Building Educational Cooperation in Smart Cities

Handbook

Nordplus Horizontal 2018

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Responsible partner: International School of Tallinn

Project coordinator: Estonian Entrepreneurship University of Applied Sciences

Contents

Abstract

This project is formed around the common interests of participating educational institutions to provide qualified graduates to the labor market, taking into account the real needs of enterprises to perform in fast and flexible ways. The differences between what has been taught in schools and what kinds of skills enterprises actually need has grown over time, resulting in higher unemployment and enterprises that still lack a skillful workforce.

The overall aim of the project is to support the creation of a new multicultural network of knowledge transfer and innovation between educational institutions, enterprises and sector organisations, and to further support the close cooperation between these groups in Nordic and Baltic countries.

This fully corresponds to two general objectives of Nordplus 2018-2022 program which are:

- support, build on, reap the benefits of and promote innovative products and processes in education through the systematic exchange of experiences and good practice;
- contribute to the development of quality and innovation in the educational systems for lifelong learning in the participating Nordplus countries through cooperation in education and training, as well as cooperation with the labour market on development projects, exchange programmes and networking

Objectives

As partners from educational institutions experience a growing need to support students and teachers, there has been a related push for cooperation and sharing of ideas between these groups. The networking activities of the present project have been organised with this in mind. Particularly from the perspective of innovation, learning is of critical importance, taking place in horizontal networks of educational institutions of different levels, enterprises, sector organisations and others.

The cross-sectoral dimension of the project is related to the choice and participation of partners, extending from different levels withing educational organisations to businesses and sector organisations. This kind of partnership is vital as the main objective of the project is to find and describe flexible ways, study methods and/or curricula development for meeting the rapidly

changing demands of enterprises towards the specific skills of graduates. The economic sectors concerned are differing from country to country, but the ways to reach cooperation with businesses in order to enhance innovation in teaching methods or environments, could be similar or adaptable to different sectors. Therefore, it is crucial to examine today's process of cooperation with enterprises within different partnering countries and cross-sectoral educational institutions to find suitable model(s).

The concrete objectives are:

- thematic reports on three themes of the project - work-based learning, entrepreneurship and IT/digitalization which entails both methodological part as well as a collection of case studies from partnering countries
- study tours implemented in these themes to evaluate and complement the reports with the results of study tours and discussions
- a handbook that entails the end results and findings of the three thematic reports;
- dissemination of handbook via events, web and other media means;
- established network that shares knowledge and works together to improve the cooperation within the network partners as well as outside.

The Estonian Entrepreneurship University of Applied Sciences takes a role as project coordinator. The responsibilities for work packages are shared between partners so that each partner has a specific role and no-one is a "silent partner" in the network. Other partners are participating in activities according to their specific interest and/or experience. Participating in the discussions, making presentations and being part of dissemination process are helping to achieve the project aims and bring extra value to the project outcome.

This project is innovative in the way that it goes beyond traditional university-enterprise cooperation. It extends also to other levels of the educational sector and sectoral organisations in order to enhance innovative solutions arising from different setups within the network. It also involves students in the process. In addition to this, one of the themes – work-based learning is an innovative study method that has not been used extensively in the world and, therefore, the members of the network are interested to learn more about it.

The long-term influence can be seen as the involvement in education has risen, graduates are satisfied with the education as they find jobs more easily after finishing school. Enterprises are

more satisfied as they find employees who are in much greater detail meeting their real needs towards the skills of employees.

International cooperation in this project adds value because:

- It enables participants to experience different cultures and environments, thus the participants (especially students) get a sense of accomplishment in international scale in the longer term. It also enables the exchange of ideas, teaching methods, and learning and have cooperation with companies (lecturers).
- From students point of view, they see innovative companies and their working environments, learn more about different themes and meet students from different countries, who share the same interests.

Development of areas concerned with intercultural and cross-cultural understanding and communication within educational and academic contexts related to new and innovative work cultures of enterprises.

Long term, it offers excellent opportunities for the Ülemiste Smart City campus https://www.ulemistecity.ee/ 26 out of 450 companies and organizations in Estonia to network and exchange knowledge together with 130 Nordic and Baltic schools students, lectors, and experts. The long term influence can be seen as the involvement in education has risen, graduates are satisfied with the education as they find jobs more easily after finishing school. Enterprises are more satisfied as they find employees who are in much greater detail meeting their real needs towards the skills of employees.

The project activities are focusing on three main themes:

Entrepreneurship - participating in this project can offer a clear surplus value for students and lecturers, who can meet the industry key players in Estonia, with the example of Ülemiste Smart City. The project brings together different parties (employers, students, teachers, administrators and other experts from partner countries) to exchange experiences and knowledge and build up stronger network where mutual expectations, possibilities and patterns are more clear. Another side of this topic is employability. It is a common goal for all parties. The study visits will broaden the understanding of how the enterprises work (in Estonian example), what are the different modern and innovative working cultures, what are the most urgently needed skill sets that

enterprises need from their employees etc. The specific sectors for study visits will be agreed during the kickoff meeting.

IT&Digitalisation – Estonian Entrepreneurship University of Applied Sciences has a very strong curricula within IT/startup studies. Within this package the methods and possibilities are explored of how IT/digitalisation is working within enterprises of different sectors or within the activities of different subjects (e.g. finances). The solutions (both products and/or services) of Estonia as a digi-country based on e-Estonia Briefing Centre https://e-estonia.com/about-us/ are explored and discussed among the partners. It may entail also visits of enterprises and universities with specific focus. Thematic report and study tour are organised within this theme.

Work-based learning – work-based learning is an innovative and rapidly growing study method of matching the skills taught in educational institutions with the new requirements of enterprises. There are very few (if any) guidelines about how to organise such cooperation, both from the point of view of educational institution and enterprise, e.g what can be the obstacles and what could be the possible solutions to overcome them, how universities can approach the enterprises or vice versa, what are the benefits to both sides etc. Thematic report and study tour are organised within this theme.

The project results will be summarized in a publicly available electronic handbook. The handbook is not only a collection of the results but serves as guidelines for other educational institutions and enterprises beyond current network about how to cooperate to achieve the best results in terms of up-to-date skills of graduates.

For more about the project: www.euas.eu/nordplus2019

Partner Institutions

Coordinating institution:

Estonian Entrepreneurship University of Applied Sciences (EUAS)

Website: https://www.euas.eu/

Facebook: https://www.facebook.com/euas.eu/

Partner institutions:

University of Akureyri (UA)

Website: https://www.unak.is/

Facebook: https://www.facebook.com/haskolinnaakureyri/

Twitter: @haskolinn_ak

Vilniaus kolegija / University of Applied Sciences (VIKO)

Website: www.viko.lt, www.vvf.viko.lt

Facebook: https://www.facebook.com/viko.vvf/

Twitter: @vikolt

Vidzeme University of Applied Sciences (ViA)

Website: http://va.lv/lv

Facebook: https://www.facebook.com/VidzemesAugstskola/

Twitter:@vidzaugstskola

Oulu University of Applied Sciences (OUAS)

Website: https://www.oamk.fi/fi/

Facebook: https://www.facebook.com/oamk.ouas

Twitter: @oamk_ouas

Norwegian University of Science and Technology (NUST)

Website: https://www.ntnu.edu/

Facebook: https://www.facebook.com/NtnuInternational

Twitter: @NTNU

International School of Tallinn (IST)

Website: https://ist.ee/

Facebook: https://www.facebook.com/InternationalSchoolofTallinn/

Mainor AS

Website: http://mainor.ee/

Facebook: https://www.facebook.com/ulemistecity

Tampere University of Applied Sciences (TAMK)

Website: http://www.tamk.fi/ and https://proakatemia.fi/

Facebook: https://www.facebook.com/tampereenamk/

Twitter: @TAMK_UAS

Aalborg University (AAU)

Website: https://www.aau.dk/

Facebook: https://www.facebook.com/AalborgUniversitet/

1. Entrepreneurship

1.1 Defining Entrepreneurship

Entrepreneurship is essential in all organisations, from small, independent businesses to large multinational companies and public sector organisations. The importance of entrepreneurship is stressed in policy documents and scholarly reports. According to the European Commission's Entrepreneurship in Europe Green Paper, entrepreneurship is essential as it: *contributes to job creation and growth, is crucial to competitiveness, unlocks personal potential and contributes to societal interests.*[1]

There are many definitions of entrepreneurship. According to P. Drucker (1985) "Entrepreneurship is an act of innovation that involves endowing existing resources with new wealth-producing capacity."[2] The European Commission meanwhile defines 'entrepreneurship' as: "the mindset and process to create and develop economic activity by blending risk-taking, creativity and/or innovation with sound management, within a new or an existing organisation."[3]

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[1] European Commission, Entrepreneurship in Europe, Green Paper, Brussels, 21.01.2003, COM(2003) 27 final,Available from: https://ec.europa.eu/invest-in-research/pdf/download_en/entrepreneurship_europe.pdf

[2] Drucker, P F. 1985. Innovation and Entrepreneurship: Practice and Principles. New York, USA: HarperBusiness.

[3] European Commission, Entrepreneurship in Europe, Green Paper, Brussels, 21.01.2003

In other words, entrepreneurship refers to an individual's ability to turn ideas into action and includes creativity, innovation and risk taking, as well as the ability to plan and manage projects in order to achieve objectives. This supports everyone in day-to-day life at home and in society, makes employees more aware of the context of their work and better able to seize opportunities, and provides a foundation for entrepreneurs establishing a social or commercial activity.[4]

Martin Lackéus (2015) provides analysis of entrepreneurship concepts of various authors: "a common conception according to Gartner (1990) is that entrepreneurship is about entrepreneurial individuals creating innovative organizations that grow and create value, either for the purpose of profit or not.[5] But entrepreneurship does not have to include the creation of new organizations, it can also occur in existing organizations (Shane and Venkataraman, 2007). It is not only limited to the entrepreneurial individual, but also to entrepreneurial opportunities and to the relation between the individual and the opportunity, i.e. the individual-opportunity nexus as described by Shane (2003). Stevenson and Jarillo (1990) define entrepreneurship as "a process by which individuals – either on their own or inside organizations – pursue opportunities without regard to the resources they currently control." Bruyat and Julien (2001) use a constructivist approach and propose a definition incorporating not only the entrepreneur, but also the new value created, the environment, the entrepreneurial process itself and the links between all of these over time. They also propose using the terms "intrapreneurship" to represent teams whenever applicable. This presents broader understanding of entrepreneurship, which includes activities of individuals when they are not the business owners, but demonstrating their entrepreneurship within their respective organisation. The need for entrepreneurial employees was expressed during the round table discussion in Vilnius (November, 2018), when qualities of the future employees were discussed with representatives of local and international companies. When talking about this type of entrepreneurship, the term intrapreneurship is typically used.

In the field of education, the EU has recognized that "*sense of initiative and entrepreneurship*" is one of the **eight key competencies for lifelong learning**, and thus necessary for all members of a knowledge-based society (European Parliament and Council, 2006). The need to promote entrepreneurship education and entrepreneurial learning is therefore high on the European policy agenda and it is explicitly advocated by the Small Business Act for Europe (European

[4] European Commission, Proposal for a Recommendation on Key competencies for Lifelong Learning, COM(2005)548 final

[5] Lackéus M, (2015), Entrepreneurship in Education: What, Why, When, How. Entrepreneurship 360 Background Paper. OECD, EC

Commission, 2008), the Communication on Rethinking Education (European Commission, 2012a) and the Entrepreneurship Action Plan 2020 (European Commission, 2012b).

The Danish Foundation for Entrepreneurship states: "Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social."[6]

Entrepreneurship is a competency or a skill that can be learnt. However, according to Gianesini and others (2018) studies on entrepreneurial competencies have demonstrated that entrepreneurship is a complex phenomenon and includes various sub-constructs.[7] For example, Man and colleagues (2002) identified six competency areas: opportunity, organizing, strategic, relationship, commitment, and conceptual competencies. On the other hand, Priyanto and Sandjojo (2005) divided entrepreneurial competency into four scopes: management skills, industry skills, opportunity skills, and technical skills. More recently, Kyndt & Baert (2015) assessed behavioral indicators in actual and aspiring entrepreneurs as proximal outcomes of entrepreneurial competencies and identified 12 competencies, from perseverance to social conduct and environmentally conscious conduct. Unfortunately, only two competencies (perseverance and insight into the market) predicted entrepreneurship three to five years after their survey. Social and environmental conscious conduct on the other hand related negatively to entrepreneurship.

The Estonian entrepreneurship competency model according to Venesaar, Täks and others (2018) is presented to emphasise the way sub-competencies are interconnected.[8] The sub-competencies are divided into four competency areas, namely 1) self-management, 2) solving of social situations, 3) creative thinking and finding solutions, and 4) acting on opportunities, which together comprising 14 sub-competencies. The first three competency areas are used to highlight competencies needed for developing entrepreneurial mindsets, creative and entrepreneurial members of society. Meanwhile, the last competency area – acting on opportunities – is necessary for entrepreneurial action and becoming an entrepreneur. Further, it is beneficial and essential for

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[6] Danish Foundation for Entrepreneurship, https://eng.ffe-ye.dk/education/higher-educations

[7] Giovanna Gianesini, Serena Cubico, Giuseppe Favretto and João Leitão, 2018, Entrepreneurial competencies. Comparing and Contrasting Models and Taxonomies, Available from: https://www.researchgate.net/publication/326027338_Entrepreneurial_competencies_Comparing_and_Contrasting_Models_and_Taxonomies/link/5b4ed8b1a6fdcc8dae27b755/download

[8] Venesaar U, Täks M. et al., 2018, Model of entrepreneurship competency as a basis for the development of entrepreneurship education. Estonian Journal of Education. Available at: http://eha.ut.ee/wp-content/uploads/2018/10/11_06_venesaar_summary.pdf

those choosing a career as an employee. This fourth competency area must therefore be developed together with the entrepreneurship sub-competencies of the other three competency areas.

The *Entrepreneurship Competency Framework*, also known as EntreComp, offers a tool to improve the entrepreneurial capacity of European citizens and organisations.[9] The framework aims to build consensus around a common understanding of entrepreneurship competencies by defining 3 main competency areas from a list of 15 competencies (see Annex 1). This framework can likewise be used for entrepreneurship competency development and assessment.

1.2 Aim, Objectives and Programme

A "study tour" was organised between the 16th and 18th of January 2019 in Ülemiste City, Tallinn, Estonia. The aim of the study tour was to organize creative entrepreneurial activities (meetings, seminars, lectures) to share experiences/good practices and knowledge for the development of entrepreneurial mindset and knowledge between the international partners and experts in this field.

The objectives:

1. To provide students an opportunity to meet business companies and to work in international teams developing solutions for real business problems.
2. To organise experience sharing on entrepreneurship education workshop for lecturers.
3. To provide open lectures for study tour participants and Ülemiste City business companies staff and provide an opportunity to share experiences and opinions in the panel discussion.
4. To introduce new views on international cooperation, the entrepreneurship mindset and skills development, as well as the creation of new services for the Ülemiste City businesses.

The study tour was planned to find out: (1.) Why do companies need people with a creative entrepreneurial mindset? (2.) What defines an enterprising company? (3.) How does the creative entrepreneurial mindset affect the success of the company? (4.) taking into consideration entrepreneurial competencies, what should be the future services in the Smart City?

[9] https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/entrecomp-entrepreneurship-competency-framework

In accordance with the stated objectives, three main target groups were involved in study tour activities: students, lecturers, and business companies. More than 40 students, teachers and entrepreneurs from six different countries attended the study tour. The programme was planned in order to present various activities for all target groups: a Creative Campus dedicated to students acquiring creative business problem-solving skills; workshops and lectures for networking and sharing experiences in entrepreneurship education, with a particular focus on the creation of entrepreneurial mindset; direct contact between businesses, students, and speakers and their participation in open lecture and panel discussions (see Study Tour Programme, annex 2).

1.3 Creative Campus[10]

The Creative Campus has been organised aiming to encourage students to demonstrate their entrepreneurship skills working on a real business problems presented by participating companies. The study tour's goal was to give students practical experience and innovative opportunities to work together directly with real estate development in Ülemiste City.

During the first day, students visited 12 companies in Ülemiste City – two per group. Students took interviews with the company representatives using the KISS method (see explanation in Annex 3) in order to map the soft services of Ülemiste City and identify possible improvements. After the visits, CEO of Ülemiste City, Mr. Margus Nõlvak, provided additional background information about the City.

On the second day students in the four international teams worked on the information collected during the visits. They had to describe three services which they marked out for improvement as well as provide possible solutions for the solving of their designated problems. For the assessment of student proposals an expert committee was formed: Ülemiste City CEO Margus Nõlvak, Tehnopolis Ülemiste Marketing manager Tõnis Pechter and ABB CEO Henry Arusaar. After presentation of the ideas to the committee students received feedback and start to work on one theme, preparing 5 min. pitches for the next day.

The third day was pitching day. Students made their presentations to all participants of the study tour. Team Green Boat presented ideas on how to bring environmental and organic mindsets into Ülemiste city. Team Oh Boy presented a concept how to initiate networking in Ülemiste City,

[10] Prepared with the assistance of Creative Campus Report moderator Rode Luhaäär

which would help to create a community in the city. Team i3 presented a rebranding concept, where Ülemiste City would be more people-oriented and would create a "soul" for the city. Team Blondy's+1 saw an option to improve signs and indicators in the city so it would be more navigation friendly. After the event, EUAS Rector Mr. Mait Rungi gave diplomas to all the participants.

1.4 Workshops for Lecturers

During the workshop for lecturers, all participants were introduced to the Estonian youth, employment, education & entrepreneurship competency model.

Picture 1. Estonian entrepreneurship competency model

All lecturers then shared the ways in which they have developed each sub-competency for students and thoroughly analysed the entrepreneurship competency model. Lectures were split into 4 groups (based on components) and included discussions of how best to improve the delivery of entrepreneurship competency to students.

The findings were presented to all participants at the end.

1.5 Open Lecture

During the third day of the study, all students and lecturers participated in open lecture, where three speakers presented their views on entrepreneurship. Hans Dorsch from Aalborg University talked about focusing on exactly what a talent for innovations means within a Western narrative. Daiva Pakalnė from Vilniaus Kolegija (University of Applied Sciences) presented a speech on

how to think like an entrepreneur. Dan Ackers from Buutti Oy and OAMK presented his findings on the way success is achieved through inspiring others.

1.6 Outcomes

Ultimately, the study tour was beneficial to all participants:

- Students had an opportunity to demonstrate their entrepreneurship competencies, to meet innovative companies, to expand their network and to even expand their career opportunities.
- Lecturers had an option for international cooperation and option to exchange know-how.
- For the business companies and Ülemiste City it was an option for improvement and offer additional services.

The final project meeting provided the opportunity for all participants of the study tour to make general observations about the project. It was agreed that development of entrepreneurial competencies of students is a complex issue, involving (1.) the close cooperation of higher education institutions and the business world and (2.) the development of an entrepreneurial mindset in teaching staff.

Several methods were introduced, which are presented in a table below:

Method	Beneficiaries	Benefit	Description
Hackathon	Students and business companies	Creates innovative ideas for improvement of business performance; International cooperation experience.	Companies are providing problems for international students teams. Students discussing problem and proposing ideas.
24 hours challenge	Students and business companies	Development of justified solutions ready to apply	Companies providing problems (challenges) and resources for its implementation. Students (last year studies) during 24 hours working on

			the issue and at the end presenting solution and its implementation plan.
Interview with real entrepreneurs	Students; teaching staff	Understanding business reality having meetings with real entrepreneurs; possibility to get real cases.	Entrepreneurs sharing their experience about success and failure of business establishment and performance.
Internships	Students Teaching staff	Learning by doing experience. Better understanding of business processes.	Close cooperation of business and educational institution helps to organise valuable practical experiences for students and teachers.
Switching the roles	Students, teaching staff	Getting better understanding of various aspects of business	Students are analysing particular business issues in order to explain it to other students. Evaluation of business cases against presented criteria can be also applied.

Developing of Entrepreneurship competencies

The project partners agree that the main goal of Entrepreneurship Education is to support entrepreneurial skills development in students. According to the Martin Lackéus (2015), there are significantly differing views on what is meant by entrepreneurship in the educational domain: 1) it may be about opportunity identification, business development, self-employment, venture creation and growth, i.e. becoming *an entrepreneur* (Fayolle and Gailly, 2008, QAA, 2012, Mahieu, 2006), or 2) it may be about personal development, creativity, self-reliance, initiative taking, action orientation, i.e. becoming *entrepreneurial*.[11] In case of the present project, both views are relevant and correspond to a definition of entrepreneurial education, in line with that which has been proposed by Danish Foundation for Entrepreneurship: "Content, methods and activities supporting the creation of knowledge, competencies and experiences that make it

[11] Lackéus M, 2015, Entrepreneurship in Education: What, Why, When, How. Entrepreneurship360 Background Paper. OECD, EC, https://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf

possible for students to initiate and participate in entrepreneurial value creating processes" (FFE-YE, 2013).[12] Such a definition stresses the value-creating processes, which should be understood as reaching beyond the learning of the individual student and as far as possible **into the community outside the class or educational institution** (Rasmussen, Moberg, Revsbech, 2015).

Being experienced in business and entrepreneurship education, the Project Partnership believes that besides development of technical competencies (e.g. business establishment and running) the creation of an entrepreneurial mindset in students is crucial. Such an entrepreneurial mindset (Bosman, Fernhaber, 2018) would involve an inclination to discover, evaluate, and exploit opportunities.[13]

There are many best practices in higher education (including Partner organisations), in using various methods that support creation of the entrepreneurial mindset in students (e.g business incubation, project development, business simulations, workshops and seminars, etc.). Nevertheless, visits to the classroom by entrepreneurs to talk about their experiences (success stories or failures), contacts with local and international entrepreneurs, company visits, opportunities to be involved in real company problem solving (i.e. close links with the real business world) brings undeniable added value to the process. A survey on entrepreneurship education in European universities and business schools (Wilson, 2004) stressed importance of **establishment of better links with business and entrepreneurs** and **sharing of good practices**, across their own institution as well as with other institutions.[14] The involvement of entrepreneurs in the development of entrepreneurial competencies of students has been stressed in many publications. The Entrepreneurship Education within Higher Education Institutions (Ghina, Simaputang, Gustomo, 2017) provides Alistair Shepherd's opinion: "entrepreneurship can be taught to and accelerated by practitioners who are living within it."[15] Higher education institutions could give students valuable and systematic knowledge of all aspects of business, while equipping them with the necessary tools to prepare for all possible eventualities. The students could test

[12] Rasmussen A., Moberg K,& Revsbech C., 2015, A Taxonomy Of Entrepreneurship Education, https://eng.ffe-ye.dk/media/785766/taxonomy-en.pdf

[13] Bosman L., Fernhaber S. (2018) Defining the Entrepreneurial Mindset. In: Teaching the Entrepreneurial Mindset to Engineers. Springer, Cham

[14] Wilson K, (2004), Results of a Joint Pilot Survey http://www.gvpartners.com/web/pdf/European_Entrepreneurship_Education_Pilot_Survey_Results_FINAL.pdf

[15] Ghina A., Simatupang T. M., Gustomo A. (2017). Entrepreneurship Education within Higher Education Institutions (HEIs), Global Voices in Higher Education, Susan L. Renes, IntechOpen, DOI: 10.5772/intechopen.69043. Available from: https://www.intechopen.com/books/global-voices-in-higher-education/entrepreneurship-education-within-higher-education-institutions-heis-

ideas and concepts, besides which they could get worthwhile feedback in HEIs. In this respect, mentorship and guidance is important for developing students into accomplished entrepreneurs.

Appendices

Appendices 1

EntreComp conceptual model

Areas	competencies	Hints	Descriptors
1. Ideas and opportunities	**1.1 Spotting opportunities**	Use your imagination and abilities to identify opportunities for creating value	● Identify and seize opportunities to create value by exploring the social, cultural and economic landscape ● Identify needs and challenges that need to be met ● Establish new connections and bring together scattered elements of the landscape to create opportunities to create value
	1.2 Creativity	Develop creative and purposeful ideas	● Develop several ideas and opportunities to create value, including better solutions to existing and new challenges ● Explore and experiment with innovative approaches ● Combine knowledge and resources to achieve valuable effects
	1.3. Vision	Work towards your vision of the future	● Imagine the future ● Develop a vision to turn ideas into action

			● Visualise future scenarios to help guide effort and action
	1.4 Valuing ideas	Make the most of ideas and opportunities	● Judge what value is in social, cultural and economic terms ● Recognise the potential an idea has for creating value and identify suitable ways of making the most out of it
	1.5 Ethical and sustainable thinking	Assess the consequences and impact of ideas, opportunities and actions	● Assess the consequences of ideas that bring value and the effect of entrepreneurial action on the target community, the market, society and the environment ● Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen ● Act responsibly
2. Resources	**2.1 Self-awareness and self-efficacy**	Believe in yourself and keep developing	● Reflect on your needs, aspirations and wants in the short, medium and long term ● Identify and assess your individual and group strengths and weaknesses ● Believe in your ability to influence the course of events, despite uncertainty, setbacks and temporary failures
	2.2 Motivation and perseverance	Stay focused and don't give up	● Be determined to turn ideas into action and satisfy your need to achieve ● Be prepared to be patient and keep trying to achieve your long-term individual or group aims ● Be resilient under pressure, adversity, and temporary failure
	2.3 Mobilizing resources	Gather and manage the resources you need	● Get and manage the material, non-material and digital resources

			needed to turn ideas into action ● Make the most of limited resources ● Get and manage the competencies needed at any stage, including technical, legal, tax and digital competencies
	2.4 Financial and economic literacy	Develop financial and economic know how	● Estimate the cost of turning an idea into a value creating activity ● Plan, put in place and evaluate financial decisions over time ● Manage financing to make sure my value-creating activity can last over the long term
	2.5 Mobilizing others	Inspire, enthuse and get others on board	● Inspire and enthuse relevant stakeholders ● Get the support needed to achieve valuable outcomes ● Demonstrate effective communication, persuasion, negotiation and leadership
3. Into action	**3.1 Taking the initiative**	Go for it	● Initiate processes that create value ● Take up challenges ● Act and work independently to achieve goals, stick to intentions and carry out planned tasks
	3.2 Planning **and management**	Prioritize, organize and follow-up	● Set long-, medium- and short-term goals ● Define priorities and action plans ● Adapt to unforeseen changes
	3.3 Coping with uncertainty, ambiguity and risk	Make decisions dealing with uncertainty, ambiguity and risk	● Make decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes ● Within the value-creating process, include structured ways of testing ideas and

			prototypes from the early stages, to reduce risks of failing ● Handle fast-moving situations promptly and flexibly
	3.4 Working with others	Team up, collaborate and network	● Work together and cooperate with others to develop ideas and turn them into action ● Network ● Solve conflicts and face up to competition positively when necessary
	3.5. Learning through experience	Learn by doing	● Use any initiative for value creation as a learning opportunity ● Learn with others, including peers and mentors ● Reflect and learn from both success and failure (your own and other people's)

Appendices 2

Nordplus Horizontal 2019 Building Educational Cooperation in Ülemiste City

Nordplus Ülemiste City 1'st Study Tour: Creative Entrepreneurship

Where and when: 16th-18th of January 2019 in Ülemiste City, Tallinn, Estonia.

The aim of the Study Tour To organize creative entrepreneurial activities (meetings, seminars, lectures) to share experiences/good practices and knowledge for the development of entrepreneurial mindset and knowledge between the International partners and experts in this field.

We will find out

1. Why do companies need people with creative entrepreneurial mindset? 2. What the enterprising company means? 3. How the creative entrepreneurial mindset affects success of the company? 4. Using entrepreneurial competencies - which should be the future services in Smart City?

Initial program

Time	Students	Employers	Project partners (admin.)	Lecturers	Location
1st day, 16.01.2019					
12.00 – 13.00	**Arrival,** welcome snacks, small talk etc.				Öpik Conference Centre, Valukoja 8, room Kosmos
13.00 – 16.15	**Company visits** for students, lecturers and partners (companies as Let´s do it world!, Zone Media, ABB, Estonian Association of Information Technology and Telecommunications, Helmes, Restaurant "Juur", Estonian Tax and Customs Board, Securitas Eesti, Innove, Tallinn Airport, International House of Estonia, MoveMyTalent). People will be divided into the small groups. Every group will visit one company, get the intro of the company, interviews the employees, specially HR person and find out the answers to the KISS*				Different locations in Ülemiste City
16.15 – 16.45	**Coffee break**				Öpik Conference Centre, Valukoja 8, room Kosmos
16.45 – 17.30	**Opening of the Study Tour.** Welcome speech and the introduction of the Ülemiste City from the Chairman of the management board Mr. Margus Nõlvak. Introduction of the program, hosts etc.				Öpik Conference Centre, Valukoja 8, room Kosmos
17.30 – 18.30	**Free time**, preparation for the dinner		**Meeting for the administrative questions** and also for the planning of the next ST	**Free time**, preparation for the dinner	Öpik Conference Centre, Valukoja 8, room Kosmos
19.00	**Dinner** at Restaurant PoMo				PoMo, Sepise 8
2nd day, 17.01.2019					
9.00 – 11.00	Opening words from the rector of Estonian Entrepreneurship University of Applied Sciences (EUAS), prof. Mait Rungi and from the Head of International School of Tallinn (IST), Olavi Otepalu				International School of Tallinn (IST), Keevise 2

	Creative Campus* Creative Campus moderator is Rode Luhaäär, the CEO and co-founder of the start-up Paytailor and internet marketing lecturer at Estonian Entrepreneurship University of Applied Sciences (EUAS).		
10.45 – 11.00	**Coffee break**		International School of Tallinn (IST), Keevise 2
11.00 – 13.00	**Creative Campus continues** ● Working out 3 possible solutions for each raised problem	**Creative Entrepreneurship Education workshop.** Discussion on the following topics: Estonian model of entrepreneurship competency (Marge Täks, lecturer of Entrepreneurship at Estonian Business School (EBS) and University of Tartu (UT), former leader of nationwide entrepreneurship education programme) ● How to teach entrepreneurship competencies at university? ● Do the employees need to have the entrepreneurial mindset and how this can support the creative entrepreneurship in organization	**Students** – International School of Tallinn (IST), Keevise 2 **Lecturers** – Estonian Entrepreneurship University of Applied Sciences (EUAS), SuurSõjamäe 10a
13.00 – 14.00	**Lunch**		**Students** – International School of Tallinn (IST), Keevise 2 **Lecturers** – Estonian Entrepreneurship University of Applied Sciences (EUAS), SuurSõjamäe 10a
14.00 – 16.00	**Creative Campus continues** Validating the possible solutions in front of the experts from Ülemiste City companies	**Creative Entrepreneurship Education work-shop continues** ● Entrepreneurship competency in vocational standards (Mariken Ross,director of the Hematology	**Students** – International School of Tallinn (IST), Keevise 2 **Lecturers** – Estonian Entrepreneurship

		Centre in TheNorth Estonia Medical Centre) ● Input to the professional standards (EQF level 6) to value and enhance entrepreneurship competency based onNordplus other countries practice	University of Applied Sciences (EUAS), Suur-
16.00 – 16.15	**Coffee break**		**Students** – International School of Tallinn (IST), Keevise 2 **Lecturers** – Estonian Entrepreneurship University of Applied Sciences (EUAS), SuurSõjamäe 10a
16.15 – 18.00	**Creative Campus continues** ● Developing the 2nd version of the solution ● Preparing a pitch for the 3rd day	**Creative Entrepreneurship Education work-shop continues** ● How the creative entrepreneurial mindset affects success of the company ● Preparing the short (10min) presentation for the 3rd day	**Students** – International School of Tallinn (IST), Keevise 2 **Lecturers** – Estonian Entrepreneurship University of Applied Sciences (EUAS), SuurSõjamäe 10a
18.00 – 19.00	**Free time**, preparation for the dinner		
19.00	**Networking dinner with companies' representatives** at Restaurant Viktoria		Viktoria, Keevise 6
3rd day, 18.01.2019			
9.00 – 10.30	**Creative Campus - students teams pitches** (the solutions)		Öpik Conference Centre, Valukoja 8, room Universum and Galaktika
10.30 – 10.45	**Coffee break**		Öpik Conference Centre, Valukoja 8, room Universum and Galaktika
10.45 – 11.45	**Creative Entrepreneurship Education work-shop – lecturers teams presentations**		Öpik Conference Centre, Valukoja 8, room Universum and Galaktika

11.45 – 12.15	**Study Tour conclusions** by the expert group and organizers	Öpik Conference Centre, Valukoja 8, room Universum and Galaktika
12.15 – 13.00	**Lunch**	Öpik Conference Centre, Valukoja 8, room Universum and Galaktika
13.00 – 15.30	**Open lecture** "Entrepreneurial mindset – natural or learned?" Register here: https://www.facebook.com/events/2390713931208148/ ● **The Innovation Industry** (Everyone knows the fairy tale of Hans Christian Andersen about t*he Emperor's new clothes – this describes the reality and appearance in the innovation industry.* Although the politicians are focused on the threat from the East and the need to re-invent Western society as a knowledge based society, we should focus on exactly what the Western narrative tells us to be our special talent for innovation. It is time to look at it and see where we are going.) **Hans Dorsch**, Aalborg University ● ***Entrepreneurial mindset – how to think like an entrepreneur.*** (Learning to master your inner game is essential in developing an entrepreneurial mindset. It is always about growth mindset and being able to overcome a self doubt and limiting beliefs. You will understand how your success is stuck into the lack of enterprising mindset) **Daiva Pakalne**, Vilnius College ● ***Success through inspiring others*** (A wise man once said, "if you help enough people get what they want, you can have whatever it is you want". How to give others what they want and through that achieve your own aims.) **Dan Ackers**, Buutti Oy and OAMK ● **Panel-discussion: What we can do to be more enterprising and successful?**	Öpik Conference Centre, Valukoja 8, room Supernoova
15.30	**Closing**	

Appendices 3

KISS METHOD EXPLANATION

Keep-Improve-Start-Stop

Keep-Improve-Start-Stop (KISS) is a simple process. It is about asking team members, departments, or the entire organisation to suggest what activities need to continue, be improved, started and/or stopped.

KEEP asks: "What are we doing well and need to keep doing as a leadership team/Governing Body in order to achieve our vision?"

IMPROVE asks: "What are we already doing that could be improved to make us as a team even more effective, efficient and better?"

START asks: "What do we need to start doing that we haven't been doing or that other leadership teams/Governing Bodies do to have a greater level of success?"

STOP asks: "What do we need to stop doing either because it no longer contributes to the overall school vision or is no longer effective?"

The KISS process enables leadership teams to refocus their objectives on the things that have the greatest contribution to the overall strategy and vision of the organisation whilst supporting team building, collaboration and engagement throughout the organisation.

2. IT&Digitalisation

2.1 Defining IT&Digitalisation

Innovations are needed in the public sector as well as in companies. Fresh ideas could be developed and implemented, modernization of existing ones may be reached by involving future talents and creating a network.

Urban performance currently depends not only on a city's endowment of hard infrastructure (physical capital) but also, and increasingly so, on the availability and quality of knowledge communication and social support (human and social capital). The latter form of capital is decisive

for urban competitiveness. Against this background, the concept of the "smart city" has been introduced as a strategic device to encompass modern urban production factors in a common framework and, in particular, to highlight the importance of Information and Communication Technologies (ICTs) in the last 20 years for enhancing the competitive profile of a city[16] (Caragliu et. al. 2011).

Cities are becoming smart – in the way we can automate routine functions serving individual persons, buildings and traffic systems, as well as in ways that enable us – in real time – to monitor, understand, analyse and plan the city to improve the efficiency, equity and quality of life for its citizens. This is changing the way we can prepare across multiple time scales, raising the prospect that cities can be made smarter in the long term by continuous reflection in the short term[17] (Batty et. al. 2012).

2.1.1. Table. *Sectors of a smart city* (Batty et. al. 2012)

Smart technology (Competitiveness)	**Smart people (Social and Human Capital)**	**Smart governance (Participation)**
- Innovative spirit - Entrepreneurship - Economic image and trademarks - Productivity - Flexibility of labour market - International embeddedness - Ability to transform	- Level of certification - Affinity to lifelong learning - Social and ethnic plurality - Flexibility - Creativity - Cosmopolitanism/ Open-mindedness - Participation in public life	- Participation in decision-making - Public and social services - Transport governance - Political strategies and perspectives
Smart mobility (Transport and ICT)	**Smart environment (Natural resources)**	**Smart living (Quality of life)**
- Local accessibility - (Inter-)national accessibility - Availability of ICT-infrastructure	- Attractivity of natural conditions - Pollution - Environmental protection	- Cultural facilities - Health conditions - Individual safety - Housing quality - Education facilities - Touristic attractivity

16 Caragliu, A., Del Bo, C., & Nijkamp, P. (2011). Smart cities in Europe. *Journal of urban technology*, *18*(2), 65-82.

17 Batty, M., Axhausen, K. W., Giannotti, F., Pozdnoukhov, A., Bazzani, A., Wachowicz, M., ... & Portugali, Y. (2012). Smart cities of the future. *The European Physical Journal Special Topics*, *214*(1), 481-518.

- Sustainable, innovative and safe transport systems	- Sustainable resource management	- Social cohesion

In business, digitalisation most often refers to enabling, improving and/or transforming business operations and/or business functions and/or business models/processes and/or activities, by leveraging digital technologies and a broader use and context of digitized data, turned into actionable, knowledge, with a specific benefit in mind[18] (Parviainen et. al. 2017). Meeting the digital future demands a three-part response. Digital innovation will require information technology (IT) to ideate, or dream the digital dream, and execute in close partnership with colleagues, in an exploratory way, with an understanding of the potential of new trends. Digitalisation includes focusing on business models, having digital leadership capability, treating colleagues as partners and engaging with external customers[19] (Gartner 2014).

2.2 Aim, Objectives and Programme

The second study tour 'Challenges of digitalisation in smart cities' took place in Ülemiste City, Tallinn, Estonia from June 3rd through the 5th, 2019. The study tour aimed to organise activities, such as lectures, case studies, and meetings, and share experience and knowledge between participants and partners – improving cooperation, collaboration and communication skills.

The objectives:

1. To provide students with an opportunity to meet business companies and to work in international teams developing solutions for real business problems.
2. To improve student cooperation, collaboration and communication skills by working in international teams.
3. To introduce generated solutions, which can be implemented for the Ülemiste City business company cases.
4. To organise networking meetings to expand horizons and get to know other cultures.

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18 Parviainen, P., Tihinen, M., Kääriäinen, J., & Teppola, S. (2017). Tackling the digitalization challenge: How to benefit from digitalization in practice. *International journal of information systems and project management*, *5*(1), 63-77.

19 Gartner, Inc. (2014). Taming the Digital Dragon: The 2014 CIO Agenda. *Insights From the 2014 Gartner CIO Agenda Report*, 1-10.

5. To provide open lectures for study tour participants and Ülemiste City business companies staff and allow sharing of experience and opinions in the panel discussion.

The study tour planned to find out: What is digitalisation in smart cities? Why should entrepreneurs think about digitalisation? How can it improve our lives? What can companies implement to provide digitalisation and educate clients/users/others about it?

Under the stated objectives, three main target groups were involved in the study tour activities: students, lecturers, and business companies. More than 40 students, teachers, and entrepreneurs from six different countries attended the study tour.

The following activities were included (see study tour programme, annexe 2):

Lectures, including an open lecture about how artificial intelligence simplifies our life, ABB Robot's (YuMi) performance and introducing Estonia as E-country from an IT and digitalisation perspective.

Networking meetings, including explanations, introduction and aims of case studies, dividing into teams and team leads introduction.

Case studies providing teams with a problem description and the main information about a company and its clients, working on problems, following the structure and aims of the canvas, mapping problems and using IT and teamwork knowledge, finding the best solution, co-working with mentors, making conclusions and phrase solutions, making a presentation and preparing to pitch ideas.

Presentations with public pitching to representatives of companies and employees of Ülemiste City, presenting solutions.

2.3 Creative Campus

The Creative Campus has been organised and aims to encourage students to demonstrate their cooperation, collaboration and communication skills working on real business problems, which were presented by business companies. The study tour target was to give students practical output and innovation opportunity to work together with real estate developer Ülemiste City.

Cooperation between educational institutions, enterprises and sector organisations has been well-developed. According to participant feedback about teamwork, collaboration and communication, it was successful and will continue. During this project, the focus was on partnership, and the results were good.

Thoughts about cooperation, collaboration and communication from participants:

"Companies found the ideas presented at the mini-hackathon valuable and planned to develop them in cooperation with students in the near future."

"Students offered fresh ideas for refuting the widely spread myth that secure passwords must always contain different case letters, numbers and punctuation."

"Cooperation and communication with students will continue since the offered solutions were not only exciting but also truly practical and applicable."

"The quality of the offered solutions is proven by the fact that cooperation between Nordea and students from the hackathon will continue in the future, and the university will begin to direct talented student to Nordea."

Problem-Solution Fit canvas (see Canvas, annexe 1) a defined purpose was made during working on solutions. The canvas included customer segments, problems or pains, triggers to act, customer limitations, problem root or cause, behaviour and intensity, channels of behaviour solutions, etc. Final ideas were presented, giving a solution, argumentation, target group and explaining how it works.

Two teams offered Zone real practical solutions for making people pay more attention to their passwords. According to the teams, a built-in password generator would make finding a password easy, and the user would not get confused. One specific solution included a story-based password generator that creates a strong password and deletes all of the user's data. The crux of the idea is that the user feeds the tool a simple story, e.g., that they live in a green five-storey house, and the generator offers up several long but memorable passwords based on that.

Students had to design and present a plan to make Nordea more famous in Estonia and attract people speaking Scandinavian languages to the service centres here. Both teams working on Nordea's problem came up with several solutions out of which the need for good marketing campaigns and the importance of job offer packages stood out. The quality of the offered solutions is proven by the fact that a partnership between Nordea and students from the hackathon will continue in the future, and the university will begin to direct talented students to Nordea. Nordea Bank ABP Estonia received confirmation that cooperation with students is valuable and Estonian Entrepreneurship University of Applied Sciences and Nordea plan to found a joint scholarship fund for finance students.

There were highlighted current issues and offers of a web platform that could be used to navigate, even without Wi-Fi, with the help of screens installed across the city to better navigate the Ülemiste City. This would help visitors find the right parking house or building and even precise rooms.

To solve a task given by Qualitas Medical Centre, students had to take on the role of a marketing expert and try to see the viewpoints of both medical staff and the patient to find a solution that suited both parties. The teams on the Qvalitas case came up with not one but two or three solutions for making patients more aware of various services. Exciting and applicable ideas were presented; answers ranged from Google adverts to patients' bonus systems and ways to make people more trusting of the institution.

The project had its participants use group chat on Facebook. The work was then able to follow. Facebook chat also made it possible to get the tacit knowledge about how to successfully implement transnational work. Information about the latest project activities and results were published on the university Facebook pages and websites.

2.4 Open Lecture

During the third day of study, tour students and lecturers participated in the open lecture 'Meet the future of Artificial Intelligence (AI)', where four speakers presented their views on digitalisation and information technology roles in our lives. Roksoloana Sliusar is an Automation Specialist at ABB and gave a presentation concerning the unique ABB dual-arm collaborative robot YuMi, the first real collaborative robot in the world. Also, specialists spoke about automated business processes and using networked robotics in offices. Marten Kaevats, Estonian National digital advisor, introduced future steps and trends in Artificial Intelligence. Mats Kyyro, Experimentation Designer at OP Labs, OP Financial Group's internal accelerator, was speaking about Artificial Intelligence in fintech industries. Tonis Jaaniste, Chief Engineer of Milrem Robotics AS, spoke about the benefits of Artificial Intelligence to the war industry and where the future may bring us.

The lectures were inspiring and made everyone think about how vital digitalisation is in the modern world. AI is evolving, and much effort is invested in improving and developing it. The future is closer than we think, and technologies, as well as digitalisation, is growing rapidly. For example, face recognition is already implemented, but the question is – will there be an option to pay for your meal, clothes, etc. by only scanning your face? Nearly everything that is seen as a problem can be solved by thinking about how to digitalise it. Lecturers suggested thinking outside

the box to find these solutions by recognizing how and what to digitalize to improve lives. Collaboration, cooperation and communication allow us to see a problem from another point of view so it is easier to find a working solution.

2.5 Outcomes

There should be constant IT support and knowledge updates concerning how to use technologies given to students, teachers, entrepreneurs and other involved persons to provide digitalisation of social processes.

It is necessary to respect an interdisciplinary approach when searching for solutions with IT/digitalisation related problems (focal group research methodology approach: problem-solving groups with different backgrounds, various study areas and different ages).

Nowadays, most university researchers support IT/digitalisation industry research practices, so there is a need for deeper integration – especially among different socio-technical processes like technologies, IT, public governance, sustainable policies development, ethics, psychology, pedagogics and others.

IT/digital area specialists/experts must update their skill sets and mindsets with experiences and competencies from other areas, especially social and humanitarian.

Modern-world challenges with IT/digitalisation require advanced policies of the state economy and industry development (proposed activities must be stated and executed in logical and sustainable ways with a target to zero-emission and non-polluting systems).

As a derivative from the Smart City project hackathon activity during the IT/digitalisation study tour, an internet (online) hackathon approach should be introduced to solve IT/digitalisation and social challenges.

As the first stage of an “online hackathon”, a concept basis must be created an "open pool" of companies’ challenges for students’ teams (in forms of open or closed working groups).

The integration of representatives/specialists from successful IT/digital industry companies as mentors into the university study process must be made on a regular and systematic basis.

Proper education for children from the start regarding how to use computers in productive and sustainable ways without danger of "computer sickness" and addictions is necessary, for instance:

- learning how to create valuable IT/digital content but not just to consume it;

- educating children that a computer cannot solve all problems in real life;

- understanding how mental and physical activities are interconnected and must be in balance.

For specialists in different social areas (humanitarians, social science representatives, economists, politicians, etc.), there is a need for advanced, specialized courses in IT/digitalisation/programming to understand the scope of modern developments.

“Smart development” is a core component in most “next level” society development models.

The “Smart City” has proven very successful, and as an important concept is the “leading force” for further IT/digital industries’ sustainable development activities.

Conclusion

There should be constant IT support and knowledge updates on how to use technologies given to students, teachers, entrepreneurs and other involved persons to provide digitalisation. An aim should be clear – why it is necessary to make solutions digitalised and who is the target audience?

It is essential to compare the benefits and risks before developing a solution for digitalisation in a smart city. Examples of digitalisation in other cities should be analysed. Efficacy of a new digitalised solution should be clear to avoid a situation where the old solution works faster uses fewer resources or is more user-friendly. It is essential to educate the target audience, explaining the importance of the solutions and getting their acceptance. There should not be solutions implemented only because the city wants to be digitalised or defined as a smart city. Every digitalised solution deployed should be based on successful problem-solving and being aware of the risks.

Risks include:

- Financial aspects (costs of developing and implementing a solution, planning future costs like system maintenance, support, improvements, etc.)
- Technology development (technologies develop rapidly and should keep up with the latest and most beneficial)
- Infrastructure (infrastructure should meet the requirements required to implement smart solutions while maintaining historical heritage)

- Cyberattacks and privacy (if the system crashes, users cannot do their daily tasks and financial resources are being lost), etc.

Technology is changing the classroom of today. Simulators in professional education and simulation-based training are involved in the learning process. Technology is meant to complement teachers, not to replace them.

Implementing digitalisation in schools means a change in the classroom model is required. The ‘traditional classroom’ model includes lectures where students listen to a professor and then work on their homework after lessons. The ‘flipped classroom’ model is more digitalised as students can watch lecture material online and then come together to participate in classroom activities to improve their skills and knowledge.

In the modern world, a student is self-motivated to learn using digital solutions. Using MOOCs is a new way to learn something. MOOC stands for Massive Open Online Course. Massive – up to 10,000 students; Open – free, anybody can register; Online – through the internet; Course – with a defined start and ongoing support. MOOCs consist of many short videos, online assignment submission, discussion forums, online activities, formative assessments and final tests.

Inspirational video lectures, like TEDx, can be found online. These lectures provide an opportunity to widen horizons, get to know anything students are interested in and have a little rest from working on assignments, assessments or tests.

Methods to do digitalisation in schools:

- Replace the ‘traditional classroom’ model with the ‘flipped classroom’ model
- Use MOOCs (Massive Open Online Course)
- Inspirational video lectures online

Important criteria that would motivate schools to focus on digitalisation – a clear indication that students would benefit and time-economy on designing and redesigning courses.

As a result, from Study tour II, solutions were developed, described and presented after defining the target group, identifying problem areas and defining the areas of interest. Throughout the event, students could communicate with the companies, gather info, learn more about them and, thus, promote cooperation moving forward.

The goal of the event was reached – to bring together international talent and companies and to create new partnership opportunities.

Evaluation of the communication while working on solutions was made during and after the solution-making process. Evaluations of collaboration and cooperation between participants were made after the solution presentations. Conclusions were made based on interviews and discussions.

Students expanded their career opportunities and network. Lecturers and business companies had an option for international cooperation.

There were no deviations from the planned outcomes during this project activity.

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Appendices

Appendices 1

Canvas by IdeaHackers (http://solutioncanvas.com/)

Goal of canvas is to help entrepreneurs find solutions that actually work in the real world.
Segments 1, 6, 5 are responsible for customer state fit.
Segments 2, 9, 7 are responsible for problem – behaviour fit.
Segments 3, 4, 8 are responsible for communication – channel fit.
Segment 10 is your solution guess.

1. CUSTOMER SEGMENT(S) (Who is your customer?)	6. CUSTOMER STATE LIMITATIONS (Explore limitations to buy/use your product or service.)	5. AVAILABLE SOLUTIONS (How are you going to be different than competition?)
2. PROBLEMS / PAINS + frequency	9. ROOT / CAUSE of every problem	7. BEHAVIOUR + it's intensity (Tap into, resemble or support existing behaviour.)

(Focus on frequent, costly or urgent problem to solve.)	(Understand the cause of the problem.)	
3. TRIGGERS TO ACT (Design triggers that fit real life, spark associations, make it familiar.)	10. YOUR SOLUTION (Your 'down to Earth' solution guess.)	8. CHANNELS OF BEHAVIOUR online + offline (Be where your customers are.)
4. EMOTIONS (Add emotions for stronger message.)		

Appendices 2

Nordplus Ülemiste City 2nd Study Tour: Challenges of digitalization in smart cities

Where and when: 03rd-05th June 2019 in Ülemiste City, Tallinn, Estonia.

Time	Students	Employers	Project partners (admin.)	Lecturers	Location
1st day, 03.06.2019					
14.00 – 15.00	**Arrival and Opening of the Study Tour** Opening words from the rector of Estonian Entrepreneurship University of Applied Sciences (EUAS), prof. Mait Rungi and Ülemiste City introduction by representative of Mainor Ülemiste AS; Snacks, small talk and settling in etc.				Öpik Conference Centre, Valukoja 8, room Supernoova
15.00 – 16.00	**e-Estonian Briefing Centre visit** Estonia as E-country is going to be introduced from IT and digitalization perspective.				Öpik Conference Centre, Valukoja 8,
16.00 – 17.45	**Briefing meeting for Project partners (admin.)**				EUAS, Suur-Sõjamäe 10a, room Ülo Pärnits,
18.00	**Networking dinner** at Restaurant Viktoria ● Opening words from the moderator of Study tour Andrei Hrustaljov (entrepreneur, lectured in EUAS) and explanations, introduction and aims of case studies				Restoran Viktoria, Keevise 6

	• Briefing about next day's case studies and dividing into teams; • Team leaders are introduced;	
2nd day, 04.06.2019		
09.00-13.00	**Case study** Companies are providing teams with problem description and main information about company and clients; Teams start to work on problem(s), following the structure and aims of canvas (was explained at the kick-off); Teams are mapping problems and using IT and teamwork knowledge, try to find the best solution; Teams are co-working with the mentors;	Estonian Entrepreneurship University of Applied Sciences (EUAS), Suur-Sõjamäe 10a, Different Rooms
13.00 – 14.00	**Lunch**	Restoran Dvigatel, Lõõtsa 6
14.00 – 17.00	**Case study continues** Teams continue their work; Teams make conclusions and try to phrase their solutions; Teams make presentations and prepare to pitch their ideas (final pitching is the next morning) for 3rd day;	Estonian Entrepreneurship University of Applied Sciences (EUAS), Suur-Sõjamäe 10a, Different Rooms
19.00	**Dinner** at Old town	"Golden piglet" Suur-Karja 17, Old town
3rd day, 05.06.2019		
9.00 – 10.30	**Case study final - students teams pitches** (the solutions). • Public pitching to representatives of companies and employees of ÜC; • Teams present their solutions/findings (presentations).	Estonian Entrepreneurship University of Applied Sciences (EUAS), Suur-Sõjamäe 10a, Room 227
10.30 – 10.45	**Coffee break**	Estonian Entrepreneurship University of Applied Sciences (EUAS), Suur-Sõjamäe 10a, Room 228
10.45 – 11.45	**Case study final - students' teams pitches** (the solutions). • Public pitching to representatives of companies and employees of ÜC; • Teams present their solutions/findings (presentations).	Estonian Entrepreneurship University of Applied Sciences (EUAS), Suur-Sõjamäe 10a, Room 227
11.45 – 12.15	**Study Tour conclusions and handing out diplomas** • Closing statements from Mait Rungi and **Katrin Sulg** (Mainor Ülemiste).	Estonian Entrepreneurship University of Applied Sciences (EUAS), Suur-Sõjamäe 10a, Room 227
12.15 – 13.00	**Lunch**	Estonian Entrepreneurship University of Applied Sciences (EUAS), Suur-Sõjamäe 10a, Room 228
13.00 – 13.30	**ABB Robots (YuMi) performance**	Öpik Conference Centre, Valukoja 8, room Supernoova

13.30 – 15.30	**Open lecture** "How artificial intelligence simplifies our life?" Register here: FB LINK SIIA • **"Small but significant e-helpers and IA future trends"**, who helps Estonia (Estonia government and society are using a lot of artificial intelligence and they are behind the success story. Marten is going to introduce future steps and trends in AI. **Marten Kaevats**, Estonian National digital advisor. • **Mats Kyyro**, Experimentation designer at OP Lab, OP Financial Group's internal accelerator; speaking about AI in fintech industries. • **Tõnis Jaaniste, Milrem Robotics AS**, Chief engineer of Milrem Robotics AS; speaks about the benefits from IA to war industry and what the future may bring.	Öpik Conference Centre, Valukoja 8, room Supernoova
15.30	**Closing**	

3. Work-based Learning

3.1 Defining Work-based Learning

Neither working or learning are the same as they were even 20 to 30 years ago. The development of technologies during the fourth industrial revolution and the new global economy have undoubtedly had an impact on the organisation of work and employment (Guile & Unwin, 2019; Schwab, 2017). Organisations have reacted differently to these changes, and this in turn has impacted the ability of organisations to create effective environments for learning (Unwin, 2017; Felstead et al., 2009). At the same time, educational institutions (HEI, VET Schools etc, hereinafter as school) have been under pressure to meet the needs of employers and the wider economy (Wall and Jarvis, 2015). Employers are therefore concerned about the perceived quality of graduates leaving schools and entering the labour market. Rising dissatisfaction with regard to poor graduate-work readiness and transferable skills has been problematic (Archer and Davison, 2008; Hughes et al., 2013). Work-based learning is one possible alternative which can be seen as a solution to challenges facing both schools and companies. Madeleine Atkins (2016) argues that apprenticeships present a powerful means to meet the rising demand for higher level skills, but this also means that employers need to proactively engage with higher education. Atkins further notes that employers and schools will further need to develop and adapt to new ways of working together, while also exploring new methods of teaching and learning.

To define the WBL, it is important to understand first that it contains two aspects: (1.) learning and its linkage with the workplace and (2.) necessary competencies for the particular job/profession. As Elmgren and Henriksson (2014) emphasise, the learning process itself increases one's knowledge, so it can be done by any individual engaged in any activity or environment, either alone or together with others (Fjellström & Kristmansson, 2016). From the perspective of schools, any WBL activity can thus benefit students to be trained with the skills required by the labor market (CEDEFOP, 2013). In general, WBL can help develop tacit knowledge of students, to mimic behaviors and learn decision-making processes, as well as incorporate values and culture that lead to actions (Moon, 2017). Traditional WBL (eg. apprenticeship) focuses primarily on the transmission external knowledge or techniques (Lave & Wenger, 1991) and typically combines "work with study" (HM Government, 2018). Thus for successful WBL, learning occurs both in a formal educational setting (such as a classroom or lecture theatre) and in the workplace.

Based on the above definition and background theory, there are two main rationales for developing the WBL. Firstly, to provide young people and adults with the job-specific and generic skills that employers need, providing young people with a soft landing from school to work (CEDEFOP, 2013). Secondly, to develop relevant talent through an alternative to traditional academic programmes (Jeffrey, 2016). If the first rationale focuses more on the interests of educational institutions, then the second pertains more directly to the interests of companies participating in WBL activities. It is clear that the schools and companies must cooperate in creating supportive, work- and learning-oriented environments for students to gain success – i.e. talented employees for the company. Learning in workplaces is an ongoing trend (Billett, 2006) and the support and guidance provided in the workplace specifically can be a critical aspect of learning and progression towards full participation in the workplace community (Billett, 2001). Learning is strongly affected by the context (Metso, 2014), whether constructed in a social environment (Lave & Wenger, 1991), or involving at least some interaction with other persons (Vygotskij, 1978). Likewise, the learning gained and guidance provided through ongoing activities in workplaces, and factors (particularly goals, activities, and guidance) will all affect student's professional and academic development (Fjellström & Kristmansson, 2016). WBL is in other words situational, which means that learning in a work context helps knowledge transfer to real-life situations and practical application. Accordingly, WBL is similar to organizational learning in that it occurs through hands-on experiences and the transfer of knowledge in a real world context (Moon, 20).

Different learning activities, characteristics and sub-processes are involved in the full WBL process (Fig. 1) and each of these presents a range of challenges and which must be paid attention to within any WBL network, at every level.

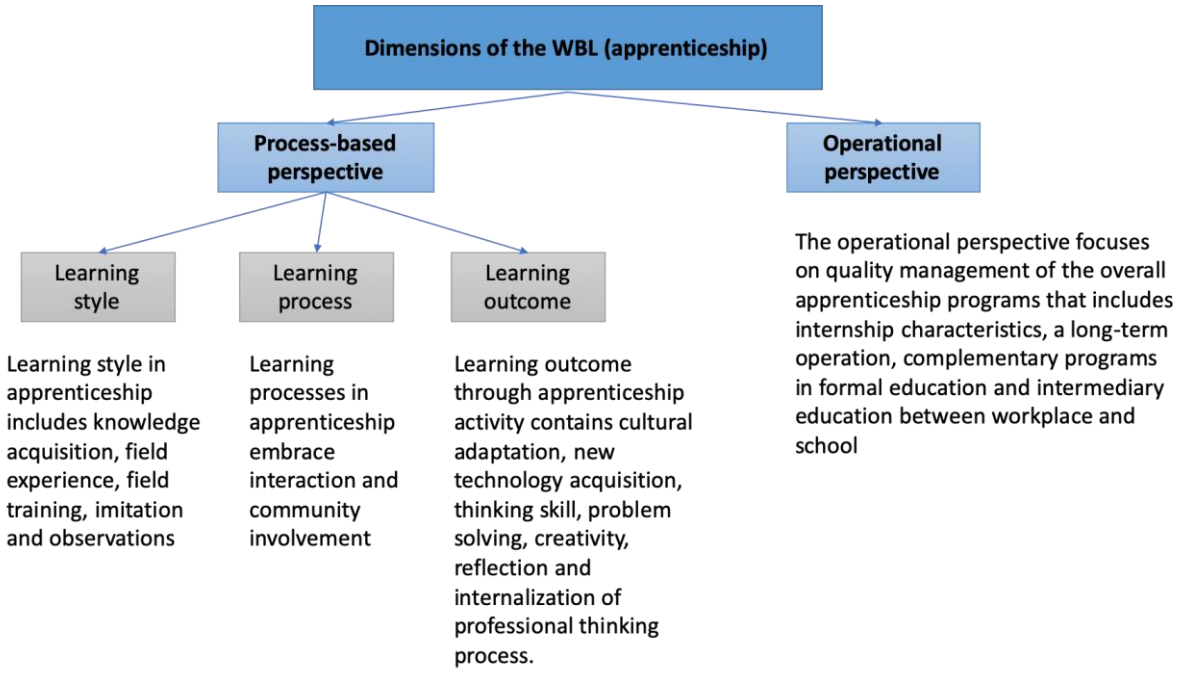


Figure 1 bases on sources: Collins et al., 1989; Jo and Lee, 1994; Kang, 1996; Casey, 1996; Barab and Duffy, 2000; Nonaka et al., 2000; An, 2009; Eurostat, 2010; Yoo, 2012; CEDEFOP, 2013; Yin et al., 2013; Gu, 2014; Lee et al., 2014; Kim and Lee, 2015.

Work-based Learning Challenges

The aforementioned aspects of WBL and the three-parties-collaboration (students-schools-companies) give rise to an awesome amount of challenges and opportunities that the parties need to deal with in order to achieve the WBL benefits. The most discussed party in WBL activities is typically the company and its problems in organizing the work when "hiring" the student-apprentice. The range of challenges varies from selecting the talented student (Bhatanagar, 2008) to possible loss of productivity of key members of staff during the supervision of the student (Mulkeen et al., 2017). Some authors (eg. Jansen & Pfeifer, 2017) argue that the good WBL support and meaningful use of apprenticeship training in the company can bring both short-term benefits (resulting from the work apprentices perform during the training period) and post-training benefits in the form of future competent employee performance. To gain both, the appeal to – and selection of – productive apprentices is crucial for a positive cost-benefit relation of WBL activity. The company's challenge is to not only find talented students who have the ability to explore and

generate innovative ideas and the courage to implement them. The company must also motivate their WBL students and direct their activities in a way that matches organizational strategy, goals and culture.

Learning-oriented culture inside the company is one of the key preconditions for successful WBL (Cortini, 2016), because only then can the company and student develop together and reap the benefits from WBL. A further prerequisite for learning is access to goals and knowledge that are difficult or impossible to attain alone (Billett, 2001); the organizational culture should not only support learning, but also teamwork. The implicit expectation is that managers will need to develop and adopt new approaches in order to support and manage both students and colleagues as they progress through WBL programmes, combining work-related study with full-time employment (Rowe et al, 2017). In creating a culture of learning, a good supervisor is as important as talented students and general organizational culture (Mikkonen et al., 2017). Supportive workplace supervisors trust their apprentices and enhance their self-esteem by praising them when they have carried out their work duties well (Chan, 2014); they provide positive support in cases of complexity, encouraging student self-development, enabling the apprentices to develop, and enhancing their network within the workplace, thereby developing further opportunities for learning (Minton & Lowe, 2019). The student-apprentice is potential talent for the company, so a focus upon talent management processes and learning on the job remains a distinct employer responsibility (Rowe et al., 2017).

Provision of a workplace supervisor, creation of a culture of learning, allowing employees school as well as work time – these and other WBL supportive activities all bring cost to the employer. Some employers view supervision as a loss of productivity from an experienced member of the team, as supervisors need to pass on knowledge and skills to ensure that effective apprentice-learning takes place (Minton & Lowe, 2019)

The main challenges facing schools are connected, first, with the range of competencies the student-apprentice needs in order to be a valuable employee in the labor market and, second, with the curriculum design itself, where the WBL is focused – i.e. how best to match school-based and work-based studies in order to produce a holistic and meaningful set of necessary competencies. Several sources (eg. Tynjala, 2008) argue that schools do not sufficiently provide students with the relevant transferable skills necessary for work-place success. Although schools that explore work-based learning approaches and partnerships with employers tend to offer a range of valuable insights and perspectives (Major et al., 2011), it is not always clear which are the most valuable competencies students need to achieve, primarily due to constant changes in skill standards.

Focusing solely upon short-term technical skills which are too often based upon narrowly focused and outdated curricula (Kossek and Perrigino, 2016; Schwab, 2017), brings poor results – poor performance of the student-apprentices, dwindling retention and engagement, and graduates ultimately blaming companies for insufficient training and opportunities (Butler and Felts, 2006). Many authors state that companies prefer to choose students-apprentices who can reflect, analyze, critique and synthesize work-based experiences, and develop themselves accordingly (Harvey, 2003). Such students have the ability to think and work "outside the box" having embraced lifelong learning and development of conceptual and analytical thinking skills (Beardwell and Claydon, 2007).

Moreover, schools are similarly responsible for managing the quality of the student's learning experience, including within the workplace (Minton & Lowe, 2019). When professional competencies can be taught in the workplace, schools likewise need to prepare students for WBL and provide them with general, transferable competencies like problem-solving, as well as oral/writing/IT competencies which have a significant positive influence on productivity in commercial occupations (Jansen & Pfeifer, 2017), and which will in turn be further developed in the workplace. Anderson et al. (2012) notes that several schools have developed study programmes that are constructed to meet the needs of a particular company and linked to professional standards, thus integrating workplace learning activities within an academic study programme. A good WBL study programme integrates pedagogical approaches with professional competencies and transferable skills (Rowe et al., 2017). It is worth mentioning again that WBL study programmes need to adopt an approach of experiential and reflective learning, marks of quality, work-based learning designed in collaboration with employers (Smith and Paton, 2014).

Student-apprentices will furthermore confront challenges while participating in WBL activities. Most prominent among these is the student's ability to cope with working and studying at the same time. But no less important are self-management skills, which express themselves in the student's self-determination, independence and autonomy required to fulfil his or her role as a student and future employee (Mikkonen et al., 2017). Behavioural characteristics that predict success in a WBL environment include motivation, resilience, and a low susceptibility to stress (Jansen & Pfefer, 2017). Students may, on the other hand, suffer if their work-based supervisor has him or herself developed poor work habits, and especially if personal and professional development are not already key features of the organisational culture (Tanggaard, 2005). Billett (2016) emphasized how "rather than viewing WBL as being just learning 'on the job', it is characterised as being mediated by learners themselves, rather than the kinds of activities and

interactions through which others (e.g. teachers and practitioners) directly attempt to mediate that learning (e.g. teaching and direct guidance)."

In fact, the biggest challenge facing the schools and companies in implementing WBL is the ability to cooperate and agree on goals and the work-study balance needed for successful collaboration and the attainment of those goals. To overcome the above mentioned challenges all schools and companies will thus need support in their efforts to organise and implement WBL.

3.2 Aim, Objectives and Programme

The 3rd study tour was organised on 14th-16th of October 2019 in Ülemiste City, Tallinn, Estonia. The aim of the study tour was to share the Nordic and Baltic work-based learning (WBL) experiences from different universities and companies. With this in mind, the suggestions for activities aimed at each target groups (students, universities and companies) were made in order to produce the best possible outcome. A number of Ülemiste Smart City company/organisation visits were organised, along with a job-shadowing day, presentations made by universities/companies and a workshop where best practices were exchanged between experts, students, lectors and company representatives.

The objectives:

1. To provide students and lecturers opportunity to meet companies and ask questions direct to experts in their fields.
2. To hear about different international work-based learning cases/experiences.
3. To participate in a work-based learning workshop, inclusive of teamwork.

In accordance with the stated objectives, three main target groups were involved in study tour activities: students, lecturers, and business companies. More than 40 students, teachers and entrepreneurs from six different countries attended. The programme was planned specially to present various activities for all three target groups (see Study Tour Programme, Annex 1).

During the first day the students and lecturers received welcome words from the moderator of the Mainor Study Tour, Mrs. Katrin Sulg, and the rector of Estonian Entrepreneurship University of Applied Sciences (EUAS), Prof. Mait Rungi. The Ülemiste City introduction was made by Mainor Ülemiste Customer Experience Manager, Mr. Teet Raudsepp. A representative from Innove,

Development Manager for Work-based Learning, Mrs. Piret Lilover, presented an introduction to work-based learning in Estonia: What is work based learning? What opportunities does it present and how is it working in Estonia? Apprenticeship training in Estonia (VET) consists: 1/3 of the curriculum is delivered at a VET institution with an emphasis on theoretical training, and 2/3 at an enterprise offered at EQF levels 2-5, the same curriculum as for school-based programmes and with the same learning outcomes and final exam (either a school exam or professional qualification exam). The total study duration is from three months to three years. VET institutions cooperate with employers to design curriculum modules and an implementation plan.

On the second day students and lecturers participated in company visits and a Job-Shadowing Day at Ülemiste City companies (Magnetic MRO, Tallinn Airport, Zone Media, Healthcard, Securitas Eesti, Ülemiste Health Centre). After lunch there was an Open Feedback Discussion about what students and lectures experienced during said company visits. An international group, G4S, which specialises in providing security services, shared its experience implementing a WBL programme in collaboration with Estonian educational institutions.

On the third day a group visit was organised to The North Estonia Medical Centre where students and lecturers had a tour of the hospital and received an overview of how the worked-based learning programme for nurses has been running there. After that the international group turned back to Ülemiste City and the Work-Based Learning Workshop was taking place together with 5 key speakers. After the event EUAS Rector Mr. Mait Rungi gave diplomas to all the participants.

Company visits, Job Shadowing Day [20]

The Ülemiste City company visits and job-shadowing day for lecturers and students took place in following companies: Magnetic MRO, Tallinn Airport, Zone Media, HealthCard, Securitas Eesti, Ülemiste Health Centre, G4S, The North Estonia Medical Centre.

After the the company visits and job-shadowing day the organisers of the event carried out an open feedback discussion among lectures, students and company representatives. Participants were given two questions: 1. What did you learn? 2. What was the highlight for you?

Please find a summary of the answers received, below:

What did you learn?	What was the highlight for you?

[20] Prepared by using Report of the Open Feedback Discussion made by Katrin Eha - EUAS

HealthCard	Great, a lot to learn, amazing. Health app, sporting experience. Very inspiring. How to do 14 hours sport? Medical, genetical, physical properties - data analysis and making conclusions.	The person has started ski jumping (person who had never ski jumped before). Voluntary work during different events. Organizing events with volunteers. It's good to be a volunteer and help to make things happened.
Zone media	Had learned a lot. Was surprising - the system. Interesting. There is a big difference between what is on paper and what is real. The structure was inspiring. The area was interesting. Different examples, areas they had in mind, haven't heard about them before.	Good company with more than 20 years, different from start up. See the new place and areas.
Securitas Eesti	Different assets. Hance to do by himself something. Great learning in the field, haven´t had a lot of knowledge before. To solve the problems together. To hear how HR manager works - the system, how the system works, how they track etc.	IT solutions, the schedules in the programme, meet other HR people, was interesting and useful. Was nice to get to know about HR daily work.
Tallinn Airport	Different job positions, training programmes. Expanded the view how airports work. The procedures, roles and rules, the communication between different companies. Impressive equipment.	The tour, background and the history, baggage handling, to see behind the scenes. To see what happens after you drop your luggage. Machines - for example cleaning snow. Highlight – entire tour! Also job opportunities / internship etc. To see what happens if things don't work smoothly.
Magnetic MRO	Being close to an aircraft maintenance company, getting to know the system, the textures, different fabrics, sustainability, biometric signatures - new things, new technologies. To communicate the customers, the maintenance. Using technologies. Was interesting how difficult was to get in. How to organize inventory, the system. Surprised - many things are done by hand.	Whole process, running e-platform. To see those big machines working. Opening the eyes from different perspectives. Maintenance things. Challenge how easily track.

In summary the international students and lectures were very thankful of the journey they have had in different types of companies, having learned a lot and being inspired by the job-shadowing day as one highly effective form of work-based learning.

In addition to the job-shadowing day there were two companies that made a presentation to the whole international group regarding the way work-based learning is carried out in G4S and The North Estonia Medical Centre.

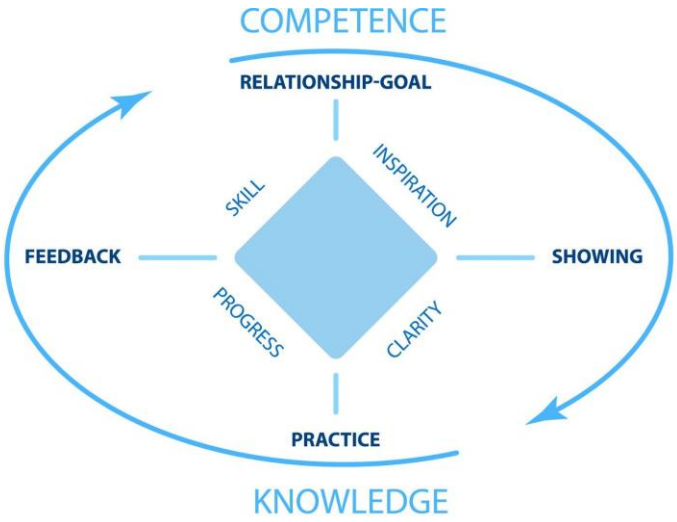
G4S - HR manager Indrek Sarjas gave a presentation about how their company have run a work-based learning programme: the G4S Security technicians guidance programme. G4S is an

international group which specialises in providing security services. See the company introduction video here: https://youtu.be/_pyNzEC4FXY . The issue was that, in Estonia, three years ago, nobody was teaching security systems, yet the need for those security technicians was rising. The company understood that it was too expensive to teach personnel individually, so they organised a WBL programme and implemented it.

The G4S WBL programme was advertised as follows:

- We sign an employment contract and pay you for your time.
- It's practical - you learn exactly what you need in your daily work.
- You will be guided by the best G4S professionals.
- Teaching lasts only a year - only lectures are required at school.
- You can seamlessly combine your work with your studies, and work time is included in your studies.
- The study ends with a professional exam and is free for students.
- You can develop further within the company and gain new knowledge.
- Get some of the sporting opportunities through the G4S Sports Club.
- You will receive the same benefits and benefits as any other student during your studies.

G4S used Technician Guidance Model below:



1. RELATIONSHIP-GOAL
· establish a trustful relationship
· explain to the new employee the broader goal and what is needed to be done
· explain what a good relationship is

2. SHOWING
· teach how to do
· show 2-3 times
· explain why and how you do
· emphasize important issues

3. PRACTICE
· the new employee performs the easier part of job
· the new employee performs the whole job

4. FEEDBACK
· give the new employee feedback of success and what to do differently
· share your tips
· inspire to practice

In summary the G4S HR manager, Indrek Sarjas, explained that at first the people who joined the programme did not understand what they were learning or why, but in the end they did not want

to leave and simply remained working for G4S. He recognised it is a successful programme and said the company will continue to use it.

The North Estonia Medical Centre is one of the top healthcare providers in Estonia. As a regional hospital, it has the highest-level competency to provide specialised medical care. See the web here: https://www.regionaalhaigla.ee/en

The international Nordplus programme students and lecturers had a tour of the hospital. Mariken Ross, the Head of the Department of Hematology, introduced the work that nurses perform everyday and talked about the training programmes. Aleksandra Sandre, the Nursing Manager in the Hematology Department, introduced work-based learning as key to her becoming the first specially-trained nurse in the hospital.

3.3 Workshop

The workshop "Different Practices of Work-based Learning: how to prepare students to be better specialists and what can universities and employers do?" was held on 16th of October 2019 at the Estonian Entrepreneurship University of Applied Sciences. It was moderated by Helna Karu-Baher, SA Innove, who also gave a summary presentation.

The workshop itself was divided into two sessions. In the first session there were 5 key speakers from Denmark, Finland, Estonia. They all shared experiences in work-based learning in their own country, whether from a university's perspective or that of a company.

3.3.1 First Session: Key Speakers

- Aalborg University experiences in work-based learning – Mrs. Janne Bang, Teaching Associate Professor, Department of Communication and Psychology (Aalborg University).
- OAMK Labs and Incubator – Mr. Kimmo Paajanen, Senior Lecturer, Information technology, new technologies (Oulu University of Applied Sciences).
- Proakademia – Mr. Timo Nevalainen, Coach (Tampere University of Applied Sciences).
- Cleveron Akademy – Mr. Kristjan Oad, CEO (Estonian Entrepreneurship University of Applied Sciences).
- Scholarship programme at Hansab – Mrs. Anneli Laines, Area Manager (Hansab AS).

Aalborg University experiences in work-based learning

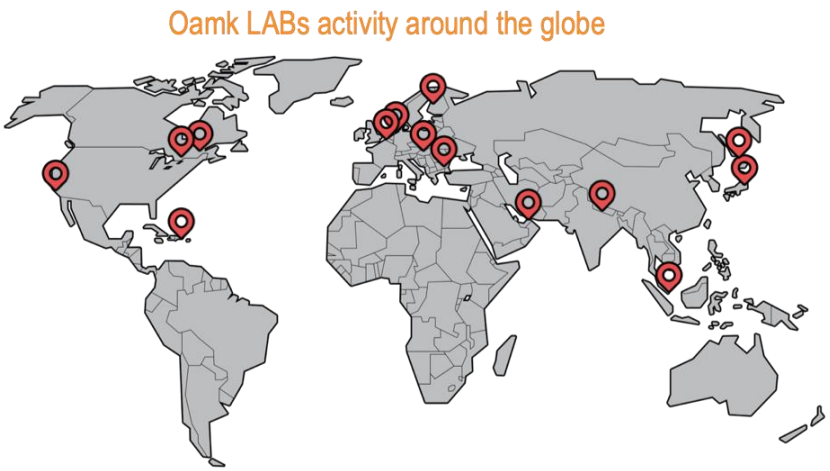
As is well-known work-based learning has been on the market for more than 30 years in Denmark. Mrs. Janne Bang said there are 5 universities that provide it in Denmark. There is a rule that if you offer an internship then it cannot be paid. Nevertheless, 95% of the students are interested in participating.

OAMK Labs and Incubator

OAMK Labs is a pre-incubator programme offering an inspired way to learn new competencies: developing, supporting and creating businesses and innovative solutions. In 2011 the well-known company NOKIA had fallen on hard times, with many NOKIA workers losing jobs. During this same period, the gaming industry was very active in the region. So the city of Oulu turned to OAMK and asked whether gaming industry employees couldn't come out of their university. The university thus decided to encourage students to found start-up companies. OAMK developed an Oulu-Based Learning Model that helps to implement work-based learning in different fields like Mobile Apps; Entertainment Games; Health+Wellness; IT; Sustainability and Green Care; the Construction Industry, etc.

See more www.oamklabs.fi

This same model has also been used internationally. See the countries below.



Proakademia

Mr. Timo Nevalainen gave a presentation on the theme of how to prepare students to be better specialists. TAMK has an Entrepreneurship unit, Proakademia, within TAMK. It encompasses a BBA programme in Entrepreneurship and Team Leadership and an MBA programme in Entrepreneurship, with about 150 students, and 9 + 2 coaches. See more: https://proakatemia.fi/en/

In Proakatemia students learn entrepreneurship through action. Proakatemia is a community where students study entrepreneurship and team leadership. They also actively develop teamwork

and leadership skills. During the studies they carry out customer projects through which they gain experience and earn money for their team enterprises. Proakatemia's wide national and international networks provide students with a range of useful contacts during their studies.

The key focus in Proakademia is that they help students to be prepared to become better specialists as well as generalists. How? Over 3 years the student teams lead themselves through the process of having the idea of the product or service, and up until the point of having their student business up and running a ready for investment. Coaches are available for them throughout, if there is a need.

Cleveron Academy

EUAS CEO Mr. Kristjan Oad gave a presentation on work-based learning at EUAS: the Cleveron Academy project. Cleveron is the innovation leader in retail click & collect pickup solution companies by developing intelligent parcel lockers and robots.

Mr. Oad introduced the Estonian Industrial Policy Green Book:

- "Several key prerequisites for a rise in added value are unmet – there is a shortage of skilled labour (e.g. developers, engineers etc)"
- "The electronics industry is developing rapidly and needs more engineers."
- "If we wish to apply the Industry 4.0 approach, the education system must be flexible and adapt to changes."

In the year of 2018 Cleveron CEO Mr. Arno Kütt turned to EUAS and asked whether they might prepare a work-based learning programme together. The answer was "Yes, let´s do it!" So, the Cleveron Academy started with its first 20 students on September 2019.

Cleveron Academy's work-based learning programme "Robotics software development"

- Applied higher education programme, 3 years, 180 ECTS
- Work based learning: 60 ECTS internship + problem-based learning, study tasks input from
  Cleveron
- Applied problem-solving individually and in teams; knowledge creation in cooperation with

the students
- Study rhythm: Monday-Friday at Cleveron, 50% in classroom, 50% hands-on
- Group of 20 students, divided into 4 teams
- Engaged by Cleveron as R&D teams, with actual tasks and goals. Mission: self-driving
- parcel delivery vehicle

Read more about the Cleveron Academy here: https://cleveron.com/news/cleveron-will-open-a-robotics-academy

Work-based learning at Hansab

Area Manager Mrs. Annely Laines introduced the company Hansab and explained how it offers Innovative Technology solutions for businesses: complete solutions involving consultancy, software development and integration, installation and after sales services, together with service export.

Hansab faces several challenges nowadays like:

- Wide products & solution portfolio
- Pre-sales consultation, project management and service
- Constant development of new solutions & business areas
- Specific professional knowledge needed

To face those challenges Hansab is doing regularly:

- Regular interns in Estonia, Latvia and Lithuania
- Scholarship programmes for technical / IT students
- Other activities in cooperation with schools/ students

To finance the above the company has scholarship programmes running together with universities like TalTech etc. They also have a stipendium. Mrs. A. Laines added that they are primarily looking for personality and potential from participants: general background fit as opposed to specific skills, as the company can train anyone whose motivation is in the right place.

3.3.2 Second Session: Workshop

Topics:

1. Is every company suitable for WBL? How to choose?
2. What kind of support/motivator/mentor the learning employee needs?
3. What is meant by a working student (studying and working in the same field at the same time)?
4. How to bring together the three key WBL parties (school, company, student) and start learning? How to prepare and organise collaboration?
5. What it means for a company to have an employee working and studying in the same field and at the same time? Challenges? Benefits?
6. What kind of support/motivator/mentor does the company need?

Participants were divided into 6 groups and given one of the questions above. Brainstorming was used to look for answers and to draw out ideas that could work for development in each specific area. For increasing participant inspiration before the workshop, there were also a number of short presentations regarding work-based learning in different countries.

Main statements of workshop were:

Not every company is suited for work-based learning from scratch, but any company has the capacity to become a good work-based learning environment. Work-based learning is a meaningful collaboration between parties: student, university and company. All should gain something – it is a WIN-WIN situation. In the company there should be a flexible and trustful environment, where development-minded people work, who are ready to see things from different perspectives. They should also be able to gain from new expertise, skills and knowledge that the student him or herself brings into the company and at the same time share the knowhow which already exists in the company. Why not trust students to try to solve some challenges the company is facing? Students should be given a chance to take responsibility and plan their own work, as time management is important for students (indeed, he or she has double workload while studying). It is important that goals are set clearly. Students should feel they have become a part of company's team if they are to be motivated. Company supervisors must likewise support and coach for maximum development of the student. Regular communication and feedback are very important for development (360-degree feedback, whenever possible), between the colleague/supervisor and student and vice versa; company to university; university to company; company supervisor to university supervisor and vice versa, etc.

Some questions left open for next brainstorming sessions: Shall a student be paid a salary for the time he or she is at the company? Different countries have had different experiences, which also differ company by company. The general understanding was that some remuneration creates greater responsibility on both sides. One very challenging idea was also thrown into the air: maybe students should pay for the company...

Other areas of discussion left a bit open: How to be an attractive company/future employer for students? How to be an attractive student/future employee for a company? All participants of the workshop agreed that further discussions and developments are needed to support students in becoming better specialists and future employees in fast-developing smart companies.

3.4 Outcomes

At the end of the third study tour there was a Nordplus project summary event at Oulu University of Applied Sciences where the project partners had an additional workshop to wrap up all the experiences during WBL study tour in Ülemiste City. There, suggestions were made with regard to future activities to help students, universities and companies to work more closely and successfully in work-based learning contexts. Please find the workshop findings below.

Activity	Target Group	Goal/Expectations Why?
• Pop-Up study programmes	• Companies and Universities	• Short-cycled programmes where groups can partner and train small groups and describe practices already in place.

• Government supports lecturers to do internships in companies	• Companies and Universities	• Lecturer competency. Pay for the travel and the lecturer if in addition to the workload. A kind of sabbatical is taken to work more in the labor market.
• Experts visit universities	• Companies and Universities	• Experts go into the universities to give recommendations on how universities can improve work-based learning in the classroom.
• Experts work with the students	• Companies and Students	• Experts are working with the students to help them be more competent with work-based learning
• Hackathon	• Companies and Students/Universities	• Companies give a task to a challenge and the students work on finding solutions
• Job Shadow	• Companies and Students	• Students go into different companies to see what is happening in the workplace.
• Volunteering	• Companies and Students	• Students have responsibilities within companies. Gives good experience.
• Cross-Border Assignments	• Companies, Students/Universities, and ÜC	• A company from one country gives an assignment to students from another country.
• Community Tourism Strategies	• Students and Companies	• Students are working with strategies to help with tourism within different places.
• Real-World Application Projects	• Students	• Students work on projects that can actually be implemented into the community. Supporting action.
• Hiring Process	• Students and Companies	• Students went to companies and worked on the process for how companies should hire. From the advertisements to interview questions. Students created all of the documentation for hiring within a company.
• Audit Book	• Students and Companies	• Students go into companies and audit in an informal way. Feedback is given to the companies and companies can decide to implement change if deemed necessary.
• Career Days	• Students and Companies	• Students are practicing the interview process and meet with companies to seek knowledge for the job process.
• Global Entrepreneurship Week	• Students and Companies	• https://www.genglobal.org

Ülemiste City with facilitate the process for the projects listed above.

Conclusion

The study tour was beneficial to all the participants:

- Students had interesting innovative company visits. Participants enjoyed a Job-Shadowing Day outside their home countries. They got to know more about what is going on internationally in WBL, meet new friends, got further motivation that anything is possible. Moreover, they now consider Ülemiste City as their possible future workplace.
- The lecturers' experiences were quite similar to that of students, except the fact that all the experiences they had in WBL, as well as the knowledge they received, can be turned into action in their universities and immediately begin making a difference in their home countries.
- For the business companies and Ülemiste City it was a good opportunity to meet international talents, introduce Ülemiste Smart City and its innovative companies, and to further share their experiences in WBL and learn from the experiences of others.

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Appendices

Appendices 1

Nordplus Horizontal 2019 Building Educational Cooperation in Ülemiste City

Nordplus Ülemiste City III Study Tour: Challenges of work based learning in smart cities

Where and when: 14th-16th of October 2019 in Ülemiste City, Tallinn, Estonia.

Time	Students	Employers	Project partners (admin.)	Lecturers	Location
1st day, 14.10.2019					
14.00 – 16.00	**Arrival and Opening of the Study Tour** ● **Opening words from the moderator of Study tour** – Mainor, Mrs. Katrin Sulg. Explanations, introduction and aims of study tour. Briefing about next day's doings. ● **Opening words from the rector** of Estonian Entrepreneurship University of Applied Sciences (EUAS), prof. Mait Rungi ● **Opening words and Ülemiste City introduction** by Mainor Ülemiste, Customer Experience Manager, Mr. Teet Raudsepp ● **Introduction to worked based learning in Estonia** What is work based learning? How we understand it, different opportunities and how it is working in Estonia? Representative from Innove, Development Manager for Work-based Learning, Mrs. Piret Lilover. Snacks, small talk and settling in etc.				EUAS, Suur-Sõjamäe 10a, room 227
16.00 –17.45	**Briefing meeting for Project partners (admin.)** Nordplus Summary Event in Oulu, dissemination, articles, reports, handbook, final report.				EUAS, Suur-Sõjamäe 10a, room Sahver
18.00	**Dinner** at Pizza Restaurant POMO				Restoran POMO, Sepise 8
2nd day, 15.10.2019					
09.00-13.00	**Ülemiste City company visits for lecturers and students (Magnetic MRO, Tallinn Airport, Zone Media, Healthcard, Securitas Eesti, Ülemiste Health Centre)**				Different companies
13.00 – 13.30	**Lunch**				Restoran Dvigatel, Lõõtsa 6
14.00 – 16.30	**G4S sharing experience of work based learning**				EUAS, room 227 (Suur-Sõjamäe 10a)
18.00	**City tour and dinner** at Old town http://www.talukorts.ee/et/kontakt				Talu kõrts, Viru 18, Tallinn Old Town
3rd day, 16.10.2019					
9.15-12.00	**Group visit The North Estonia Medical Centre**				Buss waits in front of the Ülemiste hotel (Lennujaama tee 2)

12.00 – 12.30	**Lunch**	EUAS, Suur-Sõjamäe 10a, Room 228
12.30 – 15.30	Work-shop: "Different practices of work-based learning: How to prepare student to be better specialist? What can universities and employers do?" **First session: Key Speakers (5x15min)** ● Aalborg University experiences in work-based learning - Janne Bang (Aalborg University) ● OAMK Labs and Incubator - Kimmo Paajanen (Oulu University of Applied Sciences) ● Proakademia - Timo Nevalainen (Tampere University of Applied Sciences) ● Cleveroni Akademy – Kristjan Oad (Eesti Ettevõtluskõrgkool Mainor) ● Work-based learning at Hansab - Anneli Laines (Hansab AS) **Second session: Work-shop, managed by the Key Speakers** **Topics:** 1. Is every company suitable for WBL? How to choose? KIMMO 2. What kind of support / motivator / mentor the learning employee needs? TIMO 3. What does mean a working student for a school (studying and working in the same field at the same time)? INGRID 4. How to bring together three parties - school, company, student - and start learning? How to prepare and organise collaboration? JANNE 5. What it means for a company to have an employee working and studying in the same field and at the same time? Challenges? Benefits? ANNELI ● What kind of support / motivator / mentor the company needs? HELNA Facebook: https://www.facebook.com/events/476974229700789/ Moderator is Helna Karu-Baher, Innove SA	EUAS, Suur-Sõjamäe 10a, Room 227
15.30	**Closing**	

Thank you for reading!
THE END