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Talent Retention and the Development of Digital Skills

A study of the ecosystem-based Digitalisation Academy located in Vaasa, Finland

Ministry of Economic Affairs
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Abstract

In 2018, Vaasa-based energy cluster companies and higher education institutions jointly established the Digitalisation Academy. The aim of the Digitalisation Academy, which was created as a joint effort, has been to respond to the talent shortage in the region's business sector by strengthening the digital skills of Finnish and foreign students studying in Vaasa and supporting their employment in the region's companies.

This publication is the final report of a research and development project to develop the Digitalisation Academy, funded by the Ministry of Economic Affairs and Employment and carried out by the University of Vaasa's Innolab. The international multidisciplinary group of researchers studied the experiences of the students and the representatives of companies and higher education institutions involved in the project. Based on these observations, the report includes proposals on how the Digitalisation Academy can be developed in the future. The report also describes the previous talent shortage and the ways to commit experts, as well as research on ecosystem cooperation and cooperation between companies and higher education institutions. In view of these, the researchers have issued recommendations on actions to the parties. The report can also be used as a handbook for setting up similar units in other Finnish clusters and as a basis for a discussion on how to support the commitment of highly educated experts to Finland.

Osaajien sitouttaminen ja digitaitojen kehittäminen
Tutkimus Vaasan ekosysteemiperustaisesta Digitalisaatio-Akatemiasta

Tiivistelmä

Vuonna 2018 Vaasan energiaklusterin yritykset ja korkeakoulut perustivat yhdessä Digitalisaatio Akatemian. Yhteisponnistuksena syntyneen Digitalisaatio Akatemian tavoitteena on ollut seudun elinkeinoelämän osaajapulaan vastaaminen vahvistamalla Vaasassa opiskelevien kotimaisten ja ulkomaisten opiskelijoiden digitaitoja ja tukemalla heidän työllistymistään alueen yrityksiin.

Tämä julkaisu on Digitalisaatio Akatemiaa kehittäneen, TEM:n rahoittaman ja Vaasan yliopiston InnoLabin toteuttaman, tutkimus- ja kehityshankkeen loppuraportti. Hankkeen kansainvälinen, monitieteinen tutkijaryhmä selvitti mukana olleiden opiskelijoiden sekä yritysten ja korkeakoulujen edustajien kokemuksia hankkeesta. Näiden havaintojen pohjalta hanke esittää kehitysehdotuksia Digitalisaatio Akatemian seuraavalle ajanjaksolle. Raportissa myös summataan aiempaa osaajapulaa ja osaajien sitouttamista sekä ekosysteemiyhteistyötä ja yritysten ja korkeakoulujen yhteistyötä koskevaa tutkimusta. Näihin peilaten hankkeen tutkijat antavat osapuolille toimintasuosituksia. Raporttia voidaan hyödyntää myös käsikirjana perustettaessa vastaavia yksiköitä Suomen muihin klustereihin sekä käytäessä keskustelua siitä, kuinka tukea korkeakoulutettujen osaajien sitoutumista Suomeen.

Kvarhållande av kompetens och utveckling av digitala färdigheter
En studie av den ekosystembaserade digitaliseringsakademin i Vasa

Referat

Företagen och högskolorna i Vasaregionens energikluster inrättade tillsammans en digitaliseringsakademi 2018. Målet för denna gemensamma insats var att åtgärda bristen på kompetent arbetskraft inom näringslivet i regionen genom att stärka de digitala färdigheterna hos finländska och utländska studerande som studerar i Vasa och genom att stödja deras sysselsättning i företagen i regionen.

Denna publikation är slutrapporten från det forsknings- och utvecklingsprojekt som har utvecklat digitaliseringsakademin. Projektet har finansierats av arbets- och näringsministeriet och genomförts av InnoLab vid Vasa universitet. Projektets internationella, tvärvetenskapliga forskargrupp utredde vilka erfarenheter de deltagande studerandena och företrädare för de deltagande företagen och högskolorna har av projektet. Utifrån dessa observationer har projektet lagt fram utvecklingsförslag inför digitaliseringsakademins följande period. I rapporten ges också en sammanfattning av den tidigare bristen på kompetent arbetskraft, kvarhållandet av kompetens samt forskningen kring ekosystemsamarbete och samarbete mellan företag och högskolor. Forskarna i projektet ger också handlingsrekommendationer till de berörda parterna som baserar sig på dessa. Rapporten kan även användas som handbok när man inrättar motsvarande enheter i andra kluster i Finland samt när man diskuterar möjligheterna att stödja högskoleutbildade experters engagemang för Finland.

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FOREWORD

The Digitalisation Academy was established in Vaasa, Finland, as a joint effort by companies and universities, to help tackle the talent shortage in the area by developing digitalisation skills. Its core idea is to provide an interdisciplinary programme to boost university students' digitalisation skills, while offering them networking opportunities and assisting them in finding internships and thesis work. What makes the programme unique is that it is regionally developed and managed by universities, companies and industry actors from the Vaasa-based energy cluster. It has been funded by the companies in the region and is cost-free for students.

It was recognised that while Vaasa's universities and universities of applied sciences attracted a good number of students each year, too few of them stayed. There was a clear demand in terms of showing students the opportunities the Vaasa region had to offer and supporting them in their networking with the companies in the region. From companies' point of view, developing students' digitalisation and project work skills was an equally important factor.

As an initiative, the Digitalisation Academy relies on the strength of ecosystem thinking: a variety of actors from different fields collaborating for mutual benefit. In solving complex challenges associated with several fields, it is necessary to utilise insights and resources from a variety of sectors.

This report is the main outcome of a research and development project called "DA-Pito", which supported the further development of the Digitalisation Academy model. "Pito" is the Finnish word for grip or traction, referring to the elements needed to retain talent. This report summarises the work conducted in the DA-Pito project from 2019 to 2020. While the work of the Digitalisation Academy has been funded by the companies in the region, the research and development project was funded by the Ministry of Economic Affairs and Employment of Finland and conducted in the University of Vaasa's InnoLab.

How it all began

The Digitalisation Academy's story began in the Palosaari district of Vaasa in January 2018. Andreas Paschinsky, Head of Business Development in a company called Devatus, stood in his company's office looking at an empty chair. Devatus provides digital solutions to its

customers, and digital skills were – and still indeed are – in high demand. The company was growing, but it would have grown even faster had employees with the right skill set been available.

Paschinsky was not alone. Several other companies working in the region's vibrant energy cluster were facing the same struggle. While universities brought thousands of bright young people to Vaasa, too many of them left the city, or even Finland, after finishing their studies. In particular, students that had moved to Finland from abroad were likely to lack connections and could benefit from a better cultural and practical understanding of how to get on the first rung of the career ladder in Finland.

Collaboration between the Vaasa region's ecosystem actors did exist, but there was clearly a need to bring universities and companies closer together in solving this matter. However, deepening collaboration alone would not solve the problem. Paschinsky realised that there were other issues that needed fixing. Companies' needs in terms of digitalisation skills were changing rapidly, but there was also variation between companies. While universities provided high quality teaching, traditional university education was not responsive enough to the industry's changing and fragmented needs.

Moreover, there was a growing demand for a workforce that had good communication skills, that was able to contribute in multicultural and multidisciplinary teams and that understood how to run projects. Skilled coders were of course still in high demand, but in order to succeed in the job and to benefit the employer's business within a relatively short orientation period, these additional skills had gained relevance.

Paschinsky was determined that the talent shortage issue needed a wider-scale solution. Therefore, he contacted several stakeholders in the region to join forces with them and move from focusing on the problem to a solution. I was one of those contacted, and the University of Vaasa's InnoLab became the hub that developed the Digitalisation Academy in wide collaboration with stakeholders. We did not participate in the day-to-day running of the Academy's teaching and other activities, but our research team was enthusiastically involved in developing the Digitalisation Academy model. In addition, I was also a member of the Academy's steering group.

The Digitalisation Academy was established in 2018 as a collaborative action between Devatus and several other companies in the region: Wärtsilä, Wapice, Danfoss, the KWH Group, VEO and Vaasan Sähkö. Financial support was also received from LähiTapiola and the Ostrobothnian Chamber of Commerce. The University of Vaasa, Novia University of Applied Sciences and Vaasa University of Applied Sciences (VAMK) joined the initiative as partnering organisations. Peter Hellström, an expert in digitalisation processes and

transformation in business and industry, was recruited as the head of the Digitalisation Academy in August 2018, and its first pilot period ran from 1.1.2019 to 31.12.2020.

It soon became clear to us that while financial contributions from companies were necessary to run the Academy, the development work would benefit from broader shoulders. The Digitalisation Academy was an innovative way to provide solutions to a problem acknowledged at the national level: a lack of talent in the digital field. The Academy model developed in Vaasa showed a lot of promise as it did not rely on public funding. Instead, companies shared the costs, and universities took on a supporting role. Funding from the Ministry of Economic Affairs and Employment made the DA-Pito project and our development work possible.

The DA-Pito project's goals and team

This publication marks the end of the DA-Pito project, which had three main tasks. The first was to support the development of the Digitalisation Academy by searching for ways to release its full potential. Its second goal was to scrutinise how the Academy model could be developed in the future and, based on that analysis, create a model that could be easily communicated to other Finnish clusters struggling with talent shortages to provide feedback and inspiration. The third aim was to give advice to all key stakeholders – companies, universities and students – on how to work better together in solving talent retention issues.

The research team's close relationship with the Digitalisation Academy has been beneficial for the DA-Pito project; communication with stakeholders and access to information have been flawless. However, we must acknowledge the limits that even a partial stakeholder role brings. It would not have been possible for us to credibly conduct, for example, an impartial assessment of the Digitalisation Academy's success. Therefore, our focus has been on where our positioning best serves the purpose: in development work.

Our project's work would not have been possible without financial support from the Ministry of Economic Affairs and Employment. Our gratitude, however, goes beyond the financial support received, as the Ministry's representatives have played a significant role as insightful members of the project's steering group. For that, we want to warmly thank Tiina Hanhike, Pirjo Kutinlahti and Lasse Laitinen from the Ministry. Furthermore, the Ministry's Talent Boost Programme and the events organised as part of it have been inspiring and collaboration with the programme's head, Laura Lindeman, always fruitful. We would also like to thank DA-Pito's advisory board members for their dedication and support – Francesca Cucinotta from the Centre for Economic Development, Transport and the Environment; Peter Hellström and Mika Konu from Technology Centre Merinova; Heidi Kuusniemi from the University of Vaasa's Digital Economy Research Platform;

Johanna Hämäläinen and Kai Kamila from Wärtsilä; Juha Nieminen from VAMK; and Andreas Paschinsky from Devatus. Many of them also helped us in finalising this report by giving valuable feedback. In addition, Leena Kunttu, Ville Manninen and Adam Smale kindly helped us with feedback on the first draft of the report. Many thanks also go to our colleagues from the University of Vaasa, who provided insightful info boxes from their fields of expertise for this report. Collaborating with Andrei Palomäki (Studio Andrei), who provided the report's visualisations, was smooth as always.

Next, it is my pleasure to thank the team of enthusiastic and skilled researchers for our shared journey. I have previously described the three main goals we had for this project. In addition, there was a fourth mission. It was to include people at the very heart of the talent retention theme in the discussion. Therefore, our team consists of both Finnish and foreign academics with a variety of scholarly and cultural backgrounds – and many with years of experience as educated talents working and living in a foreign country. You can read more on our team at the end of this report. This publication is written in English for the same purpose: to enable international talents who are living in Finland, or who are considering moving here, to participate in the debate.

As this report also marks the end of my time in Vaasa, I would like to extend my gratitude to all those in the region that have helped InnoLab's team and myself over the years. From the report's perspective, collaboration with the following experts has been especially active, helping our team to grow, network and develop, specifically in terms of ecosystem thinking. Heartfelt thanks to Riitta Björkenheim (Vasek), Tomas Häyry (the City of Vaasa), Juha Häkkinen (the Chamber of Commerce), Katja Rajala (Vaasan yrittäjät), Joakim Strand (the Finnish Parliament), Sture Udd (Wasa Innovation Centre), Marja Riitta Vest (VAMK) and Kenneth Widell (Wärtsilä).

Our view regarding the discussion on "international talent"

The authors of this report realise that issues related to talent attraction and retention can be sensitive in nature and that debates around these topics are highly politicised. Therefore, some notions from our working group may be useful in placing us in the field. Educated and talented young people are the core of the Digitalisation Academy and also of the DA-Pito project. This is a pool of people that businesses, industries, cities and regions aim to attract and retain. As the workforce moves beyond countries' borders, these people are often referred to as "international talent" in both governmental policies and academic research. While following this terminology helps us to avoid confusion when discussing, for example, the Finnish Government's Talent Boost Programme or previous research that has used the same wording, "international talent" is not always precise enough. There are a few problems. Firstly, if "international talent" aims to refer to foreign students and graduates, there is a risk we downplay the difficulties these people

may face when wishing to stay and work in Finland; the playing field is not even for a foreigner who may have to worry about visa problems, overcome language barriers, build contacts and tackle prejudice in the job market. What is likely to make their situation more fragile and complex is not that they are "international" but that they are from abroad and treated as foreigners here. In order to openly discuss these issues, we need a language that acknowledges these factors and is precise. Secondly, one could ask whether simply moving country makes someone "international"; we may have Finns that may be international in their approach and, similarly, people with different passports that just happened to change country without being very international themselves. These are the reasons we are not able to just pick one expression ("international talent" or "foreign talent") and use it throughout the report but instead use both depending on the context.

Although this report discusses an educated workforce mostly in the context of "international talent" or "foreign talent", typically referring to highly educated young people that have moved to a country from abroad, the authors recognise every individual's ability to contribute positively to their surroundings, regardless of their age or educational or cultural background. As individuals, our worth cannot, and should not, be weighed in financial terms. We understand that the discussion on attracting talents from abroad can be painful for people who have – for one reason or another – fallen or been pushed out of the job market. In the future, Finland needs to improve its actions with regard to supporting these people and helping them return to working life, whether they be Finns or foreigners. On that front, flexible solutions created in collaborations between educational institutions and businesses are needed. However, we are also aware of positive news: for example, actions concerning lifelong learning are going to improve in Finland in the coming years.

If you have questions or feedback regarding this report, the project leader is the correct person to contact.

24th February 2021, in Glasgow, Scotland.

Mari K. Niemi
DA-Pito Project Leader and Director of the University of Vaasa's InnoLab (2018–2020)
Research Director, e2 Research (2021–)

1 Introduction: Digitalisation and an educated workforce – factors in Finland's success

1.1 Visions of Finland's future

When it comes to innovation, digitalisation and utilising new technologies, Finland has a brave vision of its future role. The country aspires to be the most attractive and competent environment for experimentation and innovation by 2030 (Research and Innovation Council Finland, 2017). Finland's national goal is to be a competitive developer and the best adopter of new technology and innovations (Ministry of Economic Affairs and Employment, 2019a). In terms of attracting talent from abroad, the vision is equally clear. In 2020, the latest Talent Boost Action Programme was approved by the government. The goal of this programme is for Finland to become an "internationally attractive place to work, study, research and pursue private enterprise, with a view to applying the expertise of international specialists to accelerate the growth, globalisation and regeneration of businesses and RDI" (Ministry of Economic Affairs and Employment & Ministry of Education and Culture, 2020).

The spirit and actions of the Vaasa-based initiative, the Digitalisation Academy, are well in line with the current government's 2019 programme. It names digitalisation as one of the megatrends driving the change: the key to the country's success lies in its ability to tap into the opportunities this change provides. The programme underlines the need for ecosystem collaboration across sectors, for example, through companies and higher education institutions (HEIs) innovating together. An emphasis is placed on regions, as Finland's future development entails greater demographic concentration into growth centres, which has consequences: "We must foster vitality and the ability to function effectively in all parts of the country." (Government Programme, 2019). Moreover, the programme clearly states the need for a talented workforce: "The Government will support growth by investments in RDI, by developing new operating models in public-private partnerships, and by attracting more top international talent to Finland" (Government Programme, 2019).

Some critical voices have pointed out areas where Finland needs to improve its game. For example, the goal of obtaining a leading role in digitalisation may be optimistic. A report published in 2017 by the Boston Consulting Group found that the Nordics in general only

compare well in terms of digital vision and strategy; when it comes to execution, Nordic companies are well below the global average. While Finnish companies' digitalisation strategies are "world class", they do not deliver commensurate results. In short, the Nordics, Finland included, should look for braver and bigger steps and act faster (Boston Consulting Group, 2017).

In the globally competitive environment of the 2020s, achieving the above-mentioned goals requires bold investments in education, inclusive and agile collaboration across sectors and success in the global "war for talent". Finland needs to ensure its base of competence and make sure it has the right skills and circumstances to achieve this.

Since spring 2020, the Covid-19 pandemic has affected the way we work, socialise and, to some extent, want to live. University campuses have been closed and empty, with studies taking place digitally. In addition, many international exchange programmes have been cancelled, further diminishing contacts and the networking aspect of studies. In the case of universities such as Vaasa, which welcomes students from around Finland and abroad, an unfortunate consequence may be the following: students' relationships with the city, their knowledge of its opportunities and their willingness to move there may be negatively affected. Following the pandemic, what at first was seen as forced remote work has become the preferred way of living for some. In addition, a rapid rise in digital skills, facilitating distance working and studying, has opened up new alternatives in terms of how to arrange work in the future. It is quite possible that students will, in the future, demand more opportunities for distance learning so that they do not necessarily have to move because of their studies. For places such as Vaasa, dependent on people coming from elsewhere to fill positions in the job market, this would not be a welcome trend. However, there may also be more positive aspects in sight. As jobs are less place-based, and more people can work from a distance, cities such as Vaasa could attract those who are willing to move from more densely populated areas to live closer to nature, have more living space and still be in a vibrant, international city.

1.2 Growth in the digital economy and the adoption of novel technologies create new demands

Digitalisation as a global megatrend affects our lives in multiple ways: the way we work, consume, innovate, network, socialise and relax. A recent report by ETLA, Research Institute of the Finnish Economy, (2020) measured the size of the digital economy in Finland. Calculations performed for that report indicate that the digital economy comprised nearly 11% of Finland's GDP in 2017, or over EUR 21 billion.

Digitalisation has contributed to both innovations and standard procedures in production, services, business models and development. This has created an urgent need for experts in the digital field. Digitalisation itself, however, does not guarantee success: it requires that the organisation has the right capabilities and employees with skills to implement digital technologies efficiently (Halme & Niinikoski, 2019). Consequently, many countries, regions, cities and companies alike are implementing talent attraction and retention programmes to meet the growing need for a skilled workforce (Rilla et al., 2018).

Interest organisations operating in the fields of technology and business, such as Technology Finland and the Finland Chamber of Commerce, have been active in introducing the demand for an educated workforce into public debates. Technology Finland (2018) estimated that the country needed over 53 000 new talents between 2018 and 2021. Similarly, a more recent report by the Finland Chamber of Commerce summarises the issue from the business perspective: the immigration of a skilled workforce is crucial for Finland's competitiveness and for tackling the demographic challenges Finland will face in the relatively near future (Finland Chamber of Commerce, 2020).

It is important to note that talents in the digitalisation field are not the only experts in short supply, albeit they are an important group. The reason is linked to Finland's demographic forecast. If the current population trend continues, Finland's population will begin to decline in 2031, and by the year 2050, there will be 100 000 fewer citizens nationwide (Official Statistics of Finland [OSF], 2019). In order to keep the country vibrant and support the welfare society, Finland needs a new young workforce alongside its existing, ageing population.

1.3   Foreign workforce needed – where are the bottlenecks?

According to demographic forecasts, the population in Nordic countries will become increasingly urban, diverse and old. Immigration continues to increase the population, but the average citizen is ageing, putting pressure on welfare systems. Many areas suffer from talent shortages, and due to the urbanisation megatrend, the situation is most difficult outside metropolitan areas. In remote and sparsely populated areas, populations are declining and ageing rapidly. Consequently, municipalities outside metropolitan areas increasingly recognise the importance of immigrants' contributions to their communities and pursue talent attraction and retention policies (Nordic Council of Ministers, 2018). Highly specialised technology companies typically seek a workforce with specific skills and a higher education background. While there is a need for a workforce in general and society benefits from a variety of skills, we must recognise the kind of workforce that industries and businesses are urgently lacking and admit that the current composition of immigrants does not sufficiently respond to these needs.

One promising route for responding to the skill gap is the recruitment and retention of foreign students (typically referred to as "international students") in Finland. However, the influx of international students does not translate into an equivalent increase in the educated workforce, as many foreign graduates struggle to find relevant employment and adequate opportunities to integrate into society (Garam, 2018; Ministry of Education and Culture, 2019; Ministry of Economic Affairs and Employment of Finland, 2019a; Loukkola, 2020; Taloustutkimus Oy, 2020). This leads to an outflow of qualified people that could have been retained, leaving regions beset with the challenge of attracting talent that can address their needs.

Currently, every fifth foreign student moves out of Finland in the year of their graduation (Loukkola, 2020). Statistics show that it is more difficult for foreign students to find employment after graduation than for graduates with a Finnish origin, and this might be one of the reasons they leave Finland (Loukkola, 2020). The Confederation of Finnish Industries (Susiluoto, 2019) suggests that companies should hire foreign students in order to integrate them into society and simultaneously boost such companies' own internationalisation – after all, language is often a barrier to growth for Finnish companies.

A study by Taloustutkimus Oy (2020) showed that only 23% of the Finnish companies examined are ready to hire an immigrant without almost fluent Finnish language skills. Similarly, the greatest obstacles in finding suitable employment after graduation in Finland are a lack of language skills (Finnish/Swedish) and an absence of work experience and networks (Shumilova et al., 2012). The Organisation for Economic Co-operation and Development (OECD, 2018) has also observed the labour market integration of immigrants in Finland, and it found that immigrant employment rates are lower compared to those of native-born Finns and that women, in particular, have difficulties with integration. Therefore, policies, services and other actions that encourage and ease foreign talent recruitment and retention are in great demand.

Technology Finland (2018) has listed actions it would like to see decision makers take. Firstly, it called for the active benchmarking of successful countries' actions, learning from best practices and active policy-making for Finland to improve its attractiveness. The report noted that finding internships or employment is still more difficult for foreign technology students in Finland than their Finnish classmates. Including industry-connected learning projects as a part of their studies could be a way to smoothen their path. Importantly, Technology Finland called for more flexibility in obtaining work permits in Finland; graduates should automatically receive permits to work in the country. In general, the work permit process should be made quicker and simpler – and digitalised (Technology Finland, 2018).

Findings of the International Student Barometer regarding foreign degree students in higher education institutions in Finland (Garam, 2018) raised similar issues. The study revealed that international students in Finland wish to receive support and advice on career alternatives, help in producing a CV and contacting employers, opportunities for network building, interview practice, knowledge about information sources and work placements. All the mentioned issues were also relevant when developing the Digitalisation Academy.

Cities with universities play a crucial role in turning the tide as they attract both national and international students and are hubs for knowledge and innovation. However, more could and should be done in terms of helping students network with possible future employers, for example, industry actors, in order to assure that a more skilled workforce stays in the regions – and in Finland.

1.4 Ecosystem members join forces to tackle the talent shortage

The role of universities in creating economic and social well-being for the wider society can be best approached from the ecosystem perspective (Novotny et al., 2020). What makes ecosystems so valuable and relevant is that, in them, action is directed by shared objectives and platforms, which creates new value in a network open to various actors. These can include, for example, public administration, entrepreneurs, companies, industries and start-ups and third sector actors, as well as research and education institutions. Ecosystems are constantly developing systems in which self-organisation is one of the critical features. Ecosystems are flexible and enable continuous renewal as, within them, a large number of networks function and reorganise themselves without any hierarchical control (Valkokari et al., 2021).

Innovation is best fostered in networks and arrangements involving universities, industry and public organisations, rather than in any single organisation, and this collaboration has been named as the triple helix model (Etzkowitz, 2003). The open innovation paradigm (Chesbrough et al., 2006) acknowledges that new innovations are best developed in networks of different actors, such as companies and universities, rather than in one single organisation. Finding good skills and competences outside of one single actor's boundaries is a central idea in the open innovation paradigm.

Among other things, innovation ecosystems typically require creative and active people, a sufficient amount of supporting activities and expertise, a lack of difficulty in terms of networking and forming partnerships and strong incentives for entrepreneurship

(Sotarauta, 2019: 74). The university's role includes preparing people to take part in society by developing, understanding, adopting, using and expanding innovative insights, services and products in the surrounding ecosystem (Rissola et al., 2017: 38). However, as Davey et al. (2018a, also Kalliomäki et al., 2018) underline, there is an urgent need to better align universities with business innovation supply chains and the talent needs of employers. These matters are particularly topical for regional universities in small and medium-sized cities as the urbanisation megatrend generally disfavours them. Universities are the engines of these regions: necessary sources of new industry, innovation and employment, and valuable partners for regionally based businesses in tackling deepening talent shortages and the "brain drain" to cities (Davey et al., 2018a, 2018b). Universities of the future have been envisioned (Plewa et al., 2018) as actors in a campus ecosystem, increasingly taking a leading role in shared efforts to solve pressing social challenges. Within this, needs-driven interdisciplinary research and the translation of science into effective and sustainable solutions are crucial.

The Vaasa-based Digitalisation Academy was established in 2018 as a pilot initiative by industry and universities working together and aiming to help tackle talent shortages in the field of digitalisation. From the beginning, an additional aim of the project was to support the attractiveness and success of the region's energy cluster, EnergyVaasa, and the centre of competence formed by Vaasa's universities and universities of applied sciences. Importantly, the Digitalisation Academy was envisioned as a tool for bringing together Finnish and foreign students and companies, developing students' digitalisation skills and supporting them in finding positions in the energy cluster's companies.

The DA-Pito project was established to support the first period of the Digitalisation Academy (2019–2020) and to develop and conceptualise the operating model. Funding received from the Ministry of Economic Affairs and Employment has enabled us to support the systematic development of the Academy's operations, for example, through collecting feedback from stakeholders (companies, universities, students, educators), conducting interviews and hosting innovative workshops. The funding has also enabled us to work on modelling the Academy's activities into a process that could be exported to other clusters and regions suffering from talent shortages but with a steady flow of foreign students visiting them. This could benefit, for example, the maritime industry, gaming clusters or companies in the health technology sector.

The Digitalisation Academy model

OFFER

- Funding for the Academy
- Industry insights and needs via teaching and visits
- Internships and thesis work for students

BENEFIT

- Access to a talented future workforce
- Close contact with ecosystem actors
- Way of showing social responsibility

OFFER

- Perspectives from their respective academic fields
- Fresh thinking, expertise from their countries' cultures
- Insights into the future workforce's expectations regarding employers

BENEFIT

- Insights into industry needs and the Finnish job market
- Expertise on digitalisation, project work and collaboration skills
- Networking with the ecosystem actors

1. Companies

2. Students

3. Universities

Digitalisation Academy

- Joint effort by the ecosystem actors to tackle talent shortages
- Tool for supporting foreign and Finnish students' digi-skills and employment
- Hub of digitalisation expertise with insights into industry's needs

OFFER

- Access to students
- Support for planning and marketing the programme
- Organisational support

BENEFIT

- Free programme for students, chance to support their employment
- Insights into industry's needs, networks
- Tool for fulfilling universities' third mission

WIDER BENEFITS FOR THE REGION

- + Helps in retaining a talented workforce for the region
- + Chance to contribute positively to the economy
- + Offers a platform for ecosystem collaboration
- + Sends a positive message about the region's collaborative and student-friendly culture

Several opportunities were detected at an early stage. Significant potential lay in the Academy's capacity to strengthen the region's cooperation networks and innovation ecosystem, as well as in its potential to support the retention of both domestic and foreign students in the region. In the longer term, it could have positive effects for the regional economy. For participating universities, it offers a way of fulfilling their third mission, a role that has significantly grown in importance in the past decade.

Alongside opportunities, risks were also identified. The successful implementation of the Digitalisation Academy model requires effort from the participating students, university staff and especially the companies involved. The latter contribute not only financially but also by dedicating their workforces to creating content for lessons and exercises for the students. Therefore, it was necessary to scrutinise how the model could be developed to produce value and the best answer to the needs of all the key stakeholder groups in order to maintain their participation on a sustainable basis.

When we started the DA-Pito project, our goal was to find ways to make the Digitalisation Academy as flexible, useful and efficient as possible for each stakeholder group. Our initial analysis was – and still is – that in order to be relevant, the Digitalisation Academy needs to respond quickly to skill shortages, produce results commensurate with stakeholders' investments and be flexible to the different needs of companies and students alike.

1.5 Data collected and structure of the report

A wealth of previous academic research on talent attraction and retention has supported our understanding of this matter. For the purpose of this project, we reviewed literature on talent retention by searching the Web of Science and Scopus databases, covering the years 1999–2020. We identified 115 articles that were relevant to this topic and addressed talent retention at both organisational and policy levels. We used the results of the systematic literature review to feed into the design and production of this report. Furthermore, we also familiarised ourselves with numerous reports on the topic, typically offering insights into the political side of the issue and published by, for example, ministries and other interested organisations.

Original data collected to serve this report include specifically tailored research interviews with the three stakeholder groups most relevant for developing the Digitalisation Academy model: company representatives, university personnel and Finnish and foreign students. The aim of the data collection was to gather different viewpoints, ranging from concerns and critical remarks to ideas on development and other insights that might otherwise be passed over. The goal was to gain tools for our development work, which is reflected in the number and selection of the interviewees (explained in detail below). It

needs to be underlined that it is not possible to draw generalisable conclusions based on these data, for example, with regard to various groups' attitudes and experiences. Instead, our focus has been strictly on development work.

The first set of interviews focused on academia. We carried out 16 one-hour interviews with people from the academic side to understand the universities' changing roles in academia-industry collaboration and to examine the functioning and current state of the Digitalisation Academy. Seven of those interviews were with individuals working in the academic institutions collaborating with the Digitalisation Academy: The University of Vaasa, Novia University of Applied Sciences and VAMK. Interviewees included director-level individuals working with services in education and degree programmes. Nine of the interviews were with students, four of them from the University of Vaasa and five from VAMK and Novia University of Applied Sciences. The interviewees represented both women and men (four and five, respectively) and Finnish and foreign students (five and four, respectively) rather equally. The second set of interviews was carried out with interviewees representing industry's perspective on the collaboration, in order to gain their feedback for developing the Academy. All the interviews were carried out via Zoom and Teams in the spring and early autumn of 2020 and lasted about 1 hour 15 minutes each. Of the five participating companies, four were already Digitalisation Academy partners. One additional company brought viewpoints from an actor that was considering joining. These interviews serve both this report and further academic publications that will follow the project. Finally, two interviews were conducted with individuals at the heart of the initiative, Andreas Paschinsky and Peter Hellström, who were interviewed to gain a status update on the Academy and to provide support in writing the development section of this report.

Furthermore, we participated in and organised events that brought together stakeholders from various fields to discuss these issues and to identify problems and solutions. This has improved our understanding of the issue, which is hopefully reflected in the report. Our team has participated in two Talent Boost events: one in Tampere (7.11.2018), where we participated by giving a talk on "Rethinking the academia-to-industry talent supply" and sharing our insights into the Digitalisation Academy model; and the other in Turku, where our researchers joined the event to obtain ideas and networking opportunities (12.11.2019).

Events organised in the Vaasa region have typically attracted participants from several industries and other backgrounds to jointly seek solutions for mutually identified problems. In an information and communications technology (ICT) workshop for universities and companies in the Ostrobothnian and Central Ostrobothnian regions, our team hosted a table to discuss "How can companies help to tackle the talent shortage issue in collaboration with universities and universities of applied sciences?" (18.2.2019,

by the Ostrobothnia Chamber of Commerce and the University of Vaasa's Digital Economy research platform).

A learning café-style workshop was arranged at the University of Vaasa (on 25.4.2019) by the InnoLab research platform to learn more about the needs of different regional stakeholders regarding the role of the university in the local innovation ecosystem. Several stakeholders took part in the four-hour event, including large corporations and small to medium-sized companies, City of Vaasa officials and councillors, regional development organisations, non-profit organisations and higher education institutions (including students, researchers and other personnel). The ideas and conclusions from this workshop have contributed to our understanding of the needs of different stakeholders regarding the university, and close local collaboration has helped to identify further research needs in relation to the DA-Pito project.

To engage local, regional and national stakeholders in a discussion on our project's themes, we organised three panels on talent attraction, retention and digitalisation during the Wasa Future Festival in 2019 (8.–9.8.). In a panel on "Attractive Cities and New Vaasa" (in English), we discussed talent attraction and retention, as well as how to build a socially and economically sustainable, innovative and inclusive urban environment. In the second panel, the theme was "Solutions for the Future: Knowledge, Innovations and Sense of Community" (in Finnish and Swedish). The third panel in the Digitalisation Academy's field focused on "Digitalisation and Public Sector" (in English). Panelists in these sessions included researchers and other experts, mayors of cities, members of the Finnish and European Parliaments, youth representatives (e.g. student unions), ministry officials, business representatives, Talent Boost Programme staff and foreign talents living and working in Vaasa. Finally, we have participated in public discussions on the topic on our dedicated blog and in op-ed pieces on various platforms[1].

Finally, when we were close to finishing this report, we organised a cluster webinar with representatives from Lahti and Lappeenranta to give us feedback on the model: Could it also work in their regions? What resonates with them and what might need further thought?

This report continues as follows. In the next chapter (chapter 2), we take a closer look at talent retention in Finland and beyond, first focusing on a theoretical understanding of talent retention. After that, we discuss the findings of academic literature on talent retention from three perspectives: organisational, regional and national. Finally, we

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1   E.g. Niemi: "Suomessa jyllää suomenkielisten asiantuntijuus", Tiedekeskiviikko blog 2.10.2019; Dan and Shakeel: "International talent retention in Finland – are we asking the right questions?" InnoBabble blog 3.2.2020; Niemi: "Miksei koulutettu ulkomaalainen kelpaa?" Kauppalehti column 24.2.2020.

scrutinise talent attraction and retention activities in Finland and learn of initiatives similar to the Digitalisation Academy in Finland and beyond.

The Digitalisation Academy model is thoroughly scrutinised in the report's third chapter, beginning with its basic structure and building blocks. After that, we move to a critical assessment of the model in the form of a SWOT analysis (SWOT standing for Strengths, Weaknesses, Opportunities, and Threats) and continue to list development ideas. The chapter concludes with a discussion on the possibilities of reproducing the Academy for other regional clusters, as well as alternative working models for Digitalisation Academies in the future.

The fourth chapter of this report is dedicated to lessons learned and, specifically, what stakeholders can learn from this and how they can improve their actions and mindsets in responding to the mutual challenge of talent retention.

2   Talent retention in Finland and beyond

2.1   Theoretical understanding of talent retention

When talking about talent, the first question should be "What is talent?" In common parlance, talent refers to a special skill or ability. It also refers to someone who is educated, typically above what is considered average, or who has achieved a high level of performance in a specific activity or field such as sports or arts. In the world of work, business and public policy, there has been a growing interest in issues related to talent and talent management over the past two decades (Dan et al., 2021). The processes of globalisation, digitalisation and growing international competition have fuelled this interest. Research on talent management has gradually developed since the publication of McKinsey's seminal report on the "war for talent" in 1998. Talent management has become a hot topic in policy circles, driving academic interest in this subject. Despite this growing interest, recent research has shown that many questions concerning talent management remain. These questions relate to why and how talent management programmes are developed and implemented and what their outcomes are. Moreover, leading authors in the field have argued, in a recent special issue of the International Journal of Human Resource Management entitled "A Contextualized Approach to Talent Management: Advancing the Field" that our understanding of the organisational context in which talent management is developed and implemented is insufficient (Gallardo-Gallardo et al., 2020). It is argued that the meaning of talent is embedded in a given organisational setting at a specific point in time and is influenced by different factors, such as workforce composition, ownership structures and individual perceptions (Wiblen & McDonnell, 2020). For this reason, it is important to understand how contextual factors influence talent retention at different levels of analysis: organisational, regional and national. We discuss in detail each of these levels later in this chapter.

Digitalisation and the demands of Industry 4.0 (i.e., data-driven, automated business processes) have further sparked interest in talent and its management. The 2019 Boston Consulting Group's "Decoding Global Talent" series of articles has focused on trends in global talent, including expert-level professionals who work in the digital and IT&C industries. These IT&C experts known as digital talent (Dan et al. 2021), possess a high degree of flexibility and mobility – both highly valuable skills during the current Covid-19 pandemic. Global talent can constitute the engine of innovation, business development and economic growth. Given this, it is no surprise that in the corporate sector the meaning of talent is closely, if not explicitly, associated with being hi-tech.

Attracting specific and carefully selected talent is only one part of the puzzle. The key is not only to attract talent, but also to keep it. The concept that both practitioners and scholars use for keeping talent in a certain organisation or jurisdiction is talent retention. From a policy perspective, talent retention is not a stand-alone process. Rather it is part of broader talent management programmes or practices, which include the attraction and integration of talent and the overall management of the talent ecosystem in a specific jurisdiction (Future Place Leadership, 2019). Research, most of which deals with retention in an organisational, multinational corporate setting, typically operationalises retention through talents' willingness or intention to stay (Ortlieb & Sieben, 2012). In order to increase retention, several factors and conditions need to be in place. These include allocating resources where they are needed, keeping employees motivated and satisfied and providing adequate career development opportunities and supervisory support as well as work-life balance (George, 2015; McCracken et al., 2016). These factors are likely to increase organisational commitment and reduce turnover. In a recent study, George (2015) distinguished two main types of factors that influence professional workers' retention: organisational and occupation-related factors. At the organisational level, retention factors such as the type of management, a conducive environment and social support matter. Important occupational factors include development opportunities, autonomy, compensation, crafted/sculpted work that is tailored to employees' needs and abilities and work-life balance.

2.2   What attracts educated talent and makes them stay?

There is scattered evidence about the factors that make talent stay. Before we can review the existing evidence on talent retention, it is important to acknowledge the role that context plays in the implementation and outcomes of talent management initiatives (Gallardo-Gallardo et al., 2020). The retention of talent depends on what types of talent we consider, in other words, the socio-demographic (gender, age, nationality, etc.) and professional characteristics of talent (level and type of education, work experience, etc.). Talent retention also depends on the organisational setting, which can be an organisation/company (which in turn varies depending on the type of activity/industry, geographic location, size, management characteristics, etc.) or a municipality, region or country. In the former case, we talk about organisational strategies and initiatives that aim to manage and retain talent, whereas in the latter case, the aim is to develop public policies to retain talent in a certain jurisdiction. Such initiatives are oftentimes government-facilitated but involve other stakeholders from the business, non-governmental or academic sectors. All these levels of analysis touch upon characteristics that influence the retention of talent. For this reason, it is important to structure the review of the evidence according to levels of analysis and contextual factors. We organise this section accordingly and first

distinguish between different levels of analysis. Then, within each level of analysis, we will outline the factors that make talent stay.

Talent retention at the organisational level

a) Companies

Attracting and retaining highly educated talent has become an increasingly important issue for many industries, since corporate activities are expanding globally while talent scarcity still exists (Li, 2020; Suutari et al., 2014). Prior studies have demonstrated that several countries have enjoyed net innovation and productivity benefits as a result of talent inflows, with the US being an obvious case (Shumilova & Cai, 2016). Other countries in general and European countries and Finland in particular are competing over talent but still suffering from a talent shortage. These countries are looking for ways to alleviate the negative effects of this talent shortage on their long-term social and economic sustainability (Li, 2020). Because of this negative trend, Finland is not just missing the opportunity to create additional jobs but also failing to prepare for the future need for trained and educated workers (Ministry of Economic Affairs and Employment of Finland, 2018; 2019a). Thus, it is not easy for industrial organisations to attract and retain highly educated international talent, as international competition for it is fierce.

Organisations are now in real need of international talent, and fulfilling this need requires systematic talent retention strategies instead of arbitrary and ad hoc approaches (Tlaiss et al., 2017; Li, 2020). Nevertheless, talent is often drawn to world renowned and multinational companies because of their impactful marketing strategies, which offer them multiple opportunities to lead in terms of cultural diversity. Consequently, it is even more difficult for relatively smaller and local companies to compete in attracting and retaining international talent. These smaller companies are also often hindered by their unplanned and unsystematic talent management practices. Thus, such talent wars create a need for industry to identify and understand the factors that address the issues of talent shortages and strengthen its links to the best talent (Boštjančič & Slana, 2018). Therefore, building and successfully communicating a positive corporate image facilitates organisations to widen their reach towards the best global talent. However, hiring such talent is not enough for organisations because this same talent is equally attractive to other organisations, including competitors. Losing talent to another organisation leaks professional knowledge, making it imperative to focus on retaining talent (Schuler & Tarique, 2012; Suutari et al., 2014).

A growing body of academic literature has identified and emphasised the human side of employment relationship factors and development possibilities (Dan et al., 2021). These approaches integrate socio-cultural and business-related knowledge across different

streams of the ecosystem in order to attract, develop and retain highly educated talent (Boštjančič & Slana, 2018; Suutari et al., 2014; Li, 2020). For example, Aguinies et al. (2012) evaluated company policy aimed at winning the talent war by retaining top talent. Based on their findings, they argue that performance management systems that take into account individualised developmental plans; challenging, interesting and meaningful work and advancement opportunities and rewards drive companies to actively pursue talent retention activities. Companies incorporating an ethical and responsible approach to their practices become an attractive place to work (Young & Thyil, 2009; Jones et al., 2013). Similarly, companies that incorporate corporate social responsibility as a business and human resource (HR) policy attract more talent than their competitors (Barrena-Martinez et al., 2015).

Global talent management and retention programmes are considered to have an important, positive effect on talent's career success – both in objective and subjective terms. Job rotation and international assignments as well as off-the-job training support the further career development of talent (Bonneton et al., 2019). Fair assessment, open communication and psychological skills development are also some of the factors that talent appreciate (Boštjančič & Slana, 2018). Managers should regularly use job sculpting as part of performance assessment (Butler & Waldroop, 1999). Unfortunately, women in science, engineering and tech careers (i.e. SET careers) experience sexual harassment, long working hours and isolation, which hinder such talent growth. Therefore, it is imperative for organisations to support their female employees by changing organisational cultures, adopting family-friendly policies and helping to promote the presence of women in higher positions (Servon & Visser, 2011). Although managing talent does not necessarily translate into employees' effective trust towards their employers, it is still imperative for organisations to align talent management practices with their strategies and commitment towards their employees (Seopa et al., 2015; Stahl et al., 2012).

To retain the best talent, it is important for organisations to gather insight from their employees' psychological points of view (Dan et al., 2021). For example, gauging employees' expectations (Seopa et al., 2015) can help create value propositions and explore the reasons behind earlier changes in employers and occupations. Suutari and colleagues (2014) reported several reasons why talents change careers and move from one organisation to another. For example, organisational restructuring, mergers or acquisitions, the periodic nature of jobs, a desire to be exposed to new challenges and learning opportunities and location and family-related issues, as well as financial benefits, are some of the reasons that influence talents' decisions to change organisations.

In Finland, the competition for the best talent is zealously expanding and growing in industries, such as the information technology and energy sectors. Companies in these industries are trying hard to hold onto their best talent by finding ways to increase the

level of job satisfaction and organisational commitment. In this vein, an organisational culture that underlines openness, continuous growth, independence and communality has been considered a key driver in retaining the best talent. Such an organisational culture entails some actions that companies habitually promote, for example, low language barriers, a low hierarchy and flexibility, in addition to developing, nurturing and protecting their employees, as well as providing work that is valuable and meaningful to them (Havu, 2016; Pyhälammi, 2019; Suutari et al., 2014; Li, 2020). Based on interviews with 62 experienced international professionals, Suutari et al. (2014) found that organisational support in relocating talent and their families and in other practical matters is fairly valued and has implications for retention. They further suggested that talent retention can be improved if organisations facilitate work-life balance and dual-career practices, for example, by offering job search assistance and career counselling for the talent's spouse.

Therefore, various solutions can enable companies to retain their best talent, as long as they entail the necessary elements of good care and support for their employees. Such solutions must not mimic the practices of other top performing companies but should be truly customised and aligned with the company's own strategy and values (Stahl et al., 2012). This requires companies to consider their educated talent as human capital (with knowledge, skills and higher education) and to focus on the non-financial elements that trigger loyalties towards the employer, since talent retention goes beyond financial packages. This means that a total reward approach, encompassing all the reward elements that employees value the most, should become prevalent in attracting and retaining talent (Tornikoski, 2011). Furthermore, companies also need to pay more attention to their existing talent retention strategies by understanding their employees' values (Tlaiss et al., 2017).

b) Universities

Like companies, universities are constantly looking to attract and retain talent to maintain their competitiveness and standing. A university's success depends on its ability to excel at two of its core functions – knowledge creation and transmission – through the processes of research and teaching (Romainville, 1996). Universities strive to ensure they have the necessary skills and resources to perform well in terms of these functions. Excellence in teaching helps universities attract students while their ability to conduct high quality research helps them gain strong reputations and become world-class universities (Lorange, 2006).

Universities are different from conventional business organisations in that the success of a university heavily relies upon the success of its academic staff. Annakis et al. (2014) suggested that for universities, academics are the main source of competitive advantage.

Therefore, a university aims to have a faculty that has the potential to meet its aspirations. Thus, universities continuously strive to become an attractive workplace for talented staff and seek to meet its needs by recruiting foreign talent (Altbach, 2006; Cantwell, 2011; Van de Bunt-Kokhus, 2000). However, the recruitment of an excellent faculty is rarely as easy as it sounds. There is a breadth of evidence indicating a shortage of skilled academics across the globe (Selesho & Naile, 2014), and universities have to resort to aggressively competitive measures in order become attractive workplaces (Van de Brink & Thunnissen, 2013).

Universities' ability to attract and retain talented staff depends on a multitude of factors. Verhaegen (2005) stated that academic freedom, professional and personal development and a stimulating peer community play an important role in recruitment and retention. Lepori et al. (2015) explained that foreign academics are generally more attracted to positions that have more of a research orientation compared to one of teaching. In academia, performance is often assessed by the ability to publish in high quality scholarly journals. Therefore, academics value jobs that offer opportunities and resources to conduct research. A study conducted by Wan and Sirat (2018) presented how employment security and an opportunity to integrate into the local system are important factors in foreign talent retention. These findings are particularly interesting in contexts where English is not the primary language, as a lack of language skills often causes difficulty in terms of integration and causes dissatisfaction among staff. Institutions need to offer opportunities to foreign staff to learn the local language as well as ensure that relevant information is available in English. Johnsrud and Heck (1998) suggested that professional priorities, institutional support and quality of life have been seen as instrumental in talent's desire to stay. Remuneration and financial incentives also play an important role in the retention of foreign talent. A study conducted by Weetman (1993) identified uncompetitive salaries as one of the biggest challenges in recruitment.

Lepori et al. (2015) argued that an organisation's best practices alone may not be enough to attract talent, as the characteristics of a country also play an important role in international talent's choice of employment. The evidence suggests that economic wealth and the strength of a national research system influence internationalisation. Higher education institutions in attractive countries often display a higher level of internationalisation, whereas in less attractive countries even reputed HEIs often struggle to attract foreign talent. Likewise, a country's ability to attract foreign talent is strongly associated with its higher education institutions and international networks.

Moreover, in addition to skilled staff, universities face the additional challenge of attracting international students. International students are seen as a natural solution to bridging the national skills gap as well as a good source of funding (Geddie, 2015). Tremblay (2005) stated that countries relying on immigration have realised the potential benefits of facilitating the permanent migration of international students. However, in order to

become international students' preferred destination for studies, universities need to create a conducive environment, which often requires a collaborative effort from the government, universities and other relevant actors (Sá & Sabzalieva, 2018). There are a number of factors that influence international students' choices to study in international destinations, such as cost, the standard of education, the availability of education programmes, openness and their perception of the quality of life in the destination country (Mpinganjira, 2011; Farivar et al., 2019; Amuedo-Dorantes et al., 2019; Murphy-Shigematsu, 2002; Van Wissen et al., 2011). However, the availability of employment and future career prospects are often among the most important factors in making the decision. Choudaha (2017) highlighted the importance of institutions developing practices that not only improve international student enrolment but also help in meeting students' expectations of career and employability outcomes – otherwise students may lose interest in a particular country as their place of study. Universities must ensure that, in addition to education, there is support available that can help students in their careers.

Info box 1: Academia and international talent – a case study by the University of Vaasa

Mia Smedlund, Hanna Turpeinen and Zakir Hossan.

Alongside companies, universities and other higher education institutions are important employers of foreign talent in Finland. The number of so-called international faculty at the University of Vaasa has increased considerably, now amounting to more than 30% of academic staff. Therefore, we at the University of Vaasa's International HR Services frequently find ourselves wondering whether we are focusing on the right things. As a result, we started an International HR Services design development project at the beginning of 2020, cooperating with the University of Vaasa's InnoLab and Design Centre Muova. In order to find out about the well-being and needs of, as well as the challenges faced by, our non-Finnish staff members, we conducted a survey (accessible from 7.–19.1.2020). Later on, the survey was complemented by interviews with key internal stakeholders. We were interested in the following questions:

What does it feel like to move to a new country in the very North of Europe?

Is there enough support available to cope with the practicalities and peculiarities of Finnish administration?

How is one's social life in a new city and a new country?

Are our university's services accessible to all – including those just starting to learn the Finnish language?

The survey invitation was sent to persons currently registered in the University of Vaasa personnel database who had a country of origin other than Finland or who had selected a contact language other than Finnish (N = 116). The response rate was 38% (44 respondents).

The survey mainly focused on four phases related to careers at the University of Vaasa and life in Finland in general: recruitment, relocation, onboarding and integration. Furthermore, we wanted to chart the eventual needs of the spouses and families of our international researchers.

The majority of the respondents had been in Finland for some years. We were pleased to find out that, in general, the majority of the respondents were highly satisfied with both the services and processes, and happy with the overall support and coordination they received from the University of Vaasa. As many as 88% of the respondents either agreed or strongly agreed that they were happy with their decision to relocate to Finland and work at the University of Vaasa. The remaining 12% chose a neutral response. However, there are some clear development needs based on the survey findings.

The survey helped us understand very concretely that relocation to a new country can be costly and time consuming. For example, the permit process and miscellaneous moving costs can easily amount to several thousands of euros.

As many as 93% of our respondents were happy with the overall onboarding phase at the University of Vaasa. The onboarding process is a joint internal venture where all parties need to work together and do their part in order for the practice to be successful. The Working and Living in Finland module of the Univaasa Induction Programme was especially appreciated by the respondents because it gives useful knowledge about life, customs and culture in Finland, which are often very different from those in the new recruits' home countries.

Not surprisingly, the part we need to develop most is integration. Among the things we need to focus on in the future are the Finnish language (learning possibilities and the university language policy), social events and family issues. Some of the respondents also stated that they would be interested in a coordinated spouse programme that would offer support to the employees' partners in finding work, studies or other meaningful activities in the region.

Based on the findings of both the survey and related interviews, we will begin developing our services further. The Career Journey Map visualises the path of a new international recruit from early arrival to integration and feeling a sense of belonging.

A Guide map for the International HR services

Career Journey Map

4 – INTEGRATION
- Need for family / spouse support
- Work-life balance
- Language skills
- Networking | *Social and professional*
- Social life

3 – ONBOARDING
Univaasa Alumni-recruits
- Getting to know your new hometown Vaasa
- Essential information | *Organization & practices, occupational safety, organizational structure, tasks and working time*
- Induction Programme
- Programme for 1st week(s) | *Meetings with supervisor, international HR, HR & management services, colleagues, university premises, social programme*

2 – RELOCATION
- Getting to know your surroundings
- Registrations, taxation & bank account
- Arrival in Vaasa | *Reception, meeting with supervisor & work contract, work facilities & equipment*
- Apartment search & related arrangements
- Relocation support before arrival | *Compensations, moving, permits, family*

1 – RECRUITMENT
- Recruitment decision | *Incl. work contract negotiations*
- Interviews and assessments
- Selection process | *Processing the applications, selecting the key candidates*
- Recruitment phase | *Criteria, timetable, budget incl. relocation support, recruitment ad, marketing*
- Personnel planning and permission to recruit

Talent retention at the city and regional levels

How should cities and regions approach the issue of talent attraction and retention? Visiting any city's or municipality's homepage, one typically finds numerous attraction points and pull factors listed, explaining why relocating to this particular region, city or town would be a wonderful choice. However, this information is not necessarily

based on hard facts. As Beckers and Boschman (2019) pointed out, in the international competition over foreign talent, little is still known about which regions, municipalities and neighbourhoods are attractive – and why. The task is not an easy one, as the group we understand as "talents" includes people from various fields, cultural backgrounds, lifestyles and situations with different expectations and values. Regardless of this ambiguity, attempts to communicate the region's, city's or municipality's offerings is one tool for solving a talent shortage.

In the context of Finland and other Nordic countries, the issue of attracting and retaining talent is especially pressing outside Southern metropolitan areas. Regional university cities gain thousands of young talents from across the country and from abroad, so the momentum is there. However, the challenge remains: how to make the students stay. Moreover, not all regions have universities, and yet a talented workforce would help them keep the wheels turning and develop regional businesses.

When applying previous studies' findings to the context of one country – in this case Finland – it must be kept in mind that some of the findings may be too region-specific to be useful: not all policy advice or contextual factors are applicable elsewhere. Here, we have listed findings that we also find noteworthy in the Finnish context, regardless of the contextual factors of the particular cases studied.

Academic research offers some valuable case studies that scrutinise different areas and recent graduates' or more experienced talent's location choices. Based on an analysis of recent research in the field, Hooijen et al. (2017) clustered the determinants of migration into four factors: hard locational factors, soft locational factors, social factors and individual characteristics. They did point out that there is no research-based unanimity over how big of a role soft locational factors play compared to the hard ones. Importantly, the role of networks has been raised as a key factor for the choice of location alongside job opportunities (Musterd & Gritsai, 2013).

As summed up by Hooijen et al. (2017), the so-called hard locational factors include traditional economic aspects, labour market opportunities, residential opportunities, transportation and language. The so-called soft locational factors, on the other hand, refer to the quality of life in the given area, living environment, available amenities, climate and opportunities to live a fulfilling life outside work. Social factors include the closeness of friends and family, whereas the individual characteristics refer to aspects such as gender, age and education level: women, younger people and university graduates are generally seen as more mobile compared to men, older people and those who graduate from universities of applied sciences.

Metropolitan areas attract talent with their promise of almost endless employment opportunities. For rural areas and regions further away from growth centres, the challenge is that even if the area offers international job opportunities in globally relevant companies, the perception of the area may not be in line with the students' preferences. Furthermore, smaller cities tend to be less known, making them harder to market.

When choosing a region to settle in, students value interesting jobs with attributes such as a good salary, advancement opportunities and a high likelihood of their partners finding employment opportunities in the same region (e.g. Vazzana & Rudi-Pollshka, 2019). Not every area can offer these, and consequently, many must start from the job-creation phase. However, even if an area has all this to offer, these attributes do not work in its favour in the competition over talent unless students become aware of the opportunities.

Interestingly, there are studies that suggest a region's job opportunities may be, for some, less important than other factors. In the context of knowledge workers and innovation districts, factors related to lifestyle options, amenities, networking and possibilities related to social life may matter more (Baum et al., 2009; Esmaeilpoorarabi et al., 2018; Yigitcanlar et al., 2007). It is worth noting that in the post-Covid-19 world, where remote work is becoming common practice, qualities other than a region's job offerings may gain more weight in people's decisions regarding where to settle down. However, other contextual factors may play a role: for example, during an economic downturn, job opportunities may override the other qualities of a place (Sánches-Moral et al., 2018).

In summary, the factors contributing to talent retention are varied and inseparably intertwined. They include services offered by cities and municipalities; unofficial social structures; and companies', universities' and other employers' ability to offer jobs. Therefore, regional talent retention solutions must be sought through wide collaboration spanning all these areas of life.

Info box 2: What attracts students to a city and makes them stay? Exploring the expectations of Vaasa-based students in higher education

Johanna Kalliokoski, Emmi Suomäki, Tuomas Honkaniemi and Ilkka Luoto

Universities and university students are an important part of a liveable and prosperous city, and cities in Finland and elsewhere attempt to attract this talent pool to their areas. Success in terms of this competition is not always

easy for small and medium-sized university cities like Vaasa. In March 2020, researchers in regional studies from the University of Vaasa conducted a survey of students enrolled in higher education institutions in Vaasa. Its aim was to investigate the students' motivations for staying in or leaving Vaasa and to explore factors that would make Vaasa more attractive to them. For 67% of the total respondents (N=611), Vaasa had been their first choice of city for beginning their studies, and more than half (63%) were working or had previously worked in Vaasa, while only 24% of the respondents thought of Vaasa as their home. This is in strong contrast to the fact that half of the respondents saw Vaasa as an attractive city for a new graduate. Among others, three important conclusions can be drawn from the study:

1) For international students, the features of the city of Vaasa are not the reason behind them studying there.
From the 611 respondents, 11% knew Vaasa well before starting their studies. From the answers given in English, the corresponding figure was only 2%. In this sense, it can be said that the students arrived in Vaasa without major presumptions that would have affected their expectations of the city. For 73% of the English answers, Vaasa was their first choice of a place to study. To the question "Why did you choose Vaasa as your place of study?", respondents were given different statements, for which they had to rate their agreement on a scale from 1 to 3. The three most common responses among the English answers were "I chose Vaasa because I got a place to study there" (49%), "An interesting field of study" (35%) and "Multicultural atmosphere" (31%). The most popular statement is not necessarily the most flattering from the city's perspective, as it seems that factors other than the students' specific desire to live in Vaasa decide whether foreign students end up there. Even though the higher education institutions are attractive to students, perhaps the city of Vaasa should not rely too much on these institutions' pull, and instead work more actively towards making the city a desirable place to move to.

2) Multiculturalism and bilingualism are seen as Vaasa's strengths
A multicultural atmosphere was the third most important reason for choosing Vaasa as a place to study for foreign students (31% of the English answers). Multiculturalism and internationality should therefore be cherished as strengths and assets in the city's decision-making and attraction and retention activities. An essential element of this appreciation should be engaging foreign students in the daily activities of the city. Therefore,

employment and integration into society should be made as accessible and easy as possible. In addition, strict Finnish language requirements, for example, in job offerings, might need reconsideration. When examining all 611 answers, bilingualism stood out as a positive aspect in several parts of the survey, e.g. Swedish-Finnish bilingualism creates several opportunities and therefore may encourage some students to stay in the city. When those who planned to stay in Vaasa in the future were asked to choose from positive things associated with staying in Vaasa, the English answers emphasised identifying Vaasa as their home and Vaasa being a safe, peaceful and communal city.

3) Only a small portion of students are likely to remain in Vaasa after their studies

When asked, "Are you planning to move out of Vaasa after your studies?" 33% of the English answers stated "yes" and 45% "maybe". In addition, 2% had already moved elsewhere, while only 20% were certain that they would stay in Vaasa after their graduation. The numbers are similar when all 611 answers are considered: only 15% of respondents said they would certainly remain in Vaasa after their studies, and 30% were confident they would relocate. The main reasons for the possible move in terms of the English answers were "I believe that I will progress better in my career elsewhere", "I want to move closer to family and friends", "I think I'll find employment more easily elsewhere" and "I want to live in a big city". These reasons should be taken seriously, although it is understandable that for some living close to family and friends is a key factor. The City of Vaasa could pay enhanced attention to employment and networking services for foreign talent's spouses and families and create opportunities for social free-time activities. The survey found that there is a large body of students who are on the fence over whether to move out of Vaasa or not, and this group, in particular, should receive increased attention in terms of retention activities.

Conclusions

Even though Vaasa lacks some cosmopolitan attractions, it has other strengths of its own. When examining the answers given in English more specifically, it can be said that international students have a more positive and open attitude towards Vaasa in general compared to Finnish and Swedish respondents. For example, when asked, "What feelings does Vaasa evoke in you as a place?" the answers had mostly positive connotations, although negative and neutral comments were also given. Descriptions

such as "beautiful nature", "clean and safe", "quiet" and "not too small but not too big" were frequently used in a positive sense. On the other hand, negative comments described Vaasa as "boring" and "too small", or pointed out that "Vaasa needs to create more working and living opportunities for international students".

If students perceive that they are integrated and comfortable, it is more likely that they will stay and seek employment in the city. Deep social relationships established during the first year of studies also determine commitment to the place of study (e.g. Wilcox et al., 2005: 720). Therefore, the relationship between students and the city works in both directions; the city must also engage with the students (Kalliomäki, 2014). Integration could be strengthened, for example, by integrating international students with local students and people (e.g. Rienties et al., 2011: 9). The most important field of development, as the results derived from the student survey show, is establishing a permanent actor that (pro)actively generates possibilities for networking and career opportunities for both domestic and foreign students, their spouses included. In addition, students should be encouraged to engage in city life outside of work and study hours, for example, through improvements to public transport. Likewise, cafeterias, bars and clubs are important, especially for younger students, as well as good access to leisure activities and nature.

The survey
All in all, 611 students from a population of about 13 000 students enrolled in higher education institutions in Vaasa completed the survey (Vipunen – Education Statistics Finland, 2020). From the 611 students, 66% were women and 33% men, and the rest did not share this information or chose the "other" option. Answers were received from all six higher education institutions in Vaasa, and most of the respondents were aged between 20 and 25. The majority of them were living in a rented apartment and had an upper secondary school background. Respondents answered in Finnish (49%), Swedish (41%) and English (10%). These percentages correlated well with the population, although Swedish speakers were slightly overrepresented. For the purposes of the Digitalisation Academy, we explored the data by focusing on the perspective of international students, who we defined as respondents with a mother tongue other than Finnish or Swedish. Of the total 611 respondents, 51 had another mother tongue. This international group consisted of at least 17 different native languages, and the majority of these respondents (75%) were women. A strong majority of the respondents who had answered in English

were under 30 years old. In addition, 49% of the English-using respondents reported their place of residence as being outside Finland, and 51% felt that their home was outside of Finland. When it comes to Vaasa, around one third of the foreign respondents named the city as their emotional home.

Talent retention at the national level

What can Finland and the Government of Finland do to keep talent in Finland? As highlighted throughout this report, this question is more complex than it first seems. There are many contextual factors, some of which are beyond a government's immediate control, that influence talent retention. There is no simple, one-size-fits-all solution that the government can readily adopt in order to increase retention when bearing in mind regional and local differences or the different characteristics of foreign talent. At the same time, there are legal and policy instruments (e.g., residence permit processes for work and study) that the Government can use to address national-level bottlenecks that hamper the attraction and retention of talent. A recent report commissioned by the Government of Finland on work-related residence permit processes found that Finland can improve the duration and administrative processes of granting permits (Paavola et al., 2020). The report found that these processes are more cumbersome and time-consuming in Finland compared to countries such as Denmark, Norway, Sweden and the Netherlands. The study recommends concrete national-level policy action to address the identified bottlenecks. The actions include reducing the barriers to entry and providing work early on; increasing the role of employers in the residence permit process; further digitalising the process to improve accessibility; and changing the labour market testing policy (Paavola et al., 2020). Factors that support retention at the national level complement factors that operate at the organisational, regional and city levels. Talent do not only choose an organisation or a city, but they also choose a country or a (sub)continent, such as Northern Europe or North America.

Countries can exert significant push-pull influences that can sway talent's relocation decisions. The push-pull theory, which dates to Toren's (1976) analysis, has been widely used to understand international talent's mobility choices (Farivar et al., 2019; Kondakci, 2011; Tharenou, 2015; Tharenou & Caulfield, 2010). Push factors make talents leave a country while pull factors attract talents to a host country. Similarly, in the case of foreign talent, push and pull factors that are related to their home countries play a significant role. The balance between push and pull factors shapes the outcome. A host country's government seeking to attract foreign talent needs to ensure that pull factors within its sphere of influence outweigh the push factors. There are a variety of push and pull factors that can be instrumental (Farivar

et al., 2019; Tharenou, 2015). Home countries can attract international graduates through different repatriation schemes and incentives (i.e., financial/professional means) or national support groups and networks that aim to create a sense of moral duty towards the home country, including pressure from family and friends (i.e., non-financial/personal means). At the same time, international graduates can be "pushed away" from their home countries due to career-related dissatisfaction, unemployment or precarious socio-economic and political conditions. In this context, graduates may be convinced to stay in the host country by career opportunities and higher pay, international work experience and the quality of work and living environments (Tharenou, 2015).

Farivar et al. (2019: 1065) group these push-pull factors into two broad categories: work conditions and socio-cultural conditions. Work conditions include pay rates, opportunities for career progression, the quality of the work environment, chances of obtaining international work experience and the ability to find suitable employment. Socio-cultural conditions include a desire to serve the home country, cultural familiarity, the ease or difficulty of assimilating into the local culture, home country incentives to return, the opportunity to gain permanent residency, social and political systems in the home country and the overall quality of life.

International experiences regarding talent retention have shown, however, that some countries are better able to manage the push-pull factors to their advantage and retain foreign talent than others. The prominence of internationalisation policy in higher education institutions, as "gate keepers" of the foreign talent pool, can significantly influence attraction and retention. Structural, legal and immigration policy changes in the national system and a change in the popular mindset concerning foreign-born talent can improve attraction and retention (Azman et al., 2016). Immigration policy features can prove instrumental in fostering an educated workforce in fields with a high demand for talent, such as science, technology, engineering and mathematics (STEM). Experiences regarding the US Optional Practical Training (OPT), a scheme through which foreign graduates in the US can work on their student visas following graduation, have shown that OPT extensions can encourage foreign graduates to major in a STEM field (Amuedo-Dorantes et al., 2019). Small economies, like Finland's, are faced with more challenges in terms of talent retention compared to larger and more attractive economies. A study of another small and open economy in the EU Austria found that Austria's ability to attract and retain foreign talent is modest, leading to "brain drain instead of brain gain" (Reiner, 2009). This push is due to the large share of non-hi-tech industries in the economy and universities' modest performance in attracting and retaining talent (Reiner, 2009).

As part of the national-level policy discussion about foreign talent, it is important to stress the ethical dimension of talent retention. As countries compete for talent, some benefit from this competition while others may lose out, and developing countries may be on the losing

side. This deprives them of a much-needed workforce to foster their national socio-economic development. Moreover, their incentives and mechanisms (pull factors) may be insufficient and poorly developed in terms of determining repatriation decisions. This has implications for the Government of Finland and other developed countries, as the effects of this uneven competition point to insufficient ethical considerations of the current policy interest in attracting and retaining foreign talent. Moreover, the issue has implications for cross-governmental policy coordination: some government programmes, such as Talent Boost, aim to increase the attraction and retention of foreign talent in Finland, while other national and multi-national policy programmes (e.g., in the field of international development) aim to enable socio-economic progress in developing countries (Sá & Sabzalieva, 2018).

2.3 Talent attraction and retention policies in Finland

In recent years, the key ministries and governmental actors associated with migration, innovation, education and employment have paid increased attention to attracting and retaining foreign (typically phrased "international") talent. The Government Migration Policy Programme to Strengthen Labour Migration from 2018 highlights the importance of immigration in tackling the talent shortage in various fields, in enhancing the dependency ratio and in attracting foreign talent and entrepreneurship to Finland (Ministry of the Interior, 2018). According to the programme, these goals will be supported and achieved by policies that promote work-based immigration, integration and good relations among people from diverse groups (Ministry of the Interior, 2018).

A cooperation group formed in 2019 by the Ministry of the Interior and the Ministry of Education and Culture in 2019 gave 34 measure proposals to support the attraction, entry, integration, employment and retention of foreign students in Finland (Ministry of Education and Culture, 2019). According to the cooperation group, the success of education-based immigration is dependent on many things, such as future career opportunities; the appeal of the town/city and the higher education institution; the quality of research, learning environments and education; and the attractiveness of the education available in English. The Forum for International Policies in Higher Education and Research set up by the Ministry of Education and Culture has given 17 policy recommendations to make Finnish higher education and research more international by the year 2025 (Kokko et al., 2020). These recommendations include actions to, for example, improve cross-governing collaboration for talent retention and attraction; create better possibilities for studying Swedish or Finnish as a part of research work or degree studies; and improve employment opportunities for foreign degree students by providing internships. These policy recommendations are designed to achieve several goals, such as improving the employability of foreign degree students until it reaches the same level as that of students with Finnish origin and employing more international and foreign researchers in Finnish universities.

In 2015, the Ministry of Economic Affairs and Employment published a report on immigration policies in the Finnish innovation economy (Raunio, 2015), which claimed that immigrants are indeed crucial for the Finnish innovation economy and that cross-administrative collaboration between innovation, immigration and integration-related activities is needed in order to merge immigration as an element in Finnish economic and innovation policies. Following this theme, the Prime Minister's Office published a report considering immigrants in the innovation economy (Rilla et al., 2018). It reviewed good practices in Austria, Canada, Denmark and the Netherlands and found that in order to integrate foreign talent, Finland needs to create a shared vision and long-term plan of action for international talent attraction, generate a widely accepted strategic intent for foreign talent retention and design and apply new solutions for systematic and continuous talent integration (Rilla et al., 2018).

2.4　A dedicated programme is launched: Talent Boost Finland

In 2016, the Ministry of Economic Affairs and Employment of Finland launched an agenda called "Growth from international talents" (Kasvua kansainvälisistä osaajista), which was meant to direct the skills, expertise, networks and innovation potential of foreign talent to support Finnish companies' internationalisation and growth (Ministry of Economic Affairs and Employment of Finland, 2020a). Later, this initiative became the Talent Boost Action Programme, and in 2017, there was a call for projects to launch this agenda into action. Eventually eight projects were funded with Finland's structural fund programme (Ministry of Economic Affairs and Employment of Finland, 2020a). The Talent Boost Finland Programme was launched by the Government of Finland to boost the attraction and retention of talent from abroad (Ministry of Economic Affairs and Employment of Finland, 2020b). This programme can be seen as a significant, structured attempt to considerably improve talent attraction and retention in Finland. As a cross-administrative initiative, Talent Boost is meant to increase the immigration of international talents, such as students, researchers, specialists and employees (Ministry of Economic Affairs and Employment of Finland, 2020b).

The programme helps Finnish companies recruit foreign talent by, for example, supporting recruitment with funding, helping to assess organisations' capabilities to recruit with the Talent Boost Index and providing guidance and services related to getting started with the international recruitment process (Business Finland, 2020). The Ministry of Economic Affairs and Employment and the Ministry of Education and Culture are jointly coordinating the programme, and Business Finland – a governmental organisation responsible for innovation funding and trade, investment promotion and travel – is handling the coordination of the business services. Talent Boost has three main goals: helping Finland to become an internationally attractive location to study, work, conduct research and

invest; making Finnish employers more capable and eager to recruit foreign talent; and having international experts drive the renewal and internationalisation of Finnish organisations and companies (Ministry of Economic Affairs and Employment of Finland, 2020b). As a part of Talent Boost, immigration legislation and permit procedures will also be developed in accordance to the current Government programme's goals of speeding up the process of issuing work-based residence permits, making moving to and staying in Finland easier for researchers and students and improving the position of seasonal workers (Ministry of Economic Affairs and Employment of Finland, 2020c).

As a part of Talent Boost, the Jobs in Finland website was created to make it easier for foreign talents to find open positions in Finland; here, information about high quality jobs and jobs requiring specific skills can be browsed by sector and region, and external links are provided for more information about moving to Finland and working there (Jobs in Finland, 2020). Finnish higher education also has its own collective website, Study in Finland (Study in Finland, 2020). A lot of information has also been collected on Talent Boost Cookbook Finland, which is a central publication about good practices concerning international talents in Finland (Ministry of Economic Affairs and Employment of Finland, 2019b). It uses Talent Attraction Management (TAM) as its methodology and educates its readers on talent attraction, reception, integration and reputation in Finland, while also giving an overview of the international talent ecosystem (Ministry of Economic Affairs and Employment of Finland, 2019b).

Talent Boost activities in Finland have been national, regional and local, and funding has been available to launch Talent Boost-related activities. The Talent Hub funding and service model was established as a tool meant to specifically support regional talent attraction and retention activities. Its purpose is to bring together regional actors concerned with international talent and recruitment and to create cross-organisational service paths for talented people and for the organisations interested in recruiting them (Finnish Government, 2020). Finnish municipalities with 15 000 or more foreign language-speaking residents are able to apply for government funding to support Talent Hub activities (Finnish Government, 2020). The first funding application round was organised in early 2020, and in total, one million euros was allocated to increasing Talent Hub activities in 2020 (Finnish Government, 2020). For example, a Talent Hub Robotics project in Satakunta aspires to ease the skill shortage in the fields of robotics, automation and artificial intelligence by attracting foreign talents to regional companies, helping the talents to integrate and building a functional ecosystem around these fields (Sataedu, 2020). The Talent Hub Robotics project will be ongoing during 2020–2022.

Talent Boost projects have also been backed with AIKO (regional innovations and experimentations) funding to support Talent Boost activity coordination at the city level (Pirkanmaan liitto, 2020). The latest funding application round for AIKO ended in 2019, and

funded projects include, for example, the Talent Turku ecosystem model and International Tampere Hub (Pirkanmaan liitto, 2020). In addition, there is a European Social Fund (ESF) financed project called "Setting the course for Finland", which is meant to secure the progress of Finnish companies in growth centres by supporting the employment of international talents and the integration of these talents and their family members (ELY-centre, 2020a). The goal of this project is to implement ten to fifteen regional projects. In addition, ESF funding has been used on a scheme called "Labour Mobility in Europe", which aspires to bring together skilled people and available jobs by enhancing European employment services (EURES) as a part of Finnish Public Employment and Business Services (TE-services) (Ministry of Economic Affairs and Employment of Finland, 2020d).

An additional goal of the recent Talent Boost action programme is to get Finnish employers to become more willing to recruit international talents and make them more capable of doing so, while reducing the processing time of study- and research-related residence permits to an average of one month (Ministry of Economic Affairs and Employment & Ministry of Education and Culture, 2020). In autumn 2020, a publication on the most recent Talent Boost Action Programme was published, including a plan on how to bring together employment, economic, innovation, education and immigration-related policies with three action types: advancing the availability of a skilled workforce, developing immigrant legislation and residence permits and ensuring the necessary conditions for talent retention and growth (Talent Boost Action Programme, 2020). In addition, the publication proposes the making of a roadmap for study- and work-based immigration in Finland to signpost the national strategy until the year 2035.

Talent Boost activities in Ostrobothnia and Central Ostrobothnia

Talent Coastline is an ecosystem operating in the Ostrobothnia and Central Ostrobothnia regions in Finland, where Vaasa is also located. It is a part of the national Talent Boost Programme, and the aim is to attract international talent to the area in order to boost growth and to ensure that local companies have access to a skilled workforce (ELY-Centre, 2020b). The Ostrobothnia Centre for Economic Development, Transport and the Environment (ELY-Centre) coordinates Talent Coastline. It works as a collaborative ecosystem, as it gathers together international talents, regional cities, business centres, education institutions, companies, regional Talent Hubs and other relevant organisations with specific needs and offerings. The ecosystem actors work together towards making the Ostrobothnian regions attractive to international talent, retaining the talent in these regions and bringing international talent and small and medium-sized companies closer together (ELY-Centre, 2020b).

The future of Talent Boost in the aftermath of Covid-19

The coronavirus disease (Covid-19) pandemic has had significant effects on Talent Boost activities in Finland during the year 2020. These effects will be discussed next, based on discussions with Laura Lindeman from the Ministry of Economic Affairs and Employment. Due to travel restrictions, the international workforce's entry into Finland has become more challenging. In addition, along with other Schengen countries, Finland suspended the reception and processing of ordinary visa and residence permit applications until further notice (Ministry of Foreign Affairs of Finland, 2020). When writing this report in February 2021, the Covid-19 pandemic is ongoing. As the pandemic shrinks the global economy, both immigration and the demand for workers will likely decrease compared to previous years (Talent Boost Action Programme, 2020). Companies' needs and chances to recruit international talent have decreased in some cases, and some companies may instead need to increasingly adjust their operations and lay off personnel. The pandemic has also affected the application and selection processes for international degree programmes in higher education as the uncertainty of the current situation may prevent exchange students and international degree students from accepting study positions (Finnish National Agency for Education, 2020).

According to the Talent Boost Action Programme (2020), the pandemic demanded that all the campaigns and actions aimed at international talent attraction be put on hold or stopped altogether. Instead, for the time being, the execution of the programme was focused on international talents already in Finland. Talent Boost actors have concentrated their efforts on, for example, helping companies to get through the crisis, planning and implementing virtual events, creating multilingual communication and information about Covid-19 and generating information for companies about workforce availability and mobility during the pandemic.

Regardless of these challenges, the need for international talent in Finland remains unchanged in the long term. As Finland's working-age population continues to shrink, the maintenance of the welfare state and a stable economy will require increased work and study-based immigration in the future (Talent Boost Action Programme, 2020). The Talent Boost Programme may play a significant role in recovering from the negative effects of the pandemic, as the increased digitalisation of services and work creates even greater demand for a skilled workforce in related fields. Thus, competition for talent will continue after the pandemic as economies' need for new businesses and innovations persists.

2.5   Talent programmes from companies operating in Finland

In addition to public actors, private companies are increasingly launching their own talent programmes to tackle the skill shortages and to attract the best talent to their organisations. One of these initiatives is graduate trainee programmes (GTPs), where companies engage skilled and competent, recent or soon-to-be graduates through hiring them to participate in structured programmes, where the graduates receive training and learn the knowledge needed to work in the organisation (Gama & Edoun, 2020). Cases of this kind of programme can be found in some companies that operate in Finland, examples of which are presented below.

One quite recent example is the KPMG Digital Academy, which was launched in 2018 (Tuky, 2018). A two-year graduate programme combines a traineeship, training and mentoring with academic studies (Tuky, 2018). KPMG Oy Ab offers auditing, tax, law and advisory services in Finland, and therefore, students from various fields can take part in the programme, for example, students of data analysis, economics and human-technology interaction (KPMG Oy Ab, 2020a; Tuky, 2018). The KPMG Digital Academy especially targets students who are interested in technology and who are undertaking their master's studies. The KPMG Academy has been promoted in English, and Finnish language proficiency is not required for participation (KPMG Oy Ab, 2020b). Since its launch in 2018, some students have been employed by KPMG through the scheme, and among its 12 participants are also students who have come to study in Finland from abroad (KPMG Oy Ab, 2020b).

Another example is the ABB Talent Internship Programme, which is a two-year internship programme for master's students, especially those in the fields of engineering and IT (ABB, 2020). The programme guarantees a summer job for two subsequent summers, provides training in the field of technology and work-life skills and offers personal mentoring to each student (ABB, 2020). The programme has also been promoted in English and is open to foreign students who meet the qualifying criteria.

In addition to GTPs, some companies offer intensive courses where attendees learn the new, required skills in a shorter time. For example, inspired by accelerated learning programmes in the US, the Academic Work (AW) Academy has started to offer a 12-week intensive course in the field of information technology (IT) in Finland and some other countries (Academic Work Academy, 2020a). Academic Work is a recruitment and personnel service company operating in Finland (Academic Work, 2020). The AW Academy furnishes the chosen attendees with suitable technical skills, after which they are ready to work as junior IT consultants after graduation (Academic Work Academy, 2020a). The AW Academy is free of charge and guarantees a job to everyone who is accepted onto the programme. Most of the 177 graduates have since been employed by the IT industry through Academic Work (Academic Work 2020). The AW Academy was launched in 2017 in Finland and currently only provides its education in Finnish (Academic Work Academy, 2020b).

Info box 3: Developing digitalisation skills – benchmarking Finnish examples

Graduates are deemed to be a key source of talent for many organisations, and thus recruiting, developing and retaining them is viewed as a logical talent management strategy. Since most companies that hire them look for some form of experience or traineeship in the related field, there must be a way for students nearing graduation to get work experience during their studies.

In the table below, five examples of Finland-based digitalisation skill initiatives are presented and compared with the Digitalisation Academy (see further: Digitalisation Academy, 2021; Codebar, 2021; Hive Helsinki, 2021; Finnish Software and E-business Association, 2021; Raahe Coding School, 2021; South-Eastern Finland University of Applied Sciences [XAMK], 2021).. The main criteria for choosing these initiatives were 1) no costs for the students 2) a focus on enhancing digital skills and 3) operating in similar environments (cities and towns in Finland that have recognised the need for digital skills). Some of them (the Digitalisation Academy, XAMK Digiverstas and Raahe Coding School) have also been able to award study credits to students whose education institutions recognised the offerings of the initiatives as a part of the students' study records.

Name	Purpose	Financing	Length	To whom
The Digitalisation Academy, Vaasa	To provide students with training, projects, networking possibilities, internships and thesis work in the digitalisation field (e.g. cyber security, data science).	Regional Council of Ostrobothnia, Merinova, and sponsor companies	Academic year	3rd and 4th year students at VAMK, Novia and the University of Vaasa
Codebar, international, operations in Helsinki	To improve the growth of a diverse tech community by organising regular programming workshops. To enable underrepresented people to learn programming and expand their career opportunities.	Funded by sponsors	One-day workshops and events	Women, the LGBTQ community and other people who are underrepresented in the technological industry
Coding School Hive, Helsinki	To offer a higher education-level programme in coding based on collaborative, project-based learning.	Financed by Supercell	3 years	Minimum age of 18 years old, or the completion of basic comprehensive education

Mimmit koodaa, in many cities across Finland	To offer free-of-charge training for women in coding/programming.	The Finnish Software and E-business Association and its member organisations	One-day work-shops and events	Women interested in programming
Raahe Coding School, Raahe	To offer afternoon and early evening clubs dedicated to web programming and robotics. Personalised guidance from programming professionals.	Based on collaboration between the governing bodies of Raahe Business College, Raahe Upper Secondary School and three regional higher education institutions	Academic year	Anyone over 15 years old
XAMK Digiverstas, Kymen-laakso	To provide a work-based learning environment through real-life projects and assignments. To conduct multidisciplinary business projects and find internships and thesis topics.	Helsinki-Uusimaa Regional Council, European Regional Development Fund (ERDF)	Depends on the project	Students at South-Eastern Finland University of Applied Sciences (XAMK)

The purpose of benchmarking these examples was to map what similar initiatives to the Digitalisation Academy already exist in Finland, to explore how they have organised their operations and funding and to understand what have been the motivations behind establishing the initiatives. By examining good practices, we were able to reflect on the Digitalisation Academy and evaluate its procedures. As expected, securing funding is essential for ensuring the operations of this kind of initiatives. The benchmarked initiatives had somewhat similar funding models, as many of them are supported by sponsors. XAMK Digiverstas ("Digital Workshop" in English) also had European Regional Development Fund (ERDF) funding to establish its operations during 2017–2019 (South-Eastern Finland University of Applied Sciences [XAMK], 2021). Public development and project funding might be a possibility for the Digitalisation Academy in the future, yet the engagement of sponsor organisations is essential for long-term funding.

Another notable fact is that there are indeed benefits that can be gained through synergy in collaboration: initiatives like the benchmarking examples and the Digitalisation Academy create win-win situations where the needs of both students and companies are met, and both gain additional value from participating. Students want to advance in their studies and obtain employment following them, and companies are willing to hire students with the right set of skills, creating a motivation basis for agile initiatives to bring the different actors together.

Consequently, we also found that the need for initiatives like the benchmarked examples and the Digitalisation Academy is indeed significant all over Finland. All the benchmarked initiatives have been successful in gaining participants, which shows that people are interested in developing additional skills and identifying opportunities in the digital field. The presence of sponsors and private funding highlights the need for digital skills on the industry side. Many initiatives also pay attention to the importance of underrepresented groups entering the digital field: in order to tackle talent shortages, it is essential that all potential candidates and those that are interested can learn new skills and be employed in the digital field regardless of their backgrounds.

Where the Digitalisation Academy stands out for students is that it provides a structured, scalable programme that brings together the elements of learning new skills, academic studies and employment, and not just one or some of these. It embraces cross-sectoral collaboration and brings together several ecosystem actors to find solutions to shared challenges.

Lappeenranta-Lahti University of Technology (LUT) has been conducting research on an initiative similar to the Digitalisation Academy, the Mimmit koodaa ("Women code") programme (LUT, 2019). As an initiative, Mimmit koodaa has focused on women with no previous coding experience and a willingness to learn programming. Its aim is to increase equality and diversity within the software industry. A survey conducted among women (252 respondents) who had shown an interest in the initiative revealed some problems that they face in obtaining software engineering roles (Wolff, Knutas & Savolainen, 2020). The aim of the survey was to understand what early experiences may influence later career choices and how feelings of efficacy and confidence are needed to pursue technology-related careers. The initial findings revealed that early experiences indeed shape women's feelings of computing self-efficacy and attitudes towards software engineering. Negative experiences decrease the likelihood of working in software engineering roles in the future, despite an expressed interest in the field.

Info box 4: Developing digitalisation skills – benchmarking India, Pakistan and Romania

Next, we will take a closer look at three foreign country cases – India, Pakistan and Romania – to learn about initiatives established to maximise the benefits of digitalisation in terms of developing skilled people to work in the field. All three countries are emerging economies, which our research team has insights into and where initiative-boosting digitalisation skills are valued quite intensively. Improving these skills heavily contributes to these countries' economies. These cases provide examples of the scale of talent development carried out in the digitalisation field in some countries. Furthermore, they provide inspiration regarding collaboration between governments and global companies.

INDIA

India's IT-BPM (Information technology and business process management) industry's revenue was estimated at around US$ 191 billion in FY20, growing at 7.7% year-on-year. It is estimated to reach US$ 350 billion by 2025. Moreover, revenue from the digital segment is expected to form 38% of the total industry revenue by 2025 (Indian IT & BPM Industry Report, 2020). The total number of employees in just four of India's leading IT companies (TCS, Infosys, Wipro and HCL Tech) grew to 1.02 million cumulatively as of 31 December 2019. In 2019, the entire Indian IT industry employed 205 000 new hires and had 884 000 digitally skilled talents (Indian IT & BPM Industry Report, 2020).

The National Skill Development Corporation (NSDC) (https://nsdcindia.org/) The NSDC is a not-for-profit public limited company set up by the Ministry of Finance in accordance with the public-private partnership (PPP) model. The Government of India, through the Ministry of Skill Development and Entrepreneurship (MSDE), holds 49% of the share capital of the NSDC, while the private sector holds 51% of the share capital. The NSDC was set up as part of a national skill development mission to fulfil India's growing need for a skilled workforce across sectors and to narrow the existing gap between the demand and supply of skills (NSDC, 2020).

Through various programmes, training centres were set up in each region for specific skills. In the case of IT, more than 400 training centres, offering basic level to advanced skill training, have been established. They offer training in skills as specific as using SAP, the software suite for banking or retail, or programming in languages like C, C#, Java and others (NSDC, 2020).

The duration of the studies varies depending on the training programme. There are no study credits offered. Funding-wise, the programme is subsidised heavily by the government and companies, and only a nominal fee remains to be paid by the students. In terms of accreditation, students receive a certification for the completed training. IT employers consider the certification of specific IT skills to be an asset and a valid basis for hiring decisions.

For example, Google, Microsoft, IBM and other multinational IT companies have collaborated with the NSDC and the Government of India in upskilling India's digital workers. Microsoft's learning resource centre, Microsoft Learn will be integrated with the eSkill India digital platform to provide access to personalised learning paths and timely resources. Microsoft will collaborate with the NSDC's eSkill India portal to provide free access to learning resources and conduct digital skilling awareness drives. There is also an initiative to impart digital skills to more than 100 000 underserved women in India. The partnership is an extension of Microsoft's global skilling initiative, which seeks to help 25 million people worldwide acquire new digital skills (Economic Times Government, 2020 & Microsoft News Centre India, 2020).

The professional networking platform LinkedIn and the NSDC have recently announced a partnership, which will provide free access to LinkedIn Learning resources to upskill Indian young professionals and create a future-ready digital workforce. Under the partnership, 10 free LinkedIn Learning paths (consisting of 140 courses to prepare participants for a range of in-demand tech jobs) will be made available for free on the eSkill India digital platform until 31 March 2021 (Tripathy, 2020). IBM has announced a collaboration with the NSDC to offer "Open P-TECH", a free digital education platform focused on emerging technologies and professional development skills (Sarkar, 2020).

PAKISTAN
The IT sector of Pakistan is rapidly emerging which contributes circa 1% of GDP to its economy. It has doubled in size during the last four years and is expected to continue growing in the coming years. The IT industry in Pakistan contains the potential to additionally contribute to the overall economy with a 30% annual growth rate, and this is because of an increase of about 70% in IT exports during recent years (Sector Profile Tech, 2019).

The KP Youth Employment Programme – digital skills for all
(https://www.kpyep.com)
Although Pakistan has taken several initiatives towards developing digital
competencies for youth employment, the Khyber Pakhtunkhwa Information
Technology Board's (KPITB) flagship initiative, entitled the "KP Youth
Employment Programme (KPYEP)" addresses youth employment through
building a skilled workforce. The KPYEP aims to empower unemployed
youths and provide training, digital skills and employment prospects
by designing its approach in a way that meets the changing demands
of digitalisation (Khyber Pakhtunkhwa Information Technology Board,
2019). This initiative also seeks to minimise the skill gap that exists in
industry-academia collaborations through offering courses that increase
employability. In terms of geographic coverage, the programme covers
seven districts of Pakistan's Khyber Pakhtunkhwa province. The targets of
this initiative are youth groups who are interested in starting their careers as
developers and do not have any particular previous experience in the field.
This will produce a large base of IT workers in the market. No study credits
are offered to the students, and the duration of the studies varies depending
on the course. In terms of funding, the KPITB offers this programme free of
charge; however, the certification cost is not covered.

ROMANIA
The IT&C sector in Romania has been growing steadily, and it is estimated
that by 2025 it will reach 12% of the country's GDP. With an estimated
140 000 employees in the IT&C industry in 2020, four main IT hubs
(Bucharest, Cluj-Napoca, Timişoara and Iaşi) and three rapidly growing
centres (Braşov, Sibiu and Craiova), Romania currently ranks at the top of the
list of countries in Central and Eastern Europe concerning the development
of the IT&C industry (Brainspotting, 2020). The figures are expected to
continue to grow in the coming years, and the talent attraction and retention
capabilities of the Romanian IT&C sector and the continual development of
up-to-date skills will prove instrumental to maintaining the momentum.

The Informal School of IT (https://scoalainformala.ro/)
Initiatives such as the Informal School of IT aim to contribute to the goals
described above. The purpose of the initiative is to develop the digital
skills needed in the growing IT sector using hands-on, alternative teaching
methods based on the needs of specific companies and the labour market.
Geographically, it covers six IT hubs in Romania: Cluj-Napoca, Bucharest, Iaşi,

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Timișoara, Brașov and Craiova. The target groups include all those interested in developing a career in IT or improving their IT skills, depending on the level and type of course (there are also courses for children and teens, but most are for adults who have at least a high-school degree). The duration of the courses varies. This initiative does not offer study credits. In terms of funding, it is paid for by the students, with the fees depending on the city and type of course and it averages averages 150 euros per month (4 sessions). The Informal School of IT aims to provide IT training that is an alternative to university courses. Most courses are not accredited by the Ministry of Education or the Ministry of Labour. However, companies may recognise the certificate and value it despite the lack of official accreditation.

3   A Digitalisation Academy – the model

3.1   Building blocks and success factors

The starting point for the Digitalisation Academy was regional businesses' need for an educated workforce in the digitalisation field. Therefore, the aim was to cultivate students' digitalisation skills in close collaboration with companies, hoping this connection would increase the relevance of studies and create much-needed networks and support students' recruitment into Vaasa-based companies. Running the Academy was funded by the companies participating in the initiative. Technology Centre Merinova became the administrative base camp for the Academy; the person responsible for running the Academy's activities works under Merinova. Three regional higher education institutions took a supporting role, and a representative from each also participated in the Digitalisation Academy's steering group, working alongside company representatives. Physical activities (e.g. classes, practices, group and project work) took place on the Palosaari campus in a dedicated classroom on the top floor of a building that houses Technobotnia, a wide-ranging laboratory co-owned by the three universities participating in the Digitalisation Academy.

It is worth underlining that, in the beginning, foreign students were not a specified target group of the Digitalisation Academy. The hope was that the Academy would appeal to all students, regardless of their backgrounds. From the beginning, the teaching was given in English in order to make the Academy accessible to all students – whether their first language was Finnish, Swedish or something else. However, it became apparent early on that the benefits of the Academy could be especially significant for foreign students if elements such as supporting their recruitment into the Finnish job market were included. Such offerings included, for example, support in understanding Finnish recruitment processes and CV writing. Obviously, companies and the entire ecosystem in Vaasa would benefit if any students, Finnish or foreign, stayed in the region. However, on a national level, the biggest loss for Finland is when students educated in the country leave for good, and the risk of this happening is highest with foreign students, who often struggle to find their first job in Finland. Therefore, placing emphasis on supporting these students is a worthwhile investment.

Another important element to highlight is that the Academy wished to target students from various academic fields. Future experts in marketing, communication, strategic management and so on were considered to be equally interesting for the companies, alongside skilled coders and others with a clear technological orientation. Feedback from the companies indicated that, in an ideal scenario, students would learn to work in a multidisciplinary environment and learn from each other's expertise. Consequently, for

example, future engineers would have a wider understanding of issues such as marketing, communication and project management. Importantly, students could also make friends and connections across sectors. Studies on talent attraction and retention show the importance of so-called soft locational factors, including closeness to friends and family (see chapter 2.2.). Therefore, supporting foreign students in making friends and building networks in Finland was seen as being especially important.

3.2   Establishing a Digitalisation Academy – tips and ideas

A natural starting point for establishing a Digitalisation Academy initiative in another cluster in Finland would be a regionally identified lack of a talented workforce. Ideally, the need for such a workforce would be uniform enough to make collaboration fruitful and relevant to all partners. In the Vaasa model, a common interest was found among companies within the energy cluster, while regional universities provided the students. In the Digitalisation Academy model, collaboration between companies and HEIs is a must, making academies suitable for regions with existing HEIs. Our advice would be to gather all relevant organisations around the table early on, but also to choose one organisation to be responsible for keeping the wheels turning.

As in all collaborations, early planning is highly important. It enables all stakeholders to join and fix the activities in their schedules and makes it possible to utilise resources from all partner organisations and find committed individuals that prioritise the Academy's activities. In addition, it is important to collaborate with HEIs early on to ensure that study credits can be given to students if desired. The process of recognising the content of a Digitalisation Academy as a part of students' study records and granting credits may not always be straightforward, and therefore it is important to communicate with HEIs regarding the matter in advance.

A wide group of stakeholders can be a strong asset for a Digitalisation Academy, but only if all of its member organisations are committed to it, their expectations and roles are clear and they all contribute in ways agreed upon jointly. Communicating and marketing are a good example of this: a lot can be achieved in terms of visibility if all the partnering organisations share information about the Academy on their web pages and use their communication channels to promote the initiative. Equally, the portfolio of master's thesis, summer job and internship opportunities available to Academy students can be seen as impressive if pooled together. The same is true in terms of teaching: combining expertise from several universities and companies will produce an impressive amount of timely, high quality knowledge on offer – something that would otherwise be beyond the students' reach. Importantly, when all the stakeholders contribute, individual workloads will remain moderate.

Finally, the role of the steering group is an important one and could be developed further from its current form. Including student representatives, arranging more frequent meetings, giving

more weight to developing ways to measure the Academy's impact and assigning more clearly defined tasks and roles would very likely make the steering group's work more effective.

Digitalisation Academy's student's views: What were the benefits for me?

Woman, China
UNIVERSITY OF VAASA

"I took some basic accounting courses during my master's programme, but **somehow the Digitalisation Academy gave me the feeling that I can handle it and I can do it!"**

"The strongest point is the visitors [from companies] and the courses they gave us. It's really helpful to hear about the real things that companies have worked with."

"The academy gave me visibility. It was wonderful to talk with people from [e.g.] Mirka, Devatus and Danfoss."

"The opportunity to **improve your leadership skills, coding skills and to become a better person."**

Man, Nigeria
UNIVERSITY OF VAASA

Man, Finland
VAMK

"Mostly, my expectations were filled, but I was hoping for a few more company cases.

"I would say that it is **a great way to make contacts.**

"It would be really nice if this would be done in different cities around Finland."

"I wanted to understand how much the Finnish side differed from my [international] studies. Although, my main goal was to network with students and company representatives."

Woman, Ethiopia
VAMK

"The strong points were that we had a lot of resources, at least one company coming over [for presentations] per week and Peter's [Hellström, the Digitalisation Academy's head] excitement throughout."

"The Academy **gave me a clearer view of which company I wanted to apply for and which speciality I should choose** for my master's studies. So, in that sense, it was an eye-opening experience."

Woman, Finland
NOVIA

"As part of the course, we **gained more knowledge about what companies are located in Vaasa and where to look for a job."**

"I went to some interviews with companies involved with the Digitalisation Academy, and I got the feeling that they knew more about me because I had been in the academy."

Info box 5: Overview of the Digitalisation Academy's pilot period 2019–2020

Peter Hellström

The Digitalisation Academy was established in January 2019 with a group of 16 students from 3 universities (the University of Vaasa, VAMK and Novia). The size of the first group was relatively small in order to make the management of the first pilot group easier. The pilot phase lasted for two years (2019–2020), and the agile project method was used to enable rapid changes in the routine and the content of the programme. The second group, starting in October 2019, was expanded to 21 students. About one third of the students came from each institution, and approximately half of them were from Finland and half from abroad. The selection of the students was based on both their CVs and interviews.

In terms of gender parity, 12.5% of the first group's students were female. There was a notable improvement for the second group, as 24% of the students were female. The regional shares of foreign students in the second group were approximately 50% from Asia (Vietnam and China), 25% from Africa and 25% from India and Pakistan. There were about 90 applications for each group.

The Academy's teaching language is English, and it uses a so-called flipped classroom, using Udemy's online courses as material (www. udemy.com). Every student gets their own Udemy licence for one year, with access to 3 500 different courses, specially chosen for business use (digitalisationacademy.udemy.com).

The business licence offers the possibility of assigning courses and following up on students' progress and activity within the group. Students also have the possibility to use the licence for courses that help them in completing their degree studies or when entering working life. Every student will also receive a certificate for each completed Udemy course, which can be used on LinkedIn as proof of merit.

The Academy's education comprises three main topics – Cyber Security, Data Science and Digitalisation – each worth 5 ECTS. These topics were chosen after consultation with the partnering companies and thus reflect urgent skills needs.

Alongside learning digitalisation skills, the Digitalisation Academy offers foreign students contact with their fellow Finnish students. Similarly, Finnish students become familiarised with an international and intercultural working environment. Furthermore, students gain valuable skills in project management, interdisciplinary teamwork, working cultures in the Finnish business environment and skills related to job-seeking.

Nine companies participated in the Digitalisation Academy with the first group of students: Wärtsilä, Danfoss, VEO, Devatus, Wapice, Mirka, KWH Logistics, Vaasan Sähkö and Gambit. Eight of those companies continued their participation with the second group of students. New partnerships have been under discussion, and two companies have expressed their interest in joining the initiative. In the early stages, the Digitalisation Academy also received funding for development work from Lähi-Tapiola and the Ostrobothnia Chamber of Commerce.

Topical activities of the Digitalisation Academy
Digitalisation Academy students attended Wärtsilä's Smart Technology Hub Ecosystem Challenge from 11–12 November 2019, a two-day event where the students got to innovate and develop new ways of solving different challenges together with 60 other students from different universities in Finland.

The Academy's first major project will be to produce an application for the EnergyVaasa cluster. For this project, the Academy will have an actual customer, the Vaasa Region Development Company (VASEK), which will provide the student teams with both an incentive and a challenge.

The third Digitalisation Academy group and distance learning
The third group, starting in October 2020, was expanded to 25 students. The Covid-19 virus hit both Finland and the rest of the world, resulting in a decision to teach the third group entirely through distance learning, using tools like Zoom and Microsoft Teams. Some of the students joined the Digitalisation Academy from their home countries instead of staying in Vaasa. While distance work has added some new challenges for both students and teachers, it made it possible to increase the group size further. This will most probably be the "new normal", and one of our partner companies has already informed us that they believe that up to 40% of their personnel will work remotely from their homes, even after the Covid-19 pandemic. This is a good reason to develop such teaching, learning and teamworking methods further as the Digitalisation Academy continues.

3.3   SWOT analysis and points for development

The following analysis on the strengths, weaknesses, opportunities and threats related to the Digitalisation Academy model is mostly based on the interview data gathered within the project, providing insights from all stakeholders.

Strengths

What are the strengths of the Digitalisation Academy model? What makes it appealing and effective?

- Appealing ethos: a joint effort shared by the ecosystem actors
- Quick and flexible way of responding to specified talent needs
- Can shorten students' paths from completing their studies to becoming productive employees
- As companies are sponsors, studies are free for the students
- Companies receive access to an updated and skilled future workforce
- Universities gain access to collaborations with companies and insights into their needs
- Platform for cross-sectional collaborations between companies, students and universities

Weaknesses

What are or could be seen as weaknesses? How should the Digitalisation Academy be improved?

- Reliance on only one funding source (companies) is a risk (the Covid-19 pandemic is a challenge)
- Networking and social aspects are important but harder to facilitate in some circumstances (e.g. Covid-19)
- Many stakeholders make this a work-intensive initiative in terms of scheduling and building commitment
- Resourcing requires wider shoulders: coordination, communication and marketing are necessary for success
- Some of the impacts are difficult to measure
- Partnering universities' different administrative systems may add to the workload — coordination can take time
- Role of the steering group is critical — also in ensuring that their respective organisations are committed

Opportunities

What opportunities are there for the Digitalisation Academy model? What trends speak on its behalf?

- The need to retain talent will continue and will remain relevant
- Could be scaled up by adding more partners and by expanding to wider target groups (e.g. lifelong learning) and to other clusters in Finland
- Companies' and universities' increased commitment would likely improve results
- Enhancing communication efforts would help strengthen the brand
- Could be used by universities in marketing their degree programmes
- Improving cross-sectional networking may result in new start-ups
- A stronger feeling of community may increase willingness to stay in the region
- Can help partners in establishing their reputations as socially sustainable actors
- Can add to the attractiveness of the region, companies and participating universities

Threats

What threats may harm the Digitalisation Academy? What weaknesses could become threats? Is there competition in the field?

- If built too quickly (e.g. a lack of coordination, planning and communication), the student and partner experiences may be negatively affected
- If higher education institutions find the initiative undermining or interpret it as being a challenge to their roles, collaboration may be difficult
- Some companies have their own talent programmes — a need to show the benefits of taking joint responsibility
- If companies do not get involved practically (teaching, visits) alongside giving financial contributions, the networking and employment elements may become weak, and the teaching may lose relevance
- Difficulties in measuring the impact can undermine the perceived value of the programme and may lead to some partners losing interest
- The flipped classroom approach requires planning and preparatory work, and an inability to do so may affect the efficiency of the programme

3.4 Development ideas for the current Vaasa-based initiative

While the SWOT analysis above focuses on aspects of the model, data collected in our project provide ideas worth considering as focal points in developing the Vaasa-based pilot.

1. **Improving communication – internal and external.** A clearer message regarding the Digitalisation Academy's activities and action plans should be developed and communicated in order to have a wider reach. This requires increased communication on how the Academy's vision, goals and action plan benefit the entire ecosystem. It also requires continuous discussion, learning and the seeking out of opportunities to connect the most relevant actors: universities, students and companies.

2. **Widening the funder base.** Currently, the Digitalisation Academy is funded by its partner companies. The ongoing pandemic and difficult economic conditions have further heightened concerns that the companies' financial support may be discontinued or reduced with regard to its current level. There are two main solutions to this threat: increasing the number of partnering organisations or deepening the collaborations with existing ones. Succeeding in both would not only help the Academy to get additional financing but also resources for teaching, more connections and an increased number of students wishing to take part in the programme. However, extending the network will only be useful if sufficient resources can be directed to, for example, communication, planning and the administration of the Academy. It is also important to consider what alternative models and approaches could be adopted to ensure the Academy continues to function in the future – on a more or less self-sustaining basis. Could the Academy become a tool for universities in fulfilling their expanding duties related to their third mission, e.g. in terms of lifelong learning activities and talent boosting efforts?

3. **Strengthening the brand.** As the initiative supports the success of the region, regional actors could participate more widely in the Academy's branding and marketing. This would not only attract more potential students but also give the Academy the necessary visibility and recognition. Promoting the initiative on the company and university websites and at different events and fairs, as well as in local media, could strengthen the brand name. Working on the Digitalisation Academy's branding is also important for spreading awareness to a wider audience, for example, across Finland. This may encourage others

to follow in the Academy's footsteps and utilise the model in addressing talent shortages and improving digital competencies in their regions.

4. **Developing the steering group work.** The collaboration between different actors to ensure the Academy's functioning is a demanding task. It could be aided by improving the steering group's effectiveness. By involving relevant stakeholders and identifying clear roles and tasks, as well as ensuring active participation in the meetings and related activities, it can help in providing much-needed advisory support. It is also important to have someone responsible at each partner institution for communication, coordination and assisting the Academy where needed. Since the initiative involves different actors, it is important to have clearly defined points of contact.

5. **Establishing an internal follow-up, feedback and monitoring system.** A formal follow-up system would help identify the fronts on which the Academy needs to improve. It could be used to collect feedback from students on what is working well and what needs to be improved, as well as for soliciting their suggestions. Similarly, evaluating the extent to which students were able to network, develop the necessary competencies and find thesis opportunities, internships or job placements could help demonstrate the Academy's performance. Finally, timely feedback from companies and universities is vital to its continuous development. The steering group could be a key resource for the latter.

3.5   Scalability of the model

In order to scrutinise the Digitalisation Academy model's scalability, the DA-Pito project organised a webinar for the ecosystem actors from Lahti and Lappeenranta in February 2021. In the session, representatives from higher education, businesses, the public sector and development companies learned about the model and gave us their feedback.

As expected, the general theme of talent retention resonated strongly with the participants: the need to find ways of encouraging students, whether Finnish or foreign, to stay in these regions is acute. The situation of foreign students in terms of finding their first company contact was described as being especially difficult. Therefore, strengthening connections between students and companies was considered important, and some actions had already been carried out on this front.

The main strengths of the Digitalisation Academy model identified by the participants included the fact that it stems from companies' concrete needs and is based on their

funding, making it a flexible, relevant and timely initiative. The interdisciplinary approach also gained positive feedback, and it was seen as something that working life requires.

Possible weaknesses identified included that the Digitalisation Academy best suits areas with various companies with similar enough needs so that a common goal can be found. Without this basic condition, establishing an academy would be difficult. Also, in some areas, the companies needing a skilled workforce are mostly small and medium-sized firms led by entrepreneurs, which may not have resources to recruit staff members that do not speak Finnish (e.g. if the entrepreneur him/herself does not speak English). For them, the perspective of foreign talents would therefore not resonate so well. However, the Digitalisation Academy model could also be easily organised in Finnish and could equally benefit from recruiting Finnish students who come to Lahti and Lappeenranta for their studies and normally leave after graduating.

The most promising concrete idea in terms of scaling up Vaasa's Digitalisation Academy model was related to Lahti region's upcoming new cluster in the field of electrified transportation. The City of Lahti is known for its ambitious approach to meeting climate targets, and the region already has a good industrial basis; expertise in automation, the electrical industry and logistics; and some ongoing promising activities in the field of electrified transportation. The Lahti-based "Academy of Electrified Transportation" could be run in English, targeting both Finnish and foreign students. Companies involved in it would be in the technology industry.

Discussions with representatives from Lahti and Lappeenranta helped us in highlighting the strengths and also important preconditions. Across Finland, there are several existing and upcoming clusters, ranging from the maritime to the food industries and from the gaming sector to forestry and beyond, which could benefit from the Digitalisation Academy model in addressing talent retention and skills management issues.

4 Lessons learned and future actions

4.1 Challenges for ecosystem collaboration

Before moving forward with ideas on future actions, we would like to share, based on this project's findings and previous research, some critical notions of difficulties embedded in ecosystem collaboration that need to be discussed. Unless these are recognised and taken into account, disappointments and frustration may follow.

Collaborations between ecosystem actors provide the opportunity to join forces and, in this way, enhance the capacity to address existing challenges concerning talent shortages in a more effective way. However, it is often challenging for such organisations to establish the routines, practices and principles needed to initiate, implement, sustain and benefit from collaborations (Awasthy et al., 2020). In addition, both research and practice have begun to document the potential "dark side" of such collaborations and to point out specific reasons and factors that hinder them. The partners that form the ecosystem can have different organisational cultures, values and goals, as well as organisational routines and practices that may be difficult to reconcile (Dan, 2017; Ali et al., 2021; Parida et al., 2014). These factors can lead to conflict and unmet expectations, which, although common and inevitable, are an essential aspect of the practice of ecosystem collaboration (Shahzad et al. 2020; Shahzad, 2018). Moreover, ecosystem partners may experience opportunistic behaviour, which means that some partners benefit from the collaborations while making insignificant contributions. This challenge is intrinsic to multilateral collaborations and is generically known as "the tragedy of the commons" (e.g., Almeida et al., 2020). In practical terms it can lead to a lack of trust and commitment and a disincentive to continue the collaboration over the medium and long term. Unbalanced interdependencies, resulting from differences in size, market position and the power to influence decision making, can pose additional challenges to effective and sustainable collaboration. If unresolved, they can deteriorate the very foundation of the partnership (Shahzad et al., 2018; Liu et al., 2009).

The above-mentioned factors are all relevant to the Digitalisation Academy initiative. Reliance on only one funding source (companies) risks putting pressure on corporate budgets to the extent that the other main partners do not contribute in financial terms. The different sizes and organisational capacities of the ecosystem partners and their varying levels of commitment make the collaboration time-consuming and work intensive. This has implications for the practicalities of the collaboration, which require adequate resources. Relatedly, managing this collaboration requires efforts regarding coordinating schedules and extensive communication and promotion activities.

4.2 How to boost university-industry collaboration for talent retention

In order to respond effectively to socio-economic and socio-demographic changes, even more attention is now being devoted by governments, universities and industries to attracting and retaining foreign talent (Vauterin, 2012). However, ecosystem thinking currently lacks the idea of reshaping and aligning universities' strategic activities with industry's innovation supply chains and talent needs (Davey et al., 2019). Industry collaboration is still considered quite challenging since both parties have different objectives and operating models. The question of collaboration is still most topical, even critical. Solving it requires the industry taking an active role in prevailing the vision of a fourth industrial revolution and digitalisation in order to develop strong, long-term bonds with universities in terms of utilising the talent available in them.

Next, we will focus mostly on how universities could improve their role in ecosystem collaboration. However, a few words on the role of industries and businesses are also needed. In order to build and nurture dynamic ecosystem activities, all partners could step up their game. One important aspect of this is quite a basic one: understanding the other parties' work cultures, operations and "business models". This includes being curious, asking questions and openly explaining what is important to the organisation one is representing.

It is not always clear for industrial or business partners entering a collaboration with universities what the key performance indicators for universities are: How are universities funded and on which performance targets is this based? While it is in the universities' interests to find jobs for their students, this should happen after their graduation or in a way that does not threaten them to graduate on time, otherwise the universities will suffer financially. Equally, universities are experiencing an increasing push to publish, and to do so in an accessible manner (open access publications), something for which there is no equal appetite among industrial partners.

Based on these examples, it is clear that mutually beneficial collaboration can only be achieved through compromises, open communication and lots of goodwill from all partners.

A change in mindset

Attention must be focused towards boosting the value of university-industry collaboration, which is still an under-recognised source of value co-creation. Energising this type of collaboration is necessary for advancing sustainable foreign talent attraction and retention solutions. The value generated by such collaboration helps society tackle the problems of decreasing public funding for universities and industry's challenges in

terms of gaining a sustainable competitive advantage and tackling obstacles related to activating other actors in the ecosystem towards transitioning to the knowledge economy. Such a shift in thinking, from closed towards open boundaries, necessitates that industry partners involved in university-industry collaboration encourage and generate creative opportunities for successful talent recruitment. A relevant example of such a vibrant collaboration towards a sustainable society is the co-creation ecosystem known as the Smart Technology Hub and Smart Partner Campus created by Wärtsilä, a major Finnish energy technology and manufacturing company in Vaasa. The aim of this initiative is to provide an open platform of knowledge transfer, opportunities for students to work on international projects and an ecosystem of co-creation that supports students, employees, employers and researchers in their interacting and networking.

Commitment towards improved collaboration with universities

Learning from key stakeholders must be the key focus of an integrated infrastructure and knowledge management framework, where this input is necessary for building capacity for greater capture of value. Organisations need not only to acquire new talent but also to utilise and retain the knowledge and value already imbued in their pools of talent; both are needed in order to cope with the challenge of acquiring new and valuable practical knowledge and staying ahead in the R&D and innovation race. Joint initiatives, such as the Digitalisation Academy, support firms by producing a bespoke, educated workforce for them in the form of student talent and so help in mitigating the talent shortage. The future of digitalisation and the competitive market environment requires companies to go beyond their current operative standards and integrate with universities even further in order to forge closer ties to highly educated talent. This provides them with an opportunity to access skills and competencies as well as to address regional talent shortage issues. This also provides an opportunity for university students and researchers to mutually agree and work with the most relevant industrial projects that best suit their career development. However, this integration requires commitment and dedication from the firms – which they sometimes lack. Ecosystem thinking and its dynamic interactions are important and require improved collaboration and clear communication.

Make it formally and openly communicated

Academia and industry should communicate openly about the needs of both sides. Companies might even participate in developing educational content as it will help supply the industry with competent people to hire and retain in the future. This is possible by actively taking part in joint workshops and seminars. However, university-industry collaboration, at the moment, is mainly based on personal networks; formal arrangements or programmes for long-term cooperation are rare. Building trust, establishing permanent contact points and appointing dedicated people to smoothen such collaborations are

required first steps in forging such ties. Industry must involve itself more actively in knowledge-sharing activities within the region, as these will help it connect with the skills available through different projects.

Be inclusive towards ecosystem actors

Universities also need to comprehensively develop their technical education by covering the most pressing issues in society. This means that their curricula should not only serve one stratum of an ecosystem but the whole ecosystem. For example, in Vaasa, customer service companies can still feel isolated, which means collaboration is mainly focused on the manufacturing industry. Therefore, customer service companies need to be more actively included in the ecosystem – they also provide solutions to the region's talent shortage issues by hiring students and other talent. Small and medium-sized companies are the backbone of the economy, and they should be involved in discussing and co-creating solutions to the talent shortage. This will help the whole ecosystem to work together in order to retain the best talent in the region. Of course, it will require a boundless mindset, more flexibility towards the local language, an open organisational culture and collaboration in terms of bringing students and different industrial actors together. This will help the whole ecosystem to create a working community and to pool innovative ideas and fresh knowledge.

4.3   Universities' future roles

Universities have long played an important role in accelerating countries' economic growth and development by educating and training a workforce that can serve industrial needs (Yusuf & Nabeshima, 2006, Shakeel, 2020). They also have a historical role as places where scientific breakthroughs, critical thinking and new ideas are developed and nurtured. However, the conventional model of teaching and learning is being questioned, and universities are faced with an enormous challenge to transform their operations in order to remain relevant and maintain their role as value-offering institutions in the contemporary world. The rise of the fourth industrial revolution, the technological advancements of the recent past and the use of information and communication technologies offer numerous opportunities as well as posing challenges to educational institutions. The opportunities, if properly exploited, can make universities increasingly important institutions, extending their contributions to society. However, if ignored, they can challenge universities' very existence and marginalise their utility.

The growth of knowledge-based economies, driven by technological advancements, has brought the world to a point where development and growth are not necessarily dependent upon a pre-existing industrial base, massive infrastructures and expertise

in conventional business (Swab, 2016). Instead, growth today is more reliant on technological proficiency and innovations with value offerings – assets that can serve the needs of the digital age. This digital revolution requires countries to equip their workforces with the skills necessary to meet present-day industrial needs.

Universities need to be proactive while strengthening public values

Universities need to play a proactive role by adjusting to the changing needs of society and the economy alike. It may no longer be desired that graduates spend months training in the workplace before they can start contributing in real terms. Instead, universities will have to transform their education and integrate content that has practical relevance, as well as developing teaching methods that enable students to utilise the learned knowledge in a practical setting as soon as they graduate. If universities fail to step up, part of their functioning may be replaced by other actors. For instance, platforms offering online courses for skill development, massive open online courses (MOOCs) and content available on digital forums may influence universities' student intakes for conventional degree programmes. This may consequently affect universities' revenues, which could have serious consequences in the long run.

Universities will not only have to take measures to address the challenges at hand, but also take a leading role by participating and contributing in the domains where they possibly could, but rarely have contributed in the past. Firstly, universities will have to open up in order to develop closer cooperation with other academic institutions, industry, society and other stakeholders to ensure an efficient utilisation of resources and the understanding of their needs. The advancement in technology has made it possible for universities to collaborate with other academic institutions in planning joint courses and other activities, sharing resources and developing complementary services that can help improve the mobilisation of resources.

Likewise, universities may benefit from placing emphasis on what could bring value in the long run. For instance, in Finland, graduate placement has not been viewed as a key performance indicator of higher education in the same way as, for example, graduation times have. Investing more heavily in careers services and rewarding universities based on their graduates' success in employment after graduation could support the performance and culture shift needed. This would be a welcome change in terms of taking responsibility for students in the longer term, especially for those coming from abroad and sometimes needing more support in finding employment.

Bridging the gap between what is taught and what is needed

Universities need to develop closer collaborations with industry in order to better understand what is needed and what can help students contribute to the workplace. There is a need to develop joint projects where students can work on practical tasks during their academic life and involve industrial partners in practical coursework. This will help students learn industry practices, provide students with an opportunity to familiarise themselves with skills that could be useful in the future and build the trust and confidence necessary to thrive in working life.

A closer connection with society

Universities also need to develop a closer connection with society. Looking from the outside in, universities may seem to be working in silos to which members of the outside community have very little access. Much interesting research ends up being published in academic journals, which are rarely available to the masses. Universities opening their doors to the outside community, arranging activities and seminars for the common good and sharing and disseminating information that has public value may help the general public get access to useful information. Moreover, this can help develop trust and closer collaboration, in turn leading to open discussions that can help universities understand the needs of the community and society. In the future, having strong skills and a proven record in partnerships, stakeholder collaboration and ecosystem activities could be a way for individual universities to positively differentiate themselves from others and to attract students and faculty who share a mindset that embraces working as a wider community.

Universities as means to promote inclusiveness and social sustainability

Universities need to understand their strategic importance and the role they can play in addressing issues that go beyond conventional teaching and research. Universities can help improve the inclusiveness and social sustainability of regions. Universities mobilise students, researchers, knowledge and networks, which can benefit the cities they are located in. Finland, being a leader in terms of the quality of its education, can successfully attract thousands of international students and benefit from their skills and diverse expertise. However, this potential is not fully realised. The influx of international students does not translate into an equivalent increase in the educated workforce as many foreign graduates do not find relevant employment and adequate opportunities to integrate and contribute to society (Garam, 2018; Ministry of Education and Culture, 2019; Ministry of Economic Affairs and Employment of Finland, 2019; Loukkola, 2020; Taloustutkimus Oy, 2020). This leads to an outflow of qualified people who could have potentially been retained, leaving regions beset with the challenges of attracting talent to address their needs. Foreign graduates' poor employability has previously been explained by students lacking an understanding of the local work culture and language, a lack of social and

networking skills, and by companies' reluctance to hire foreign talent (Zafar, 2019). Thus, talent retention goes beyond economic measures and requires a supportive and equitable environment for foreign talent to feel included and play an active part in society (Geddie, 2015; Lepori et al., 2015). Universities can play an important part in supporting the inclusion and retention of foreign talent, as well as other groups of students in danger of being sidelined, by taking a more proactive, collaborative, inclusive and networked approach.

The balancing act

While developing a closer connection with industry and other stakeholders, universities must ensure that collaboration does not compromise their core activities. For centuries, universities have acted as knowledge hubs, creating and disseminating knowledge for societal good. Breakthroughs in science and the understanding of the world need space and time and are not linked with immediate financial targets. This increased emphasis on collaboration with industry may influence universities' approaches with regard to a shift from basic (pure and curiosity-driven) to more applied research (practical and market-oriented), as well as stimulating a prominent orientation towards industrial needs (Etzkowitz & Leydesdorff, 2000; Debackere, 2000; Dooley & Kirk, 2007). Therefore, this perspective of universities' attuning to the demands and needs of the labour market is contrasted with a competing viewpoint that argues for a more balanced role of universities. The proponents of the former propose the need to maintain a balance between the extent to which universities should operate according to entrepreneurial principles, which may undermine traditional public values, such as a public service ethos, equity and the development of a wide spectrum of values. Although they are more difficult to measure in economic terms, these values are equally important for the advancement of knowledge and the development of society. This balancing act can serve against the "commodification" of educational services, which runs contrary to the very notion and raison d'être of academia and constitutes a trend that may not be socially desirable over the medium and long term (Ivana et al., 2019; Lawrence & Sharma, 2002).

4.4 Directions for future study

There has been a steady growth in literature on talent retention, along with scholarship on talent and talent management in general (George, 2015). However, most of this work is concerned with talent retention in an organisational setting, usually in the corporate world of multinationals. Research on business HRM has long addressed issues such as employee turnover, which are closely related to retention (Holtom et al., 2008). There is less research on the talent retention policies of governments, regions or local authorities and limited research on collaborative, multi-actor programmes. For this reason, initiatives

such as the Digitalisation Academy provide a good opportunity to better understand how different stakeholders, such as companies, public authorities and universities can join forces in order to address talent shortages.

Capturing the focus of future research on talent retention

City/Regional/ National Level:

Key retention policy initiatives: flexible immigration policy, economic incentives, the availability of job opportunities, individual and family integration, educational opportunities, improvements in quality of life, social and cultural programmes

Collaborative retention initiatives/ programmes/academies established and run by companies, universities, governments, societal organisations

Organisational Level

Key retention practices and job characteristics: work-life balance, ethical and responsible behaviour, performance management, career development, job rotation, tailored work, compensation and rewards, job autonomy

PRE-EXISTING RESEARCH

FUTURE RESEARCH DEMANDS

The first and most developed stream of research focuses on retention practices at the organisational level (George, 2015; Holtom et al., 2008; McCracken et al., 2016; Ortlieb & Sieben, 2012). These studies usually focus on large, multinational companies, which may have already established talent management programmes. To a lesser extent, this research also captures the retention practices of small and medium-sized companies, which might not have full-blown retention strategies but may have developed certain initiatives or practices designed to retain talent (Dan et al., 2021). Retention practices at the organisational and job levels can involve work-life balance, ethical and responsible organisational behaviour, performance management schemes, compensation and rewards, career development, increased job autonomy and tailored and flexible work arrangements (which are highly relevant during times of crises such as the Covid-19 pandemic).

A second stream of research is less developed and relatively more recent than the first one (Geddie, 2015; Hooijen et al., 2017; Lepori et al., 2015; Shin et al., 2019). It looks at talent retention initiatives taken at the city, regional and/or national levels, usually by public authorities. These may be stand-alone local or regional initiatives, or they can be part of a larger national programme, such as Finland's Talent Boost. The key point, however, is that local action is encouraged and required, given that talent shortages and requirements are best identified and addressed locally, by relevant actors and stakeholders. These policy initiatives may include flexible immigration arrangements, economic incentives, the availability of job opportunities, integration schemes, improvements in the quality of life and social and cultural programmes.

A third stream of research, situated at the intersection of the first two, closely relates to the Digitalisation Academy, but is insufficiently researched. This nascent branch of research scrutinises collaborative talent retention initiatives jointly undertaken by different stakeholders, including companies, universities, city, regional and/or national governments and other societal organisations. While there is a growing interest in these initiatives in both Finland and elsewhere, there is little systematic research on the process of managing these collaborations and on their sustainability over time and their effectiveness in retaining international talent.

5   Authors

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Appendix: Research questionnaires

Addressing the issues of talent shortages and retention: A multiple case study approach

Background information of both partnering and non-partnering respondent(s)

1. Years of experience in the company
   a. Less than 5 years
   b. More than 5 years

2. Your name and position in the company

3. Which unit (organisation/business unit) are you from?

4. In what capacity are you involved in the Digitalisation Academy programme and how do you contribute to it?
   a. Do you participate in teaching?
   b. Are you a steering group member?
   c. Have you participated in any events related to the Digitalisation Academy (DA)?

General questions about the Digitalisation Academy (DA)

Partner firms

1. What is the DA all about in the context of your organisation? How do you see it?

2. What made you join this initiative? What were the motivational drivers?

3. What were your expectations before joining it and how are they being met?

4. Do you have your own tailored activities to tackle talent shortages?

5. One of the aims of the DA is to address the issue of talent shortages. Has this been relevant to you and if so, how?

6. Has the DA responded to your current needs with regard to talent shortages?

7. What kind of suggestions do you have for improving the DA?

8. The trial period is ending soon. In your opinion, in what areas has the DA succeeded and how would you improve it?

I. Overall activities

II. Communication and collaboration

III. Responding to talent shortages

Challenges – (Tafti et al., 2017; Thomas & Kerr-Phillips, 2009; Goswami & Jha, 2012; Yiu & Saner, 2014; Oladapo, 2014; Schuler et al., 2011)

Prior literature on talent management has identified certain internal and external key challenges for the talent shortages faced by organisations. We would like to hear your organisation's point of view, for example, on how relevant these challenges are and how you manage these.

Internal challenges:

A. In your company, do you have people with foreign backgrounds and people who do not speak Finnish/Swedish?

B. A lack of management commitment and support (an openness and readiness towards talent acquisition and retention) as well as a lack of organisational policy targeting talent shortages

C. A lack of internal resources – training requires resources but companies fear that trained people will leave after a certain period of time. Thus, they need to integrate and motivate talents to ensure they stay

D. Trust issues (companies' reluctance to hire international/student candidates), students are often seen as a high risk and low value option

E. Companies' inability to utilise knowledge produced in the universities

F. Resistance to cultural change – e.g. language barriers, cultural awareness

G. A lack of coordination among different departments in implementing talent management processes

H. Challenges in terms of digital transformation and globalisation

External challenges:

A. Finding a person with the relevant prior experience and the right set of skills – a student's ability to use the latest technologies and programming skills
B. Vaasa as a region for attractive work opportunities
C. Work permit (students' 25-hour-week work restriction during their studies) and partners' integration (dual employment for spouse)
D. University programmes (content) lack a practical understanding of industry needs
E. A lack of coordination between companies and universities/students

Partner organisations

What kind of role do you think the DA can play in tackling some of these challenges?

Opportunities – (Tafti et al., 2017; Schuler et al., 2011; Thomas & Kerr-Phillips, 2009)

Prior literature on talent management has identified certain key opportunities in order to address talent shortages while retaining talent for organisations. We would like to hear your organisation's point of view, for example, on how relevant these opportunities are and how you ensure these opportunities are realised.

A. Obtaining a competitive advantage by retaining your best talent
B. Attracting and retaining valued domestic and foreign talent
C. Longer-term collaboration opportunities with universities
D. Integrated talent management programmes
E. Strategic alignment between talent management/retention strategy/policy and business strategy
F. The commitment, support and involvement of management
G. Holistic approach to developing talent and to filling a talent shortage gap
H. Increased cross-sectoral communication and collaboration
I. Strong employer brand

Partner organisations

What kind of role do you think the Digitalisation Academy can play or is playing in providing valued talent in order for you to take advantage of some of these opportunities?

Organisational perspective/Factors tackling talent shortages and facilitating talent retention (Thomas & Kerr-Phillips, 2009; Schuler et al., 2011; Sinha & Sinha, 2012; Boomer Authority, 2009; Eyster et al., 2008; Bethke-Langenegger et al., 2011)

Addressing the issue of talent shortages

1. What kind of role should your company play in addressing the issue of talent shortages?
    a. How can trust be developed between students and companies?
    b. Do you think companies should be more active in close collaborations with universities and participate in workshops and student training in order to prepare their future employees? If so, what further actions must be taken?
    c. What actions can universities take in terms of updating their curricula and making changes regarding their educational practices in responding to industrial need?
    d. How flexible should the local language requirements be when hiring international students?
    e. Do you consider the issue of gender equality while looking for candidates? Do you think the effective utilisation of female talent potential remains untapped?
    f. How is the DA helping your organisation to reach out to the best talent available? Are any communication and interaction actions being taken to raise awareness of where students and companies can find each other?

Partner organisations

What kind of role do you think the Digitalisation Academy can contribute or is contributing to addressing the issue of talent shortages by connecting with trained talent and channelising networking possibilities?

Addressing the issue of talent retention

1. What kind of role should your company play in retaining the best talent? What actions have been taken so far and what else can be done?
    a. Breaking language barriers, offering dual employment and flexible working conditions and working hours
    b. Top management support and cultural support/an inclusive culture with effective communication embracing employee diversity to motivate talent and to integrate talent retention at the overall organisational level
    c. Organisational openness and readiness and competitive remuneration packages
    d. Skills and leadership development, a supportive learning climate, performance assessment and recognition

e. Very little organisational bureaucracy and gender equality and inclusiveness
f. Developing a solid internal organisational policy for talent retention

Partner organisations

What kind of role do you think the Digitalisation Academy can contribute or is contributing to addressing the issue of talent retention?

Concluding question

How would you improve the DA in the future so that you will remain a part of it while getting the most out of it? Consider the following:

a. The company's contribution to it – payment matters etc.
b. The role of the steering group – how can it be organised so that the company can contribute?
c. Relationships between students and the DA and between students and companies
d. The overall quality of the teaching content and methods
e. Organisation – timing, duration, class schedules, etc …
f. Mechanisms for evaluating the DA's performance etc.

Interview with Universities/Universities of Applied sciences

Degree programme coordinator

1. Are you familiar with the Digitalisation Academy (DA)?/How do you see the DA initiative?

2. Is the DA initiative complementing students' degree programmes?

3. Can students include DA work for credits in their degree programmes?

   a. If so, how many credits and how will DA work be integrated into their degrees?
   b. If not, what are the obstacles and can these be addressed in the foreseeable future?

4. What does the DA need to do in order to get its work assimilated into the degree programme for credits?

5. How do you see this DA programme impacting students' graduation timelines, and what are the possible implications it could have for the university (in terms of graduation targets)?

6. Can the DA programme positively or negatively affect the reputation of the degree/accreditations etc. in any way?
   a. Could it be used in the marketing of the degree or as a selling point?

7. How do you see their enrolment at the DA affecting international students' residence permit matters?

8. Do you think their enrolment at the DA will affect students' performance in their conventional studies or their grades, credits, participation in different activities, etc.? (the question becomes more relevant if the DA credits are not registered in the degree programme)

9. What is your view on getting companies involved in teaching/the changing role of universities? Would you personally like this change to take place/ how could it affect the future of universities?

10. How would you describe your working relationship with the DA management team (frequency of discussions/planning meetings, expectations from each other, resources on hand [human, financial, infrastructure])?

11. Do you have any idea of whether the previous year's Academy students benefitted from becoming part of this programme (jobs, internships, master theses, networking, etc.)?

12. What kind of support does the DA require from you if any?
    a. Were you contacted by the DA to discuss credits/students' degree-related issues?
    b. How much effort did you put into discussions with the DA coordinator?

13. What aspects of the Academy need radical improvement if any, and should it become successful/achieve its objectives? Any suggestions?
    a. What kind of help/assistance can be provided from the university side?

14. What are your hopes and concerns for the future?

15. Is there anything else you want to add in addition to what we have discussed that could be valuable in this context?

16. Now, before we finish, I would like to ask one hypothetical question: If you were given a free hand, would you want the academy to continue in the future (why/why not)?
    a. If so, what changes should be made to improve it (administratively, planning-wise, resources, practical issues, credits, job market)?

Administrative staff

1. What is your take on the DA programme? (Is it important and why/why not?)
   a. Do you think the initiative could help students in achieving their desired objectives (getting master theses, internships or employment, networking, etc.)?

2. What kind of support does the University of Vaasa provide with regard to this initiative?

3. Is there anything else the university can do in order to facilitate the development of the DA?

4. How is your relationship with the DA programme director/coordinator?
   a. Can you also tell us how frequently you have discussions with other university staff concerning the DA (concerning planning, administrative support, practical issues, etc.)?

5. What are the DA coordinator's expectations regarding the university?
   a. Are these realistic and is the university in a position to meet these needs?

6. Are you familiar with the support that other universities/UAS are providing for this initiative?
   a. Is the higher share from other institutes a cause for concern?

7. Do you think that the previous DA programme has achieved its desired objectives?

8. What are the things you have liked or practices that need to be altered?

9. Has the DA added to the university's workload (coordination, communication, publishing information, marketing, other costs, contact with industry, etc.) in any way?

10. Are you satisfied with the way this programme was advertised on the university's platform?
    a. If so, what has been good about it, and if not, what can be improved in order to increase its reach?

11. Which aspects of the academy need radical improvement, and should it become successful/achieve its objectives?
    a. What kind of help/assistance can be provided from the university side?

12. What are your hopes and concerns for the future?

13. Is there anything else you want to add in addition to what we have discussed that could be valuable in this context?

14. Now, before we finish, I would like to ask one hypothetical question: If you were given a free hand, would you want the academy to continue in the future (why/why not)?
    a. If so, what changes should be done to improve it (administratively, planning-wise, resources, practical issues, credits, the job market)?

Interview with students participating in the DA programmes (UVA, VAMK, Novia)

1. How did you come across the DA?

2. What expectations did you have regarding the DA?

3. Were your expectations met?
   a. If so, how, and if not, what was lacking and what were possible reasons for this?

4. In your opinion, how well was the whole programme planned (advertisement, recruitment process, notifications, start date, timings)?

5. Were you aware of whether the work done with the DA could be used as credits towards your degree programme?
   a. If so, at what point, and were the promises (if any) made by the DA honoured by your school?
   b. How important is the registration of credits as part of your degree from your point of view?

6. Were you satisfied with the lecture contents, teaching style and overall working style (the availability of the projects, practical learning, industrial-focused teaching/training) of the Academy?
   a. If so, can you highlight good points?
   b. Do you have any suggestions as to how it could be improved?

7. At what stage of your degree did you join the DA?
   a. Are you satisfied with the timing of your joining? If not, when could be the ideal time for a student to join the DA?

8. Since you were also taking courses for your degree, was it difficult to prepare for the DA classes (time needed for preparation/overburdened/overlapping/conflict with jobs, etc.)?

9. Being an international student, you are required to pass a certain number of credits to have your residence permit extended. Did you consider this when you were deciding whether to become part of the Academy?
   a. How can this issue be addressed (if the credits issue still remains unresolved)?

10. How much has the Academy helped you in getting a master thesis with a company, an internship, networking contacts or an opportunity to work on small projects with a company?
    a. How was the process of getting a master thesis/internship carried out? Were there any special recruitment procedures for Academy students?
    b. Did you receive any special treatment when you contacted the partner companies or applied for internships/jobs/master theses?
    c. How frequently did you have opportunities to interact with professionals (for networking)?
    d. Were the timings or the schedule) of the allocation of theses/internships appropriate for you if you obtained any?

11. Do you think the DA will strengthen your resume and will help in finding future employment (resulting in long-term benefits)?

12. What were the strongest and weakest points of the DA?

13. What suggestions do you have for improving the DA?
    a. Which of these is the most important and the second most important?

14. Is there anything else you want to add in addition to what we have discussed that could be valuable in this context?

15. Finally, I would like to ask a hypothetical question: If you could go back in time (to when you made the decision), would you join the DA programme?
    a. What are your reasons for this choice (anything that you have not highlighted before)?

Interview with the head of the DA

1. How easy or difficult was it to get UVA/VAMK/NOVIA to participate in the DA programme?

2. What other universities/UASs did you contact for this purpose if any?
   a. Why did they not participate in this initiative?

3. Who was your primary contact at the universities/UASs?

4. Were you able to get the necessary support from the universities/UASs?
   a. If so, what kind of support?
   b. If not, how could they have helped you?

5. In your opinion, were the people designated by the universities for coordination purposes suitable for this task?
   a. Did they have enough power to take the required decisions (without being too affected by bureaucratic issues)?

6. What were the major obstacles that you faced at the beginning of the programme (from the university/UAS side)?

7. Since the DA has been running for a couple of years now, have the working relationships/coordination improved? If so, in what respect? (UVA/VAMK/NOVIA)

8. How would you compare the participation of one of the institutes to that of the other participating universities (comparison of UVA with VAMK and NOVIA and vice versa)?

9. Are you satisfied with the way the DA was advertised by the universities/ UASs and companies? What needs to be done in order to enhance its reach?

10. Did you, at any point in time, feel that the universities/UASs had any reservations about the programme? If so, what kind?

11. In your opinion, what are the major motivating drivers/concerns that the universities had regarding this initiative (in terms of degree reputation/ student credit registration/the effect on students' graduation timelines)?

12. What were the major driving factors/impediments that companies had (according to your understanding)?

13. How do you compare the current DA programme with that of the previous year in terms of performance/achieved goals?

14. Is it what you hoped for when you initiated this programme? If not, why not? Please explain.
    a. Was the DA able to achieve its stated objectives (in terms of master's theses, internship opportunities and future employment)?

15. Were any follow-up activities conducted to get feedback from the students/ companies/universities? If so, were any changes made based on the feedback?

16. Are there any changes that you would like to see in the structure of the DA (participating institutions' roles, your role, the steering group's role, etc.)?

17. How has Covid-19 affected the functioning of the DA (short-term and long-term effects)?

18. What are your hopes and concerns for the future?

19. If the companies were to withdraw their financial support (reduce their financing of the DA), is there any way the academy could continue to function (alternative model for the future)?

20. Is there anything else you want to add in addition to what we have discussed that could be valuable in this context?

21. Now, before we finish, I would like to ask a hypothetical question: If you were given a free hand, what would you like to change to achieve the desired objectives/to facilitate collaboration (from the university side)?
    a. Can you answer the same question but from a company perspective?