

Host company collaboration and workplace learning for a successful curriculum concept

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Abstract

For a period of more than ten years a very successful Host Company Program has been running at the School of Engineering at Jönköping University (JTH), Sweden. This program is a key part of the JTH *curriculum concept* and provides close collaboration between the university and the 500 regional host companies (HCs) who support the quality assurance of the engineering education given at the School of Engineering.

This paper will explain in more detail how the HCP is orchestrated at JTH as well as how it is perceived by university staff, the engineering students, and the HCs.

Introduction

The Host Company Program (HCP) has many purposes and benefits. One HC role is as a member of a 'trade council' supporting the continuous work within the 'board of education' in guiding the engineering education given at the School of Engineering towards supporting the creation of "work-suited" engineers. This involvement is today ranged through both bachelor and master programs. The success of this collaboration is supported by a study conducted by the 'Confederation of Swedish Enterprise' showing that the former students of JTH were rated as number one in being successful in finding job employment quickly after completed studies. Other valuable collaboration activities are company placed projects, both as projects running during the in-between semester leave as well as projects offered as after-diploma projects, allowing students to get a first chance at work experience while applying for job employment. Yet another specific HC activity is the involvement in the course 'Engineering Methodology' given during the first and second years of all bachelor programs at JTH. During this course student groups get a HC and HC 'mentor' within their engineering discipline appointed to them. They then follow this company during the course, making regular visits, and learn about the company, the role of an engineer through the eyes of their mentor, and also perform smaller tasks which then are reported at university seminars. This course is for many of the students the first contact with industry and serves an important role as the students get a more balanced view of being an engineer than they would get from only academic studies.

History of the Host Company Program

The Host Company Program (HCP) started in 1994 as an activity within the civil engineering bachelor program. At the start, around 50 companies were involved. The initiative came from the program teachers and coordinator but was at the beginning not introduced as an obligatory part of the curriculum. Nonetheless, student participation was very high (close to one hundred percent). Because of this success among students and involved companies within the civil engineering sector the HCP quickly spread among the other bachelor programs. First in line to follow were the two bachelor programs mechanical and electrical engineering.

As early as 1996 the HCP served a key role in providing the “red thread” through the engineering education at JTH. The HCP has since then evolved to include all engineering programs at JTH and around 500 HCs (and organizations). Within the region, small and medium size enterprises (SMEs) constitute the greater part and the HCs within the HCP therefore naturally reflect this. This is also something that supports the JTH educational focus towards SMEs.

The JTH Curriculum Concept

The basis of the curriculum concept is the genuine engineering and entrepreneurial spirit which characterizes SMEs. All engineering students at JTH participate in the HCP which plays a major role in preparing them for professional occupations within SMEs. The students get first hand experiences of industry practise through their personal contact with HCs. This helps in seeing the link between theory and practice. The students also get a unique opportunity to familiarize themselves with the setting of their future workplace environment. Apart from a broad technical know-how, the programmes also develop good engineering, leadership and communication skills, along with business-mindedness and an environmental approach based on an international perspective (Figure 1).

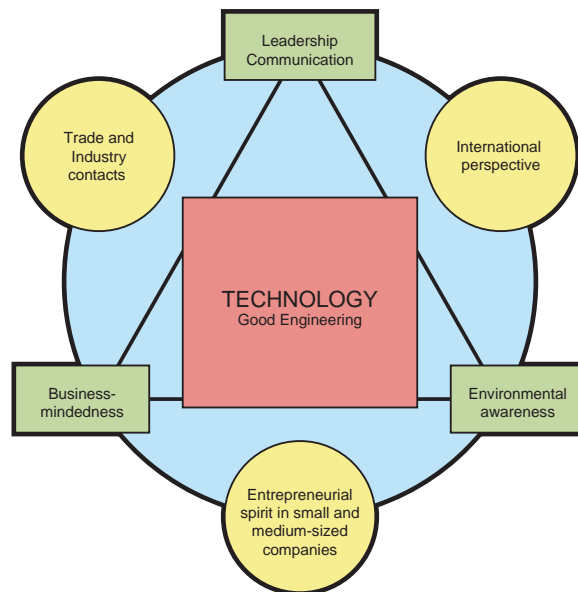


Figure 1. JTH's curriculum concept.

Good engineering involves training in how to identify, analyze and solve problems, as well as how to express this well verbally and in writing. In order for students to develop their ability to identify contexts and find alternative solutions to technical problems, the teaching not only covers theory, but also how it is applied.

Leadership and communication cover such areas as training in oral and written communication, project-oriented working methods, leading and motivating people in small and SMEs, entrepreneurship and decision-making.

Business-mindedness involves taking a business-like approach to engineering work. Students are taught the fundamentals of business law, marketing, financial control, accounting and production finance calculations.

Environmental awareness covers knowledge about what is in keeping with a sustainable ecological society, as well as environmental and human aspects of future products and production.

An additional and important part of JTH's curriculum principle is the possibility to study abroad at one of JTH's many partner universities. This opportunity together with the education's strong connection between academia and industry prepares students for a professional, creative, and entrepreneurial future. This is shown by the fact that many students start their own businesses while studying at the university.

The Host Company Programme Organization

The HCP organization is not a separate organization devoted only to university and industry collaborations. All actors within JTH's host company program are personnel from within the educational organization as illustrated below (Figure 2). The exception is the position "Head of HCP" which is held by one person, half-time devoted to university and industry collaboration. The *head of HCP* is supported by a HCP council consisting of university staff (such as course examiners and teachers) representing all education programs within JTH. The *head of HCP* answers directly to the head of education who also has a supporting council consisting of all the education programme heads and some key administrative personal. The individual program heads have their own supporting trade council, consisting of HC representatives, which main focus is to continuously better the education quality at JTH. The major role for the *head of HCP* is coordinate and maintain good HC contacts and activities as well as recruit new companies. On a yearly basis, about 500 companies, 350 students and 20 teachers/university staff are involved in the HCP.

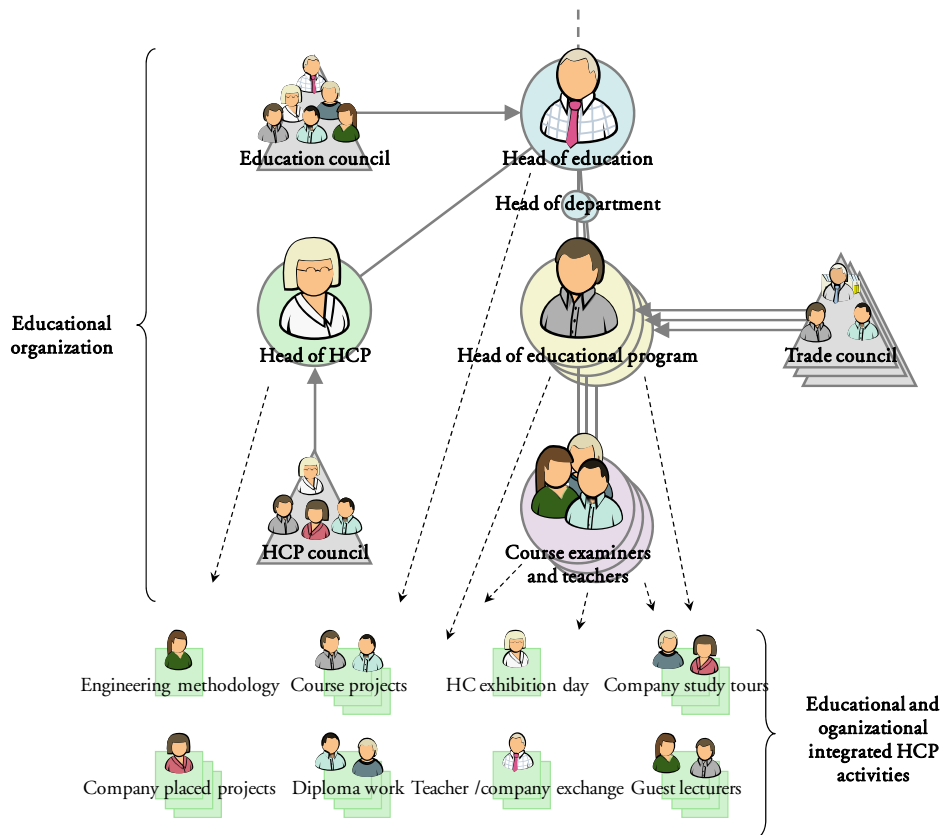


Figure 2. Educational and HCP organizations.

The Host Company Program Activities

The close collaboration and integration with industry, together with industry and work-place practice, are two of JTH's corner stone philosophies. This of course influences the education curriculum supported by the host company program but also JTH's strive to conduct research in close collaboration with industry in general and SMEs in particular. This will in turn strengthen the education and better prepare the students to adapt to an ever changing industry practice.

The JTH research profiles are focused, applied, and of national importance and recognition. The ambition is that the HCs through closer collaboration with researchers at JTH will become powerful channels of knowledge dissemination within the region. This is also why JTH wishes to intensify its collaboration with industry even further.

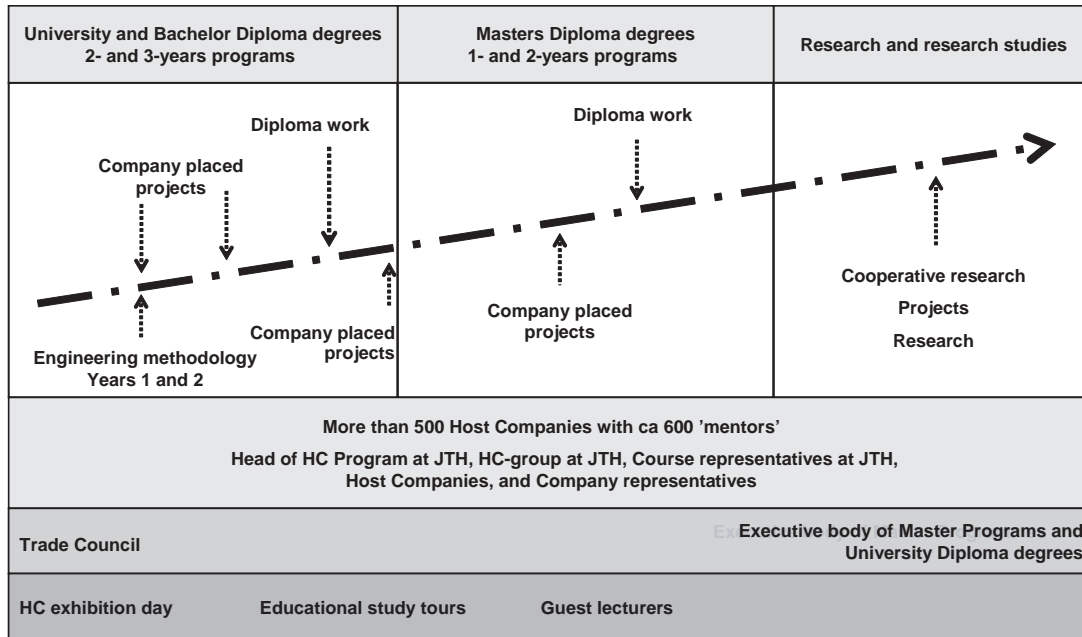


Figure 3. HCP activities and functions at JTH.

The now running activities within the HCP (figures 2 and 3) are:

- Engineering Methodology, years 1 and 2 for all bachelor programs
- Guest lecturers
- Company collaborative projects (within program courses)
- Diploma work, third year for all bachelor programs
- Educational study tours and industry visits
- Company placed projects (provided as an extra-curriculum activity for all students)
- Trade Council
- HC exhibition day (annually)

A web service which provides the companies with the opportunity to advertise project or employment opportunities directly to the students, and where students can learn more about a specific company, is also running.

University-Company Collaborations

Following are short summaries of some of the HCP activities.

The Engineering Methodology Course

One central role for the HCs is within the course “Engineering methodology” (7.5 ECTS) where all students get a HC assigned to them. All students take this course during their first and second years. During this course the students make six visits at “their” HC conducting interviews and studies. They then report their findings as written reports as well as in classroom seminars. This way all students get first hand contact with one company as well as second hand information about several others, preparing them for a life after university studies. This close student-company collaboration provides both

students and companies with an opportunity to establish personal contacts for future contact (in courses, projects, or employment).

Lectures and Company Collaborative Projects

JTH motivates representatives from industry, and its HCs in particular, to visit the university and its students as well as appearing as guest lecturers in university courses within all programs. Both general company presentations as well as domain specific lectures are welcome as it gives the students an in-depth view of industry practice. Also, the HCs are welcome to participate in regular program courses by providing real-life examples (or project tasks) for the students to work on, either as short assignments or as full course-length projects.

Visits

Continuous contact between university staff and company representatives are upheld in part by the contacts within the Engineering Methodology course where university supervisors, throughout all programs, are given time to set up the collaboration. A total of 220 hours have been assigned for this activity. All companies are contacted by phone and in some cases even personal visits are made.

Throughout all programs at JTH educational study tours and industry visits are made, often in collaboration with a HC. This provides students with first person experience of industry practice and a chance to relate theory to practice. Together with other HCP activities it also provides the students with an opportunity to establish personal contacts with representatives from industry. Also JTH staff (both administrative personnel as well as teachers) is given the opportunity to visit industry through educational study tours. This strengthens the personal contacts between university and industry individuals.

Company Placed Projects

JTH provides the opportunity for all students to take the course “Company placed project” (10.5 ECTS and 18.5 ECTS). This is placed during the summer, between the first and second or second and third years, as six or eleven weeks work practice. The students then write a report about their industry practice, and also make a presentation about their experiences.

A second course is also provided to students after their graduation, “Company placed project” (30 ECTS). The purpose of this course is to provide in-depth knowledge about and experience of industry activities and engineering professions. The course requires a total of 18 weeks work practice. The students report their experiences both orally and in writing.

In the university’s two-year programs, which are given in cooperation with several trade associations, company placed projects play a key role throughout the program. These projects are more extensive and span over 20 weeks divided over the two years of study.

JTH continuously develops and intensifies the opportunities to incorporate company placed projects within all its programs.

Appreciations of the Host Company Program

In the Confederation of Swedish Enterprise's study of collaboration for the year 2007, JTH was ranked as number one with 84 percent of the students finding relevant employment within one year of finishing their education. This achievement is according to the evaluators due to the extensive collaboration with industry which has led to the students' high appreciation of their education.

The Host Companies' View on the Program

Every year JTH holds the "host company day" where all companies participating in the host company program are invited to JTH to meet students and teachers. One main activity during this day is a company fair held at the university. In 2007 more than 50 companies were represented by well over 100 representatives. During this fair company representatives get a chance to meet with first, second and third year students. The first year students take this opportunity to familiarize themselves with some of the companies they might get assigned to in the engineering methodology course (running during their first and second years). The third year students as well as the company representatives get a unique opportunity to discuss both diploma work assignments and future employment.

All in all JTH has more than 500 HCs involved in the HCP in some way, although not all of them are active at once. However, JTH's ambition is to expand the collaboration further by engaging a growing number of the involved companies to be active within the HCP activities each year.

Several company representatives have responded positive to the host company program. Following are some of their statements:

"We have always seen this as a very good way of recruiting future co-workers as we get to know students at an early stage." – Henrik Larsson-Hellström, Husqvarna AB in: Jönköpingsposten, November 24, 2006.

"This way we get to recruit new people at the same time as we get a chance to increase our competence level." – Mikael Johansson, PaperPak AB in: JönköpingNU, November 29, 2006.

"You cannot be a business manager if you don't know what the business is all about." – Per Segelryd, Transab AB in: DN.Jobb, January 21, 2007.

"We host a group of students from JTH every year. It feels very meaningful to us as many of the students are very curious and interested. Some return during their last year to perform their diploma thesis and it is also very common that students work here at the manufacturing plant during their summer holidays." – Lisbeth Falkstedt, Fläkt Woods AB in: Dagens Industri, November, 2007.

The Students' View on the Program

The HC collaboration is widely appreciated among the students and is something they would like more of during their education. The goal for JTH is to incorporate as many HC related activities as possible during the education.

One problem is that the HCP includes all students at all programs and that they, depending on their backgrounds and interests, have different expectations and/or experiences of the HC collaboration. Thus it is difficult to satisfy everyone's wishes although JTH continuously strives to develop and perfect the program.

The Future of the Host Company Programme

The development of the HCP is an ongoing activity. In the coming years research collaboration with industry will be further integrated with the HCP, more extensive company placed projects will be integrated in the engineering curriculum, and regional nodes (already in the making) will be set up to further simplify knowledge and need dissemination as well as meeting opportunities between industry and academia.

Goals to Achieve

The following future goals for the HCP at JTH have been set up:

- Make the elements (courses and activities within the HCP program) more appealing to prospective students.
- Thru HC collaboration strengthen the “curriculum concept” and better prepare the students for their roles in industry, especially in SMEs.
- Document the experiences regarding the curriculum concept, especially the HCP, to share with other collaborators.
- Develop a system that evaluates programs against the twelve CDIO-standards, and provides feedback to students and faculty for the purposes of continuous improvement.
- Develop a model for research focused a HCP activity.

References

Berglund, E., Birgersson, J. and Cederfeldt, M., (2008), “Ten+ Years of Successful Workplace Learning Through Host Company Collaboration”, Proceedings of the 4th International CDIO Conference, Hogeschool Gent, Gent, Belgium, June 16-19, 2008.

Confederation of Swedish Enterprise's study of collaboration for the year 2007:
<http://www.hj.se/cmscripts/php/press.php?page=show&id=223>

List of links to Swedish articles on JTH and the host company program.

JTH and company collaboration:

<http://www.svensktnaringsliv.se/skola/hogskolan/article20078.ece>

Collaboration with Husqvarna AB:

<http://www.svensktnaringsliv.se/skola/hogskolan/article20089.ece>

Jönköping University – a good example of industry collaboration:

<http://www.svensktnaringsliv.se/material/rapporter/article245.ece>

Jönköping University – a good example of industry collaboration:

<http://www.svensktnaringsliv.se/material/debattartikel/article3241.ece>

University studies in Jönköping leads to quick employment:

<http://www.svensktnaringsliv.se/regioner/jonkoping/article26812.ece>

Host companies employ students:

http://www.teknikforetagen.se/upload/sve/Teknikforetagen_Direkt_nr2_06.pdf