EIT HEI Initiative

Innovation Capacity Building for Higher Education

European Institute of Innovation & Technology

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D7.3: Impact Assessment Report for Phase I

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Contents

Executive Summary

Skills2Scale is a project designed to empower Higher Education Institutions (HEIs) to play a leading role in the development and implementation of Beyond 5G networks and applications. Through a range of activities such as training programs, peer-learning events, mentoring, and acceleration, the project aims to equip HEIs with the knowledge, skills, and networks necessary to support the development of the Beyond 5G ecosystem.

The project's goal is to foster institutional engagement and change, strengthen partnerships, contribute to developing innovations and businesses, enhance the quality of innovation and entrepreneurial education, and support knowledge sharing. By doing so, the project aims to develop a skilled workforce in the field of Beyond 5G technology, which will help drive innovation and economic growth.

The objective of this deliverable is to assess the data collected and report on the project achievements, impact of phase 1 and indicate what the impact means for phase 2. The structure of the deliverable is based on the main Key Performance Indicators of phase 1 and analyses the content that contributed to the KPIs. Based on the analysis the impact is noted and recommendations for phase 2 are provided.

About the EIT HEI Initiative

The EIT HEI Initiative: Innovation Capacity Building for Higher Education has been designed with the aim of increasing the innovation and entrepreneurial capacity in higher education by bringing together HEIs in innovation value chains and ecosystems across Europe. A central philosophy of the EIT is the integration of the EIT Knowledge Triangle Model into all its activities. HEIs selected to participate in the HEI Initiative will also leverage and use the Knowledge Triangle Model as an enabler, facilitating the creation of systemic, institutional change. Additionally, HEIs selected to participate in the HEI Initiative will contribute to and leverage Smart Specialisation Strategies, the Regional Innovation Impact Assessment (RIIA) Framework, as well as align to the goals of the EIT Regional Innovation Scheme (EIT RIS).

This will strengthen the links between HEIs and their local and regional ecosystems and provide an impetus to leverage additional funding sources beyond the HEI project funding period of the selected HEI projects.

HEIs are encouraged to prepare applications which will support the development and implementation of six Actions in their institutions, cumulatively leading to institutional transformation, an increase in entrepreneurial and innovation capacity, and integration with innovation ecosystems.

1 Introduction

This task involves conducting the impact assessment for the first phase of the project, analysing the data collected, and reporting on the project's achievements and impact. The Impact Assessment Report for Phase 1 is a comprehensive analysis of the project's achievements and impact during the first phase. The report will be based on the data collected throughout the project, including both quantitative and qualitative data. The report will include an evaluation of the project's progress towards its objectives, an analysis of the results achieved, and an assessment of the project's impact on the target audience and stakeholders.

To assess the impact of phase 1 all webinar, regional and local stakeholder events, the massive open online course, the deep tech accelerator program as well as the training program developed were analysed and benchmarked against the Key Performance Indicators.

2 Achievement of EIT KPIs

In Phase 1, the project has focused on developing and implementing the necessary infrastructure, acceleration and training programs to enable students to acquire the skills and knowledge necessary to become successful entrepreneurs in the 5G and Beyond technologies field. To facilitate a smooth implementation of the content, faculty and staff of HEIs receive training and mentoring in these thematic areas as well.

To provide adequate infrastructure, acceleration and training programs, the project team conducted a needs assessment to evaluate the current ecosystem capacity and support structures of each HEI partner. Based on the results of D1.1, a training program was set up in D1.2. The aim of the program was to enhance capacity building of HEIs in fostering institutional engagement and change in the field of 5G and beyond technology. To implement the content of this program a range of training events that cover thematic areas such as deep tech, innovation and entrepreneurship were set up.

Figure 1. KPI mapping

2.1 Supported start-ups/scale ups

Since one of the main objectives of the project is the support of start-ups/scale ups, the project developed in the beginning of phase 1 the needed tools to support start-ups. These tools include a training program, a deep tech accelerator as well as a range of training and mentoring webinars.

The development of a 2-month innovation and business driven start-up accelerator program for higher education institutions students was created to select 10 startups in developing their entrepreneurial and business skills. The accelerator program was published on the project's website: https://skills2scale.eu/ and promoted through all partners' social media and communication platforms to reach as many students as possible. After an application period of 4 weeks in September, a total of 27 applications from European countries and beyond were submitted. Based on the selection criteria defined in D3.1, 10 start-ups were selected and received support to develop their entrepreneurial and business skills through a range of interactive training and mentoring activities. The support included 8 hours of interactive workshops, 4 hours of webinars, 1 hour biweekly of personalised mentorship and a capstone showcase to deepen their understanding and develop their skill set.

2.1.1 KPIs Phase 1

In regard to the Key Performance Indicators (KPI) for supported start-ups/ scale-ups, the project has successfully met the KPI of supporting 10 student-led start-ups and providing extensive training, mentoring and networking opportunities to provide the start-ups with the needed skills to grow as a business.

Table 1. KPI Supported Start-ups/scale ups

Key Performance Indicator	Target value 2023	Achieved value 2023
Number of established/already-registered start-ups and scale-ups supported by the HEI Initiative funding for at least 2 months in 2023, provided the services contribute to the company's growth (including potential growth)	10	10
Applications for Deep Tech Accelerator Program	30	27 (-3)

2.1.2 Impact

The accelerator program was a successful method to reach students and assist them in developing their ideas and skillsets. Since the accelerator program was open to students from the stage of having an idea to a fully developed start-up, more students were reached. Allowing students at the idea stage to participate was crucial since students tend to struggle to bridge the gap from idea to functioning start up without a support system. The accelerator program provided such a support mechanism to help students develop their entrepreneurial and business-oriented skill set. The successful implementation of the first accelerator program in phase 1 will provide the groundwork for phase 2. Lessons learned from phase 1, such as a longer application period to allow for more applications and using more effective dissemination methods, will be taken into consideration when starting round 2 of the accelerator program in phase 2.

2.2 Students trained and mentored

One of the central objectives of the Skills2Scale project is the training and mentoring of HEI students. To achieve this objective, the project has set up a range of activities that allow students to participate and learn about Beyond 5G technology. Among these activities is the creation of a massive open online course (MOOC), training and mentoring opportunities as well as participation in local stakeholder events.

The creation and implementation of a MOOC on innovation and entrepreneurship in the field of Beyond 5G technology provided an essential opportunity for students to learn and develop skills in the field of Beyond 5G technology. The expected outcome of this open access online course is to foster a comprehensive understanding of knowledge essentials in 5G and Beyond 5G technology, nurturing an innovative mindset. Additionally, the MOOC provides

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information and guidance to participants to embark on entrepreneurial endeavours of HEI students leveraging the innovation potential and possibilities offered by this cutting-edge technology.

Furthermore, the learning experience provided by this MOOC will be complemented by mentorship, coaching and networking activities that were developed in Task 4.3 "Provide training and mentorship to HEI faculties on integrating the best practices into their innovation and entrepreneurial education courses".

This comprehensive training and mentoring program provided an ideal balance of training and mentoring for HEI students. The MOOC can be found at the UPVx1 educational platform and was accessible for students starting 17th November 2023 and will be available for students' enrolment during and after the lifetime of Skills2Scale project. The MOOC represents a workload of 2 ECTS, and it has been designed to provide an attractive and effective learning experience through a set of online materials, video lessons, learning reinforcement activities, and assessment tests. The structure of the MOOC was agreed among the Skills2Scale Consortium, featuring content from the project partners to introduce Beyond 5G technology and showcase best practices from Higher Education Institutions across Europe.

In addition to the massive open online course, project partners organised local stakeholder events aimed to train and mentor students in the field of Beyond 5G and entrepreneurship. Examples of such events are (i) the expert seminar 5G and (ii) the Ideathon at TUL, (iii) the Tech in Business event at the University of Lapland, as well as (iv) the V5G days and (v) the Workshop of 6G enabling technologies, which was open to students.

Uzhhorod National University (UNU) organised two local events for stakeholders aimed at education and mentorship in the fields of Beyond 5G and entrepreneurship. The first event, held on September 27, 2023, catered to representatives from government, education, science, and business, with a total of 24 participants. The second event was the "UzhNU Startup: Innovations for the Future!" competition, which took place on October 25, 2023. The competition had 26 participants (23 students) in the initial stage and 17 participants (14 students) in the final stage.

2.2.1 KPIs Phase 1

In regard to the Key Performance Indicators for students trained and mentored, the project has exceeded the target value of 35 students trained with a total of 304 students mentored. The number of students mentored was collected through participation in local stakeholder events and webinars at Higher Education Institutions that specifically targeted students.

The Key Performance Indicator of 350 students trained cannot be confirmed yet since the massive open online course, which is the main contributor to this KPI, is open until the end of December 2023. Current numbers suggest that 77 students have registered for the massive open online course developed by the consortium.

Table 2. KPI Students trained/ students mentored

Key Performance Indicator	Target value 2023	Achieved value 2023
Number of students trained	350	77 (To be updated)
Number of students mentored	35	304

2.2.2 Impact

The development and circulation of the MOOC has been successful. The content provided by Fogus, UPV, TUL, UNU, and LU has been instrumental in developing an insightful and engaging massive open online course. The efficient generation of content as well as the collaboration between partners was essential in the development process. After finalization of the content and course development by UPV, the MOOC was disseminated by all partners through social media as well as internal communication channels. Furthermore, TUL implemented the MOOC into the teaching curriculum which is an effective approach in trying to engage students to complete the courses. As an award, students who have completed the online course received 2 ECTS credits which can be seen as incentive to complete the course. Since the timeframe of dissemination was rather short in phase 1, the massive open online course will go into round 2 of dissemination to attract more students to complete the MOOC. Since TULs approach of implementing the MOOC into the teaching curriculum has proved to be successful, this strategy will be dominantly used by HEIs in phase 2. Regarding the local stakeholder events, phase 1 provided the groundwork to establish connections needed to conduct larger and even more successful stakeholder events. Phase 2 will benefit from and build-on that knowledge to improve the event structures to attract more students, in particular, than in phase 1.

2.3 Academic staff trained and mentored

The training and mentoring of academic and non-academic staff are not only essential to develop a skillset to train and mentor students, but also contributes to the ecosystem building on Beyond 5G technology and entrepreneurship at Higher Education Institutions. To offer training and mentoring opportunities to academic and non-academic staff, project partners in Skills2Scale organized a range of activities such as webinars, peer learning events and local stakeholder events. This range of activities offered an extensive knowledge gaining change for academics without knowledge in the field of Beyond 5G technology.

The idea behind the training and mentoring sessions was to bring academic and non-academic staff together to share knowledge and allow them to gain an understanding on a chosen thematic area. The training was provided through 2 informative and innovative webinars that gave insight from experts into 5G Basics and Technological Advancements and Innovation and Entrepreneurship in the Beyond 5G Industry. One of the goals of the webinar was also to provide mentoring and support to the participants of the webinar, which was beneficial since it enhanced the participants' understanding and application of the knowledge gained. This is a relevant aspect since academics transfer their knowledge to the students they teach who will ultimately benefit from that knowledge exchange.

To facilitate network and collaboration opportunities between academic and non-academic staff from HEIs, 3 interactive webinars were organized. These webinars gave insight into Capacity Building on Start-up Programmes for HEIs, Fostering Deep Tech and Beyond 5G Synergies within RIS3 countries as well as Forging Collaborative Frontiers in a transnational brokerage event. These webinars gave an insight into research activities and collaboration opportunities which creates in combination with the training webinars the right balance of knowledge input and application.

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Since physical events tend to offer better networking opportunities for academic and non-academic staff at HEIs, the physical peer learning events and local stakeholder events were crucial for networking and collaboration between staff.

2.3.1 KPIs Phase 1

In regards to this Key Performance Indicator, the numbers below show that the project output has contributed to exceeding the KPIs set at the beginning of the project. The high number of academics and non-academics trained and mentored was gathered from academic and non-academic participants in webinars and physical regional and local stakeholder events that aimed to train and mentor academics and non-academics at HEIs.

Table 3. KPI Academics trained/ academics mentored

Key Performance Indicator	Target value 2023	Achieved value 2023
Number of academics trained	50	80[1]
Number of academics mentored	15	34[2]

2.3.2 Impact

The amount and range of activities proved successful in phase 1 of the project. Diversity in topics as well as basic training allowed participants from different fields of study to attend, participate and gain knowledge.

The content generated in phase 1 will prove beneficial in organization and facilitating future events. In terms of improvement, longer duration and earlier announcement of the events will attract more participants since working professionals tend to have a busy schedule.

Another aspect that should be taken into consideration in phase 2 is the differentiation between academics and non-academics attending webinars and physical events for the collection of the KPIs. Based on the list of participation, it is difficult to differentiate between internal staff. Therefore, registration sheets need to be more precise in phase.

Lastly a Key Performance Indicator of the project is a minimum 30 % of female participation which is difficult to evaluate since the gender has not always been disclosed in physical and virtual events. For phase 2, it will be relevant to investigate how to improve the reporting structure of gender disclosure of participants in events.

2.4 Non-academic staff trained and mentored

The training and mentoring of academic and non-academic staff are not only essential to develop a skillset to train and mentor students, but also contributes to the ecosystem building on Beyond 5G technology and entrepreneurship

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[1] Number of academic and non-academic staff participating in webinars

[2] Number of academic and non-academic staff participating in regional and local stakeholder events

at Higher Education Institutions. To offer training and mentoring opportunities to academic and non-academic staff, project partners in Skills2Scale organized a range of activities such as webinars, peer learning events and local stakeholder events. This range of activities offered an extensive knowledge gaining change for academics without knowledge in the field of Beyond 5G technology. The idea behind the training and mentoring sessions was to bring academic and non-academic staff together to share knowledge and allow them to gain an understanding on a chosen thematic area.

The training was provided through 2 informative and innovative webinars that gave insight from experts into 5G Basics and Technological Advancements and Innovation and Entrepreneurship in the Beyond 5G Industry. One of the goals of the webinar was also to provide mentoring and support to the participants of the webinar, which was beneficial since it enhanced the participants' understanding and application of the knowledge gained. This is a relevant aspect since academics transfer their knowledge to the students they teach who will ultimately benefit from that knowledge exchange.

To facilitate network and collaboration opportunities between academic and non-academic staff from HEIs, 3 interactive webinars were organized. These webinars gave insight into Capacity Building on Start-up Programmes for HEIs, Fostering Deep Tech and Beyond 5G Synergies within RIS3 countries as well as Forging Collaborative Frontiers in a transnational brokerage event. These webinars gave an insight into research activities and collaboration opportunities which creates in combination with the training webinars the right balance of knowledge input and application.

Since physical events tend to offer better networking opportunities for academic and non-academic staff at HEIs, the physical peer learning events and local stakeholder events were crucial for networking and collaboration between staff.

2.4.1   KPIs in phase 1

In regard to this Key Performance Indicator, the numbers below show that the project output has contributed to exceeding the KPIs set at the beginning of the project. The high number of academics and non-academics trained and mentored was gathered from academic and non-academic participants in webinars and physical regional and local stakeholder events that aimed to train and mentor academics and non-academics at HEIs.

Table 4. KPI Non-academic staff trained/ non-academic staff mentored

Key Performance Indicator	Target value 2023	Achieved value 2023
Number of non-academic staff trained	50	88
Number of non-academic staff mentored	15	42

2.4.2   Impact

The number and range of activities proved successful in phase 1 of the project. Diversity in topics as well as basic training allowed participants from different fields of study to attend, participate and gain knowledge.

The fundamentals created in phase 1 will prove beneficial in organizing and facilitating future events. In terms of improvement, longer duration and earlier announcement of the events will attract more participants since working professionals tend to have a busy schedule. Another aspect that should be taken into consideration in phase 2 is the differentiation between academics and non-academic attending webinars and physical events for the collection of the KPIs.

Lastly several webinars did not ask for the gender of the participants, which is subject to change in phase 2 since the person evaluating would have to assume the gender of the participants to investigate whether the KPI of female participation was met.

2.5   Improved support structures and mechanisms

New and or improved support structures and mechanisms will be established or mobilised by participating HEIs. These structures and mechanisms include innovation testbeds, units, programmes, spaces and infrastructures to support innovation and or entrepreneurship in the institutes.

2.5.1   KPIs in Phase 1

Key performance indicator referring to improvement of support structures and mechanisms was met in phase 1. The consortium improved in total 8 structures and mechanisms, exceeding the set target value of 4. Through the range of activities organised by each partner contributed to the support of start-up structures at higher education institutions.

Table 5. Improved support structures and mechanisms

Key Performance Indicator	Target value 2023	Achieved value 2023
Number of new/improved support structures and mechanisms established within or mobilized	4	8

There were 8 improved support structures and mechanisms in Phase 1:

1. A new acceleration programme for start-ups involved with deep tech in the health care sector was developed by Envolve. The program starts in January, 2024. HEIs will be community partners in the programme.

2. There is a new social impact accelerator programme in Greece that focuses on deep tech organised by Envolve, called EnvolveXL. This was launched on 1st of November, 2023. HEIs will be community partners in this programme.

3. An HEIs collaboration working group under the SERN- start-up Europe regions network was established. The working group will host regular meetings to support the creation of new start-up support programmes. Start-up support services were improved in participating higher education institutes, TUL, UNU, UPV, LU, resulting in 4 additional improved support structures and mechanisms. For clarification, these developments in HEIs were calculated as one improved support structure per institution, although several changes might have been made in order to develop start up support services in each institution. Also, as part of the project's Phase 1 efforts, a deep tech hackathon was created by TUL, adding one more structure and mechanism to the total value achieved during phase 1. These improved and new support structures and mechanisms in HEIs will be described in more detail below.

4. **TUL** Thanks to the Skills2Scale project, the Technical University in Liberec has mobilised *the 5G testbed* - the first testbed in the country for the implementation of the latest Open Core & Ran solutions. The 5G CN was built in cooperation with telecom operator T-Mobile CZ, and the new Open Core & Ran technological solution was implemented by technological company Mavenir (we wrote about it here: https://skills2scale.eu/insight-article-new-5g-private-network-at-technical-university-in-liberec-unique-open-core-ran-solution-for-various-industrial-applicationsinsight-article/). The inauguration of the testbed took place during the 5G Campus Network Innovation Workshop - Technology and Implementation, which we wrote about here: https://tuni.tul.cz/rubriky/univerzita/id:149368/nejnovejsi-kampusova-5g-sit-umoznuje-excelentni-vyzkum-i-pripravu-studentu-na-technologie-budoucnosti.

5. To develop business education, TUL has innovated the curriculum of three courses in three faculties and three study programmes through *the 5G Interdisciplinary Innovation Lab* in collaboration with external partners and companies. Students in the other two faculties have implemented *MOOC* as an optional part of their credit requirements. **A new TUL inter-faculty team**, powered by the Skills2Scale project, is composed of representatives from five faculties. They systematically support capacity building for entrepreneurship education in deep tech/5G and beyond. The members of the capacity building team are mainly academics who are the authors and implementers of 5GIIL at TUL, researchers and teachers of courses that, given their focus, should be prompted towards entrepreneurship in deep tech and 5G and beyond.

6. **UNU.** In the process of implementing the Skills2Scale project, educational courses aimed at accelerating the development of innovation and business have significantly improved. These courses are organized by the Startup Center of UzhNU, which provides support to students, postgraduates, and young researchers up to 35 years old in implementing innovative ideas also conducts training in the fundamentals of business management. Educational courses at faculties involved in the project have also undergone significant transformation, namely: faculties of Physics, Biology, Dentistry, Information Technology, and the Educational-Scientific Institute of Chemistry and Ecology. Specifically, at the Faculty of Physics, these courses will be included in the following specialties: General Secondary Education (Physics), Physics and Astronomy, Cybersecurity, and Biomedical Engineering. The Faculty of Physics has already implemented courses on 5G technologies, such as "Next-Generation Telecommunication Systems and Networks'' and "Mobile Communication Systems" for the Telecommunications and Radio Engineering specialty.

7. **UPV.** During the first Peer Learning Event, held in Valencia, different members of the UPV ecosystem participated, including professors, researchers, and staff from the internal innovation (i2T) and entrepreneurship areas (IDEAS, STARTUPV, Design factory). Although all of them knew each other and their areas for many years, a decoupling or a disconnection could be noticed related to their vision of innovation and entrepreneurship, and the role of academic staff in mentoring the students. Since the UPV is a very large ecosystem, it was agreed that additional communication mechanisms might be needed to overcome the issues detected. It might take time to detect any impact, but at this moment, additional connections among the educational and the innovation and entrepreneurship areas have been established and are now working in dedicated channels to overcome the issues spotted.

8. **In LU** development of start up support services started with discussions held with LUC consortium StartUp Services, which offers guidance and counselling for staff and personnel in University of Lapland and Lapland University of Applied Sciences for those interested in entrepreneurship and establishing their own business. There was also cooperation with the Entrepreneurship studies teachers and lecturers, that can be studied as a minor, in Finnish, at the University of Lapland. Through a local stakeholder event, targeted to students these services and studies were promoted as well as feedback of the reachability and ideas for further development was gathered. Development of these services continues in project phase 2 in cooperation with different faculties of University of Lapland and Lapland University of Applied Sciences. Since, there is a rather small entrepreneurship ecosystem at the University of Lapland, phase 1 of Skills2Scale equipped the university with know-how to grow this ecosystem and provided essential connections across the two universities to continue the cooperation and development of an entrepreneurship ecosystem in phase 2.

2.5.2 Impact

During phase 1 the project partners managed to not only develop existing structures and mechanisms including start up support services, lectures and studies in participating HEIs but also create and mobilise complete new systems to boost innovation and creation of new businesses such as acceleration programmes, hackathons and testbeds. These improvements and developments will foster innovation and business orientation of the students in HEI's, resulting in the interest to start their own business. The impact of these structures and mechanisms spreads also wider, when connected with the business sector and other stakeholders.

2.6   New partnerships established

Additionally, the consortium will establish partnerships with external stakeholders, including industry and government, to empower HEIs and better connect them with the local ecosystems as a result of the HEI Initiative.

2.6.1 KPIs in Phase 1

Total of 26 new partnerships with external stakeholders were established, exceeding the set target value of 8 new partnerships in phase 1. This partnership building between project partners and government, industry and other stakeholders relevant to the Skills2Scale project can be seen as formal cooperation but also less formal, informal partnerships were made through project activities.

Table 6. KPI New partnerships established

Key Performance Indicator	Target Value 2023	Achieved value 2023
Number of new partnerships established as a result of the HEI Initiative	8	26

The **consortium** established the following 4 partnerships:

1. Envolve with ACCIO, Hungarian innovation agency, Business Support Community Centers of Ireland and Acceler8 - to create a joint action plan on how to support EU regions to become stronger in deep tech. All the HEIs in the consortium are community partners in this initiative.
2. Consortium HEIs participate in the official ecosystem as community partners of the Evolved5G project that include 21 organisations from the EU.
3. At the University of Athens, the telecommunication department adopted the MOOC to its programme.
4. WeLead, an organisation that supports women in deep tech in the EU requested the training programmes developed by the project for its alumni network and a dedicated live training from the technical partners of the project that will take place in phase 2.

Partnership building in the participating higher education institutions, TUL, UNU, UPV, LU are described below:

TUL. Within the project activities in the 1st phase of Skills2Scale, **TUL** managed to establish 3 new partnerships with companies and organisations that actively participated in the innovation workshop or the 5G Interdisciplinary Innovation Lab semester project : https://skills2scale.eu/final-pitch-decktul-students-from-three-faculties-join-forces-to-tackle-5g-digital-health-challenges/) - T-Mobile Czech Republic a. s. (https://www.t-mobile.cz/5g), Regional Hospital Liberec a. s., Linet s. r. o. (https://www.linet.com/en), Hardwario s. r. o. (https://www.hardwario.com/). TUL strengthened partnerships with 18 existing innovation partners interested in further collaboration with TUL in science, research and education. These organisations are: Ministry of Industry and Trade of the Czech Republic (5G Alliance: https://www.5galiance.cz/), CzechInvest - National Agency for Entrepreneurship and Innovation: https://www.czechinvest.org/en/About-CzechInvest/About-Us, Technology Agency of the Czech Republic: https://www.tacr.cz/en/, Liberec Region and its Regional Development Agency: https://arr-nisa.cz/en) , EDIH NorthEast consortium (https://www.edih-northeast.cz/), University of Hradec Králové, Research Institute of Textile Machinery, Czech Academy of Sciences - Institute of Plasma Physics (TOPTEC Turnov), Institute of Microelectronics Application IMA s. r. o. (https://www.ima.cz/?lang=en), NullSpaces s. r. o. (https://nullspaces.com/), StatoTest s. r. o. (https://statotest.com/), KMB systems s. r. o.(https://www.kmb.cz/en/),

Mavenir, s. r. o. (https://www.mavenir.com/), Asphericon s. r. o. (https://www.asphericon.com/en/), Digital Economy Network Prague (https://www.digitaleconomy.network/), Skoda Auto a. s. (https://www.skoda-auto.com/), Prettl Automotive Czech s. r. o. (https://prace-prettl.cz/), Ansuz s. r. o. (https://ansuz.cz/)

UNU has identified 12 key stakeholders who actively participated in Phase 1 of the Skills2Scale project, fostering effective collaboration with: Transcarpathian Regional State Military Administration (https://carpathia.gov.ua/news/zakarpatska-ova-stala-steikkholderom-mizhnarodnoho-proiektu-skills2scale-iakyi-vtiliuie-uzhhorodskyi-natsionalnyi-universytet), Department of Social Protection of the Population, Regional Development Agency, Research and Educational Center for Molecular Microbiology and Mucosal Immunology, LLC "Science Park of Uzhhorod National University", Department of the Institute of Mechanical Engineering named after A.M. Pidhornyi of the National Academy of Sciences of Ukraine, LLC "Management Company Industrial Park Uzhhorod", "Fresh Plants LLC", EDIENS, "Marine Design Engineering Mykolayiv", Public Joint Stock Company "Kyivstar", LLC 'ZakarpattyaEnergozbut' (https://zakarpatzbut.energy/pro-kompaniiu/novini/tolk-vziav-uchast-u-pershii-fazi-mizhnarodnogo-proektu-rozshirennia-mozhlivostei-visokih-tehnologii-dlia-zakladiv-vishchoyi-osviti-skills2scale). This collaboration showcases a diverse range of partnerships with government entities, scientific institutions, and private organisations and businesses, highlighting a comprehensive approach to the Skills2Scale project.

UPV is a very large ecosystem, with more than 5.000 professionals. It has a well-established network of connections with external stakeholders, and hence it is hard to state that any of the involved stakeholders did not have any kind of connection before the project was launched. At this moment, UPV can only claim that 1 new connection has been established, with the advisory company 'DCN' https://dcn.es/en/home/. In any case, other 10 stakeholders with varying levels of previous engagement have taken part in the activities of Skills2Scale, among which one can find the regional authority (GVA - https://innova.gva.es/es/), the municipal innovation centre (Las Naves – https://www.lasnaves.com/), SMEs related to Deep tech and 5G (Fivecomm - https://favit.es/, Allot - https://www.allot.com/, Exfo - https://www.exfo.com/es/ , FAVIT - https://favit.es/), accelerators and incubators (Opentop - https://opentop.es/, GoHub - https://gohub.vc/) and telco operators (Orange - https://www.orange.es/).

LU was in contact with external stakeholders that were recognised as key stakeholders of the local ecosystem as part of the ecosystem mapping conducted in project's phase 1. Peer learning events and local stakeholder events were organised in order to create and to strengthen a total of 6 new partnerships. Stakeholders involved in these activities were from local administration: Lapland Chamber of Commerce (https://lapland.chamber.fi/lapland-chamber-of-commerce/), Business Rovaniemi as part of the city of Rovaniemi (https://www.businessrovaniemi.fi/en). There were also new connections made to industry sectors including local incubator Arctic Factory (https://www.arctic-factory.com/english), 5G network operator Telia Finland Oyj (https://www.telia.fi/english), network company Nokia Oyj (https://www.nokia.com/). In addition, there was collaboration with another higher education institute, the University of Oulu (https://www.oulu.fi/en). The events worked as a platform for collaboration that can lead to formalising these established partnerships in the future. Lastly, several other external stakeholders were contacted, and cooperation with them continues in phase 2.

2.6.2 Impact

In summary, phase 1 of Skills2Scale project had a positive impact on external partnership building both at national and international level. Project partners worked together with the business sector, education units outside of the consortium, government and administration to expand and diversify the local ecosystems for 5G and beyond technology. The active efforts of participating HEIs resulted in a variety of new established partnerships that will be further strengthened in phase 2 of the project.

3 Conclusion

Phase 1 of Skills2Scale has been successfully completed. The content generated and the events organised have fostered partnerships between HEIs and external partners as well as accelerated the development of innovations and businesses of HEIs students. Since some HEIs have rather limited capabilities in the field of Beyond 5G and entrepreneurship, phase 1 of Skills2Scale has contributed to the growth of innovation and entrepreneurship ecosystems and improved the quality of innovation and entrepreneurial education at HEIs through the development of training material and acceleration activities.

Throughout phase 1, project partners have facilitated knowledge sharing, upscaling and transferability of innovation between HEIs and innovation communities. Good and effective project management provided the baseline for all internal collaboration as well as effective dissemination.

Phase 1 provided not only the needed training content and ecosystem activities, but has also served as a learning curve for HEIs with limited capabilities to continue growing and disseminating in phase 2 of the project.