

Anne Ilvonen, Pekka Malvela,  
Liisa Timonen, Kaisa Varis (Eds.)

# Selected Perspectives on Internationalisation and Applied Education and Research 2024





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# **Selected Perspectives on Internationalisation and Applied Education and Research 2024**

**Anne Ilvonen, Pekka Malvela, Liisa Timonen,  
Kaisa Varis (Eds.)**

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# Contents

<b>Foreword</b> .....	<b>5</b>
Petri Raivo	
<b>1 Innovative education models for degree students and life-long-learners</b>	
<b>Features of universities of applied sciences in international project collaboration – strengths and challenges</b> .....	<b>8</b>
Terhi Myller, Christine Pichler	
<b>Climate change – A severe risk for older people’s health – Novel education for social and healthcare professionals</b> ..	<b>14</b>
Tuula Kukkonen, Marika Lappalainen, Anne Ryhänen, Kaija Saramäki, Elina Turunen, Liisa Timonen	
<b>Digital Decathlon – Improving BIM skills via international competition</b> .....	<b>18</b>
Ossi Laakkonen, Juuso Kokkonen, Mikko Matveinen	
<b>Co-creation of an innovative European master’s program</b> .....	<b>24</b>
Tuula Kukkonen, Liisa Timonen	
<b>Supporting students work-life preparedness through RDI project</b> .....	<b>28</b>
Daisy Silvennoinen, Timo Rui, Tarja Kupiainen	

## 2 Empowering students on their learning paths

### **Developing Multidimensional Learning in Higher Education: The Impact of CLIL on Students' Learning and Motivation** .. 34

Varpumaria Jeskanen

### **Building Paths to Finnish Higher Education** ..... 39

Mia Sevonius-Male

### **Fostering student well-being in international higher education** ..... 45

Chijjoke Okoro, Kristiina Väänänen, Leena Hiltunen, Liisa Timonen, Tiina Muhonen

### **Supporting foreign students on their journey to integration and employment** ..... 51

Taru Väisänen

### **Creating the language-supported educational model for nursing** ..... 55

Terhi Hagman, Tuulia Sunikka

## 3 Elevating engineering education and contents

### **Industrial Management Curriculum Development at Karelia UAS** ..... 60

Hamid El Ouatki, Ulla Asikainen

### **Sustainable Building Technologies – Community of Practices (SBTCP)** ..... 66

Tiia Villman, Timo Pakarinen

### **The Role of Universities of Applied Sciences in Innovation and Development** ..... 73

Anne Ilvonen

# Foreword



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**T**he statutory tasks of universities of applied sciences consist of three core aspects: 1) working life-oriented higher education, 2) applied research, development, and innovation activities, and 3) regional impact. These three form an entity where higher education and development work, considering regional vitality and the needs of working life, in collaboration with companies and the third sector, are the foundation of our operation and existence.

This publication, *Selected Perspectives on Internationalization and Applied Education and Research 2024*, addresses the key themes of Karelia University of Applied Sciences: applied education, practical research, and internationalization. The work offers an in-depth look at how the university responds to the educational challenges and opportunities of today and the future. The publication aims to present Karelia University of Applied Sciences' strategic choices and actions that shape its operating methods and development directions.

Applied education and research are at the core of Karelia University of Applied Sciences. In education, this means a close connection to the ever-changing needs of industry and working life. The teaching involves many real-world assignments, and students undertake work-oriented projects and practical training that prepare them for working life. Similarly, all of Karelia's research, development, and innovation activities are very practical and applied. Research projects focus on solving real problems and developing innovations in collaboration with companies and the third sector.

Internationalization and its strong growth are a key recent factor that has shaped and developed our operating methods. This has occurred in a two-way manner. On the one hand, Karelia's strong orientation towards international forums, such as active membership in the European INVEST University Consortium, has brought new opportunities. The INVEST cooperation not only internationalizes our education but also opens entirely new possibilities for international research, development, and innovation activities.

The new wave of internationalization is also reflected in the strong growth of international student numbers in Karelia's English-language degree programs: international business, industrial management, and ICT engineering. The significant increase in student numbers in these programs has required changes, new operating methods, and pedagogical solutions. In this respect, too, internationalization serves our strategic objectives, which aim to ensure the availability of a highly educated and skilled regional and national workforce.

# **1 Innovative education models for degree students and life-long-learners**



# Features of universities of applied sciences in international project collaboration – strengths and challenges



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## Introduction

International projects and collaboration between universities and universities of applied sciences may bring about new inspiration and practical solutions for scholars, teachers,

stakeholders, and students to deal with contemporary educational and societal issues. International cooperation can enhance new and productive ways to look at challenges and possibilities and respond, such as aging, development of working life, digitalization, and multidisciplinary as well as interdisciplinary questions.

In this practical-oriented paper, we analyze the role of universities of applied sciences (UAS) in the European project collaboration of higher education institutions (HEIs) in the social and healthcare fields. The international project collaboration with these two types of academic education is a fruitful and interesting context to view the strengths, challenges, and possibilities.

In this paper, we will discuss the following questions: What are the strengths and challenges of applied sciences universities in international projects? The discussion is based on experiences of the European Erasmus + project, AliVe (Age-inclusive lifelong learning: Guidelines and micro credentials). Carinthia University of Applied Sciences (Austria) and Karelia University of Applied Sciences (Finland) represent universities of applied sciences in this international project. Knowledge is formulated due to the experiences of two researchers and project managers from these higher education institutions (IARA, 2024).

## **Similarities and differences of educational systems in Finland and Austria—Karelia UAS and CUAS**

The Finnish higher education system consists of universities of applied sciences and universities. Universities are characterized by scientific research, and the teaching is based on it. Universities of Applied Sciences are oriented toward working life, and the UAS activities are based on the ever-changing high-skill requirements of work (Finnish National Agency of Education, 2024). Because of the differences in these higher education systems, the profiles and the aims of the studies and competencies differ from each other (Act of University 558/2019; Act of University of Applied Science 932/2014). According to Arene (2022), the competences of university of applied sciences degrees “have been defined as program-specific competences and shared competences. Competences refer to extensive competence modules, which are combinations of individual knowledge, skills, and attitudes. Program-specific competences form the basis of a student’s professional expertise. Shared competences are common competence areas for different programs and degrees, and they create the foundation for operating in a workplace, cooperation, and the development of expertise.” The common competences are at the bachelor’s and master’s level, defined as 1) learning to learn, 2) operating in a workplace, 3) ethics, 4) sustainable development, 5) internationality and multiculturalism, and 6) proactive development. The differences in competences at different degree levels adopt the framework of Bloom’s taxonomy (e.g., Newton et al., 2020), which enables one to view the level of competence and expertise accurately and support teachers and students to orient their learning objectives properly. The common competences describe the close connection to working life and the applied principles of learning.

Karelia University of Applied Sciences is a strong actor in the field of education and research, development, and innovation (RDI) activities in the local context of North Karelia, Finland. Karelia UAS is nationally audited and has a high quality of activities in different sectors, providing bachelor’s degrees in seven distinct areas: arts and culture, business, administration and law, data processing and telecommunications, technology, agriculture and forestry, health and wellbeing, and the service field. Master’s level degrees are provided in six different programs, for example, in active aging and sustainability management. Karelia UAS highlights the future development of education, and it collaborates closely with local companies and other educational institutions in Finland and internationally.

In studies, teachers and students have the possibility to use the latest digital tools and blended learning methods to support learning. Karelia UAS emphasizes customized study paths and aims to construct curriculums for different preferences. (Karelia UAS, 2024a; 2024b; 2024c.)

The Austrian Higher Education system is divided into four sectors: public universities, universities of applied sciences, accredited private universities, and university colleges for teacher education. The majority of students are enrolled in one of the 22 public universities, and the number of students at universities of applied sciences is increasing constantly (BMBWF, 2024a). The University Act (UG), coming into force in 2004, defines universities as independent legal entities. Universities are financed by the public purse; universities of applied sciences are funded according to the number of student places in their programs. Besides the financing aspects, the two institutions differ in their research orientation. At universities, the orientation in research is on basic scientific research. At universities of applied sciences, it is applied research. Beyond the financing of the study programs, there is also a difference in the state funding of research. Universities of applied sciences do not receive a fixed amount of state funding for research (BMBWF, 2024b).

*“In contrast to the universities, the universities of applied sciences explicitly provide a scientifically rigorous professional education at the higher education level, in accordance with the Federal Act on University of Applied Sciences Studies Act (FHStG). Both linking to professional practice and providing education at the higher education level are central to degree programs at universities of applied sciences in Austria. In the sciences, the focus at universities of applied sciences is on applied research. As these universities are geared towards professional practice, they are a fundamental pillar of the Austrian higher education system.”* (BMBWF, 2024a.)

Carinthia University of Applied Sciences (CUAS) is one of 21 higher education institutions in this sector and was founded in 1995. Currently, about 40 bachelor’s and master’s study programs in the fields of civil engineering and architecture, engineering and IT, health sciences and social work, and management are offered. CUAS has about 2000 full- and part-time students. At CUAS, direct practical experiences, as well as constant further development of the degree programs, are the focus. Innovative teaching and learning methods, as well as cooperation with businesses and local companies in the practical field, are fundamental at CUAS. Beyond the regional context, CUAS is in cooperation with national and international networks with various stakeholders at the university and in the business sector (CUAS, 2024). “The Carinthia University of Applied Sciences is run as a non-profit limited liability company. The purpose of the GmbH is the establishment, maintenance, and implementation of UAS degree programs and postgraduate programs in the fields of technology, business, health and social affairs, as well as the implementation of courses for education and training” (CUAS, 2024).

Karelia UAS and CUAS are very similar in their size and offers, as well as in their education vision in the tertiary sector of education. With this strong emphasis on applied sciences, it is also possible to focus on specific methodological approaches and methods in international research projects, e.g., in Erasmus+ projects. Therefore, this article also focuses on one project to highlight the collaboration.

## International collaboration in AliVe project – case study approach

The AliVe project started in September 2024 and will end in August 2026. It is one of a number of projects where Karelia UAS and CUAS are collaborating. “The objective of the European AliVe project (including HEIs from Austria, Finland, Ireland, and the Czech Republic) is to address barriers to age-inclusive learning and build sustainable enablers that will extend and enhance engagement of older adults 55+ in higher education. The aim of the project will be achieved by a) developing a micro credential that is transferrable across diverse settings and flexible to local needs and b) generating guidelines as a methodological roadmap for co-constructing micro credentials in future educational initiatives”. (IARA, 2024.)

“The activities of the project that will be implemented are based on the needs analysis in the field of lifelong learning and micro credentials. Based on this, in the first step, a micro credential is co-designed with the target group and evaluated transnationally. The second step is the piloting (micro credential pilot and feasibility), on the basis of which guidelines for age-inclusive micro credentials are drawn up in the third step. Activities take place nationally, internationally, and transnationally.” (IARA, 2024.) The participatory research approach is based on the priorities of the community and is done by actively involving them in the entire research process (IARA, 2024).

All cooperating HEIs have much experience in working with participatory research and case study approaches. Especially in the field of lifelong learning, empowerment, and active aging, it can be identified that there is much expertise, on the one hand, methodological and the other hand, organizational, because of the strong network of the universities of applied sciences in the practical field. The reflection on the ongoing working process shows that it is fundamental to have a strong network for participatory and applied research. Knowing local circumstances and the needs of a local community can help in working on a project, especially when the aim is to improve the life quality of the target groups.

Participatory Research is a strong method as well as a methodological approach and, beyond that, a future-oriented methodological approach in sciences, especially for universities of applied sciences. Long-term experiences at both of the universities show that a strong emphasis should be placed on opportunities and challenges with this topic. As the project AliVe shows, there is much knowledge on lifelong learning, empowerment, and active aging. However, in many cases, this knowledge doesn't differ between a very concrete target group and specific circumstances. In AliVe, we try to focus on a particular group of people and a specific format of lifelong learning (micro credentials). In Applied Sciences, it is essential to differentiate between specific questions according to different target groups.

According to our experiences, we can learn from each national project and transfer the knowledge. However, still, there are differences in objectives all the time, frameworks, and needs of the target groups. Therefore, it is also important to have a solid research and development department at the universities of applied sciences to accompany the projects and support the project leads to summarize and synthesize the knowledge for international collaboration and research for the whole university of applied sciences. Dissemination, using this knowledge for networking and collaboration with businesses, companies, and other stakeholders can help to improve the universities of applied sciences standing and much more to strengthen their vision and mission in the field of tertiary education and social improvement.

Besides this, there are also challenges in this context: because of very high involvement in teaching and administrative work in developing study programs and accompanying

students in their lectures and theses, there are fewer resources for initiating and carrying out such project activities, even if the benefits at the didactical, pedagogical, and scientific level are predominant. It is firmly based on an intrinsic motivation and it can be recommended to combine teaching and researching more and more for mutual benefit. The attachment of the knowledge and experiences produced in the projects to educational programs and the everyday lives of the students is important. Nevertheless, the fragmented work of the experts challenges the dissemination of new knowledge to different levels. Also, the role and opportunities of universities of applied sciences may be unknown to some stakeholders. Making these characteristics and strengths visible, according to our opinion, supports tackling the challenges.

Derived from the legal structure of Universities of Applied Sciences, their aims and frameworks in tertiary education could be strengths in international project collaborations. For example, flexibility, practical-oriented working methods, close connections to the different local stakeholders, and knowledge formulation in “real-life situations” may strengthen and bring up new ideas and innovations for collaboration.

## Conclusion

This practical paper shows the differences between universities and universities of applied sciences in Finland and Austria and also their specific mission in research, development, and innovation. In international collaborations, the strength of universities and universities of applied research could be used to learn from each other and to gain knowledge to improve social life and life quality for target groups. Experiences from researchers, professors, and project leads show that universities of applied sciences have, according to their structure and framework, strong contact and resilient networks in the regional, national, and international fields with various stakeholders, including specific target groups of citizens. This can help in designing and carrying out our participatory research as was shown in this article.

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# Climate change – A severe risk for older people’s health – Novel education for social and healthcare professionals



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## Introduction

We are all, on some level, aware of climate change, its main reasons, and its effects. We consider what problems climate change causes to our environment and, on a longer perspective, to future generations. However, climate change-related health problems in older people's lives have been discussed far less. Older people are at high risk of extreme weather events caused by climate change. Their reduced physical capacity to adapt to climate change, along with health conditions and medication, puts them at greater risk during events such as heat waves. Housing conditions may strengthen the risks even more (Figueiredo et al., 2024; Kollanus et al., 2021; Meriläinen, 2021).

These risks put social and healthcare professionals in a key position to provide older people with possibilities to cope with the effects of climate change (World Health Organization, 2024). In this mission, professionals and future graduates need new knowledge and skills to succeed in both everyday work and informing and influencing policymakers to use their possibilities to have an impact on the situation. In addition, policymakers and other stakeholders need access to the most recent and relevant information about this phenomenon (Figueiredo, 2024).

In this article, we discuss how the European chAnGE alliance (Kukkonen et al., 2024; chAnGE-project, 2024) is acting to co-create and provide social and healthcare professionals with online education supporting them in their work with older people facing health risks due to climate change.

## Microcredentials for social and healthcare professionals

In the Erasmus+ co-funded chAnGE (Climate change and healthy AgeinG: co-creating E-learning for resilience and adaptation) project, there are partners from five countries: Austria, Finland, Greece, Ireland, and Portugal. The chAnGE Alliance includes higher education institutions (HEI), vocational education institutions (VET), and healthcare and social care institutions (HSCO). At Karelia University of Applied Sciences, the project team is interdisciplinary: the disciplines of healthcare, social sciences, economics, education, and environmental sciences are represented.

The objectives of the chAnGE project are to

- co-create online microcredentials (MC) for social and healthcare workers who plan/deliver care to older people to give them knowledge, confidence, and skills to plan and incorporate climate adaptation and resilience in their work;
- empower social and healthcare professionals as local climate adaptation leaders, champions, and peer trainers to multiply their impact;
- foster relationships and knowledge co-creation between vocational higher education institutions, higher education institutions, and social and healthcare organizations through project activities and targeted knowledge-exchange events;
- facilitate higher education institutions and vocational education institutions to modernize their learning offerings, support learners' transition to higher education institutions, and
- agree on an EU-aligned framework for MC credit recognition and accumulation for exploitation by higher education institutions and vocational education institutions across Europe.

Project activities cover project coordination and monitoring, preparation of microcredentials (iterative content co-creation, digitalization, piloting, MC credit certification), implementation (learning, delivery), monitoring, evaluation, and dissemination and exploitation.

As a main result, the project is expected to provide 14 microcredentials on a virtual learning platform. All MCs will be developed for EQF levels 4–6. The variety of MCs is based on extensive needs/gap analyses. It will form a unique selection of microcredentials, which are expected to be interactive, accessible, bite-sized, and stackable. They will be co-created with both target learners and older people.

## The phase of the development process in autumn 2024

During the first project year, regional workshops have been arranged to provide the development work with insights into the need for education for social and healthcare professionals and information about the experiences of older people regarding climate change and health risks. In Finland, the regional workshops were organized in close cooperation between Riveria (VET) and Karelia University of Applied Sciences (HEI). The results were directly benefitted and applied in MC development.

Riveria and Karelia implement the project in close collaboration in Hub Finland: North Karelia region. We also cooperate with the regional well-being services county, Siun sote. The employees of Siun sote are a significant target group for the offering of chAnGE microcredentials.

MC development is in an active phase: the first MC pilots will be launched in 2024. Karelia University of Applied Sciences is responsible for three MCs, with themes being project management, inclusive leadership, and informing policymakers. Each theme will be considered in the context of climate change and the concrete work environments of social and healthcare professionals working with older people.

The chAnGE project produces communication materials (e.g., newsletters, press releases, and policy briefs) to disseminate the proceedings and results to diverse groups of professionals, students, older people, and the public. The European Alliance also disseminates the results actively in the scientific community.

## Conclusions

Karelia University of Applied Sciences expects the chAnGE project to result in a very effective improvement of the continuous learning opportunities and thus foster knowledge and skills of social and healthcare professionals and future graduates in the field of adaptation to climate change and mitigation of the health risks that it brings to older people.

Cooperation on both the European and regional levels has already proved to be crucial in the development of high-quality MCs. The piloting of the MCs across different environments and cultures will provide us with a broader perspective of the substance issues as well as the online delivery of the MCs.

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# Digital Decathlon – Improving BIM skills via international competition



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## Introduction

The Digital Decathlon is a cross-disciplinary and international competition for architecture, civil engineering, and related students to develop digital design skills using BIM tools and methods collaboratively. This unique training introduces participants to digital design and prepares them for teamwork in international settings. It fosters European identity by connecting universities across Europe, providing new knowledge and cooperation opportunities. Initiated by Jade University of Applied Sciences with partners including Bergische Universität Wuppertal and Politechnika Warszawska, the competition will later open to other participants (Digital Decathlon 2024).

The project is funded by the Erasmus+ Cooperation Partnerships (KA220) initiative.

## Planning of the competition

The Digital Decathlon project commenced its planning phase at the beginning of 2022, with funding confirmation. Following funding approval, collaborative online work began on organizing the competition. In February 2023, the planning teams met in Oldenburg, Germany, for a kick-off meeting, where they finalized the competition guidelines and schedule (Figure 1). Based on the guidelines decided upon in the kick-off meeting, the actual production of competition and learning materials began in the spring of 2023. Each participating university had its own sections for which they were responsible for producing the materials. Following the deadline, the materials were cross-checked. Completion of the competition preparations was just in time for the inaugural (pilot) event, which took place in Wuppertal, Germany, in October 2023.



Figure 1. Digital Decathlon planning team. (Picture by Digital Decathlon)

## First Competition

### Assignment

The competition is structured around ten distinct disciplines, each focusing on a critical aspect of modern construction and design practices. Participants will delve into Architecture (D 01), where they will explore the principles and practices of architectural design. In Construction (D 02), the focus will be on timber construction.

The MEP (Mechanical, Electrical, and Plumbing) (D 03) discipline examines the essential systems in buildings, while Model Checking (D 04) emphasizes meticulous model checking to ensure design compliance. BIM Design Coordination and Communication (D 05)

covers Building Information Modelling (BIM) for design coordination and effective team communication.

Participants will also learn about Construction Scheduling (D 06), which includes project time management and resource allocation. The Life Cycle Assessment (D 07) discipline examines environmental impact assessment and sustainability practices in construction. Simulation (D 08) explores tools for optimizing design and construction processes. Building product traceability (D09) focuses on digital construction documentation.

Finally, Reporting (D 10) focuses on developing effective reporting skills to communicate project progress and results to stakeholders. This comprehensive competition aims to equip participants with a holistic understanding of the various facets of construction and design, fostering skills that are essential for modern construction practices.

### Start in Wuppertal

The starting event took place at the Living Lab NRW campus in Wuppertal, an ideal location for this kind of competition. It consisted of multiple student-designed and constructed prototype buildings and an old storage hall, which served as the starting point for the project (Figure 2). The initial competition featured 25 students grouped into five teams composed of members from various universities.



Figure 2. Living Lab NRW campus. (Picture by S. Steinprinz)

The initial day at the Living Lab was focused on forming teams and sharing fundamental knowledge about the different competition disciplines with the students. Perhaps the most crucial activity on the first day was the assignment of project tasks. The remainder of the day was devoted to team-building activities, familiarizing teammates with one another, and exploring the venue (Figure 3).



Figure 3. Participants and teachers of the first competition in Wuppertal. (Picture by Digital Decathlon)

After the initial meeting, students had a few months to complete their tasks before the final event in Florence, Italy, scheduled for February 2024. Teams utilized online collaboration tools to work together, honing their project management, teamwork, and online working skills while accomplishing their construction-related tasks. Teachers provided support during the online sessions, monitoring progress through regular reports and offering assistance as needed.

### Final in Florence

In February 2024, all teams and teachers convened in Florence, Italy, at the Università degli Studi di Firenze – Plesso Santa Teresa campus for the concluding event of the first implementation of the project. The goal was for students to finalize their work to present their results and attend the MedGreen forum held concurrently at the same venue. Teams showcased their results through posters, and each group also gave presentations to all of the Digital Decathlon participants and MedGreen attendees, gaining invaluable experience in an international setting.

The winning team was Team 4 with their project, “Textile Route,” which creatively combined the textile industry history of the planned construction site area with innovative construction design. The project was well-rounded, with excellent implementation across all disciplines. Team members included Anastasia Antoniadou, Anna Stuenkel, Christiane Girod, Maria Francesca Perri, and Piotr Wojnar (Figure 4).



Figure 4. The winning team of the first competition. (Picture by Digital Decathlon)

## The Digital Decathlon Continues

The second competition kicks off in late 2024 in Warsaw, Poland, in November and concludes in Joensuu, Finland, in February 2025. This iteration will involve 50 students from five universities competing in ten teams. Based on feedback from both teachers and students, the project assignment has been slightly modified from the first competition. However, the core concept remains unchanged, with minor adjustments made to the disciplines.

Erasmus+ offers great tools (and funding) to arrange multidisciplinary and international courses. By using competition as a base for the course, students will have a stronger motivation to work on the project and not only try to obtain credits but also gain experience in international team working by trying as hard as possible to achieve the best possible results.

One big challenge for this kind of competition is the variations in national laws and regulations in the construction industry, which can lead to conflicts within the project when different students follow their local regulations that may not comply with other students' local regulations. This must be considered when designing the assignments.

Also, the language barrier was seen as a considerable risk. However, during the first event, which was proved wrong, and all students were able to work together even when they had to use English as a common language.

Using competition as a base for a course is a great motivation to learn new things and work consistently on projects. By mixing up students from different universities, a lot of new friendships started and, hopefully, will endure.

### The future of the Digital Decathlon

Though the Digital Decathlon Erasmus+ project concludes with the second competition in 2025, its results will continue to be accessible to all interested stakeholders. The course materials created during the project will be freely available, and their reuse is not only possible but also encouraged, whether to organize similar competitions or for other applications.

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# Co-creation of an innovative European master's program



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## Introduction

The phenomenon of ageing affects individuals, communities, and societies across Europe and globally. Ageing societies require new perspectives and innovative solutions to promote active ageing and age-friendliness. The concept of active ageing highlights the broad societal implications of ageing, extending beyond the social and health sectors to include business, culture, transportation, architecture, and media. Age-friendliness aims to transform environments and living conditions to provide older adults with opportunities for participation and active citizenship (Chung et al., 2021; Meeks, 2022; World Health Organization, 2023; World Health Organization, 2017).

Promoting active ageing and age-friendliness necessitates new competencies and expertise. Therefore, developing educational programs that focus on these skills is of paramount importance. Interdisciplinarity is an inherent requirement for educational

programs addressing these challenges.

In this article, we discuss the process and outcomes of the Erasmus+ funded EMMA (European Master's in Active Ageing and Age-Friendly Society) project from 2020 to 2023. We also provide an overview of the master program's status in autumn 2024, focusing on the accreditation process and plans for launching the program in 2026.

## The Ambition: A European master's program

The EMMA project aimed to co-create a future-looking and forward-stepping master's program that strengthens the knowledge and competences of the professionals in the field. The aim, as described in the project application, was to:

*“Enable future professionals to develop interdisciplinary knowledge, skills, and tools to systematically build inclusive societies for the benefit of their own societies and the whole of Europe.”*

The ambitious aim was, and still is, to contribute to the European demographic challenge and foster societies to grow more inclusive and Age-friendly. Furthermore, when it comes to the delivery, the plan was to develop a European master's program that can be provided entirely online, employing state-of-the-art online pedagogy and offering shared learning experiences to students across Europe and even beyond.

The project engaged a multi-professional team of experts and teachers from the six partner universities: Karelia University of Applied Sciences, Finland, as a coordinator of the project; Carinthia University of Applied Sciences, Austria; National and Kapodistrian University of Athens, Greece; University College of Cork, Ireland; University of Lisbon, Portugal; and University of Ljubljana, Slovenia. The Karelia team included five key members: Director of International Affairs Liisa Timonen (project planning process, proposal writing, and project quality assurance); Principal Lecturer Raija Kuisma (coordination, curriculum development); Principal Lecturer Tuula Kukkonen (curriculum development, digital learning, and pedagogy); Project Specialist Antti Kauppila (online learning platforms), and RDI Specialist Elina Kerätär (communication and supportive coordination).

The development process was divided into five groups of tasks to ensure coherent and timely actions and proceedings. The main steps were:

1. needs analysis: research to establish the learning needs for addressing the challenges of ageing,
2. development of curriculum framework and learning modules,
3. project management and evaluation tools,
4. program quality monitoring processes and tools, and
5. preparation for validation and accreditation documentation.

The development process was planned and structured iteratively and in a participatory manner with all partners. The objective was to ensure equal contributions and responsibilities, as well as a balanced budget. During the implementation stage, each work package was led by one partner and supported by a co-leading partner. The entire consortium was involved in the implementation.

## Key results: Curriculum framework

The project resulted in the curriculum framework for the EMMA master's program. This framework includes descriptions of learning outcomes and indicative content, the pedagogical approach and assessment framework, as well as the structure and descriptions of the modules.

The core modules consist of learning modules for 30 ECTS and a master thesis for 30 ECTS. There are four core choice modules, each of them 5 ECTS. In the curriculum, three out of the four are to be selected. In addition, six elective modules, each of them 15 ECTS, are presented. Completing the master's program requires completing studies for 120 ECTS. The e-learning platform and tools were also defined. The topics covered in the modules were informed by the findings of a scoping review on learning needs (Wiggin et al., 2024) and a multinational survey (Wiggin et al., 2023).

The program primarily promotes active ageing, the development of an Age-friendly society, a resource-oriented perspective on ageing, and the role of older people as active participants and influencers in society. The unique approach in the EMMA program is characterized by its interdisciplinarity and focus on an Age-friendly society and active ageing.

After completion of the project, the curriculum was ready for the European accreditation process. This significant result may strongly impact master's education at the partner universities in the short and long term.

## Key results: Agreement for the European Master's of Active and Healthy Ageing

Another key result was the partners' commitment to advance with the plan and work towards the launch of the EMMA program. The establishment process has included agreement negotiations and drafting, which are now in the final stage and soon to be signed by all partners. The negotiations took more than a year due to the numerous and diverse questions related to the European joint degree, which vary across partner countries and can be challenging. However, with the good spirit and commitment of the partners, five out of six were ready to finalize the agreement and be part of the implementation team in the future.

Alongside the agreement, the partners have prepared the accreditation documents and discussed the roles of each partner. The accreditation will be conducted in Portugal due to its stringent accreditation rules—acceptance in Portugal implies acceptance by all EMMA partners. If everything proceeds as planned, the new program will be launched soon. Stay tuned!

## Conclusions

The EMMA project consortium undertook the significant challenge of developing a European master's program with unique content and entirely online delivery. The COVID-19 pandemic presented unexpected challenges, necessitating that the consortium manages the cooperation process primarily through virtual means, with only a few face-to-face workshops.

The project's aims were achieved through good cooperation and in a timely manner. The accreditation process was launched in Portugal in the autumn of 2024, and five of the six project partners are committed to launching the EMMA master's as a joint program in autumn 2026.

The interdisciplinary European master's program will promote active ageing, an Age-friendly society, and digitalization. Online delivery provides students with opportunities for flexible studying, as well as peer learning and co-development across Europe.

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# Supporting students work-life preparedness through RDI project



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## Introduction

In the case of research, development, and innovation (RDI) projects in universities of applied sciences, it has been considered important that they are linked to teaching. In this context, it has been essential that teaching staff are also integrated into the project activities. This ensures that not only are the results and outputs of the project transferred to teaching but that the project activities are also linked to teaching. One of the objectives of GLOW2.0 throughout its lifetime has been direct links with education. A good example of this is the animation on light pollution created for the project by media students at Karelia University of Applied Sciences. The animation was produced in close cooperation between the students, the project, and the teaching staff.

## Animation by media students

One of the aims of the Northern Periphery and Arctic (NPA) GLOW2.0 Green energy technologies for tourism growth project is to improve knowledge about light pollution, the excessive use and misuse of artificial lighting at night (ALAN), and ways to preserve darkness. Since GLOW2.0 is represented in multiple NPA regions (Finland, Ireland, Iceland, and Norway) with six main partners and seven associated partners, there was a mutual need across the project consortium about how to increase awareness successfully and inclusively for target groups, including those not directly involved with the project. A practical, relatable way to effectively communicate to target groups (academia, industry, policy) and the general public was considered necessary.



Figure 1. Light pollution map and Dark Site reference scale (reproduced by combining a Light pollution map, 2024, and Espey & MacMillan, 2022). The circled areas on the map show GLOW2.0 partner regions and surrounding environments.

The implications of misdirected and excessive use of artificial light at night (ALAN) on humans, wildlife, and ecosystems and the need to preserve darkness are well justified (Lyytimäki & Rinne, 2013a; Widmer et al., 2022). Many studies have investigated the impacts and effects of light pollution, with these findings widely available on a global scale (Dark Sky International, 2023). The sources of light pollution have also been studied. In Finland, for example, road and streetlights, yard lights, commercial lights, and decorative outdoor lights have been identified as primary light pollution sources (Lyytimäki & Rinne, 2013b). Despite the knowledge of light pollution sources and their impacts and effects, it has not been sufficiently communicated how to protect humans, animals, and the environment from their multifaceted impacts and effects even though in all research, humans are the sole drivers of light pollution (Dark Sky International, 2023; Lyytimäki, 2013).

The Karelia University of Applied Sciences (Karelia UAS) project team and Karelia staff brainstormed ways to communicate light pollution impacts and ways to preserve darkness effectively. On the one hand, the role of UAS is to provide higher education that supports the professional growth of students to meet the requirements of working life. On the other

hand, projects, as part of research, development, and innovation (RDI) activity in Karelia UAS, aim at the development and creation of new and already existing services, products, methods, facilities, processes, and solving practical problems. Karelia, being a learning institute, encourages enhancing students' competence development via RDI projects. It was found that media students were missing concrete, practical experience on how to make an animation video and, in the GLOW2.0 project, a way to communicate effectively to engage target groups. An animation video with visual effects (for the project) created by media students (competence development) was considered a concrete outcome with a win-win scenario for both the project and students.

Third-year media students of Karelia UAS were thereby commissioned by the GLOW2.0 project to produce an animation video (link) as part of their competence development guided by the Karelia UAS project and teaching staff. The students found the experience rewarding. The project's animation director stated that:

*The experience was interesting and rewarding. The subject matter of this animation was different from other assignments, so it was essential to consider completely different details. Cooperation with the project went well and gave me a great professional experience. (Animation project director)*

For the scriptwriter, the animation provided an opportunity to gain new knowledge in addition to the study-related competence development work with the animation:

*What rewarded me the most as one of the screenwriters in this project was the completely new knowledge about the subject, which I have nevertheless been aware of on a surface level. By studying the topic in more depth as part of the animation assignment, it gave a clear and accurate picture of the light pollution situation both in Finland and abroad. In addition, the new information has made me more aware of how I can do my part to reduce light pollution and know how to educate other people around me better about the subject, thereby also increasing people's awareness. (Animation project screenwriter)*

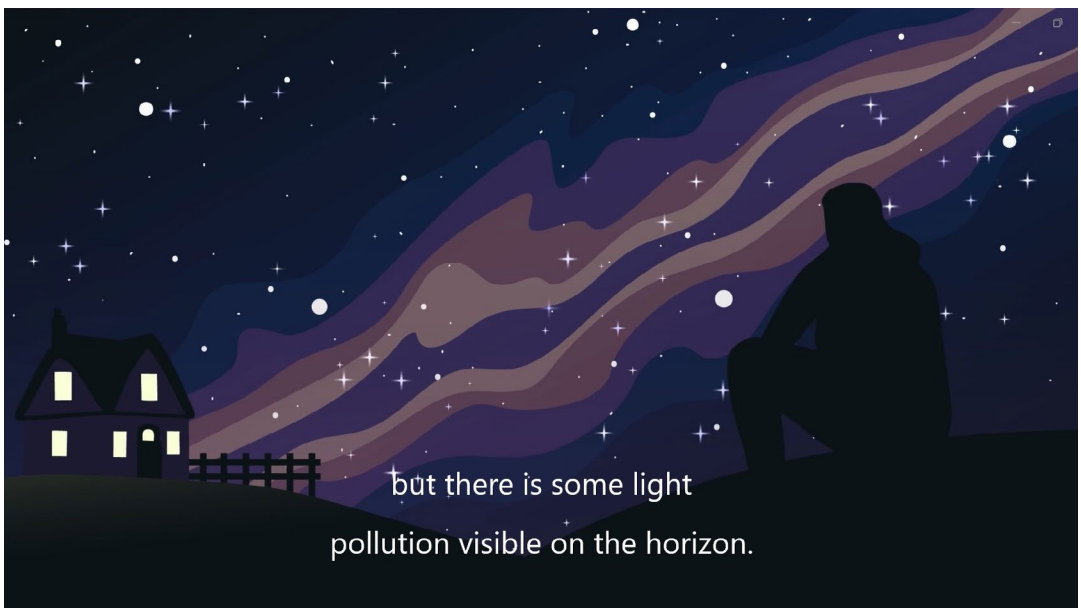


Figure 2. Image showing the screenwriter's work on the animation.

According to the animation project animator, the animation work helped advance their professional competence, giving them an opportunity to explore and test new techniques:

*The animation project offered me a nice alternation with my studies. I had not animated with After Effects before and finally got to do a whole job with it, so I learned to use the new program in the process. In addition, I got acquainted with an interesting topic from which the animation was made! (Animation project animator)*

The animation's success was measured during the April 30, 2024, joint international project webinar aimed at tourism organizations, enterprises, and regional infrastructure providers (e.g., towns, cities, municipalities, and national parks). The event gathered over 100 participants. The development method and result were highly praised, with requests to share the video with target groups for their own use and development activities.

*"Is it possible to share a link to the animation for us to use locally for educational purposes?" (Visit Narvik)*

*"Great Animation. Can we get a link for that? It would be good to use for social media, etc." (Dark Sky Freelance Ranger)*

## Conclusion

The courage to integrate students in the GLOW2.0 project offered a product (for the project) that solves a practical need (awareness) with social impact (education). Still, activeness and open-mindedness from the students were necessary, without which the output would have failed. UAS should see RDI as a venue where students can learn and develop without the stress of failure. However, it requires motivating students to challenge themselves, trust their abilities, and take advantage of available guidance to advance work-life preparedness. Offering hands-on competence development can not only help advance students' preparedness for work life without the stress of real-life working conditions, but it could also save UAS resources while providing a socially impactful result.

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# 2 Empowering students on their learning paths



# Developing Multidimensional Learning in Higher Education: The Impact of CLIL on Students' Learning and Motivation



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## Introduction

In recent years, Content and Language Integrated Learning (CLIL) has gained prominence as an innovative pedagogical approach in all levels of education. Teaching in a second language has become more widespread in higher education institutions (HEIs) across the European Union, driving universities to internationalize and creating multilingual and diverse groups with different levels of language and learning skills. At the same time companies

are experiencing an expansion of the global market. Employers expect graduates to be proficient in at least one foreign language to be able to contribute to an international business environment. This challenges higher education institutions to equip students with the necessary level of expertise in both professional and language skills.

This change is also evident at Karelia University of Applied Sciences. Currently, there are three bachelor's degrees taught entirely in English at Karelia: Information and Communication Technology (ICT), Industrial Management, and International Business (Karelia, 2024a). More than 500 degree students come from very diverse backgrounds, and currently, over 35 nationalities are studying in Karelia's international programs. (Karelia Vipunen, 2024). In Karelia's strategy 2030, Education-based immigration and internationalization is one of the core focus areas. Karelia UAS is committed to supporting the skills and competences of its students to be able to work in the region's companies (Karelia, 2024b). Both language and content knowledge are essential skills for students to acquire during their bachelor's degree and CLIL methodology is supporting their learning process.

This article presents at first a brief overview of CLIL methodology in teaching and learning, and how it aims to enhance students' competence development. Secondly, the collaborative CLIL4ALL project (2023–2025) across five partner universities is presented. In the conclusion, the key findings of the impact of the CLIL approach on student learning outcomes and motivation during the CLIL project pilots at Karelia UAS are discussed.

## CLIL methodology in teaching and learning

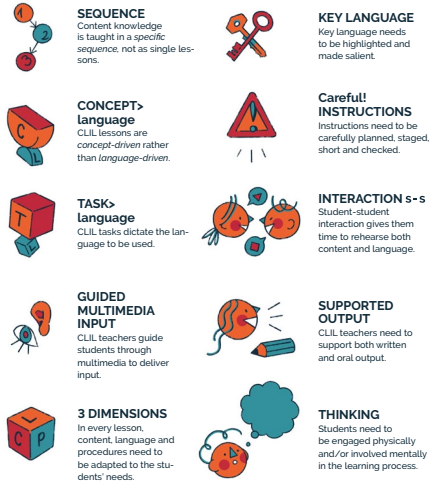
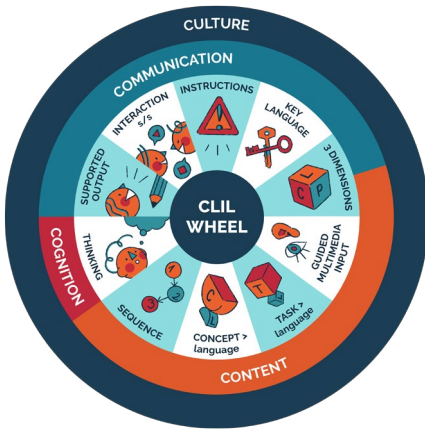
Content and language integrated learning (CLIL) is a term used to describe a “dual-focused” educational method in which an additional language, in many cases English, is combined to teach the subject (Hemmi & Banegas, 2021, p. 4). The goal is to teach content in a foreign language so that students' understanding of the content is on focus (Khalyapina & Kogan, 2017, p. 1105). CLIL has been recognized as an essential instrument to enhance the student's proficiency in learning the language, cognitive development, and critical thinking skills, such as analyzing, evaluating, and creating (Hemmi & Banegas, 2021, p. 1–4). These skills are also increasingly important in the future for managing change, such as problem-solving, learning how to learn, and knowledge assessment (OECD, 2019). CLIL, as a method of teaching, supports the personal competence development of both teaching teams and students and enables consistent development of the students' working life competences in their studies.

The CLIL4ALL project (2023–2025) was born from a joint interest in developing content and language integrated teaching and learning in the five partner universities in Europe. The project aims to study how CLIL has been previously implemented in HEIs in Europe to discuss best practices. Moreover, to develop and test different CLIL methods and materials to implement CLIL in teaching in higher education. The project provides opportunities to exchange experiences and best practices between the universities and develop common teaching methods and materials for use at three different levels: local courses at the universities, jointly implemented online courses, and jointly implemented intensive courses. The pilot courses are conducted in teaching teams and endeavour to improve teachers' competencies in combining language and content in the classroom while also studying students' learning outcomes with the CLIL methods (CLIL4ALL, 2024).

The project involved piloting CLIL in three distinct courses at Karelia UAS during the academic year 2023–2024 (Jeskanen & Vartiainen, 2023a). The framework to compose, evaluate, and measure all the pilot courses was set by using CLIL Wheel dimensions and 10 parameters (Picture 1) (Jeskanen & Plat, 2024).

## CLIL Wheel 4Cs & 10 Parameters Combined

## 10 CLIL Parameters



Picture 1. The CLIL Wheel with the 4C's and 10 parameters (CLIL Matters, 2020).

One of the goals of the CLIL4ALL project is to develop and implement a team-teaching model for the CLIL approach. The idea is that part of the course is taught and assessed in teams consisting of a language teacher and content teacher(s). The assignments were planned to support students' learning processes. Scaffolding techniques were used to help them improve their vocabulary and learn the basic concepts in a foreign language (English). More demanding tasks followed to enhance their abilities and adapt their learnings in practical case scenarios with clear instructions and support from the teachers to prepare for the task and practice the interactions in English. After agreeing on a plan for the CLIL activities and lectures for the course, the team proceeded to outline the requisite tasks, design lesson structures, and establish assessment criteria for the assigned tasks (Figure 1) (Jeskanen & Vartiainen, 2023b).

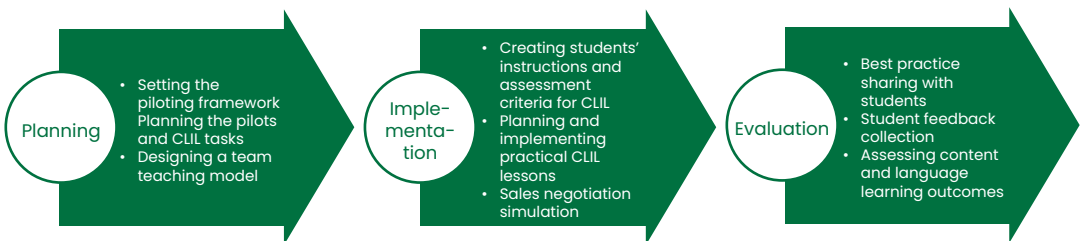


Figure 1. The process of planning a pilot CLIL course using the team-teaching model (Jeskanen & Vartiainen, 2023b).

The CLIL4ALL project is developing innovative working practices and distinct pedagogical tools and materials for higher education. These materials for best practices in implementing different work modules, assignments, and assessments, as well as teaching in teams in the various course modules, are all gathered on the project website at <https://clil4all.eu/>. The project continues developing intensive weeks with the CLIL approach (2024–2025). These weeks provide opportunities for students and teachers to work together on international projects to learn from experiences and share best practices of CLIL implementation in different universities (CLIL4ALL, 2024)

## Conclusions from the CLIL pilots

The pilot survey was conducted on all three pilots at Karelia. The purpose of the survey was to analyse students' perceptions of how they assessed their learning in relation to the learning objectives of the course, as well as their motivation to complete the course tasks in a foreign language. In general, they showed a high level of motivation to complete the tasks (Table 1). They also rated the level of participation in the various CLIL assignments as very good, especially when interacting with other students during the teamwork tasks and when preparing the documents together in the course workshops, where they received support from both language and content teachers. Students also found that CLIL teaching methods clearly helped them to improve their language and communication skills in diverse teams when learning the content and content-related skills and vocabulary at the same time (Table 1).

**Table 1.** Summary of the students' responses to the survey on Karelia's CLIL pilot courses (CLIL survey, 2023–2024).

<b>Results from the student survey (on a scale of 1–4), n = 72</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Personal motivation to complete the CLIL tasks</b>		3	22	25
<b>Estimation on the level of participation in the CLIL tasks</b>				
Group discussions and brainstorming	1	6	23	42
Asking questions, finding answers	1	11	29	31
Interacting with other students in a foreign language	0	7	29	36
Interacting with teachers in a foreign language	4	8	38	22
Preparing the documentation (written element)	1	4	29	38
Participation in the discussion (interactive element)	3	8	25	36
Participation during the feedback session (Self-reflection element) *	2	12	21	27
<b>Estimation on how the CLIL assignments in the course improved</b>				
spoken communication skills in English	3	4	28	37
written expression skills in English	3	5	34	30
intercultural teamworking skills	2	4	26	40

\* Feedback session organised in 2 pilots (n = 62)

Content-related competences were different in each course, depending on the subject. Nevertheless, it is clear from the survey that the students' impression of the development of their content-related skills was very high. For instance, in the Project Management course, 100% of the students felt that their understanding of project terminology in English improved during the CLIL tasks. Also, the same group felt significant improvement in crucial working life skills, such as analytic skills (94%) and project management techniques (94%).

From the teachers' perspective, the team-teaching experience was absolutely positive. Collaborating with colleagues who were open to new ideas and eager to experiment with innovative approaches and methods to enhance the original course contents and support language learning was highly rewarding for all teachers. The shared teaching environment on the Moodle platform ensured that all teachers remained informed about the ongoing development of the course. This supported active and timely participation from everyone and made it possible to align their teaching to support the course learning objectives (Jeskanen & Vartiainen, 2023b).

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# Building Paths to Finnish Higher Education



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## Preparing for Future Labor Market Challenges

In the future, the Finnish labour market will have two major challenges to face. Firstly, due to being a small country with a rapidly aging population, the need to rely on a migrant workforce is rising. Secondly, the workforce needs to be increasingly highly skilled. Thus, accessibility to higher education in Finland for people with a migrant background is vital.

We must acknowledge that people from abroad are a vast and diverse group. There are no “a single path fits all” solutions to ensure accessibility to higher education, and thus, we must ensure that multiple paths and various means of support are available. Currently, although few foreign-language supported versions exist, especially in the health sector, university degrees in Finland are taught either in Finnish or English. Thereby, it is essential to support migrants’ language and other skills development so that all of those who wish to pursue higher education studies in Finland are also, in reality, able to do so. This article describes how preparatory programmes for higher education increase inclusivity. It reflects the experiences of nine universities of applied sciences (UAS) from

a pilot with people who have fled Ukraine to create a national model of an English-taught version of a preparatory programme for higher education studies.

## Preparatory Programme for Higher Education Studies

Educational systems, study methods, and many other things relating to higher education degree programs vary among different countries. Many times, quiet information and skills you learn while going through the educational system not only enable students to make choices about their educational paths but also give them a head start when they begin their studies.

Immigrants often need to gain an understanding of how the education system works in their new home country and, subsequently, do not know what options they have or do not possess the required language, math, or other study skills required for a particular degree program. Therefore, if they manage to secure a study place successfully, they might struggle when their studies begin. At worst, it might prevent students from progressing into higher education altogether. For example, for non-native Finnish speakers undertaking the entrance exam in Finnish can be extremely hard, if not impossible. No extra time is provided in order to complete the exam on the grounds of being a non-native speaker.

Since 2010, higher education institutions (HEI) in Finland have had a Preparatory Programme for Higher Education Studies in Finnish available through open university or open university of applied sciences (UAS) studies. Initially, the content of the programs varied as there was no national curriculum. The main aim, however, has always been to provide immigrants with the skills and information needed to start their Finnish-taught degree studies. As there was a large discrepancy between the preparatory course providers, in a study commissioned by the Ministry of Education and Culture in 2017, the Finnish Education Evaluation Centre (Lepola, 2017) recommended the production of national standards for the program. A few years later, those standards were created and published in the Valmistavasta Valmiiksi (2017–2019) project (Stenberg et al., 2019). Since then, the national curriculum has been followed, although some slight variations still exist.

Over the years, the preparatory programme has brought many benefits to the Finnish education system and has been important to both parties: the university gains a knowledgeable, skilled, and motivated student, and for the applicant, it may open the door to the professional career they have always dreamed of. This has prompted me to question why a similar path to English-taught degrees does not exist.

The research (Lepola, 2017) and practice have shown that preparatory programmes directly increase access to higher education. Many UAS have also created additional paths to their degree programs for preparatory programme graduates. For example, Karelia UAS has a separate application process for many of its degree programs for preparatory programme alums without the need to undertake the entrance exam. Currently, many of the non-native Finnish speakers studying at Karelia UAS in Finnish-taught degrees have, in fact, undertaken a preparatory course before starting their studies. These additional paths promote the inclusion of vulnerable groups.

## The Birth of the Preparatory Programme for Higher Education Studies in English

Before Russia attacked Ukraine on February 24, 2022, around 7 000 Ukrainian nationals lived in Finland. By November 2022, Finland had granted around 45 000 residence permits based on temporary protection to people who had fled Ukraine, and by 2024, over 68 000 applications had been received by Finnish Immigration Services (Finnish Immigration Service Statistics, 2024).

The Preparatory Programme for Higher Education Studies in English (PrepProg) was a national joint project of nine UAS Consortia<sup>1</sup> (Sevonius-Male et al., 2024). It was born very quickly with a special grant from the Ministry of Education and Culture of Finland to meet the needs arising from the change in circumstances, namely to support and speed up the education and employment paths of people who had fled Ukraine. Setting up a national project within a few months would not have been possible without strong existing networks such as Supporting Immigrants in Higher Education (SIMHE)—and other partnerships supporting international students, as well as previous experience from the project developing national standards for the Preparatory Programme for Higher Education Studies in Finnish and a strong common will of wanting to help. The long-term aim was to create a national model for the Preparatory Programme for Higher Education Studies in English, and the short-term goal was to pilot the program with a group of people who had fled Ukraine and had temporary protection in Finland.

## What is the Preparatory Programme for Higher Education Studies in English?

The language level prerequisite for the preparatory programme is at least level B1 (European Union and Council of Europe, 2004–2020) in English. The scope is 30 ECTS and lasts from five to six months. The program emphasizes English language studies as the objective is to increase students' language skills to the B2 level, which is the entrance level for higher degree studies for most UAS degrees. In addition, it also includes Finnish or Swedish language studies, as national languages are essential for integration and employment paths.

The piloted version included four study paths: business studies, social and healthcare, engineering, and a non-field specific group, which was meant for students who had yet to choose the field they wanted to study or whose chosen field was not among those mentioned. Each path covered basic information about the field, developing field-specific English language vocabulary, and highlighting different degree options. In addition, all students took common studies with an emphasis on academic competences, such as study and digital skills, and the knowledge of studying at a Finnish higher education institution or more general topics that prepare the students for higher education studies.

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<sup>1</sup> Karelia UAS (coordinator), Arcada UAS, LAB UAS, Metropolia UAS, Oulu UAS, Savonia UAS, South-Eastern Finland UAS, Tampere UAS, and Turku UAS

Courses	Scope (30 ECTS)	Timing (duration 6 months)					
		Sep	Oct	Nov	Dec	Jan	Feb
<b>Common studies</b>	<i>Choose all</i>						
Introduction to Finnish Higher Education and Study Skills	6	•	•				
Mathematics	3			•	•	•	•
Improve Your English from B1 to B2 level	6	•	•	•			
<b>Finnish or Swedish Language</b>	<i>Choose 5 ECTS</i>						
Finnish Language 1	5			•	•	•	
Finnish Language 2	5			•	•	•	
Swedish Language 1	5			•	•	•	
Swedish Language 2	5			•	•	•	
<b>Field specific studies</b>	<i>Choose 10 ECTS</i>						
<b>Social Services and Health care</b>	<i>Choose all</i>						
Introduction to Social Services, Health Care and Professional English 1	5				•	•	
Introduction to Social Services, Health Care and Professional English 2	5					•	•
<b>Business</b>	<i>Choose all</i>						
Introduction to Business and Business English 1	5			•	•		
Introduction to Business and Business English 2	5					•	•
<b>Engineering</b>	<i>Choose all</i>						
Introduction to Engineering	5				•	•	•
English for Engineering	5				•	•	•
<b>Non-Field Specific Studies</b>	<i>Choose all</i>						
Building my International Career	5				•	•	•
English for my International Studies and Career	5				•	•	•

Chart 1. Structure of Preparatory Programme Studies (Sevonius-Male et al., 2024)

One can compare the content of the PrepProg project to a degree program that is being created and piloted in vast UAS consortia in a very short period. As the processes varied between the UAS, a common student services manual had to be created. Four of the UAS—Karelia, LAB, Metropolia, and Savonia—became host universities of applied sciences, each looking after one pilot group and having their own coordinating teacher.

The actual pilot program was built on Karelia's and LAB's Moodle study platform. The pilot itself was run in partnership, which meant that most courses were delivered jointly by teachers from different UAS with the assistance of targeted Ukrainian and Russian language support. Feedback procedures were also created for both staff and students.

From the very beginning, it was acknowledged that the pilot group was particularly

vulnerable and not directly comparable with a “typical” international student that the UAS were accustomed to in their English-taught degree programs. Therefore, staff members were offered crisis and trauma training and support to prepare for how the impact of the war situation might arise during the teaching sessions and to make plans for how to best support the students in such cases.

## Belonging to the HEI community is empowering

One of the main aims of the preparatory programme is to increase the integration of people into the higher education community, society, and work life in Finland. Although the PrepProg pilot was conducted online, many events, such as opportunities to visit the UAS campuses, were arranged. Seeing the actual facilities, e.g., the engineering lab with all the equipment, was an eye-opener for many and made the path to degree studies much more concrete and tangible. To facilitate peer support, field-specific WhatsApp groups were created. Students also had a joint online orientation day, digital support days on and off campus, info days, and an end-of-program celebration. These events, lessons, and social media groups were meaningful opportunities to interact with other students. They also form an essential part of the actual program.

## Promoting Inclusion in Higher Education

Accessibility to higher education consists of many things, some of which are bigger and some that are smaller. For example, it is important to bear in mind that tuition fees can form a genuine barrier, especially for minority groups. In addition, for the reasons mentioned above, it is good to explore and implement alternatives to entrance exams. By the end of the PrepProg pilot, many participating UAS, including Karelia (Karelia UAS, 2024), had, in fact, expanded their separate application paths to UAS degrees.

The preparatory programme provides information on study options, helps with applications for chosen degree programs, increases skills required in degree studies, and prepares the student for the entrance exam. The Preparatory Programme for Higher Education Studies in English has already been meaningful to the pilot group participants. In the long term, it is a vital national support structure for both employment and education-based migration in Finland. The national model and its recommendations are openly shared and included in the project’s final publication (Sevonius-Male et al., 2024), which, together with all Moodle course materials, are available until 2029 (Library of Open Study Materials). Inclusion will play an even bigger part in HEIs in the future than it does today. Hopefully, as part of this progress, within the next few years, the national Curriculum for the English-taught preparatory programme will root and find its permanent place in Finland.

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# Fostering student well-being in international higher education



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## Introduction

In recent years, student well-being has gained significant attention, particularly following the COVID-19 pandemic, which highlighted issues such as student loneliness and mental health challenges. Many Higher Education Institutions (HEIs) have responded by incorporating various mechanisms and support systems to address these concerns. However, there is considerable variation across countries and universities in how student well-being is integrated into academic life. Additionally, the needs of different student groups, including international students, may vary significantly.

Internationalization is a growing trend in European higher education. With the launch of the European Universities Initiative in 2019, more than 560 universities and universities of applied sciences are already partners in one of the European University Alliances (EUAs), offering a wide array of internationalization opportunities—from individual virtual courses to full joint degrees. As these opportunities expand, it is crucial to reassess our student well-being practices to ensure students remain motivated, mentally healthy, and able to complete their studies successfully.

At Karelia University of Applied Sciences (UAS), student welfare prioritizes early intervention, proactive support measures, and personalized assistance. A multidisciplinary welfare team plays a key role in providing comprehensive support, which is delivered through both individualized guidance and institution-wide initiatives. This includes developing supportive structures and organizing community-wide events aimed at fostering a positive and inclusive environment for all students.

This paper offers research-based practical suggestions for improving student well-being within international HEIs and European University alliances. It is informed by:

- a) A scoping review conducted at Karelia UAS in 2024 (Okoro et al.) screened 149 peer-reviewed publications from the past decade using Covidence software, with 35 selected studies based on their relevance to student well-being, mental health, academic performance, inclusivity, and student support services.
- b) Expert opinions from student well-being specialists at Karelia UAS.

As Europeans embrace internationalization even more intensively, it is critical to align student well-being practices, elevate existing ones, and co-create new good practices for the benefit of all students. This paper not only highlights the importance of individual support but also stresses the need for institution-wide strategies that promote student well-being from curriculum development through graduation.

## Understanding mental health challenges in higher education students

### Common well-being issues among higher education students

Students may suffer from several different well-being challenges that are important to recognize and provide support for as early as possible. Based on the study, mental health challenges experienced by the students include:

- Psychological distress, anxiety, and depression (e.g., Ghilardi et al., 2018; Gibbons et al., 2019),
- Burnout and high pressure from academic workload (e.g., Balaji et al., 2019; Joshi & Kiran, 2020; Luqman et al., 2021),
- Trauma arising from a variety of sources, such as stigmatization, a dysfunctional family background, exposure to crime, or poor financial circumstances (e.g., Bani et al., 2022; Gibbons et al., 2019; McIntyre et al., 2018) and
- Loneliness and isolation (Glickman et al., 2023; Knoesen & Naudé, 2018; Sagar-Ouriaghli et al., 2020).

In the worst case, reluctance to seek mental health assistance has been correlated with suicidal ideation (Bani et al., 2022; Sagar-Ouriaghli et al., 2020; Wu & Adamsk, 2021). It is to be noted that, for international higher education, the issues of loneliness, isolation, and high pressure from academic workload can be higher than for domestic students. In Finland, there are also experiences with international students coming from poor financial backgrounds and facing severe financial difficulties during their studies.

### Factors contributing to poor student well-being in higher education

To address poor student well-being and mental health challenges, it is crucial to identify contributing factors and to work to reduce the conditions causing them. Based on the study, these factors fall into six categories (Chaudhry et al., 2024; Douwes et al., 2023; Konu & Rimpelä, 2002): 1) technological, 2) environmental, 3) social, 4) multicultural, 5) demographic, and 6) institutional (Figure 1).

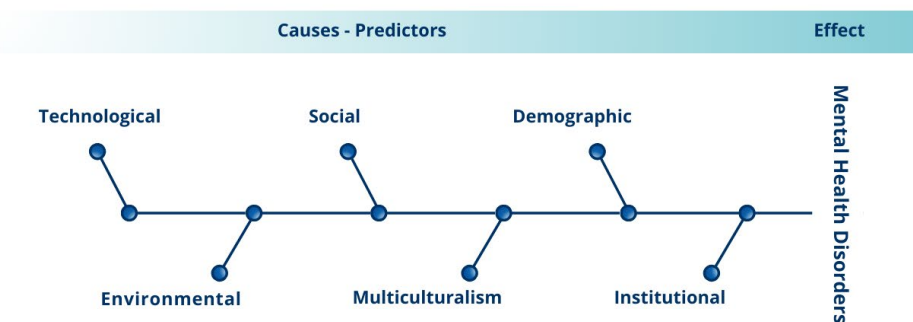


Figure 1. Factors contributing to poor student well-being in higher education.

Figure 1 illustrates the chain of factors contributing to poor student well-being. Technological issues include overreliance on digital services, low digital literacy, and nonintuitive platforms. Environmental factors involve campus safety, ergonomics, and housing challenges. Social factors relate to peer relationships and discrimination. Multicultural issues stem from language barriers and the lack of support networks. Demographic factors are linked to personal background, over which universities have limited influence. However, institutional factors like a demanding curriculum, high-pressure grading, and inadequate services are areas that HEIs should actively improve to support student well-being.

## Improving student well-being

There are several possibilities for HEIs to improve student well-being, including fostering a sense of community, creating support services for individual students, and utilizing pedagogical approaches to promote student well-being. Supporting actions can be implemented at the student, HEI, and even national or international levels. Some actions can be implemented already in the curriculum/study planning phases, and others could be executed during studies.

At the **student level**, online self-assessment tools can be launched to help students evaluate their study skills, learning abilities, and personal well-being experiences. At the **HEI level**, one suggestion is to develop monitoring and evaluation approaches for student well-being and to connect those measures to relevant practices for improving it. At the **national or international level**, surveys conducted in many HEIs can be used to produce comparable data on students between those HEIs. In addition, benchmarking from other institutions or countries can be utilized to discover best practices or to identify areas for improvement (Lankford, 2001).

## Conclusions

The effects of student well-being challenges are multiple, from anxiety and depression to poor academic performance and dropouts. A list of suggestions for HEIs was created based on the study. There are several ways how HEIs can support students' well-being and mental health—from proactive prevention mechanisms to enhancing student well-being with active guidance.

**Planning new curricula** plays an important role in preventive work. It is important to emphasize approaches to reducing excessive workload and stress by identifying the possible institutional, technological, environmental, and multicultural predictors for poor student well-being and finding solutions to reduce them. The key areas to acknowledge are:

- Paying attention to the flexibility of the curriculum,
- Ensuring student digital literacy,
- Offering affordable housing for all students, including flexible housing solutions for international students,
- Choosing pedagogical approaches supporting internationalization and
- Creating intuitive and accessible digital tools.

A lot can also be done during studies to promote a sense of belonging and to reduce stress arising from inadequate digital skills and lack of information. The key areas to consider during studies are the following:

- Give special attention to social, multicultural, and technological predictors,
- Establish peer support networks—also for virtual studies—and develop support services in languages spoken by international students,
- Ensure flexibility of the studies and communicate expectations and chosen study methods clearly,
- In international collaboration, reduce the number of technical approaches and build study modules in a similar manner whenever possible, and
- Support the integration of international students in your country and HEI.

Students are the future graduates and professionals who will shape our world. They should have all the strength to do the work well. It is of utmost importance among all HEIs to seriously consider how to foster student well-being in the best possible way to work for a brighter world.

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# Supporting foreign students on their journey to integration and employment



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## Introduction

The national goals for the employment rate of international degree students in Finland are ambitious. It is stated in the Education Policy Report of the Finnish Government (2021) that the goal is to triple the number of international degree students at Finnish higher education institutions by 2030. The second goal is to raise the employment rate of international degree students: 75% will find employment and stay in Finland after finishing their studies. Currently, about 50% of international degree students find a job and stay in the country after graduating (National Agency for Education, Vipunen Education Statistics Finland, n.d.).

It has been recognised nationally that the goals are extensive and there is much work to be done to achieve them. At Karelia University of Applied Sciences, a lot of development work has been done in recent years. Various services have been created to promote the

integration and employment of international degree students so that it would be possible for them to stay in the area and enter the labour market after graduation. This article presents some of the results of the recent and ongoing development work.

## Integration and employment go hand in hand

Only supporting employment without supporting integration is quite impossible since the two are very closely tied together. Sometimes, the goal of integration is considered to be employment, or integration is measured through employment. Actually, integration itself is essential, too.

The chances of finding a job during or after studies are much higher if the integration process has been successful. It is helpful to know the Finnish society and understand the Finnish labour market. Also, knowledge of the Finnish language is vital for entering the labour market. In Karelia UAS development work, both integration and employment have been taken into consideration.

### Ways to support integration

Since 2022, a Life in Finland orientation has been organized for all international degree students who start their studies at Karelia UAS. The orientation consists of six sessions, and it covers topics that have to do with settling in and integration. There are topics that relate to everyday life, such as opening a bank account, using public transport, furnishing an apartment, and knowing how to sort waste and recycle. In addition, using different services, such as healthcare, is explained to the students. The students also get to hear about Finnish society, history and culture, employment and the North Karelia area they live in. Securing a smooth start is very important for new students so that they get both their studies and their everyday lives running steadily.

In addition to the Life in Finland orientation, the support system at Karelia UAS includes numerous specialists. Student tutors offer peer support for the starting students; student counselors are there to help with study-related matters and student welfare officers offer their services to those who somehow struggle in their studies or have challenges in managing their day-to-day lives. Karelia UAS has also hired a full-time counselor to support the integration of international students throughout their studies by providing one-to-one counseling and group sessions on different topics.

Learning the local language is vital in Finland. There are not many employment possibilities for those who do not know the Finnish language. Furthermore, even if it were possible to do the job in English, it is pretty hard to become a part of the community if a person is unable to communicate with colleagues in informal situations. In a recently published *Report on the state of the Finnish language in Finland*, professor Tiina Onikki-Rantajääskö (2024) states that in the future, it would be beneficial to have multilingual study programs instead of English-taught programs. According to her, the English-taught programs should include 20 credits of Finnish language studies if creating the capacity to work in Finland is desired (Onikki-Rantajääskö, 2024). Even though workplaces create multilingual practices to help foreign employees, the importance of Finnish language competence will not diminish. It is doubtful that Finnish workplaces would turn into English-speaking environments. Therefore, education organizations must still and increasingly incorporate the Finnish language into the teaching of international students.

Karelia UAS offers Finnish language studies as part of the curricula for all international degree students who study in English-taught degree programs. The scope of the introductory courses is 15 credits (ECTS), and the students can also select complementary courses to boost their language studying. Students are encouraged to study the Finnish

language, as learning Finnish is tied to the scholarship system. Those who reach a certain level within a certain time will receive a scholarship that covers part of the yearly tuition fee.

Finnish language skills are needed when the students do their internship. All UAS students are required to do an internship as part of their studies. The scope of the compulsory internship is 30 credits (ECTS). In full-time work, it means an internship period of approximately 5.5 months. It is also possible to complete the training in shorter periods or part-time. For international degree students, the internship is an excellent opportunity to learn not only professional skills but also the Finnish language. This is supported by offering the students a task package to complete during their internship. It includes one task for each week of the internship period. The tasks do not focus on studying grammar but on observing the use of the Finnish language in the workplace and studying vocabulary. The idea is that even though the English language might be used frequently, at least the tasks keep Finnish language learning in mind and encourage its use in the workplace.

### Ways to support employment

Close collaboration with working life is one of the values of Karelia UAS, and supporting the employment of international students is a strategically significant development target. For students arriving in Finland from abroad to complete their degree, it is essential to get to know the local and regional companies and organizations.

A way to promote this is the Future Talents Partnership Programme that was launched in 2022. It was set up to intensify cooperation between the English-taught programs and the area's employers. It expands the employment networks of international students and provides opportunities to complete internships in North Karelia. The program also promotes the internationalization of employers in the region. For a company considering international recruitment, it is a low-threshold way to recruit their first foreign employee since there is a robust support system available for the employer. If the employer's first experience with a foreign employee or trainee is positive, this is likely to encourage them to hire the next one as well.

The companies commit to versatile collaboration, such as offering internships, thesis topics, practical cases, and projects for the courses. The company representatives can also share their expertise by visiting the campus as a guest lecturer, for example. In return, the companies receive visibility on the Karelia UAS website, social media channels and events, support in recruiting a suitable intern, and tailored support for building a diverse workplace, if needed. They will also receive up-to-date information from the study programs. At the moment, there are around 30 companies that are involved in the program.

One of the main goals of the partnership program is for students and local businesses to get to know each other. Student groups are taken to visit the partnership companies and other employers in the North Karelia area regularly. The students also need to understand the job possibilities outside of their campus city. For businesses in remote areas, labour availability can also be a bigger challenge than for those in cities, and international degree students are a potential future workforce.

Students enjoy visiting companies and they have reported that the visits give them a real insight into the companies in the area as well as their operations in practice. The students have experienced that visiting companies clarifies their own employment prospects, and things learned in lessons become concrete. During the visits, students and company representatives get to discuss and, in the best cases, an idea for a thesis topic or an internship, for example, may arise.

Getting to know companies in the area is one thing international students need to do, but they also need to learn the Finnish way of applying for a job. To support this, Karelia UAS

offers a complementary study course to improve students' job-hunting skills. Nowadays, job-seeking is a world of its own, where certain norms and customs apply. During the course, students become familiar with a typical Finnish recruitment process and progress through the different parts of it in a simulated manner. The focus is on identifying one's competence and learning how to communicate it to potential employers. The course also involves much practice: analysing a job advertisement, writing a CV and a job application letter, making an elevator pitch, and attending a job interview training.

## Conclusions

The growth in the number of international students will continue. At the same time, the Finnish population is aging, and many new employees are needed in the labour market. In order to make full use of the potential of international degree students, both educational institutions and other actors must provide students with the skills needed for employment. This is not something that any actor does alone, but goal-oriented cooperation is needed.

Not only the students as future employees need to have skills. Also, employers need to have the competence to recruit an international employee and the capacity to run a versatile workplace. Many employers are still hesitant to hire a foreign employee. There are probably many reasons for this, but often the language barrier, meaning either the employer's poor English language skills or the employee's poor Finnish skills, is mentioned. In addition, it is often felt that, at least in the beginning, many resources are needed to guide a foreign employee. Educational institutions need to keep in mind that in addition to supporting students, it is as important to offer support to employers as well.

In the future, versatile language solutions and networking can be key. Both educational institutions and employers need to evaluate their language strategies in order to find solutions that make it possible for an international degree student to enter the Finnish labour market after graduation. Also, enabling international degree students to get to know Finnish employers throughout their studies is essential. Employers also get to know international students, and as a result, the threshold for hiring them is lowered. All in all, development work needs to continue and everyone needs to be involved in it.

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# Creating the language-supported educational model for nursing



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## Introduction

Nationally, there is a shortage of nurses in our social and healthcare system. In 2022, there was a shortage of 17,000 nurses (Keva, 2023a). In North Karelia, almost 870 nurses are needed (Keva, 2023b), and only about 100 students graduate per year (Karelia ammattikorkeakoulu, 2024). Therefore, the number of graduated nurses does not meet the existing need. North Karelia is a sparsely populated area and resulting in difficulties in recruiting nursing staff causing a need for new operating models to ensure a sufficient number of employees.

Karelia University of Applied Sciences responds to the employment and education needs of the North Karelia region by managing the group project “Becoming a nurse in North Karelia,” which started on January 1, 2024, with Wellbeing Services County of North Karelia – Siun sote as the partial implementer. During the project, a working life-oriented recruitment, training, and employment model supported in Russian will be piloted for the Finnish nursing degree. Siun sote is actively involved as an employer in enabling the accessibility of work communities, internships for students with a foreign background, and part-time employment during studies. The students studying for the nursing degree are native speakers of Russian, and their Finnish language proficiency level is A2.2. Language support during education is more substantial during the first two years and decreases as studies progress. After graduation, the students will be able to work as registered nurses in Finnish healthcare in the Finnish language. During the project, support structures for a working life-oriented education model will also be developed, facilitating the education and employment paths of international students. In the North Karelia region, multicultural nursing units are just being built, and the competence needs of the employer and the training organization must be met.

## Developing the language-supported education model for nursing degrees

### Planning of studies

These studies start with an orientation course, helping to reduce students’ anxiety and increase their motivation (Worrall, 2007), introducing the students to their peers, to studying at the University of Applied Sciences, to Siun sote as a healthcare services provider, and to typical Finnish terms related to nursing and nursing education that are needed in the actual studies.

The curriculum planning has started with a core content analysis of the content to be taught. The content of the courses, the learning environment Moodle, and the teaching materials for all semesters are discussed in collaboration with the course teachers. Work has started with a strong core content analysis, taking into account the competence requirements of the general nurse. In addition, the model focuses on varied and functional teaching methods to facilitate language and content learning.

Studies focus on language learning, which is clearly linked to academic performance (Lewis & Bell, 2020). Studies that support language learning contribute to real-life interactions and improve students’ self-esteem (Rogan & Miguel, 2013). Learning is supported by roleplay interaction exercises (Miguel et al., 2006; Lewis & Bell, 2020) integrated into both Finnish language studies and professional subjects.

Students are supported by peer tutors and their own student mentoring group, who started their nursing studies a year earlier. Evidence shows that tutoring helps to progress studies and improve study skills and social relationships (Igbo & Sule, 2019).

### Plain language as a teaching tool

In this language-supported education in nursing, the focus is on the plain Finnish language. Everyday life conversations may be very fluent, and fluency is achieved quite soon, but when adding academic or medical terms, the development of conversational skills and fluency takes longer (Miguel et al., 2006). Plain language helps the student to adopt the content and have more time to absorb substantial content (Moore & Waters, 2020). Learning environments, teaching materials, and learning materials are all in plain language checked by the Finnish as a Second Language (FSL) teachers. Previous studies

emphasize the meaning of plain language and its association with better learning results (Lewis & Bell, 2020; Moore & Waters, 2020; Olson, 2023). In this educational model, Finnish has been integrated into professional studies. There are 26 to 29 ECTS Finnish courses taught focusing on grammar and also using the vocabulary of professional studies of nursing, iterating key concepts and contents.

An FSL teacher attends nursing lectures, such as seminar days and clinical days, paying attention to language and vocabulary and ensuring that students understand the contents of lectures. Though the materials and teaching are in plain language, language support is available. For example, in learning environments and teaching materials, there is supporting vocabulary in Russian. Also, in almost every lecture, seminar, or clinical day, a Russian-speaking project specialist attends to ensure understanding and, if needed, translate difficult words or contents into Russian.

### Practical training and cooperation with working life

The model includes in total 75 ECTS of practical training, which is the same as in the nursing degree practical training starting from the first semester. The practical training takes place in different healthcare units. At the beginning of every practical training, the student sets their language development goals. The purpose of this is to guide the unit's supervisor in organizing opportunities to practice Finnish during practical training. Students' progress is not possible if their language skills are not developing. Language skills are assessed before the practical training by the FSL teacher and tutor teacher.

The project also aims to turn thinking more towards work-integrated learning, which is an integral part of the education model. Every student has a home unit where they start working during the third semester. Working is also integrated into the semester's professional studies in nursing. The amount of work increases as their skills develop throughout their studies.

Working-life cooperation plays a crucial role in practical training and working in home units. Siun sote shares information about this language-supported education and the unique needs of the students with the staff of the home units. Also, language and cultural education in the units are necessary (Lewis & Bell, 2020).

## Conclusions

All students benefit from plain language and accessibility as students are having more and more difficulties in learning. Also, teachers often use complex language (so-called hospital slang), which can be challenging for students to understand. The core content analysis brings the essentials of the content to the teaching. From the students' point of view, the number of credits matches the workload better. Students practice the language and learn the essential concepts so that they can broaden their knowledge of the subject they are studying. However, core content analysis is a laborious process leading to significant changes within the courses requiring also a new way of thinking from the teacher of the course. Additionally, it requires tolerance for slowness as teaching takes more time. Even so, it takes more time to teach and students to learn, it should be seen as an advantage for students to be bilingual, knowing that geographically, we are close to the eastern border, so in healthcare services, there are many Russian-speaking clients.

This continuous language-supported educational model is an ethically sustainable way to recruit employees for the healthcare sector, targeting the recruitment of persons already living in Finland. The educational and employment path is easier and faster due to lower language skill requirements, meaning students can start studying at a university of applied sciences with a lower language skill level and learn the language alongside the

profession. The objective is to run an employer partnership model that can be implemented in different languages in accordance with the area's needs. Eventually, the model can be copied to other fields, especially those with employee shortages in the future.

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# 3 Elevating engineering education and contents



# Industrial Management Curriculum Development at Karelia UAS



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## Introduction

The Industrial Management degree was developed at Karelia University of Applied Sciences to respond to the changes and demands of industry, technology, society, and Karelia's objectives in internationalization. The regional industry was intensely involved in defining the frame for the degree as well as the actors at Karelia. Industrial management was the second program instructed in English at Karelia and the first engineering one. The surveys among the industry actors, benchmarking similar programs at other universities of applied sciences, close cooperation with international business, and Karelia's first English degree program brought up valuable information and approaches utilized in the first curriculum.

## Curriculum development process

The key elements of the development of the degree's curriculum have been the results of the findings that were compiled throughout the process to incorporate the need for modern engineering programs, cross-disciplinary knowledge and interaction, hands-on learning and innovation (Auvinen & Asikainen, 2023, pp. 28–29), in addition to emerging fields that are shaping the industrial environments that need to be integrated into the newly developed engineering curriculum. A holistic approach has been a critical factor in balancing the complexity of interdisciplinary skills with soft skills, especially with international and intercultural students, with emphasis on communication and teamwork. This article discusses the fundamental elements that have shaped the curriculum's developments and updates, as well as insights into how to create future-proof engineering degrees that respond to industry changes and prepare students for a challenging and fast-changing marketplace.

The Industrial Management and Engineering Bachelor's degree (B. Eng.) curriculum has been developed taking into account three main factors (Figure 1).

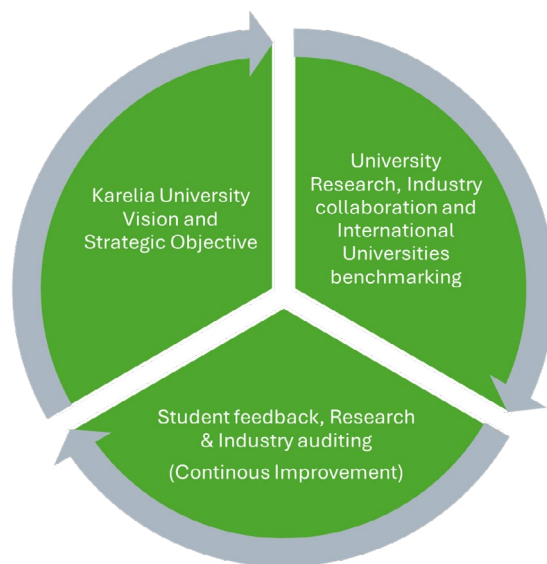


Figure 1. The three main factors in curriculum development.

### IM Curriculum Development Aligned with the University's Vision and Strategic Objectives

The Industrial Management (IM) degree originated from the audit of the Karelia Strategy 2016–2020 and was approved by the Karelia UAS board in February 2019 (Auvinen & Asikainen, 2023, pp. 28–29), with the university vision as the guiding principle for curriculum development.

In addition, curriculum development must be aligned with the university's vision, strategic objectives, and roadmap to meet the university's current and long-term goals, academic capabilities, and industry changes. Thus, developing a curriculum that takes into account the structure of the university, available resources for academic excellence, abiding by the university's quality standards, and proximity to working life.

## Strategic Objectives as a Framework

The initial start of the industrial management degree curriculum is to map it directly to the university's strategic plan and objective and indirectly to industry trends and changes. The core competencies of the curriculum should include elements that enhance vital strategic objectives such as *“strengthening the vitality of the region”* by including key subjects that respond to regional industry demand and *“promoting entrepreneurship and Industry collaboration”* by integrating project-based courses, industry projects, and practical training.

The common strategic objectives of Karelia for the engineering degree have been to develop new industrial solutions for intelligent productions and services while ensuring a green transition spanning from product development to recycling by ensuring innovation and adaptation of the latest technologies focusing on customer value creation and a centric approach. Furthermore, the strategic objectives were to enhance the university's internationalization and entrepreneurial mindset. Therefore, ensuring a better integration of the international students into Finnish society and the workforce.

The curriculum development had to respond to the strategic objective to meet the demand of the university's strategic goals in terms of incorporating modern technologies and cross-disciplinary learning from the current university department, as well as further development based on the university's strategic objectives.

The learning objectives and competence development fostered by the approach will increase student learning capabilities and enhance their problem-solving skills and versatile expertise to meet job market demands.

## Innovation and Flexibility in Curriculum Design

The curriculum development must meet the strategic objective of innovation, reacting to the needs and changes of working life in terms of technology shifts, regulation changes, and market fluctuations and changes. It should be developed to be as adaptable as possible and hence offer the possibility to keep the degree up to date with emerging changes and market demand. An example is to have a degree that offers a cross-disciplinary approach so a student can customize their learning by choosing different paths as a specialization or focus on one core competence in the engineering/technology path, such as mechanical engineering, ICT, or environmental. In addition, the university ensures the readiness of students to tackle fast-paced engineering and business challenges.

The mapped development of the curriculum is used as an initial framework that needs to be tested and improved to be aligned with local industry needs and further investigation to check if it needs further improvements. That is why it has to be tested and checked against university research, industry, and the benchmarking of other education universities to innovate and align with industry trends.

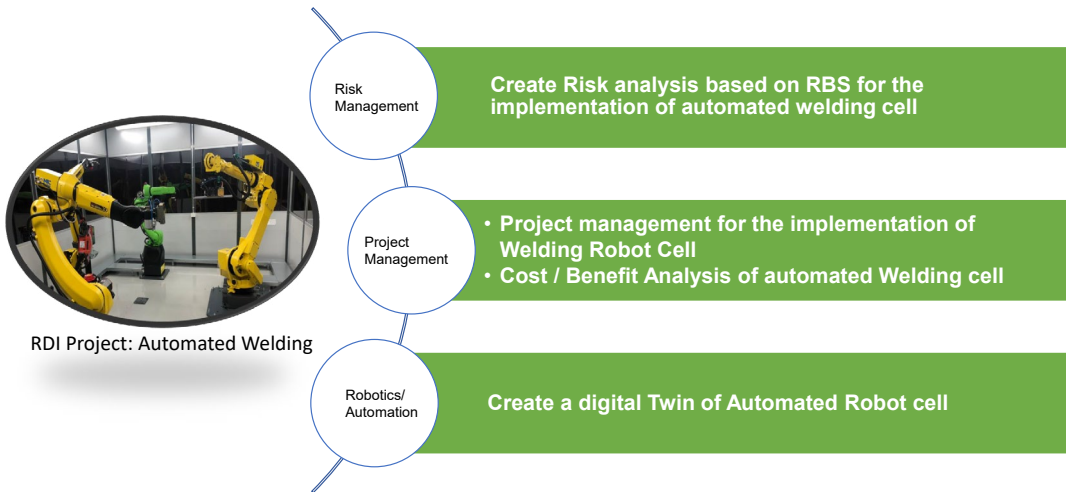
## Engineering Curriculum Development: Integration of University Research, Industry Collaboration, and Curriculum Benchmarking

Leveraging the research, development, and innovation (RDI) activities of Karelia University of Applied Sciences plays a crucial role in curriculum development by integrating the current projects into the content of the modules as well as shaping its direction.

An example is the use of ongoing RDI projects as either capstone projects/projects for students or to have an assignment on the current modules in the curriculum. Thus, offering the students the opportunity to have hands-on experience in solving a real problem.

The following figure 2 is an example of the integration of the ongoing project in RDI

into the different modules of the industrial management curriculum to foster student knowledge and provide them with real cases of a project, as well as the possibility to check the results from the actual project implementation.



**Figure 2.** Example of the integration of the ongoing RDI project into the different modules of the industrial management curriculum.

In addition, the integration of sustainability as part of the INVEST university alliance ensures that further development of the curriculum should address sustainability as part of the degree's key competencies.

## Strengthening Industry Collaboration

Industrial Collaboration is a vital point in shaping the curriculum and creating a future-proof degree. The industrial curriculum has been developed to integrate several industry projects during the four-year studies to help students gain real-life experience and also to enhance the integration of international students in the job marketplace as well as providing better visibility for practical training/internships.

The curriculum was developed by interviewing and with the participation of many industrial players in the Karelia region to meet the current and future industry demands. Therefore, ensuring the curriculum is aligned with market demand and that students receive the required training in the needed fields.

Industry collaboration also plays an essential role in improving the curriculum through industry audits, which go through the implementation and integration of the RDI, project-based work in the industry, and how they affect its future development.

## Curriculum Benchmarking

Benchmarking with local and international universities ensures that the curriculum's development meets the academic direction with university partners and enhances university collaboration for internationalization. In addition, it reduces the gaps that can be identified due to misrepresentation that might arise internally and adopts best practices.

Creating a synergy from industry, research, and benchmarking offers the possibility to

have a well-grounded, forward-looking, and dynamic curriculum that will prepare students for their future career endeavours.

The critical expertise and competencies that were drawn and must be addressed in the curriculum's development are:

- **Digital Transformation and Industry 5.0:** Integration of new trends and technologies.
- **Sustainable Product Design and Technology:** Innovative approach and integration of sustainability in the product and service design.
- **Entrepreneurship, Business, and Management:** Focusing on a customer-centric approach and new business models.
- **Sustainable and Smart Operations:** Focusing on lean, green logistics, and circular economy.
- **Soft Skills and Internationalization Approach**
- **Cross-disciplinary and Multidisciplinary Degree:** Meet the challenging market changes and flexibility.

## Engineering Curriculum Development: Continuous Improvement through Student Feedback, Research, and Industry Auditing

The continuous development of the industrial management curriculum is essential in order to guarantee that students are receiving the right competencies at the right times. This ensures that the degree is dynamic and flexible to changes affecting the industry.

The continuous development is conducted through:

- **Student Feedback:** Through the collection of students' learning experiences both during their studies as well as their interactions with industries (practical training, industry project-based assignments, and thesis projects). By allowing the students to communicate their findings and reflections, the curriculum can close the gap in teaching and create a collaborative learning environment, especially as the student body for the international curriculum is diverse in terms of origins, background, and expertise.
- **Industry Auditing and Collaboration:** The auditing of the industrial management curriculum by selected companies ensures that the program is aligned with industry trends and provides insights on the new technologies that will be in high market demand. Hence creating a future-proof degree that is flexible and evolves at the same pace as industry requirements.
- **Inclusion of Research and Other Degrees:** The importance of integrating research findings and other degrees contributes to the creation of an interdisciplinary and cross-functional curriculum that will be sought in the future. An example is the inclusion of ICT courses in the curriculum for students who are interested in SW and data engineering.

In conclusion, the development of the industrial management curriculum has a top-down approach that aligns the university's vision and strategy, research, and industry collaboration while adapting it with the latest industry trends and student feedback to create a future educational program. This integrated approach, combined with the tools

provided by the university and the skills and competencies of its departments, needs to pave the way to innovate and create a cross-functional and interdisciplinary program for international students who embark on their Bachelor's in Industrial Management journey.

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# Sustainable Building Technologies – Community of Practices (SBTCP)



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## Introduction

The construction sector produces about a third of Finland's total greenhouse gas emissions, which is why it is essential to strive to reduce carbon dioxide emissions during the life cycle of construction and buildings (Finnish Ministry of the Environment, 2024). The European Union's building stock consumes around 42%, more than a third of Europe's total energy (GBCF, 2024). Finland is committed to achieving carbon neutrality by 2035 and the EU has set itself the goal of being carbon neutral by 2050. The City of Joensuu has an even more ambitious goal: Carbon-neutral Joensuu by 2025, which aims to reduce greenhouse gas emissions by 60% from the 2007 level by 2025. In 2022, emissions had been reduced by 42%.

Carbon-neutral Joensuu 2025 steers and strategically implements the entire Joensuu City Group (Climate Joensuu, 2024).

The core of sustainable construction is to produce long-lasting, energy- and environmentally-efficient buildings and structural solutions that are versatile, healthy, and safe for their users. Life cycle thinking is a prerequisite for sustainable development, as it examines and assesses the environmental, energy, and cost impacts of a building throughout its life cycle (Construction Industry RT, 2024). Responsibility and low-carbon solutions are key factors in combating climate change and play a vital role in sustainable construction. Sustainable and innovative structural solutions, design, material choices, adaptability, and close cooperation between different construction parties support sustainable construction. Wood construction, low-carbon construction, energy efficiency, and the application of circular economy principles to new structural solutions promote the growth of carbon-neutral construction and the achievement of Europe's and Finland's climate goals (Finnish Ministry of the Environment, 2024).

The main objective of the Sustainable Building Technologies – Community of Practices project has been to build a practical community through cross-border research collaboration and knowledge sharing. The project coordinated by Karelia University of Applied Sciences has focused on the development of low-carbon and sustainable construction technologies. International cooperation has brought European expertise in circular economy, sustainable material development, and digitalization as tools for achieving the project's objectives.

The project application was prepared together with the project partners during the spring of 2021 and received a positive funding decision from the Finnish Ministry of Education and Culture in the fall of 2021. The project officially started in 2022 and will end in December 2024.

## Project Partners

The SBTCP project is a strong cooperation model between three European universities of applied sciences. The project has brought together excellence in key areas of R&D at the European level.



**Figure 1.** SBTCP project partners: 1. Karelia University of Applied Sciences, Joensuu, Finland. 2. Salzburg University of Applied Sciences, Kuchl, Austria. 3. Jade University of Applied Sciences, Oldenburg, Germany. (SBTCP)

## Sustainability, Materials Science and BIM

### Methods and results

Sustainable development, materials science, and Building Information Modeling (BIM) have defined the project's activities and the studies carried out. In the project, Karelia University of Applied Sciences focused on the sustainable development perspective of wood construction through competitiveness and energy-efficient urban planning. Research on energy-efficient city planning was done in cooperation with the City of Joensuu, Glasgow Caledonian University, and the UEF. The main results will be published in an article titled "Urban morphology-energy consumption nexus." In addition to the previous survey, a competitiveness survey on wood construction was carried out at Karelia UAS. Significant construction companies from Finland, Austria, and Germany participated in the study. The research article has been published in the publication series of Karelia University of Applied Sciences in 2023.

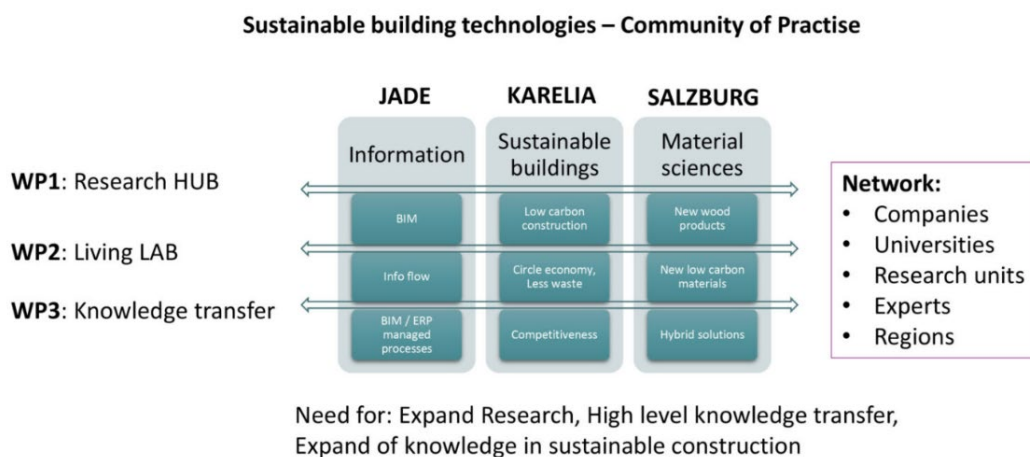


Figure 2. SBTCP project operating model. (SBTCP)

Salzburg University of Applied Sciences focused on wood materials science in the project. In Salzburg, the study concentrated on how volatile organic compounds (VOCs) from recycled building materials affect indoor air quality and how the lifetime of construction products can be extended and their environmental impact reduced. During the project, new hybrid construction products were created, such as cross-glued wood (CLT) made from waste wood and fresh wood. The studies showed that the hybrid product reduced the need for virgin raw materials and reduced CO<sub>2</sub> emissions. A central objective of the project was to certify waste wood for safe reuse. For this purpose, non-destructive (TOF) and destructive test methods of the material were compared to assess the material's properties. Despite promising results, full certification of recycled wood remains a challenge in the construction industry.

As part of the project, Jade University focused on the digital mapping of information on sustainability aspects using Building Information Modeling (BIM), life cycle analysis (LCA) and cradle-to-cradle principles. These approaches enable environmentally friendly and efficient construction that considers the entire life cycle of a building—from planning to use to recycling. The integration of BIM technology allows detailed planning and monitoring of the construction process, which means that material use and waste can be minimized

through the principle of the digital twin.

During the project, the partner universities of applied sciences prepared a sustainable construction study module (15 credits) for Jade University of Applied Sciences' open Moodle platform. Each partner created a course where students can learn and develop innovative approaches to sustainable construction:

- "Building Information Modelling (BIM)," Jade University of Applied Sciences
- "Sustainable building construction," Karelia University of Applied Sciences
- "Wood construction – materials," Salzburg University of Applied Sciences

## Workshops

The SBTCP project has focused on knowledge transfer, primarily through practical workshops where students from different countries gained important information about sustainable construction, digitalization (BIM), and circular economy. Practical events not only promote exchanges between students and specialists but also allow one to apply the latest research results in real construction projects.



Photo 1. The first practical workshop took place in Salzburg, Austria.

The first workshop took place in Salzburg in May 2022 and was attended by 28 students and a dozen teachers from Finland, Austria, and Germany. The theme of the workshop was sustainable wood construction and the utilization of the circular economy of construction products at the demolition site in Austria. The workshop activities also included visits to a glulam factory and a local construction site where sustainable wood construction was carried out, as well as familiarization with the local building culture through historical buildings.



**Photo 2.** The second workshop was held in Joensuu, Finland. The group visited the LapWall factory.

The second workshop was held in Joensuu in May 2023 and, like the first workshop, was attended by approximately 30 international students and 11 teachers. The workshop focused on efficient urban planning and structural design for sustainable construction. The group visited the LapWall factory in Pyhäntä and learned about Finnish culture and traditional construction in Koli and the Parppeinvaara poetry village in Ilomantsi. During the workshop, a design competition was organized for students to build a small movable learning environment from recycled materials.



**Photo 3.** In the third workshop in Oldenburg, Germany, students used recycled materials to build a movable learning environment.

The third workshop took place in Oldenburg in May 2024 and was attended by 30 students from Finland, Germany, Austria, and Spain. In this workshop, students used recycled materials to build a movable learning environment in Oldenburg, based on the winning design of the workshop design competition held in Joensuu in 2023.

## Thinking

The main objective of the European Green Deal is to be Europe's first climate-neutral continent by 2050 (GBCF, 2024). In April 2024, the European Parliament adopted a new Energy Performance of Buildings Directive, which aims to double the renovation rate of buildings in the short term, emphasize the importance of indoor climate quality and digitalization, reduce emissions in the sector by at least 60%, and ensure independence from fossil energy sources (BUILD UP, 2024).

The active implementation of the SBTCP project with partners has contributed significantly to the development of innovative solutions through multidisciplinary and diverse international cooperation. The project has promoted expertise in low-carbon construction and developed international studies for information exchange and education in sustainable construction. With these key measures, the project has sought to promote and increase expertise in those areas where the achievement of Europe's climate goals can best be achieved.

During the project, cooperation between the partners has intensified and the common intention has been to continue the cooperation after the SBTCP project. During the project, a project application was brainstormed and written for the future, the final funding decision of which is expected to be received at the beginning of 2025.

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# The Role of Universities of Applied Sciences in Innovation and Development



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Universities of applied sciences are pivotal in not only producing skilled experts for the workforce but also in fostering innovations within companies and other organizations through research, development, and innovation (RDI) activities. These innovations, which include new products, services, and operational models, play a significant role in enhancing organizational renewal, competitiveness, productivity, and employment. Karelia University of Applied Sciences exemplifies this innovation work through its collaborative efforts with companies, educational and research institutions, and public and third-sector agencies.

## Collaborative Efforts and Development Partners

The development partners of Karelia UAS are diverse, encompassing regional, national, and international levels. Networks and partnerships are essential for developing and

sharing expertise in practice and knowledge. This thematic publication describes views and examples of where learning, expertise, and innovations have been developed over the long term and through collaboration. It also highlights the expertise adopted at Karelia University of Applied Sciences and its partner organizations. Furthermore, the publication gathers experiences of international cooperation and the requirements for successful collaboration.

## **Themes of Working Life**

This publication highlights particularly those themes from working life that should be anticipated and developed in education. These include modern technologies, sustainable development goals, and supporting students' access to education and employment. By focusing on these themes, universities of applied sciences can better prepare students for the evolving demands of the workforce and contribute to broader societal goals.

In conclusion, universities of applied sciences play a vital role in both developing skilled experts and fostering innovations that drive organizational and societal progress. Through collaborative efforts and strong partnerships, institutions like Karelia University of Applied Sciences can effectively contribute to the development and sharing of expertise, ultimately enhancing education and employment outcomes.





This publication, *Selected Perspectives on Internationalisation and Applied Education and Research 2024*, addresses the key themes of Karelia University of Applied Sciences: applied education, practical research, and internationalization. This collection of articles offers an in-depth look at how the university responds to the educational challenges and opportunities of today and the future. The publication aims to present Karelia University of Applied Sciences' strategic choices and actions that shape its operating methods and development directions.

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