need to find how to quickly adopt new tools in education without the lengthy processes of establishing contracts with tool providers. We need to be able to take advantage of modern tools in a legally-safe way without jeopardizing the integrity of individuals.
4. *Review the needs for and provide the adequate computational capacity*. Modern IT systems and software often use machine learning and artificial intelligence, which, in turn, require significant computational resources. We need to find what kind of needs for these computational resources exists at the faculty and how to best satisfy these needs.
5. *Improve access to the library and other faculties of the university*. The field of IT is present in almost all domains in the modern society. Therefore, we see the IT Faculty as the potential partner for all other faculties at the University of Gothenburg. We will work actively to find more collaborations with other faculties to ensure that all students of the University of Gothenburg get the best possible access to the competence in IT.

Excellent teachers

We recognize the fact that our teachers are the core part of that development of students. Therefore, our strategy is:

1. Introduce *pedagogical development project funding* instead of pedagogical prizes. Based on the feedback from workshops and the input from our students, we believe that we should provide monetary resources for teachers and researchers to drive pedagogical development projects, instead of providing awards. This will stimulate more structured development of our pedagogy.
2. Introduce *teacher teams* to stimulate the exchange of ideas and support for each other during courses and pedagogical development. The teachers' teams should receive resources for their development and ample time to work together.
3. Introduce the system of *pedagogical post-docs*, i.e. 80%-100% teaching contracts for 2 years for individuals who are interested in taking part of our environment. This will help us to

combine our core values from permanent faculty with new ideas from the pedagogical post-docs. Our students will be exposed to different teaching models and we will be able to increase our international network and our competence.

4. Increase the importance of teaching during salary revisions and personal appraisal talks. We believe that we should discuss these aspects more than we do today. In the pre-workshop survey our professors expressed their concern about the fact that a lot of teachers focus too much about their research. We believe that we need to make sure that teachers at all levels in their career get the right support from their managers in both research and pedagogy.

Motivating content

In order to find the strategy to work with the content of our programs, we discussed the major challenges for each of the programs. The challenges related to student dropout, overlap between programs and mismatch between the content and the marketing of the programs.

Therefore, our strategy to work with the motivating content is as follows:

1. *Increase modern marketing of the programs* is an important element for our students. We need to make sure that the programs are marketed in a manner that attracts the right students and that we do not make promises that we do not keep.
2. *Actively work with the mix of fundamental skills and new technologies* – we need to make sure that we teach the students skills that are crucial for being IT specialist (e.g. programmer, information scientists), but we need to make sure that the students can show new and relevant courses in their curricula too. Therefore, we need to work actively to combine these, seemingly contradictory, types of education and become more proactive in creating new courses. We also need to balance technical/practical and academic skills in order to prepare our students for critical thinking.
3. *Increase our efforts on the third cycle learning (aka lifelong learning)* – our society evolves in increasingly faster pace, therefore we need to be prepared to provide education for practitioners who graduated in the past and would like to come back to the university to learn new skills. Thus, we need to prepare our courses, teaching methods and content for these students.
4. *Reduce overlap between programs* is one of the crucial strategic goals for the programs at the IT Faculty. Since our programs evolve quite independently from each other, we need to ensure that the evolution of one program does not lead to uncontrolled overlap with other programs.
5. *Reduce dropout in programs* for some of the programs. We need to work on keeping the students in the programs and making sure that they apply for the degree. This is important for their future professional career and future education (Master and PhD levels).

Engaging collaboration

The field of IT is applied and our students need as much practice as they need theories. We, as the education organization need to meet the demand of society for specialists who possess universal knowledge that can be applied over time and the knowledge that can provide value to the company directly.

Our strategy, therefore, gravitates around the collaborations with other universities, companies and public-sector organizations with the goal to help the students to find their dream career. The important aspect in this strategy is to combine both local partners (e.g. Volvo in Gothenburg) and international ones (e.g. Microsoft Research in Seattle).

The strategy is:

1. Establish wanted position for the external relations and possibly *external relations coordinator/coordination role*, who can help to maintain external collaborators beyond the individual contacts. The role of the coordinator should help us to maintain long-term professional partnerships that will benefit both the students and the faculty (e.g. help in managing international scholarship, EU research/education projects). The external relations coordinator should also work with alumni meetings and networks as well as potential fundraising.
2. Focus on *mobility for students and teachers*, where we can utilize both the long-term Erasmus agreements, short-term mobility and virtual mobility. This will help the IT Faculty to partner with organizations and individuals with needed competence and without huge start-up and maintenance costs.
3. Increase our presence at *modern outreach activities* like Hackathons, one technology-oriented workshops (Bootcamps) and similar. We see the value of this kind of activities for students' learning and we need to ensure that we provide the possibility for our students to show their abilities. Since this kind of activities are often extra-curricular ones, we do not need long lead times to organize these.

Visualization and operationalization of the strategy

After the workshops and the development of the strategy, we can visualize our framework as shown in Figure 2.

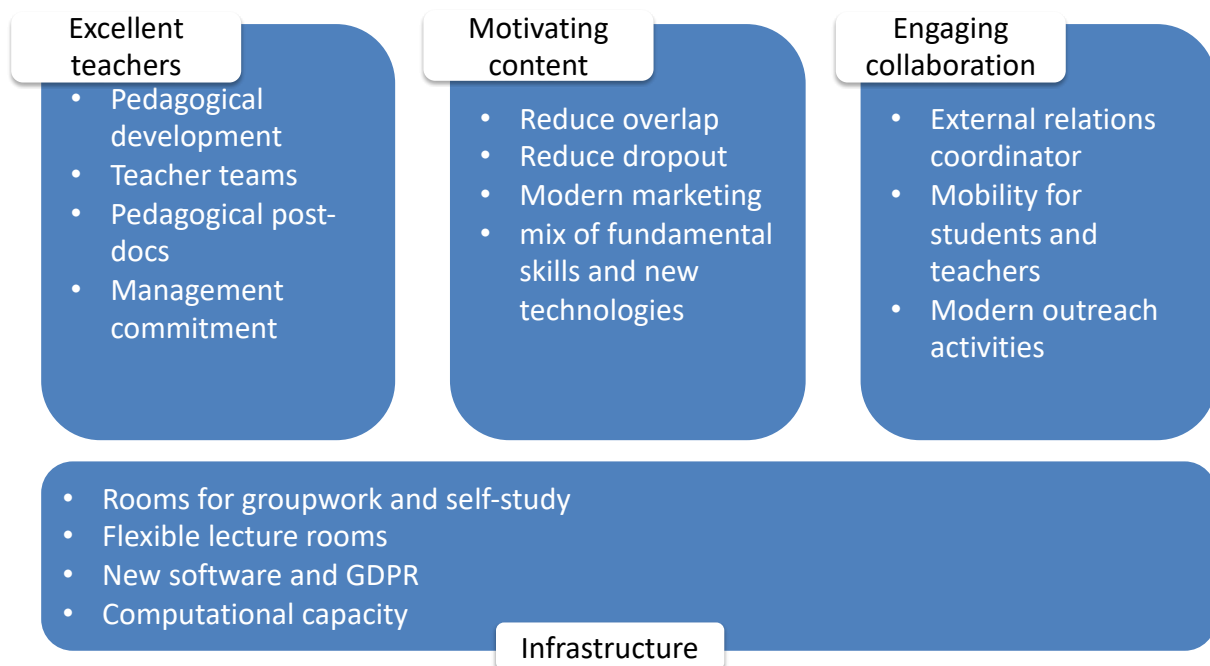


Figure 2. Strategy visualized

All points in this document will be used during the development of educational budget for the IT Faculty for the coming years (2020-2024). We will also use this document when making decisions about programs and courses at each department.

We will also review this strategy document on a yearly basis, during the HVP planning process.