



SHare, Improve, develop: today's excelleNce for tomorrow's HVET
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Intellectual Output 1 – National surveys

Sweden

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Intellectual Output 1: National Survey Best Practice - Sweden

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1. Summary

1.1 Swedish Summary

Högre yrkesutbildning på EQF-nivå 5 utgörs i Sverige av Yrkeshögskolexamen och av teknikprogrammets fjärde år, den s.k. gymnasieingenjörsexamen eller T4.

Yrkeshögskolan och T4 tillhör olika utbildningstraditioner och förvaltas av två olika statliga myndigheter; Myndigheten för Yrkeshögskolan och Skolverket. Yrkeshögskolan är en del av en klassisk yrkesutbildningstradition och vänder sig till personer i olika åldrar med förkunskaper företrädesvis från yrkesförberedande gymnasieutbildningar på EQF 4 och/eller reella förkunskaper, medan T4 har unga studenter från det studieförberedande teknikprogrammet på EQF 4 som målgrupp och ger behörighet för högre akademiska studier på EQF 6. Gemensamt för Yrkeshögskolan och T4 är att utbildningarna vänder sig till studerande som vill få en tydlig yrkesroll och kunna gå direkt till anställning efter avslutad utbildning. Båda utbildningskoncepten bygger därför på samverkan mellan utbildningsanordnare och lokala företag, som på olika sätt förväntas delta i utbildningarna genom att ingå i ledningsgrupp/utbildningsråd, kvalitetssäkra utbildningsmål och kursplaner samt erbjuda LIA/APL-platser.

I denna översikt har vi beskrivit två framgångsrika högre yrkesutbildningar för produktionsindustrin på EQF-nivå 5; Yrkeshögskoleutbildningarna på Göteborgs Tekniska College samt T4-utbildningarna på Kurt Nicolin Gymnasiet i Finspång. Vi har valt dessa utbildningar därför att de representerar goda exempel på innovation och anställningsbarhet, samt har en intressant ägarstruktur i form av samverkan kommun – näringsliv - skola. Göteborg är en av Sveriges största och viktigaste industristäder och Finspång är en liten, modern bruksort. Båda städerna har under de senaste decennierna genomgått tydliga strukturförändringar som lett till krav på högre utbildning bland de anställda i produktionsindustrin. Samarbetet mellan den lokala industrin och utbildningsanordnarna kan beskrivas som ett innovativt svar på industrins behov av mer kvalificerade medarbetare, men också på medborgarnas behov av att genom lokalt anpassade yrkesutbildningar bli anställningsbara på kortast möjliga tid. Yrkeshögskolan är här särskilt intressant, eftersom den genom möjligheten att anta 20 % av de studerande baserat på reell kompetens, står öppen även för studerande som av olika skäl inte har en fullständig utbildning på EQF 4. Icke godkända betyg på EQF 4, d.v.s. avsaknad av gymnasieexamen, är tyvärr ett växande problem i Sverige. Problemet kan med hänsyn till det stora antalet nyanlända flyktingar, som måst försaka sin grundläggande utbildning, förväntas öka under kommande år. Här kan Yrkeshögskolan komma att spela en än viktigare roll, inte minst genom att driva utvecklingen av alternativa behörighetskrav och validering av reell kompetens.

En styrka, men också en risk, med Yrkeshögskolan och T4 är att de är anpassade efter en dynamisk arbetsmarknad, d.v.s. att bara yrkesroller som för tillfället efterfrågas av arbetsgivarna beviljas statlig finansiering. För Yrkeshögskolan beviljas två starter och för T4 beviljas fyra år av finansiering. För teknikutbildningar som kräver dyr utrustning och spetskompetens hos utbildarna utgör de korta beviljandena och den hårda konkurrensen om statliga medel en risk att kvaliteten på utbildningarna påverkas negativt. Hur myndigheterna planerar att hantera detta är en intressant frågeställning inför framtiden.

1.2 English Summary

HVET on EQF 5 in Sweden consists of the HVE Diploma and the fourth year of the technology programme, i.e. the Upper Secondary Engineering Diploma or the T4.

HVE and T4 belong to two different traditions of education and are governed by two national agencies; The National Agency for Higher Education (HVE) and The National Agency for Education. HVE is part of a tradition of vocational education and targets students of different ages with primarily vocational education on EQF 4 and/or working experience, i.e. real skills. Entering T4 requires a diploma from the academic upper secondary school on EQF 4 and graduation gives access to higher academic studies on EQF 6. HVE and T4 target students who wish to achieve a distinct profession and go straight to employment after graduating. Both concepts are therefore based on a close collaboration with the local industry, which in different ways participate in the programmes by taking part in steering committees/education counsels, ensuring learning outcomes and offering internship.

In this survey we have described two examples of best practice in HVE on EQF 5; HVE at Gothenburg Technical College and T4 at the Curt Nicolin School in Finspång. We have chosen these programmes because they represent best practice in terms of innovation and employability and because they have an interesting ownership structure with collaboration between local government – industry – school. Gothenburg is a major Swedish industrial city and Finspång is a small, modern industrial town. During the last couple of decades both cities have undergone structural changes which have led to a need for more qualified production workers. The collaboration between local industry and education providers can be described as an innovative answer to the need for more qualified workers in the production industry, but also as a way of quickly making the citizens employable by the means of locally customized HVE. The National Agency for HVE is especially interesting in this regard, as it allows for 20% of a class to gain access to a programme based on real skills, i.e. students who have work experience but lack a diploma on EQF 4. Students failing to qualify for a diploma on EQF 4 is an increasing problem in Sweden. Considering the big number of refugees who have arrived in Sweden lately, of which many have been forced to give up their basic education, the problem can be expected to be intensified in the years to come. The National Agency for HVE might be able to play a crucial part here, by developing flexible entry requirements and validation of real skills.

An advantage, but also a risk, with HVE and T4 is that they are tailored for a dynamic market situation, i.e. that only programmes and competences requested by the employers are allowed government grants. A HVE programme is allowed grants for two starts and T4 for four years. For a technical programme, which requires expensive equipment and highly specialized teachers, the short term conditions and the competition for grants, can jeopardize the quality of the HVE programmes. How the National Agencies for Education and for Higher Education plan to solve this is an interesting question for future discussion.

2. Description of own context, economic, social features

2.1 Gothenburg and the Region of Västra Götaland

Gothenburg is the second largest city in Sweden and is located in the Region of Västra Götaland, VGR (see appendix 7.1). In 2014, 1.6 million people (1/6 of all Swedes) lived in the region and 541 000 of these lived in Gothenburg. During the last ten years Gothenburg has grown by 11% due to urbanization. The inhabitants of VGR are expected to grow to 1.9 millions by 2030, mainly because of foreign migration to the region.

VGR has a proud heritage of industrial production, specifically the automotive industry, with early 20th century industrial brands such as Volvo, SAAB and SKF. Diversity is another characteristic of the region and has been since the first migrants from south Europe arrived to work in the factories in the 1950's. In 2014, 266 000 inhabitants in VGR were born abroad and another 86 000 had two parents who were born in another country. In the city of Gothenburg 25% has a foreign background.

In 2014, 64% of the inhabitants (age 20-64) in VGR had a formal education equaling EQF 4 or higher and 39% had an education equaling EQF 5 or higher. Women have a higher degree of education than men. In Gothenburg only 72% of the students in upper secondary school (age 16-19) finish their education within the timeframe (3-4 years) and get a diploma on EQF 4. This leaves 28% of the young adults with the need of supplementary education on level 4 in order to be able to go on to level 5 or to employment.

The employment rate (age 20-64) in 2014 in VGR was 77%, which is the average in Sweden. The unemployment rate (age 20-64) in VGR was 6,9% in May 2015. Amongst young adults (age 18-24) the unemployment rate was 10,4%.

The second biggest field of employment in VGR is the production industry, specifically the automotive industry, and among the ten largest employers in 2015 you will find Volvo Cars (13 175 employees), Volvo Group, Ericsson, Astra Zeneca, and Chalmers Institute of Technology.

The industrial heritage with large automotive companies has led to a low rate (10%) of self-employed inhabitants in the region. In 2014, 14 000 companies were founded in VGR, i.e. 12,9 %. 1/3 of these were founded by women and 20% were within the industrial sector. When it comes to Research and Development the region is within the top 20 in Europe, spending 2,9% of the GRP on R&D in 2011 compared to the average 1,3% in the EU. Smart Specialization and RIS3-strategies in the region focus on transports, biochemistry and health. Science and Technology Parks (STP), such as the Lindholmen Science Park, which Gothenburg Technical College is connected to, are at the center of the specialization strategies of the region. Lindholmen STP is the second largest STP in the country and is an important arena for the triple helix of the region, with the Volvo companies, Chalmers Institute of Technology and Business Region Gothenburg as important players.

All statistics in this chapter are taken from: <http://www.ekonomifakta.se> and http://www.vgregion.se/upload/Regionutveckling/Publikationer/FaktaVG/Fakta_2015.pdf.

2.2 Finspång and the Region of Östergötland

Finspång is a small, modern industrial town in the Region of Östergötland (see appendix 7.1), with 20 000 inhabitants in the municipality and 12 000 in the town of Finspång. The town is a mix of traditional industrial town and modern municipality. The production industry provides 45% of the employment and many of the companies are high-tech and in need of well educated engineers and others.

During the 1990's the number of inhabitants in the Region of Östergötland decreased, but the last ten years the trend has been turned and the number of inhabitants is now again growing by approximately 2300 per year, mainly because of foreign migration. In 2012, 4063 of the inhabitants in Finspång, i.e. 20 %, were born abroad.

In 2013, 25% of the men and 37% of the women (age 30-44) in Östergötland had a formal education on EQF 6 or higher. This is slightly lower than the average in Sweden. An education on EQF 4 is still most common in Östergötland with 49% of the men and 40% of the women having an upper secondary school diploma as their highest education. Statistics from 2013 show that in Östergötland 77,1% of the students finishes their upper secondary education within the timeframe and gets a diploma on EQF 4. This leaves almost 23% of the young adults with the need for complementary and/or alternative education on EQF 4.

Östergötland had the second highest unemployment rate of all Swedish regions with 10% in unemployment in 2012. The production industry has traditionally been the number one employer in Finspång, with electronic equipment, metal products, and transportations as major products. Today the production industry is the third biggest employer in Östergötland, with public services and company services on places one and two. The number of inhabitants in the region decreased in the 1990's as a result of the employment rate (age 20-64) dropping from 85% in the late 1980's to 75% in employment in 2012. The production industry keeps decreasing, especially in electronic equipment, where approximately 1 300 jobs have been lost, according to statistics from 2012. In 2015 Siemens is the biggest employer in Finspång with 2 625 employees.

The number of new companies and innovation in Finspång is 6,1%, which is the seventh lowest in Sweden. The number of companies starting up and closing down in the region of Östergötland has followed the global economic situation. Altogether, there is a net surplus of new companies, which in the boom 2004 – 2008 led to 550 new jobs. 2012 – 2015 there have been 200 new jobs per year in Östergötland.

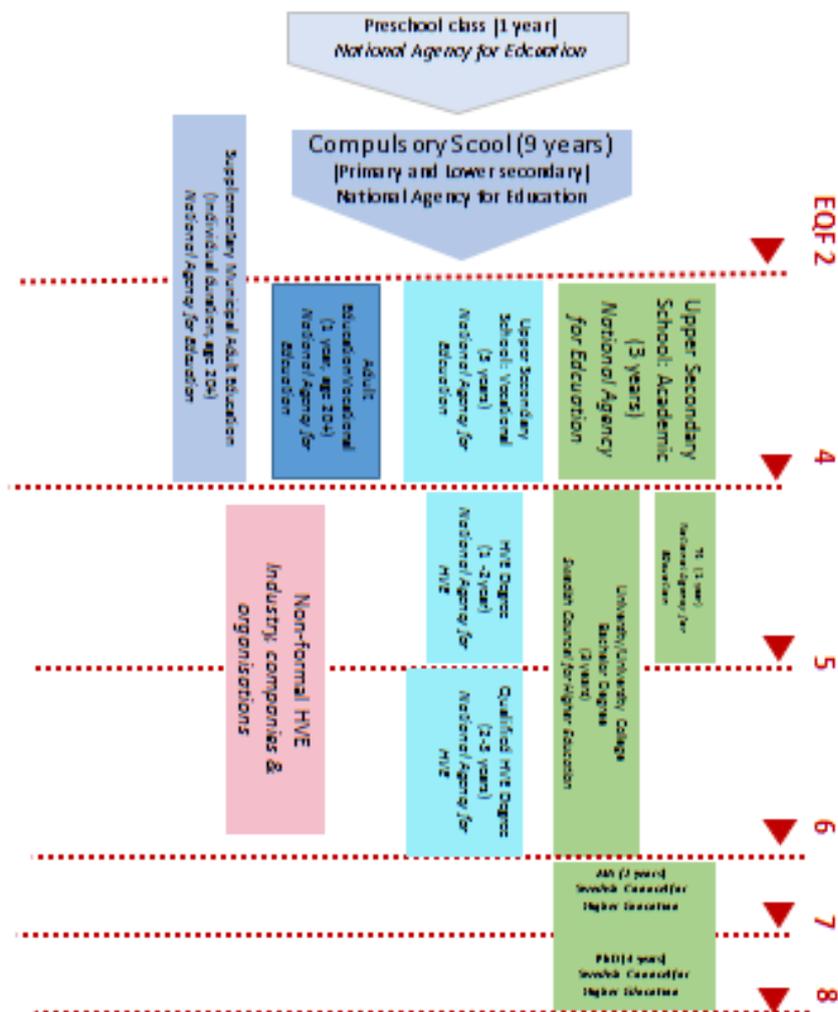
Smart specialization in Östergötland focuses on efficient logistics, business models and arenas for sustainable system solutions, smart internet-integrated communication systems, simulation and visualization and advanced materials, e.g. graphen. The University of Linköping is an important player in driving smart specialization and regional innovation strategies in Östergötland together with East Sweden Business Region and approximately 40 regional companies and organizations.

All statistics in this chapter are taken from: <http://www.ekonomifakta.se> and

https://wssex.regionostergotland.se/regsam/Samhällsbyggnad/Hur_går_det_för_Östergötland_0617.pdf

3. Structure of national school and VET system

3.1. Infographic



The Swedish school system consists of a one year voluntary preschool-class and a nine year mandatory Compulsory School (EQF 3 - age 7-16) followed by three years (age 16-19) of voluntary Upper Secondary School (EQF 4). Upper Secondary School is the first level on which students can choose a VET programme. Statistics from 2014 show that 96% of the 16 year-olds goes to Upper Secondary School, but only 88,5% finishes with an EQF 4 diploma. Of the graduates, 84% has followed a VET programme and 91% an academic programme.

For students who do not complete Upper Secondary School, a VET programme on level 4 in a Municipal Adult Education (age 20 +) or a Supplementary Education on level 4 can be a good alternative and could give access to level 5.

It is possible for a student to gain access to a programme in a college for Higher Vocational Education (EQF 5) without having completed VET-studies on level 4, as the entry requirements vary and are stipulated by the local provider. A student cannot gain access to University and University College based on VET-studies on level 4, but would have to take supplementary academic courses to gain access to academic training on these levels. A student with an academic education on level 4 can go directly to an academic education with learning outcome on level 5 or 6.

On EQF 5 we find two types of education; Higher Vocational Education authorized by the National Agency of HVE and the fourth year of the technical programme of the Academic Upper Secondary School, The T4, which leads to a Upper Secondary Engineering Diploma on level 5. As mentioned above, an HVE programme could be accessed by different local entry requirements, while the T4 follows a national curriculum and can be accessed by three years of studies of technology in Upper Secondary School.

All levels in the Swedish education system, from pre-school to university, are free of charge to the students as they are financed by the municipality (EQF 2-4) and the national government (EQF 5-8).

3.2. Definition of HVET in partner country

In Sweden, Higher Vocational Education and Training is found on EQF levels 5 and 6.

On level 5 there are two types of education; Higher Vocational Education which leads to a HVE diploma (turquoise info graphic) and The T4, the fourth year of the Technical programme of the Academic Upper Secondary School, which leads to a Upper Secondary Engineering diploma (green info graphic) . There are two national agencies, the National Agency of Education and the National Agency of Higher Vocational Education, which govern the programmes. Education providers for HVET are institutions or establishments such as universities, local authorities or private training companies. Providers of T4 are usually Upper Secondary Schools, public or private.

HVET targets students who, unlike academic students, want to be able to go straight to employment after graduating. HVE and T4 both combine theoretic studies with internship (a minimum of 10 weeks = approximately 25% for T4 and 25% for HVE) and require a close cooperation between schools and companies. A steering committee or a local education counsel with representatives from the industry is connected to every programme in order to secure that the curriculum is relevant and the students employable.

Both T4 and HVE are tailored to suit an evolving market place situation. The range of programmes and specializations will therefore change over time and span over a number of different fields. A new programme can only get authorization if there is a clear lack of competences and a need for employment within the industry. Business and organizations tied to the programmes take an active part in the planning as well as the conducting of the programmes.

HVE and T4 are both free of charge for the students. The studies also entitle you to a student grant with the National Agency for Financial Aid for Studies, an opportunity which enables everyone in Sweden to study, regardless of social or economic background.

An interesting future possibility was presented by the National Agency in 2015 when the Agency declared that based on the Swedish quality framework, SeQF, the agency plan to

validate *non-formal education outside the formal education system*, for example courses and certificates given by the industry, on level 5. Perhaps we will see new types of innovative non-formal education on EQF 5 in the future.

On level 6 a Qualified Vocational Education diploma, issued by the National Agency of HVE, can be achieved and the same criteria as for HVE on level 5 apply.

4. Methodology for identification of best practices

We have chosen to describe the practice of two education providers from the two existing types of education on EQF 5; HVE and T4. HVE and T4 come from different educational traditions, but have a lot in common and it is therefore interesting to compare them and see in which way they both contribute to best practice in vocational education in Sweden. HVE here is represented by Gothenburg Technical College (GTC) in the Region of Västra Götaland and T4 by Curt Nicolin Gymnasium School (CNG) in Finspång in the Region of Östergötland.

The two education providers have a lot in common, for example a unique and innovative ownership structure with an active triple helix; Gothenburg Technical College is owned by the City of Gothenburg (49%), Volvo Cars (25,5%) and Volvo Group (25,5%), three of the biggest employers in the region. The Curt Nicolin School is owned by the City of Finspång (49%) and the local industry (51%). The company boards of both schools consist of local government representatives and members of the local industry. In this way the triple helix share the responsibility in meeting the structural challenge of matching education and competence needed by the employers and for ensuring competence, employability and growth in the region.

The outcome of HVE at GTC and T4 at CNG cannot be measured in the number of students, which is relatively low, but in the degree of innovation and the employability of the students who graduate. Let us now take a closer look at the two programmes.

4.1 HVE at Gothenburg Technical College

HVE at GTC consists of three programmes; Production Engineering (2 years/400 HVE units, full time studies = Qualified HVE Diploma, EQF 6), Production Logistics and Production Development (2 years/200 units, part time studies = HVE Diploma, EQF 5). In January 2016 there are a total of 90 students in all three programmes. The HVE programmes at Gothenburg Technical College target students with working experience from the production industry, an experience which is considered important to comprehend the complexity of the professions the programmes lead to. One year (two for part time studies) of working experience from the production industry is an entry requirement on GTC's HVE programmes.

For several years Gothenburg Technical College struggled to find the right applicants with the right backgrounds to fill the classrooms. When in 2010 a new concept with part time studies and blended learning was introduced, the situation changed and application numbers kept rising (e.g. 3.5 qualified applicants per place on Production Engineering, start Jan 2016).

Today two out of three HVE programmes at Gothenburg Technical College are part time blended learning and the flexibility of the concept is a good example of best practice. The students all work full time in the production industry and study part time in college. They come to college one night a week for lectures and then study at home with the help of GTC's learning management system after work. Part time blended learning studies is an excellent way to provide life long learning for groups who otherwise would not be able to prioritize studies. The studies are free of charge (as they are funded by the National Agency). Students do not need to take a leave of absence and take on a mortgage for financial aid for studies, but can support themselves and their families by working as usual. The studies are also easily available in the sense that they are performed in an environment which is well known to the target group, the Learning Centre in the Volvo Cars plant, and not at a University Campus, which might seem discouraging to students from a certain social background. One final point which facilitates access to studies for the target group is the flexibility of the entry requirements. Formal entry requirements for Production Engineering are: Two years of working experience from the production industry, an EQF 4 diploma with passing grades in Mathematics 1 (Ma1A) - *or the equivalent*. This means that students who for example have the working experience, but not the level 4 diploma, can gain access to the programme *through validation of real skills*, i.e. a test which ensures that the student has *the experience and knowledge equivalent of a level 4 diploma*. 20% of the places on a programme can be reserved for students with this background.

Finally, part time blended learning HVE at Gothenburg Technical College is an example of best practice in the sense that the combination of working experience and theoretical studies and the fact that the employees do not have to quit their jobs to go back to school, is highly appreciated by the employers. They get to keep their best employees while securing new competences for the future and it does not cost the company a penny. A student from, for example Volvo Cars, who works day time in production and studies part time at Gothenburg Technical College can easily take on the roll as production engineer at Volvo after graduating, as he or she is already familiar with production engineering at Volvo. This is shown by the high employment rates with an average of 70% employment six months after graduation in the last three groups measured.

4.2 T4 at the Curt Nicolin School in Finspång

T4 at Curt Nicolin offers an Upper Secondary School Engineering Diploma in Production Engineering or in Design and Product Development (one year/900 units, full time studies = Upper Secondary School Engineer Diploma, EQF 5). In 2015, there are approximately 15 students in T4 and since 2012 75 students have graduated from T4 at CNG. T4 targets students who wish to go straight to employment in the local production industry. Entry requirements are national and not as flexible as for HVE at GTC, but stipulate an upper secondary school diploma from the technical programme on EQF 4, a diploma which the Curt Nicolin School offers. The students in the T4 are therefor young adults who have previously studied at the CNG or in similar programmes in other schools and want to enhance their level of employability in the production industry.

Best practice at CNG can partly be found in the innovative methods of pedagogy. The school strives to "provide the best basis for a modern work life" and to achieve this Curt Nicolin uses a problem-based learning method with a lot of project work – just as in the industry. 1/3 (12

weeks) of the T4 at CNG consists of internship and a final thesis is written on commission by a local company. The thesis being a sharp project for the local industry means that the T4 contributes very much to local innovation and entrepreneurship already before graduation. The close collaboration also means that student and employer create a relationship which facilitates future employment.

Just as in Gothenburg, best practice in Finspång can above all be measured in the employability of the students and the satisfaction of the employers. 70% of the students who graduate from Curt Nicolin are employed in the production industry and the remaining 30% go on to further academic studies on EQF 6. For students who, despite the network a long internship gives, find it hard to find employment after graduation, there is a three month employment guarantee from CNG and the owning companies, to facilitate building a CV and getting a kick start on the labour market.

5. Description of each practice identified

5.1 HVE at Gothenburg Technical College

The first HVE programme at Gothenburg Technical College, Production Development, started in 2001, and when the National Agency of HVE was founded in 2009, the programme was incorporated in the framework of the National Agency.

Players involved in the programme are the following: *The steering committee*, which according to the regulations of the National Agency has to include members of the industry (Volvo Cars, Volvo Group, SKF, and other subcontractors in the automotive industry), a representative of a higher educational institution (Chalmers University of Technology, EQF 6-8), a representative of the municipality (the City of Gothenburg) and student representatives. In this way, the triple helix is a regulated part of every HVE education in Sweden. *The reference groups*, one for every programme, consist of active representatives of the professions the programme is aimed at, is a player which contributes with input on learning outcomes and syllabuses. Finally *the National Agency* is an important player, as it is they who decide whether the programmes will be included in the HVE framework and be allowed government grants.

When a new programme is developed, a lack of competence is defined by the companies in the steering committee, which then gives Gothenburg Technical College the assignment to create an HVE-programme to supply the competences. In dialogue with the reference groups the learning outcomes of the programme are defined and syllabuses are written. An application to the National Agency is written in August and the following January the Agency declares which programmes will be included in the framework. If the programme is approved, Gothenburg Technical College can start marketing it to students and prepare for a start in September.

An ongoing programme is governed by the National Agency and the steering committee, which meets four times a year. The steering committee makes all formal decisions, such as issuing admissions and diplomas, approving curriculums and quality control.

25 % of a Qualified HVE programme should be internship and at Gothenburg Technical College theoretic studies in college are combined with internship throughout the programme with two to four periods of internship in two years. A programme usually starts with "the tools

for learning”, i.e. Excel, Mathematics, Communication and Project Management. It then goes on to basic courses, which are followed by advanced courses and a specialization. The theoretic studies end with a project in which all competences are required. The final internship is also ended by a project, which usually consists of a real project in the work place. As the programme progresses the pedagogics go from traditional lectures via case studies and simulations to independent project work as practiced in the industry, which prepare the students for employment. The faculty is a combination of traditional teachers with a degree from Teachers College and trainers with experience from the industry, who make for great role models in building a professional identity. This makes for a dynamic faculty with focus both on pedagogics and the expectations from potential employers.

Innovation and entrepreneurship is an overall perspective throughout the programme and should be taken into all courses. Primary learning outcomes for Production Development are; *Methods of Problem Solving - cause related solution-methodology for long-term and sustainable solutions* and *Approaches for Engineering - Quality/Lean methodology for analyzing results and solution proposals for optimizing and efficiency*. In this way, the students are able to contribute to supporting innovation in companies after graduating. Very often this is seen already during the final internship and there have been many good examples of students' projects, which have had an impressive innovative impact in the companies.

A programme which is approved by the National Agency of HVE is allowed grants for two starts, which with most education providers means a first start in September and a second start in January or the following September. Most programmes are two years long and this means that in order to always have HVE programmes available to students and industry, a provider has to apply for new starts every year. As the competition is steep (in January 2015 only 27% of the applications was accepted) being an HVE provider in Sweden is a very uncertain business. This makes it hard to develop a long term relationship with the industry and it is difficult for providers to invest in expensive equipment, as it is uncertain for how long the programme will receive funding. The same goes for employing teachers. Most providers cannot take on the long term costs and responsibilities of employing teachers and instead use expensive short time consultants without greater knowledge of the overall objectives of the programmes. Gothenburg Technical College is an exception here with almost all HVE teachers employed by the college. While the short term grants from the National Agency for HVE may be beneficial for an evolving market place situation, there is a great risk that the factors listed above will affect the quality of the HVE programmes.

5.2 T4 at the Curt Nicolin School in Finspång

With the national reform of the Upper Secondary School in 1994 the fourth year of the technical programme was abandoned. Up until then it had been a very popular programme and part of the European tradition of Polytechnics, much appreciated by students and employers. The T4 was reintroduced at Curt Nicolin in August 2012 as part of The National Agency for Education's pilot project of the T4 and is now part of CNG's permanent programmes.

Unlike the HVE programmes with their local curriculums, the T4 follows a national curriculum established by the National Agency for Education. The programme targets students who

wish to continue their studies in Upper Secondary School for a fourth year in order to go straight to employment. The T4 can also be seen as a preparation for academic studies in technology on EQF levels 6 – 8. Entry requirement for the T4 is a diploma on EQF 4 from the technical programme. Students do not have to go straight from the third year to the fourth, but can take a break, as long as they start the programme before their 22nd birthday. This is an important difference compared to an HVE programme, which does not have any limitations in age, but is open to students regardless of age.

Players involved in the T4 are the following: *The local education counsel* which at Curt Nicolin consists of the owners Borggårds Bruk, Coor Service Management, Finspångs Allmekano, Finspångs Finmekaniska, Finspångs Kommun, Grytgöls Bruk, Igelfors Bruk, IUC Öst, KL Industri, Lämneå Bruk, Saab Aerostructures, Gränges, Sapa Profiler, Sapa Technology, Siemens, Toyota Material Handling and Väderstadverken. The education counsel plays a role similar to the one of the steering committee of the HVE programmes, i.e. it ensures that the education is relevant and the students employable. This means that though the curriculum and the learning outcomes of the T4 are national and provided by the National Agency, a T4 programme is still the result of a need for competences from the local industry in the education counsel, just as an HVE programme. *The National Agency for Education* is another important player, as it is they who decide the curriculum for the T4 and allow government grants. It is also the National Agency who performs quality control and inspections.

As mentioned above, the T4 follows a national curriculum, developed by the National Agency for Education. As a pilot for T4, CNG and the companies connected to it took part in developing the curriculum and giving in-put to the agency. In order to receive government grants and permission to start a T4 programme, an education provider has to write an application to the National Agency and show that the provider has the necessary network of companies to form a local education counsel and provide internship. An ongoing programme is then governed by the education counsel and the National Agency.

Unlike HVE at GTC, which does not stipulate any specific programme on EQF 4 as an entry requirement but builds on working experience and therefore has to start a programme with the theoretic tools for learning and the basics in production engineering, the T4, which builds directly on the technical programme on EQF 4, can go straight to the more advanced courses on EQF 5 and focus on providing new working experience. Problem-based learning is used throughout the programme and as the studies advance, there is a greater emphasis on project, innovation and entrepreneurship. A minimum of 10 weeks or approximately 25% of the T4 should consist of internship. CNG offers 1/3 of the programme as internship. All students take the course *The Upper Secondary School Engineer in Practice* and complete a final thesis before graduating. Innovation and entrepreneurship are ensured by the National Agency with the CDIO model (Conceive, Design, Implement, Operate).

As mentioned earlier, the three years of the Swedish Upper Secondary School are financed by the municipality, but education providers who wish to offer a fourth year, apply for government grants from the National Agency for Education. The grant is allowed for four years (i.e. four starts of the programme) and then has to be reapplied for. Grants are issued by the National Agency “to the extent of funds”, which in reality means that, just as for the

HVE programmes, the continuity of the T4 programmes at the Curt Nicolin School are uncertain.

6. List of references

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7. Appendix

7.1 Map Regions of Sweden



Region of Västra Götaland
(VGR)

Region of Östergötland

7.2 Swedish HVE System

