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x-Inno Radar

SOFT SKILLS FOR REGIONAL TRANSFORMATION

Comparative evidence from selected non-metropolitan industrial regions

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Executive summary

European industrial regions are undergoing profound transformations driven by digitalisation, automation, artificial intelligence, decarbonisation, and demographic change. These intertwined processes, often referred to as the twin or multi-transformations, are reshaping labour markets, production systems, and regional development pathways. While policy debates and investment strategies continue to focus strongly on technological upgrading and STEM capacities, this report argues that soft skills are a critical, yet under-recognised, pillar of regional adaptive capacity, particularly in non-metropolitan industrial regions.

This transnational comparative report presents findings from the x-Inno Radar project, which explores soft skill landscapes across eight non-metropolitan industrial regions in Central Europe: Chemnitz Region (DE), Province Limburg (BE), Western Slovenia (SI), Eastern Slovakia (SK), Veneto (IT), Upper Austria (AT), Silesia (PL), and Northwest Czechia (CZ). Drawing on a mixed-methods approach, the report combines Eurostat indicators (NUTS2 level), results from an expert survey (n=175), and qualitative insights from regional expert focus groups conducted between 2024 and 2025. The analysis confirms that these regions face shared structural challenges, including population ageing, labour shortages, skills mismatches, and uneven innovation capacities. In many regions, population decline or stagnation is offset primarily by net migration rather than natural increase, while youth disengagement from education and employment (NEETs) remains a persistent issue in some contexts. At the same time, technological and skills transformation pressures are highly uneven, reflecting differences in R&D investment, educational attainment, vocational profiles, and institutional coordination capacities.

Against this backdrop, the report shows a strong and widespread perceived need for soft skill development. Across regions, experts consistently identify adaptability to change, critical thinking, communication, empathy, and strategic thinking as essential skills for navigating ongoing transformations. Notably, while interpersonal skills such as communication and collaboration are often seen as existing strengths, more transformation-enabling skills such as creativity, risk-taking, iterative problem-solving, and sustainability awareness are widely perceived as underdeveloped. Importantly, the findings demonstrate that soft skills cannot be understood solely as individual attributes. Rather, they function as regionally embedded capacities that support coordination, collective learning, innovation, and institutional adaptability. However, data on soft skills at the regional level remains largely absent, forcing reliance on proxy indicators (e.g. lifelong learning participation) and qualitative evidence. The x-Inno Radar survey and focus groups therefore provide a rare empirical window into how soft skills are perceived, developed, and constrained in industrial regions.

The report also highlights significant institutional and governance gaps. While all regions host actors and formats relevant to soft skill development such as universities, chambers of commerce, adult education centres, non-profits, maker spaces, and entrepreneurial programmes, cooperation between these actors is often fragmented or poorly visible. More than half of survey respondents report limited awareness of how regional actors collaborate on soft skill development. Moreover, an analysis of Smart Specialisation Strategies (RIS3) shows that soft skills are rarely articulated as explicit strategic objectives, instead remaining implicit within innovation or education measures. This gap is particularly pronounced in Eastern Slovakia and Northwest Czechia, though it is present across all regions to varying degrees. Taken together, the findings suggest that soft skill gaps operate on multiple, interconnected levels: individual (missing competencies), organisational (mismatches between work requirements and training), and regional (fragmented ecosystems and limited institutional coordination). Addressing these gaps therefore requires moving beyond short-term training initiatives towards place-based, integrated soft skill strategies that align education, labour market, innovation, and regional development policies.

A. Introduction

Industrial regions are undergoing major transformations driven by rapidly advancing technologies, digitalization, and the decarbonisation of the economies. These interconnected processes are often also referred to as the "twin transition", Industry 4.0 or multi-transformations. Within this rapidly changing context soft skills are becoming increasingly important, both as a way to foster regional capacities for adaptation and innovation, but also to complement and balance the growing reliance on automation, robotics, and artificial intelligence. Against this backdrop, we are running x-Inno Radar – a collaborative Interreg Central Europe project that focuses on strengthening soft skills in non-metropolitan industrial regions in order to help them navigate and actively shape ongoing industrial transitions.

What are soft skills?

There is currently a lot of curiosity and disagreement on what constitutes soft skills. They tend to appear under other related concepts such as human skills, social skills, 21st century skills, and transversal skills. There are also many definitions, and various attempts to create more comprehensive soft skill frameworks by academic researchers, the European Commission and UN bodies (e.g. UNESCO), the OECD, but also actors such as the World Economic Forum. This leaves us with the impression that there is an increased importance placed on the role of soft skills, yet the field itself is rather messy and inconclusive.

Very broadly, **soft skills can be defined as non-technical skills that enable individuals to dynamically adapt to new challenges, solve problems, successfully work and interact with others, learn, and manage themselves (Zahn et al., 2024).** Simply put, these are learned abilities and personal attributes that are useful in virtually any job or life context – as opposed to technical or job-specific skills. Soft skills can be subcategorized as Interpersonal Skills that help us effectively relate to others (e.g. communication, teamwork, leadership), and Intrapersonal Skills that help us deal with our own cognitive and emotional responses (e.g. critical thinking, adaptability, persistence). Simply put, soft skills help us to navigate challenges and thrive in various contexts, including the work setting. Perhaps the most comprehensive, yet largely complex framework out there is the European Skills, Competences, Qualifications and Occupations (ESCO) framework. Various soft skills are outlined under this framework but due to its complexity they are spread across different sub-categories (e.g. under both Transversal skills & Competencies and Skills). Whereas the ESCO framework is aimed at providing a comprehensive list and categorization of all kinds of skills and competencies essential to the European labour market, for the purpose of x-Inno Radar, we created a more focused framework to explore soft skill landscapes in industrial regions. We therefore focus on ***three distinct yet closely related categories of soft skills:*** Transversal skills, Maker skills, and Entrepreneurial skills (see Figure 1 below for details).

Figure 1. Subcategories of soft skills in x-Inno Radar

WHY ARE SOFT SKILLS ESPECIALLY IMPORTANT IN INDUSTRIAL REGIONS?

The project x-Inno Radar is particularly interested in the soft skill landscapes of non-metropolitan industrial regions. In such regions, soft skills are especially important for several reasons. We situate our interest in the experiential knowledge of working with various actors in industrial contexts who tend to excel in hard, technology-oriented skills, whereas soft skills are considered as "good to haves." Yet, research shows that these skills are in fact crucial for employability in manufacturing industries, with employers emphasizing their importance alongside technical skills (Rasul & Puvanasvaran, 2009). Communication, problem-solving, teamwork, and entrepreneurial skills are identified as particularly valuable here (Rasul et al., 2014). However, many graduates often lack these essential soft skills, leading to difficulties in securing employment (Nur Syafiqah binti Ab Aziz et al., 2023). Studies across different manufacturing sectors consistently highlight the significance of soft skills, with teamwork and communication ranking among the most important (Nur Syafiqah binti Ab Aziz et al., 2023; Miduk Purba et al., 2020).

Beyond manufacturing itself, a growing body of research shows **that soft skills correlate strongly with employment status, income levels, and job satisfaction, often more so than hard skills.** For example, a large-scale study identified 56 foundational skills for the future of work, with self-confidence and coping with uncertainty ranking as the most critical (Dondi et al., 2021). Similarly, data from 2023 shows that transversal skills are among the most demanded in online job ads across the EU27, with willingness to learn and teamwork highlighted as especially valued (CEDEFOP, 2024). Moreover, Píša argues that in order to initiate new projects and strengthen entrepreneurial efforts in old industrial regions, individual agents of change need to mobilize soft skills (2023), illustrating how these competencies support local development efforts beyond formal industrial settings.

Literature also indicates that **socio-cultural behavioural traits and regional entrepreneurial cultures vary across places**, influencing how soft skills are developed, valued, and applied locally. Differences in community culture and entrepreneurial ethos shape regional development trajectories, as regions with distinct cultural profiles can exhibit varied levels of innovation, risk-taking, and collective action, which in turn can affect the prominence and mobilisation of soft skills (Clifton, 2011; Gherhes et al., 2020; Huggins, Dixon & Thompson, 2025). In the time of rapid technological advancement that places ever growing demands for tech-related and digital skills, we emphasize the equally pressing need for soft skills development as an essential step in ensuring successful regional development, especially in already tech-savvy industrial regions.

AIMS AND GOALS FOR THE COMPARATIVE OVERVIEW REPORT

This report offers a comparative overview of the contemporary socio-economic and soft skills landscapes in x-Inno partner regions. We base the results and analysis on a combination of relevant Eurostat data, x-Inno Radar survey screening results, and the inputs from regional expert focus groups. Placing these findings in comparison enables us to better understand the regional similarities, differences and potential future challenges as well as solutions in the context of soft skills development based on empirical data. It also enables the regions to better understand their positioning through the assessment of existing strengths and weaknesses, which partner regions they could approach for learnings and tips, and who they could offer their knowledge and good practice examples to. This report serves as a comprehensive overview of empirical findings within the project, a data-informed insight for current and future work of partner regions in the context of soft skill development, and as a useful read for anyone (e.g. other region-representatives, researchers, and practitioners) interested in further exploring the role of soft skills in regional development (especially in the context of multi-transformations, and/or experiences of industrial regions).

B. x-Inno Radar regions

Introducing selected regions

The report relies on the data and insights collected within the eight partner regions of the x-Inno Radar project which we briefly introduce in the paragraphs below. Important mentioning is that, while we base most of our research and findings on the regional level (NUTS2), the project partners do operate from specific localities within the NUTS2 regions as follows:

Project Partner	Region (NUTS2)	Operates from
Association of Cultural and Creative Industries Chemnitz and Region (Creative Chemnitz)	Chemnitz Region (DED4)	Chemnitz
Stebo Competence Centre Community Development	Limburg Region (BE22)	Genk
Business support centre, ltd. Kranj	Western Slovenia (SI04)	Kranj
Creative Industry Košice, n. o.	Eastern Slovakia (SK04)	Košice
Padova Chamber of Commerce, Industry, Crafts and Agriculture	Veneto (ITH3)	Padova
Creative Region Linz& Upper Austria Gmbh	Upper Austria (AT31)	Linz
Regional Development Agency in Bielsko-Biała	Silesia (PL22)	Bielsko-Biała
The Regional Chamber of Commerce of the Karlovy Vary Region	Czechia Northwest (CZ04)	Karlovy Vary

Table 1: List of project partners (org. names), region and base from which they operate.

Chemnitz region

The Chemnitz region (NUTS2/DED4), one of three NUTS 2 regions in Saxony, covers a total area of around 6,522 square kilometres and includes the city of Chemnitz and the districts of Erzgebirge, Mittelsachsen, Vogtland and Zwickau. With around 1.526 million inhabitants, it is characterised by a diverse economic structure with a strong industrial core. Chemnitz has developed from its historical role as 'Saxony's Manchester' as a traditional industrial area into a modern technology centre. Mechanical engineering, the automotive supply industry and microtechnology are important economic sectors. Numerous medium-sized companies and research institutions, including the Chemnitz University of Technology, promote innovation. The demographic change and the emigration of young people represent challenges. The unemployment rate is above the national average, but below the average for eastern Germany. The region offers attractive tourist destinations with the Ore Mountains, the Vogtland and numerous cultural sites. The designation of Chemnitz as the European Capital of Culture in 2025 promises new impetus for the entire region.

Province Limburg

Limburg (NUTS2/BE22) is the easternmost province of Flanders, Belgium – bordered by the Netherlands to the north and east, and the Belgian provinces of Liège, Flemish Brabant, and Antwerp. The Meuse River defines its eastern boundary, and much of Limburg is part of the Campine region, characterized by sandy soils and pine forests. The capital city is Hasselt. Covering an area of 2,422,31 km², Limburg is divided into three administrative districts: Hasselt, Maaseik, and Tongeren, comprising a total of 38 municipalities. The province is known for its rich history. It has been inhabited since prehistoric times. The Romans established the city of Tongeren – recognized as Belgium's oldest city – due to its strategic location along major trade routes. Limburg's economy evolved from agriculture and trade in antiquity to coal mining in the 19th and 20th centuries, before transitioning to a service- and technology-driven economy today. Major economic sectors driving the regional development today are manufacturing, logistics & distribution, and service & knowledge economy.

Western Slovenia

Western Slovenia/Zahodna Slovenija (NUTS2/SI04) is the country's most developed region, encompassing the capital Ljubljana and key cities such as Kranj, Koper, and Nova Gorica. It borders Italy to the west and Austria to the north, benefiting from its strategic position along major European trade routes. Historically, the region's economy has been shaped by commerce and industry, with significant growth in the 19th century driven by railway expansion and industrialization (e.g. mining and manufacturing). This period saw an increase in trade and urbanization, setting the foundation for its modern economic landscape. Today, Zahodna Slovenija covers an area of 8,061 km²and boasts a highly diversified economy, well-developed infrastructure, and strong cross-border economic integration. Its proximity to Western Europe supports economic dynamism, facilitating innovation, investment, and access to international employment. Major economic sectors today are manufacturing, service and knowledge economy, and tourism.

Eastern Slovakia

Eastern Slovakia/Východné Slovensko (NUTS2/SK04) is a region in the eastern part of Slovakia, covering 15727 km²and bordering Poland, Ukraine and Hungary. The region comprises the administrative regions of Prešov and Košice. Historically, the region contained an important trade route between northern and southern Europe. Historically its industrial development focused on steel production, and machinery, while today its economy combines automotive, metal industry, logistics and growing ICT and service sectors. Tourism is also becoming increasingly important thanks to the national parks (High Tatras, Slovak Paradise), numerous thermal spas and UNESCO World Heritage Sites such as the historic town of Bardejov and the wooden churches. Despite its favourable geographical location and rich cultural heritage, Východné Slovensko is struggling with economic challenges, infrastructural deficits and emigration.

Current regional policy is focussed on improving infrastructure, promoting sustainable industries and tourism as well as integrating the Roma minority.

Veneto Region

Veneto (NUTS2/ITH3), in northeastern Italy covers 18.407 km², representing 6.1% of Italy's total area of 302,073 km². It`s structured in 7 provinces. Veneto borders Austria to the north and Trentino-Alto Adige/Südtirol to the northwest. Venice is the regional capital, while Verona is the largest city. Veneto has been inhabited since prehistoric times, with major Roman-era developments in Verona and Padua. Its strategic location along trade routes fostered economic growth. In the Middle Ages, the Republic of Venice dominated Mediterranean commerce and politics. The region's geography includes the Dolomites in the north, rolling hills centrally, and fertile plains extending to the Adriatic Sea. The Po and Adige rivers provided key waterways supporting trade and agriculture. In the 19th century, Veneto expanded its railway and industrial zones, transitioning from an agrarian to an industrialized economy. Today, it is one of Italy's wealthiest regions, with strong industry, services, and tourism attracting visitors and investors.

Upper Austria

Upper Austria/Oberösterreich (NUTS2/AT31), Austria's third most populous state, is situated in the northern part of Austria, sharing borders with Germany and the Czech Republic. Covering 11,982 km², it features a diverse geography of Alpine foothills, fertile plains, and major rivers like the Danube. Historically, the region has been inhabited since prehistoric times, with evidence of Celtic and Roman settlements and early economic activities centred on salt mining and agriculture. Its strategic location along the Danube River facilitated economic and trade development during the Middle Ages. Over the centuries, Upper Austria evolved into a national industrial leader, particularly known for mechanical engineering, metal processing, and high-tech industries. Today, the region maintains a balance between traditional craftsmanship and modern industry, with a growing emphasis on the creative economy and technological innovation.

Silesia

Silesia/Śląskie (NUTS2/PL22), is a voivodeship in southern Poland and extends over 12,333 km², bordering the Czech Republic and Slovakia. It is Poland's most urbanized and industrialized region. Historically, its strategic location fostered trade and industrial growth, especially in coal mining and steel production during the 19th century. The region's well-developed infrastructure, including extensive rail and road networks, has been pivotal in its economic development. In recent decades, Śląskie has undergone significant economic diversification, transitioning from heavy industry to a more varied economy – investing in logistics, technology and services, but also in education. While its infrastructure remains a key advantage, air pollution and land degradation from past industries pose environmental challenges. Regional policies now focus on sustainability and innovation to maintain competitiveness within both national and European contexts.

Northwest Czechia

Northwest Czechia/Severozápad (NUTS 2/CZ04) in the northwest of the Czech Republic, comprises the Karlovy Vary and Ústí nad Labem regions. Covering 8,649 km², it shares a border with Germany. This positioning has historically facilitated cross-border trade and industrial interactions. The region's economic history dates back to prehistoric human settlement, but its modern development accelerated with industrialization. The presence of significant coal deposits led to extensive mining and heavy industry during the 19th and 20th centuries, making it a centre of energy production and manufacturing. However, the post-socialist transformation in the 1990s resulted in economic restructuring, which made it necessary to diversify the economy. Since then, efforts have focused on revitalising the economy by investing in infrastructure, education and promoting new industries such as renewable energies in order to reduce unemployment and promote sustainable growth.

Region-based socioeconomic overview

Table 2. Basic socio-economic markers across selected partner regions.

Region (NUTS-2)	Population (2024)	Median Age (2024)	Tertiary Education Attainment (2024)[1]	Regional Assets / Important Capacities	Regional Challenges / Missing Capacities	Economy
Chemnitz (DED4)	1,396,049	51.8	27%	Strong STEM base: mechanical engineering, micro-technology, computer science.	Shortage of skilled workers; high outmigration; above-average school dropout rate; ageing population.	GDP lower than national average. Manufacturing above national average in GVA. Employment rate: 77.4%; unemployment rate: 5.8%.
Prov. Limburg (BE22)	904,311	48	38.8%	Service- and technology-driven economy; strong in biotech, renewable energy, and smart manufacturing; steady population growth.	Skill shortages; ageing population; need for digital transformation in manufacturing; supply-chain disruptions and material shortages.	GDP per capita higher than national average. Service sector dominates; manufacturing and agriculture follow. SMEs and self-employed form economic backbone. Employment rate: 71.6%; unemployment rate: 3.2%.
Northwest Czechia (CZ04)	1,106,246	44.6	17.3%	Historical mining and heavy industry; diversification underway including renewable energy. Strong education in engineering, manufacturing, and	Slight population decline; ageing population; lower life expectancy; outmigration of skilled labour; low tertiary educational attainment.	GDP per capita below national average. Traditionally coal mining, chemicals, energy, and manufacturing; growing service, tourism, and small-scale manufacturing sectors. Employment rate: 70.5%;

[1] People of working age

				environmental tech. Lifelong learning increasing.		unemployment rate: 5.8%.
Silesia (PL22)	4,217,521	44.5	38.4%	Well-developed infrastructure; diversified economy in logistics, technology, services, and education. Strong vocational and educational infrastructure.	Population decline; ageing workforce; youth outmigration; high internal relocation, low international migration; brain drain.	GDP in line with national average. Service and technology sectors expanding; major manufacturing hub (especially automotive). Employment rate: 71.3%; unemployment rate: 2.5%.
Upper Austria (AT31)	1,530,349	43.5	33.8%	National industrial leader: mechanical engineering, metal processing, high-tech industries. Strong R&D and innovation ecosystem; high investment in green and digital technologies; strong lifelong learning culture.	Labour shortages and ageing workforce; rural depopulation; rising energy costs; 65+ age group growing rapidly; low-skilled labour at risk.	GDP slightly below national average. Major manufacturing output (precision engineering, automotive, metalworking). SMEs (80%) and global players drive innovation. Employment rate: 76.5%; unemployment rate: 3%.
Veneto (ITH3)	4,852,216	49.2	21.7%	One of the wealthiest regions; strong industrial, service, and tourism sectors. Education focused on technical and vocational training, applied tech, STEM,	Population shrinking despite immigration; low tertiary attainment (especially men); ageing workforce; labour shortages; competitiveness challenges; need for technological renewal in	GDP well above national average. Strong industrial and manufacturing sector; vital service sector (commerce, tourism). Employment rate: 70.4%; unemployment rate: 4.2%.

				arts, and music.	manufacturing.	
Eastern Slovakia (SK04)	1,587,883	40	24.7%	Growing tourism; strong engineering and manufacturing education; vocational training important; STEM promotion increasing.	Brain drain; low educational retention among minorities; low tertiary attainment; infrastructure deficits; structural labour market problems.	GDP below national average. Heavy industry and metallurgy (US Steel a key employer); diversification toward automotive, electronics, and IT services. Creative industries emerging. Employment rate: 63.5%; unemployment rate: 9.8%.
Western Slovenia (SI04)	1,012,263	44.2	38.8%	Most developed region; diversified economy; well-developed infrastructure; robust education system; strong STEM, IT, and innovation support from government and private sector.	Urban-rural economic disparities; gender pay gap; persistent outmigration.	Slovenia's economic powerhouse; GDP well above national average. Service sector dominates (finance, ICT, tourism); high-tech manufacturing crucial. Employment rate: 74%; unemployment rate: 3.5%.

C. Literature overview

In the light of ageing populations across Europe coupled with ongoing technological transformations such as major advances in AI-powered automation and robotics as well as green transitions, the question of skill capacities and needs, current and future, is now being intensely discussed by researchers, practitioners, and relevant policy makers on national and supranational level. We can see such interest materialized in the Commission's launching of the **European Skills Agenda for sustainable competitiveness, social fairness and resilience** in 2020 outlining 12 flagship actions that aim at boosting the joint action (on EU level) in order to maximize the impact of skills investment (EC, 2020). What followed this step is the introduction of national-level strategies such as the National Skills Strategy in Germany (ger. Nationale Weiterbildungsstrategie NWS) or the Integrated Skills Strategy in Poland (pl. Zintegrowana Strategia Umiejetnosci - ZSU). Relevant to the work of x-Inno Radar is the **acknowledgment of the importance of transversal and entrepreneurial skills in the policy context, as emphasized in Action 7 of the EU Skills Agenda** - Increasing STEM graduates and fostering entrepreneurial and transversal skills. In Action 7, the importance of STEM fields in driving the twin transitions is recognized, and simultaneously the need for entrepreneurial and transversal skills to accompany such large-scale transformations while fostering human affinities such as empathy, collaboration, and adaptability.

Cedefop's long-term skills forecasts show that demographic ageing and technological change are gradually shifting the European labour market towards less routinized, more autonomous forms of work, and increasing demand for interpersonal, analytical, and problem-solving skills across sectors (Cedefop, 2018). Combined evidence from skills surveys and online job advertisements study further reveals that **employers consistently prioritise soft skills such as teamwork, communication, adaptability, and critical thinking across a wide range of occupations, including in traditionally industrial and technical roles** (Cedefop, 2019). Big-data analyses of online job vacancies demonstrate that **soft and digital skills are increasingly bundled within employer expectations**, with new indicators capturing the rising need for "digitalness" and "greenness" of jobs as the multi-transformations continue to affect a broad range of occupations (Cedefop, 2025). Thus, the Cedefop research evidence underscores that soft skills are not peripheral but central to workforce adaptability - particularly for workers in industrial regions undergoing rapid technological restructuring.

In recent years, academic research has shown a growing interest in **the role of agency in transformation and change, especially in industrial contexts** (Boschma, 2017; Grillitsch & Sotarauta, 2020). To exercise agency, which is often a collective endeavour, regional actors need specific skills and competences such as self-reflectiveness, self-regulation and forethought (Bandura, 2001). Moreover, Huggins and Thompson (2023) show that **the emergence of new regional development paths relies on strong strategic networks and shared agency across firms, organisations, and individuals**. Their behavioural approach to regional development highlights the role of "cultures of possibility" or mind-sets and decision-making capacities associated with optimism, creativity, adaptability, trust, and a sense of efficacy as a way of shaping how regions navigate uncertainty and avoid stagnation (Huggins, Dixon & Thompson, 2025). This underscores the importance of soft skills not only at the individual level but as part of a wider regional capability system.

Looking at the micro-level agency, Píša (2023) demonstrates how**, in old industrial regions, "individual agents of change" mobilise personal and social resources such as creativity, flexibility, motivation, interpersonal trust, and collaboration to push for small-scale initiatives and community projects.** Importantly, knowledge capacities coming from outside the region often matter more than formal

education in shaping individuals' capacity to act, while informal support networks commonly compensate for the institutional shortcomings. However, without regional-level coordination, these spaces of agency remain fragmented, which in turn highlights the need to align soft-skill-based individual initiatives with broader institutional frameworks (Píša, 2023). This is particularly relevant for non-metropolitan industrial regions where isolated innovation efforts often fail to scale.

However, the focus on regional, place-based development and the role of (soft) skills in driving it, remains scarce. Corradini et al. (2023) argue that **current skills-relevant policies have been mostly focusing on the labour supply-side and are treated as place-neutral - which in turn fails to echo the dynamic and changing nature of skills demand across territories.** Authors in turn propose a novel, integrated framework for regional skills policy built on three major aspects: I. Horizontal skills platforms that would enable shared skills to bridge across interrelated industries; II. Dynamic policies and institutional mechanisms that actively adapt to current and emerging skills needed for new but related industrial paths; and III. A systemic institutional approach that can make connections between main actors in skills ecosystems and the broader regional industrial strategy (Corradini et al., 2023). This argument is valuable for the x-Inno Radar project in that it emphasized the need for place-based approaches, with attention on the usefulness of soft skills that can support such dynamic transformational processes, but also how they can support the cross-sector mobility of workers, and development of institutional capacities for adaptation at the regional level — all of which matter for non-metropolitan, industrial-legacy regions currently navigating the so called twin-transitions (digital and green). As part of x-Inno Radar we aim to echo Corradini and colleagues' call for more focus on place-based experiences and collaborative knowledge exchange and sharing across industries and regions.

Relatedly, in an article from 2021, De Propris & Bailey examine pathways of regional transformation as part of Industry 4.0, and suggest that the ability of a techno-industrial local system to transform itself is based on three crucial capabilities: the innovation capabilities, the docking capabilities and the translational capabilities. Of particular interest here is the latter **- translational capability of a region - which refers to a region's capacity to access and absorb radically new technologies, and to envision new ways of applying them which combine place-based available knowledge with new ones** (De Propris & Bailey, 2021). This finding is greatly relevant for the role of soft skills such as creativity, resourcefulness, adaptability, and opportunity recognition in supporting technological transformation on a regional level.

In another recent study, De Propris et al. (2024) examine the case study of Emilia Romagna region in Italy and argue that **regional policy makers hold an important role in designing policies that are effective in ensuring a just transition**, offering tools and processes that are tailored around the specific needs of their region. The authors go on to offer a model of just transition defined as a "triple transition" that requires digital, green, and importantly, a competence and skill transition which transversely cuts across industries, jobs, and professions (De Propris et al., 2024). In a similar vein, Obermayer et al. (2024) argue that, based on a relationship analysis, **soft skill development is a crucial step for companies making sure that their human labour has the skills fitting to make successful use of the digital transformation**. The study found that digital and soft skills such as critical thinking, complex problem solving, adaptability, resilience, and creativity are essential to successful utilization of the digital transformation (Obermayer et al., 2024).

Therefore, the recent research studies point to the potentially crucial role of soft skill development as an integral part of the successful and just (regional) digital and green transformations. In a more concrete example, Goulart et al., (2021) argue that **higher education institutions need to go beyond the transfer of knowledge and technical qualification in IT, and focus on promoting a holistic education that incorporates personal development goals, especially the development of social and emotional skills.** Their study found that IT managers tend to prioritize soft skills such as entrepreneurial vision, creative

ability, holistic vision, collaboration, ethics, and social responsibility over technical skills while educational institutions (in emerging economies like Brazil) tend to focus on development of technical skills mainly (Goulart et al., 2021). This points to the increasing challenges of the gap between the comprehensive and changing needs of the industry and what the educational institutions deem important.

Another important context where skills development plays a role is that of people not in employment nor in training (so-called NEETS). In a recent study based in Portugal, Ribeiro et al. (2025) evaluated the results of a project called NEETMAKER - program for young NEETs of ages 20-34 which aimed to foster the upskilling and employability of young people who currently neither study nor work, with a special focus on STEM related fields. One of the major findings of their study is that **young people living in rural areas may enhance their employability via non-formal individually-tailored training that fosters experiential learning, entrepreneurial and soft skills.** The authors show ways in which the NEETMAKER programme had a positive impact on the participants, helping them to find employment, sense of agency, and create new business ideas, and importantly to acquire a "maker" mentality and a sense of belonging to a community of "makers" (Ribeiro et al., 2025). This last finding resonates strongly with the x-Inno Radar approach, which dedicates special focus to the role of maker skills such as resourcefulness, innovativeness, improvisation and networking, especially in the context of non-metropolitan regions. Moreover, developing one's sense of agency through relevant soft skills such as self-regulation, opportunity awareness, problem solving and more is a central concern of x-Inno Radar which is in line with the recent research presented here.

Building on these research insights, it becomes clear that understanding the role of transversal, entrepreneurial, and maker skills in industrial transformation requires attention to how such capacities emerge, are supported, and where they remain insufficient across different territorial contexts. The literature points to ongoing skill mismatches, uneven institutional capacities, and place-based challenges that shape both the demand for and development of soft skills in industrial regions, while reliable data on soft skill capacities at the regional level is practically non-existent. To address these gaps and ground our analysis in the lived realities of non-metropolitan regions, **x-Inno Radar turns to the following guiding research questions.**

- *How are soft skills needs shaped by the digital, green, and socio-demographic transformations affecting non-metropolitan industrial regions? (Context)*
- *What characterizes the soft skills development ecosystems across non-metropolitan industrial regions - in terms of existing regional strengths, provision, and institutional cooperation? (Strengths)*
- *What soft skills are considered lacking in regional labour markets and in most need of development, and how do these capacities differ across regions? (Gaps & Needs)*

D. Methodology & data

As the field of soft skills and their relevance for industrial transformation and regional development in non-metropolitan areas is still underdeveloped, we decided to do an exploratory study in eight European regions in the frame of the x-Inno Radar project (for a list of the participating regions please see Section B above).

To answer the above outlined questions, we used a mixed method approach whereby we utilize the outcomes of an exploratory online survey on regional soft skills landscapes, as well as relevant data gathered mostly from the Eurostat database. We also made use of qualitative data gathered in regional

focus groups as a way of bringing place-based knowledge and perspectives into the picture. More detailed insights into the methodology and data is as follows.

x-Inno Radar Expert Survey

The x-Inno Radar survey (https://survey.x-inno-radar.eu/) was conducted as a way to explore the soft skills landscapes in project partner regions, with the perspective of enabling the use of the survey tool and results for other European regions at a later point of time. The survey was targeting two groups – the experts and the general public. The expert version relevant to this report captures the assessment, needs, offers, and collaboration around soft skills in the respective regional contexts. Experts were defined as respondents who reported already having offered some form of soft skills training or self-reporting existing knowledge on the topics. Project partners were encouraged to distribute the expert survey in their regional/professional networks. Full expert survey can be found in the Appendix.

The survey included 175 participants from eight European countries listed in the figure depicting country distributions. Most expert respondents actually came from project partner regions. Detailed breakdown of participant location per NUTS2 and NUTS3 level can be found in the Appendix. We regard the regional-level number of survey responses as indicative or exploratory and not necessarily representative. There is a moderate risk of representative bias due to the way the survey was disseminated – the project partners were strongly encouraged to share the survey among the expert focus group members and in their professional circles. The survey was disseminated between December 2024 and March 2025 – the first phase of the x-Inno Radar project.

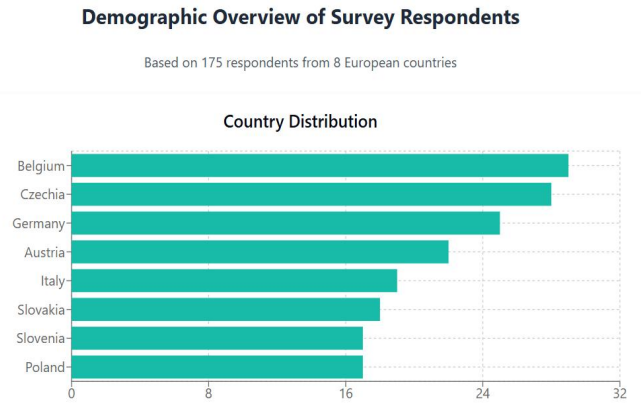
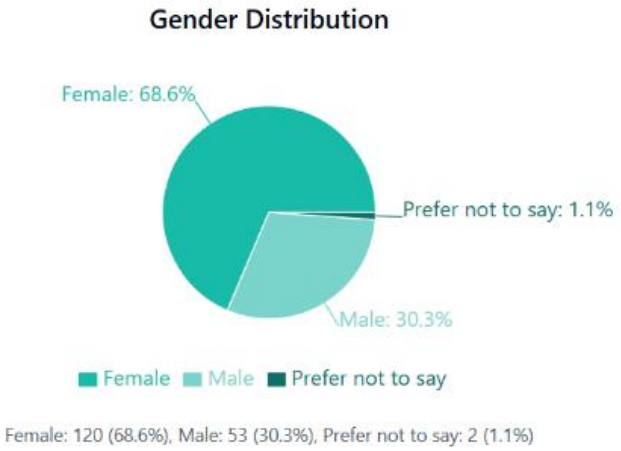


Figure 2. Demographic overview of survey respondents



Gender distribution among survey respondents shows **overrepresentation of people who identified as female over those identified as male or not specified**. In Poland, all respondents identified as female making the sample less representative. Majority of respondents fall into the age group of 31-50 years old, followed by 51-65 years old. Majority of respondents identify as manager and administrative staff, followed by CEOs and self-employed.

Figure 3. Gender distribution among survey respondents.

Educational level among survey respondents is overwhelmingly skewed towards the **highly educated** whereby over 70% of respondents report having a university degree. This is not surprising given the focus on expert respondents. Fields of work among survey respondents vary with majority of expert respondents being from Business Consultancy, Education and Creative Industry backgrounds.

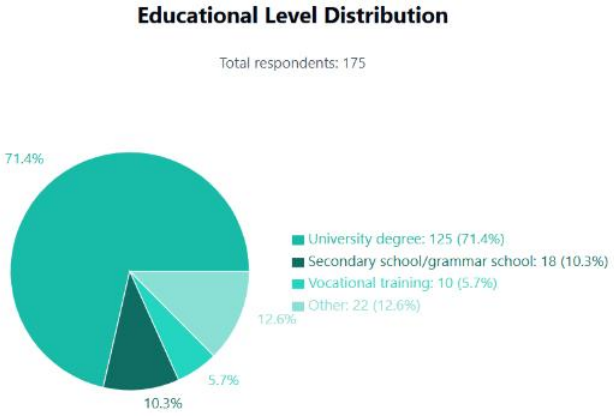


Figure 4. Educational Level of survey respondents.

Eurostat Data & Toolbase

In order to study soft skill landscapes and their role and potentials in the context of the major technological transformations in non-metropolitan regions, we made use of various data from Eurostat database which helped us assess the current socio-economic and political profiles of the relevant regions. This data was used to establish **eight regional profiles relevant to our partnership which can be browsed on the x-Inno Toolbase** (Toolbase x-Inno Radar). This in turn informed our work on soft skills development by helping us identify specific place-based strengths and challenges.

To illustrate the initial situation of the regions in terms of various topics such as population, economy, education, infrastructure, and social indicators, the statistical data is displayed graphically as **interactive charts.** To keep the chart system as flexible and expandable as possible, while also ensuring efficiency in handling multiple regions, we decided to develop and program a semi-automated workflow that retrieves relevant statistical data directly from Eurostat, filters and processes it according to predefined criteria, and then imports it into the Toolbase as ready-to-use chart code.

The **chart code itself is developed with the assistance of AI technology**, which not only generates the visualization code but also briefly analyses the data to identify key trends and noteworthy patterns. To ensure that all charts maintain a consistent visual appearance, display meaningful data correctly with appropriate scales and formatting, and are therefore directly comparable across different regions, the chart evaluation and design for each topic is first carefully modelled and refined for a designated model region. This validated model is then provided to the AI as a reference example and template for generating charts for additional regions.

With this innovative tool and workflow, we can very quickly and almost automatically import comparison charts for new regions into the system, significantly reducing manual effort while maintaining high quality standards and consistency across the entire dataset.

Expert Focus Group Insights

Project partners have established regional expert focus groups in the first phase of the project with the intention of a continuous knowledge exchange on the topic of soft skill landscapes and development**. Insights and best practices from the groups' regular meetings are used in this report** as a qualitative input supplementing the x-Inno survey and metadata outputs where fitting. In particular, we make use of FG reports summarizing the key findings and also the outcomes of a short survey conducted in 2025 with partner representatives who are involved in ongoing focus group work.

E. Results and analysis

In this section, we outline results of the x-Inno Radar Expert Survey, Eurostat data analysis and the focus group inputs. In order to make sense of the data and answer questions that drive this report, we approach the analysis in a thematic manner. Based on the driving questions, we identified three core themes which we considered most relevant for our project regions that we elaborate on in the sections below:

1. Contextualization	2. Soft Skills Landscapes	3. Gaps & Needs
We address the regional challenges in the light of multiple transformations (global and local) & how they drive the need for soft skills	We address the relevant soft skills capacities and ecosystems of cooperation in which they develop	We address which gaps and needs are important to consider in the context of soft skill development

Table 3. Core themes addressed in the findings section below.

1. Global multi-transformations and regional challenges

Global demographic and technological shifts are reshaping societies in ways that particularly affect non-metropolitan, industrial regions. Population ageing driven by longer life expectancy and declining fertility rates in many parts of the world results in less people of working age and thus rising pressure on labour markets, pension schemes and more (UN Statistics, 2023; WHO, 2025). This dynamic is especially acute in the European Union, where fertility rates fell from 1.53 in 2011 to 1.38 in 2023 (the average number of children per woman), far below the replacement rate of 2.1 (sufficient for a population to replace itself in the absence of migration), leading to negative natural change. Nevertheless, overall the EU-27 population has continued to grow due to in-migration, adding around 6 million people since 2015 (Eurostat, 2024). Alongside demographic change, global megatrends such as digitalisation and rapid technological advancement shape regional development in uneven ways and intensify the need for both continuous technological upskilling and for soft skills that support adaptability, collaboration, and navigating uncertainty (Cedefop, 2018; OECD, 2019, 2023; De Propris & Bailey, 2021; Obermayer et al., 2024).

Based on existing literature, relevant statistical indicators, and the x-Inno expert survey results, we identified three major streams of regional development challenges in the current multi-transformation context:

(1) Labour market transitions

(2) Technological and skills transformation and

(3) Institutional and adaptive capacity challenges.

In the following subsections, we first address these structural challenges before turning to how soft-skill landscapes (Section 2) and soft-skill gaps and needs (Section 3) interact with them.

1.1. Labour market transition challenges

DEMOGRAPHIC TRENDS IN X-INNO REGIONS

Population development

By looking at x-Inno partner regions, we learn that population development is not a uniform process but differs across regions. In most regions the population is steady to slightly decreasing, while more noticeable decrease is seen in Silesia, Eastern Slovakia, and Chemnitz Region. Noticeable population growth is witnessed in Upper Austria and Prov. Limburg.

Importantly, population growth in most regions is due to net migration rates while natural growth rates are either steady or decreasing. In the figures bellow is an example of two partner regions in comparison where we can see how in Chemnitz region the total population change (natural change and net migration) is close to zero, yet on a rise since 2020. This rise is strongly driven by the net migration, whereas the natural growth is on a steady decline since 2012. In Upper Austria, the total population growth follows the net migration rates, as the natural growth rate remains relatively stable over the years. We can also observe sudden peaks in population growth, hereby attributed to the incoming refugee populations. These population dynamics are important to approach in a place-based manner as they pose different development challenges and needs for flexible strategies for dealing with them within the regions, including the process of re-and upskilling of the workforces during multi-transformational processes.

Figure 5. Population change Chemnitz region.

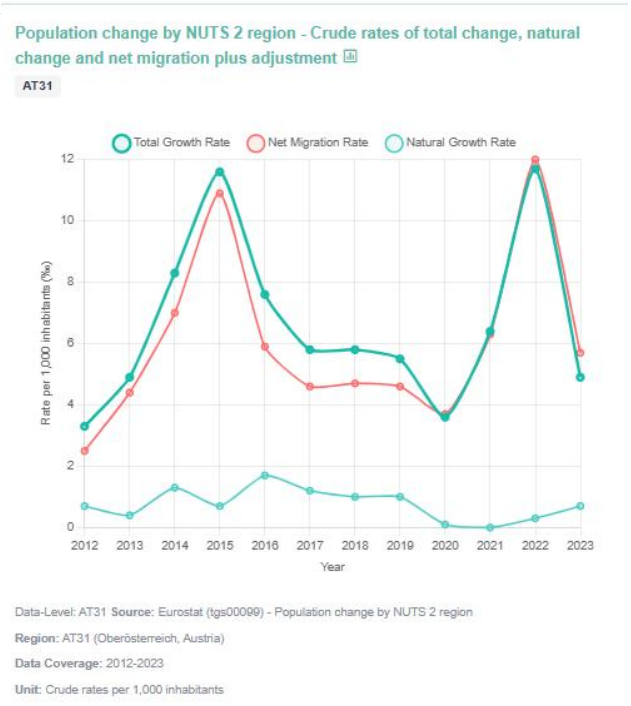


Figure 6. Population change Upper Austria.

Median age & aging regions

As for the median age of the populations, which helps us understand the aging pace on the EU level, during the last 2 decades the median age of the population has increased by 5.4 years, up from 39.3 years on 1 January 2004 to 44.7 years by 1 January 2024. Among our partner regions (see Figure 7), the median age comparison is as follows: Chemnitz Region has the highest median age (51.8) followed by Veneto

region (49.2) in 2024, whereas Eastern Slovakia the lowest median age of 40, followed by Upper Austria with 43.5 (both below EU average). Rest of the regions cluster around the EU-average (44.7). These results can be outcomes of different population structure changes (e.g. less people born vs more people reaching old age, higher rates of young people migrating outwards vs higher rates of older people migrating inwards etc.). Overall, these numbers give an indicator of the severity of aging processes which in turn pose various challenges to the future of regional development and adjustment to multi-transformations due to the strong changes in the working-age people compositions, new pressures on the pension systems and similar.

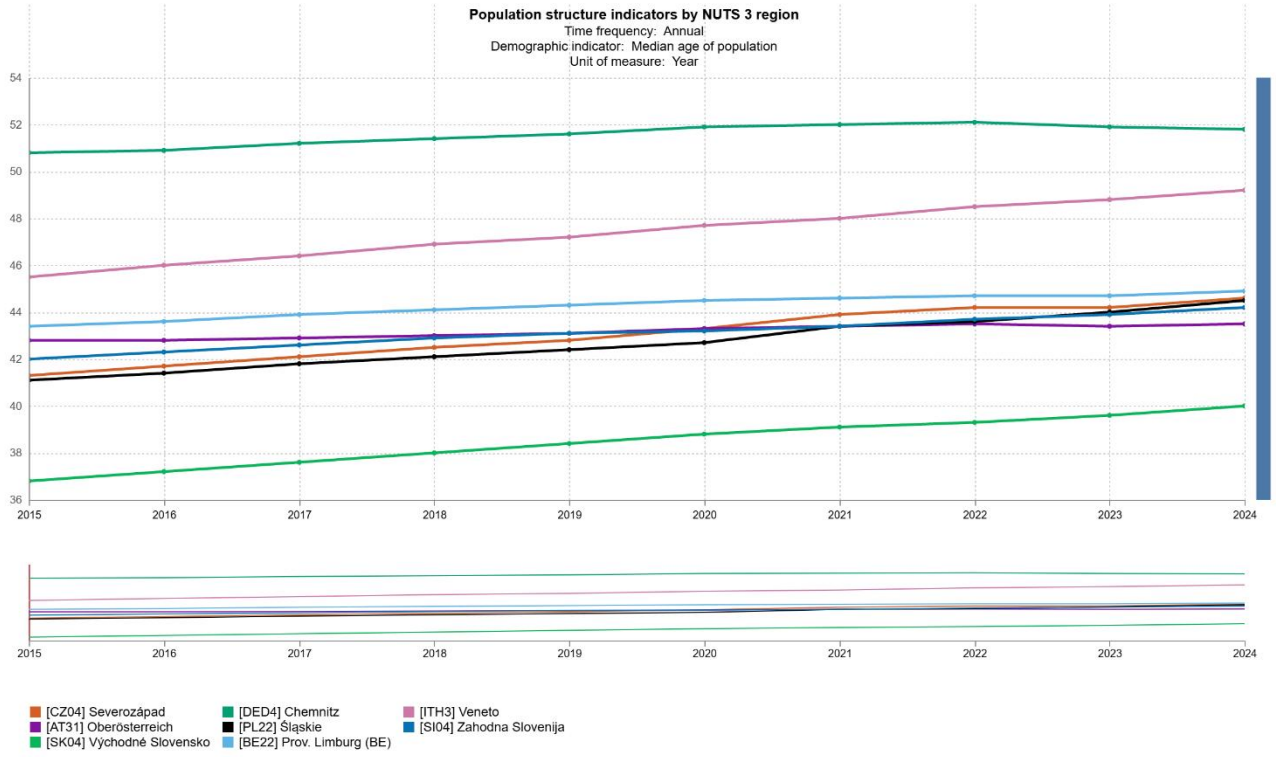


Figure 7. Median age of population over time, across regions.

Labour supply & youth transition challenges

Another Eurostat indicator helping us gain the picture of the regional labour market transition challenges is the NEET indicator or the percentage of people (aged 15-24) which are neither in (formal or informal) education or training or in employment[2]. Compared to other partner regions, Eastern Slovakia has the highest percentage of NEETS - a total of 15.5% in year 2024 (and in last 10 years). Prov. Limburg on the other hand has a steady decrease of NEETS in the past 10 years and only 3.5% in year 2024, which is the lowest percentage compared to other partner regions. Rest of the regions score between 5.2% in Silesia to 10.3 percent in Northwest Czechia in year 2024 (Eurostat). These indicators give us a sense of how

[2] Regional NEET indicators compared can seen in Figure 8 below. Data for Chemnitz region are missing.

(dis)connected or engaged young people in the regions are to the labour market and learning/upskilling systems. Although speculative, high percentage of NEETs in Eastern Slovakia can indicate both a landscape of missed opportunities for (various) skill formations and a strong need for improvement of these indicators by creating better infrastructures and motivating young people to engage in learning and skill formation at a higher rate. Existing soft skill utilization and further development can play a crucial role here as suggested by Ribeiro et al. (2025) in their work on NEETS in rural areas.

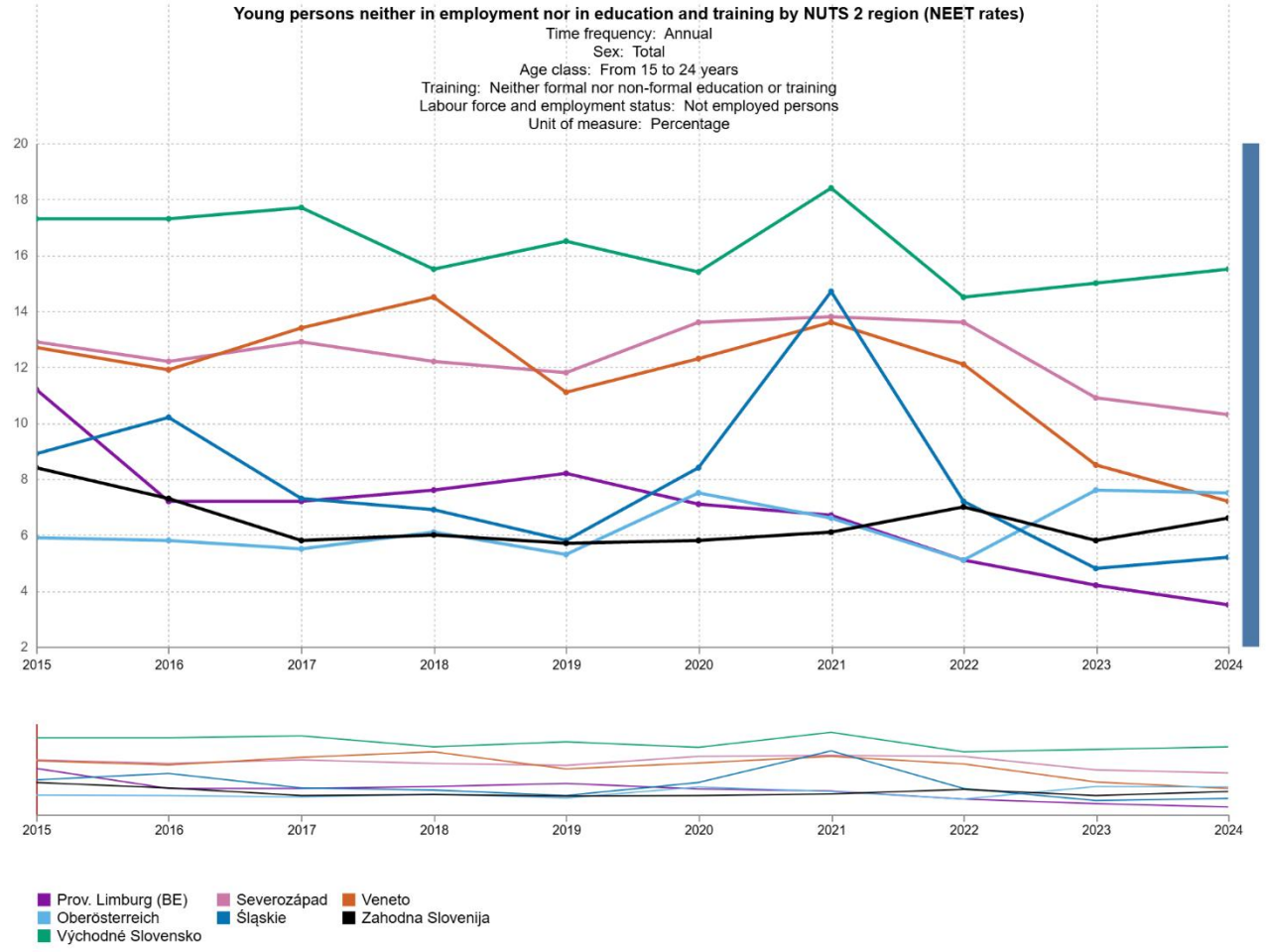


Figure 8. NEET rates over time and across regions.

CHALLENGES IN THE PERCEPTION OF EXPERT RESPONDENTS

The regional experts' perceptions of major challenges that affect the economy and development of their regions vary considerably, pointing to the unique complexities of regional challenges, and the need for

place-based approaches to skills development (Corradini et al., 2023). A figure that stands out as a shared challenge across the regions is related to the ***demographic challenges*** which reflects the Eurostat data on aging populations across Europe and similar struggles that come along such as insufficient labour replacement supply and relatedly lack or mismatch of skills, necessary for keeping up with socio-economic needs (see section above). According to the x-Inno survey, ***demographic change*** was reported as the main regional challenge in Chemnitz (68%) and Silesia (58.8%), and second most important in Northwest Czechia (44.4%). Relatedly, **the *outmigration of qualified workforce*** was reported as the main challenge in Northwest Czechia (83.3%) and Western Slovenia (53.6%).

1.2. Technological and skills transformation challenges

ADAPTATION CAPACITIES ACROSS REGIONS

Keeping up with megatrends such as the use of advanced technologies—including automation, robotisation, and artificial intelligence—as well as broader digitalisation and an increasing emphasis on sustainability across industrial and social contexts poses significant challenges to regional adaptation. These challenges tend to manifest unevenly across regions, depending on existing industrial structures, skills endowments, and political and institutional capacities (Boschma, 2017; Grillitsch & Sotarauta, 2020). Research shows that industrial and post-industrial regions adjust to such megatrends in markedly different ways, shaped by their underlying knowledge bases, innovation systems, and restructuring capacities (Boschma, 2017; Martin & Sunley, 2015; OECD, 2023). While the major transformations of our time are still unfolding and therefore difficult to assess in their full impact, selected quantitative indicators can help outline current regional adaptation landscapes. These include, among others, levels of research and development (R&D) capacity, educational attainment, and participation in vocational education and training, which together provide proxies for regions' abilities to absorb, generate, and apply new knowledge.

Research and innovation capacity (GERD)

One key indicator frequently used to assess regional innovation capacity is Gross Domestic Expenditure on Research and Development (GERD) at NUTS2 level. GERD captures total R&D expenditure across all sectors of performance—including business, government, higher education, and private non-profit organisations—as a percentage of gross domestic product (GDP). A comparison of GERD values across the x-Inno partner regions (Figure 9) reveals substantial variation: in 2017, Upper Austria recorded the highest GERD value (3.48), followed by Western Slovenia and the Chemnitz region, while North West Czechia and Eastern Slovakia displayed the lowest levels, at 0.30 and 0.53 respectively (Eurostat, 2025). These differences indicate markedly unequal capacities and support infrastructures for research, development, and innovation among the partner regions.

From a regional development perspective, such disparities are highly relevant, as the literature consistently highlights R&D capacity, education systems, and vocational training structures as interrelated pillars of regional adaptability. Regions with stronger knowledge-generation infrastructures and higher investment in innovation are generally better positioned to diversify economically, adopt new technologies, and reorient industrial pathways (Boschma, 2017; Crescenzi & Rodríguez-Pose, 2011; Grillitsch & Sotarauta, 2020). Conversely, regions with weaker R&D intensity often face greater difficulties in restructuring, making them more vulnerable to technological disruption and external shocks (Martin & Sunley, 2015; OECD, 2023). Importantly, however, innovation and adaptation do not depend on technological capacity alone: institutional coordination, skills formation systems, and the ability to mobilise actors across sectors play a crucial role in translating knowledge and investment into meaningful transformation. These interdependencies underscore why technological and skills transformation must be

understood as a structural regional challenge—one that sets the context for the soft skill landscapes, gaps, and needs analysed in the following sections.

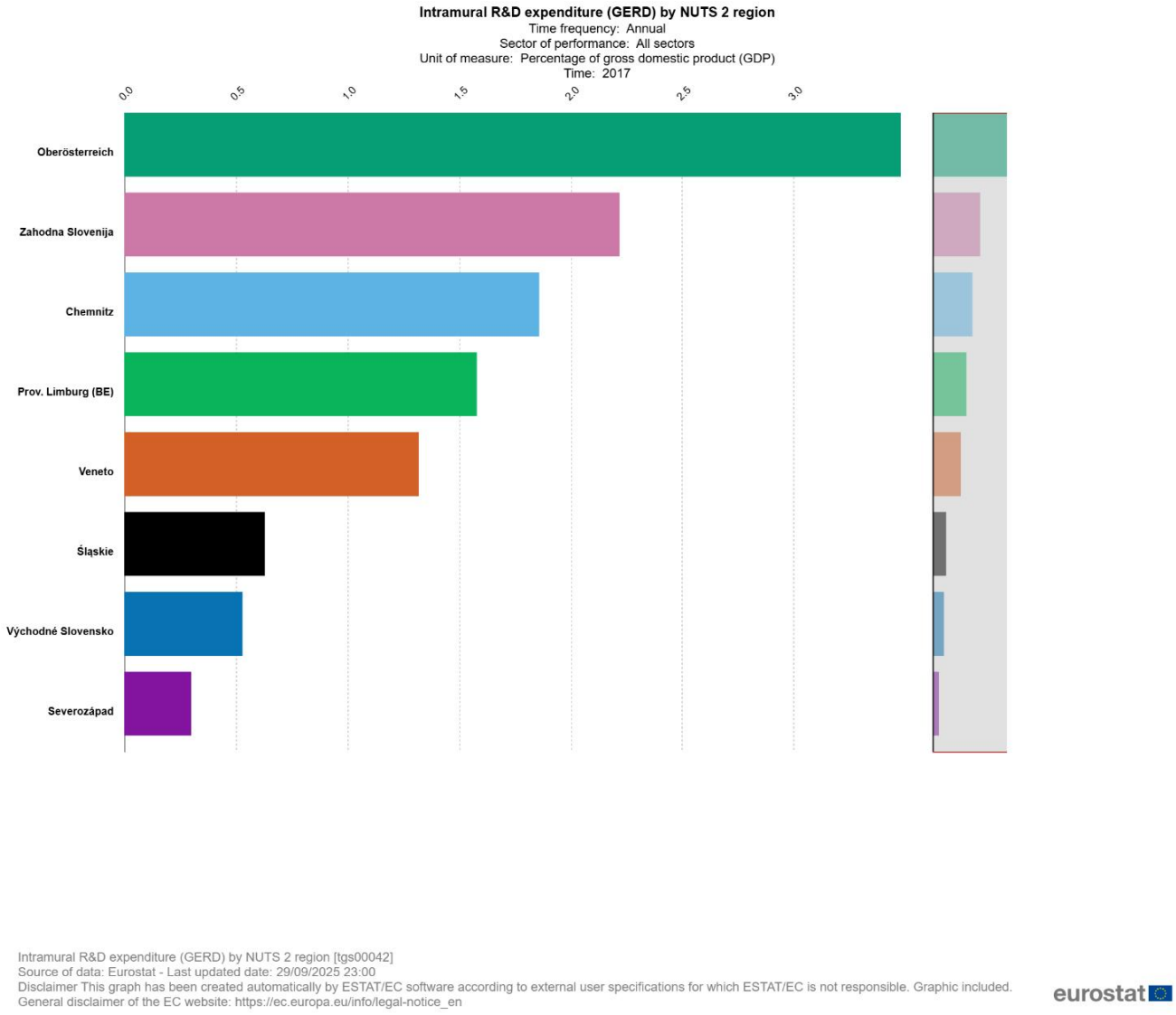


Figure 9. GERD scored across regions.

Non-tertiary educational attainment

Educational attainment of the population can help us understand the knowledge base needed to pursue innovative solutions and meet the (new) skill demands in the regions.

Eurostat data shows stark differences in educational attainment across the selected partner regions. In 2024, Veneto had a significantly higher proportion of people aged 25-64 who have ***less than primary, primary or lower secondary education*** – exactly 30.3%., whereas for Chemnitz region and Silesia the proportions are much lower than in other partner regions with 5.5 and 4.1% respectively. Relatedly, when looking at population with ***upper secondary and post-secondary non-tertiary education*** (levels 3 and 4, including vocational training) we see Northwest Czechia having the highest proportion of 71.2% of people aged 25-64 in 2024, Chemnitz and Eastern Slovakia following with 67.2 and 65.1%, and Prov. Limburg and Veneto at the bottom with 49.2 and 47.9%.

Tertiary educational attainment

In terms of ***tertiary education attainment***, data in comparison (Figure 10) shows that Western Slovenia (38.8%), Prov. Limburg (38.5%), and Silesia (36.6%) have the highest percentage of people aged 25-64 with highest level of education in 2024. In comparison, Northwest Czechia and Veneto regions have some of the lowest figures among partner regions with 17.3% and 21.7% respectively. These numbers are continuous affected by various factors including the out and in-migration of highly educated individuals, but the overall development in the last decade can be observed in the figure below. Important mentioning is that district in Northwest Czechia where our project partners are based - Karlovy Vary – is the only district without a higher education institution within the partnership, however, there are solid efforts to improve the situation through cooperation with German Universities in the border region as well as University of Plzen.

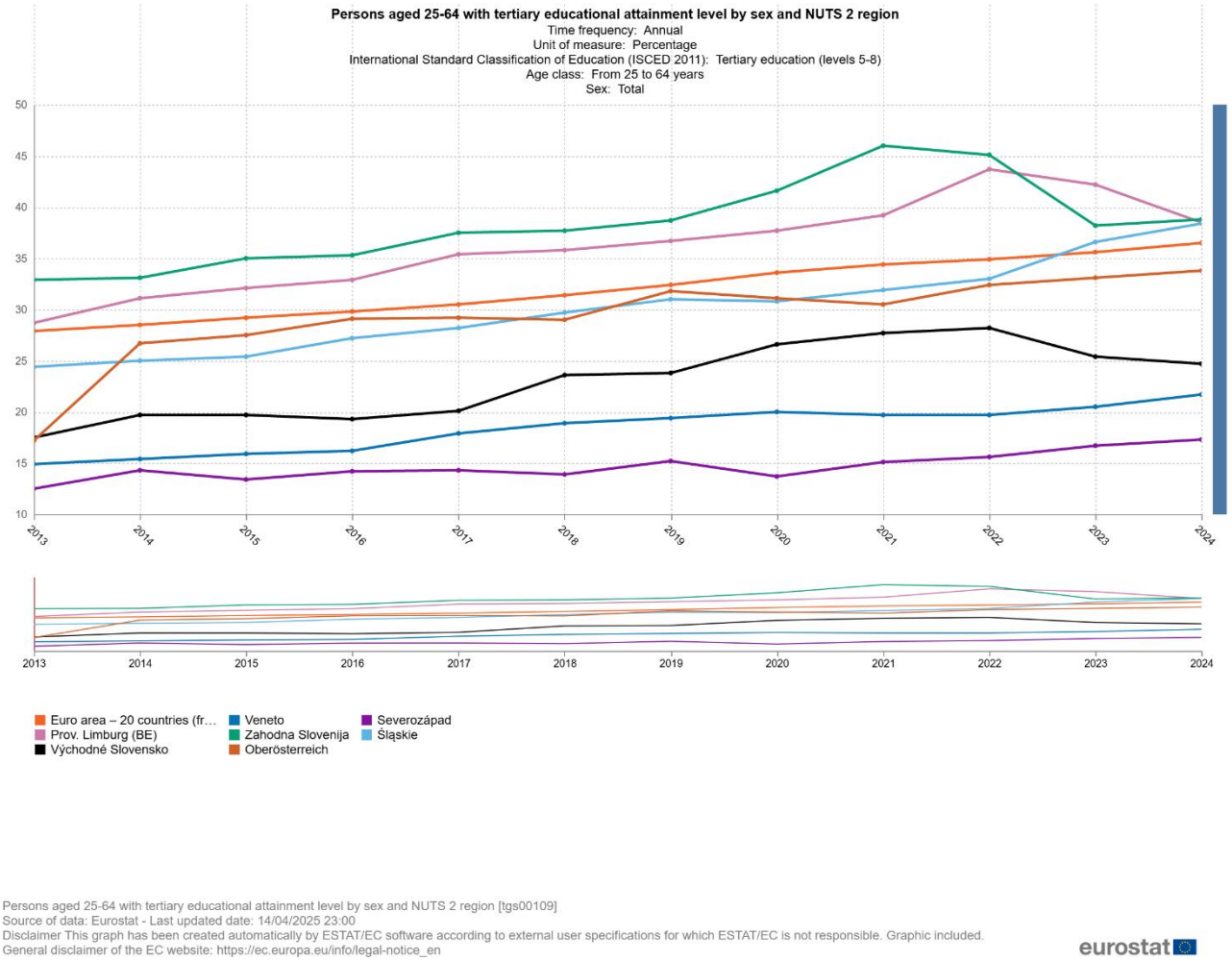
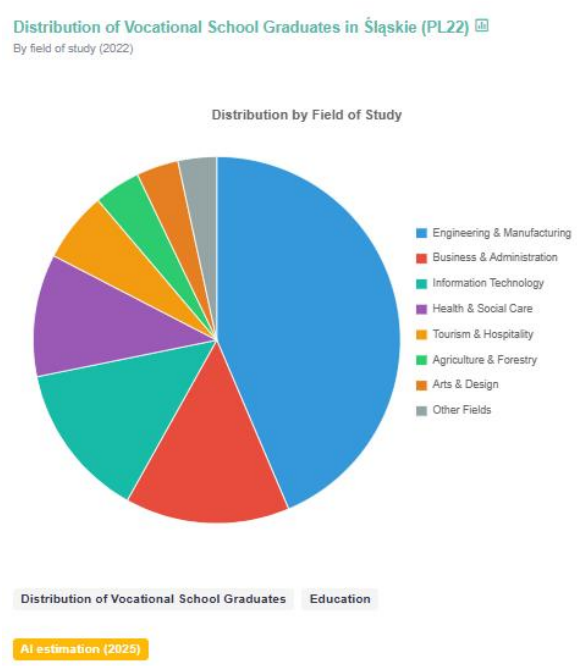


Figure 10. ***Tertiary education attainment*** *over time, across regions.*

In times of rapid technological transformations, these numbers give us an idea of potential development challenges given the existing knowledge and skills resources in terms of how educated/skilled regional populations are, but also point to the possibilities and room for place-informed re/upskilling.

Vocational education and training profiles (fields of study)

Moreover, looking at the distribution of ***vocational school graduates*** by fields of study help us in completing the picture (see Figures 11 and 12). For example, we used AI estimation to create an approximate picture for partner regions, and perhaps not surprising for industry-dominant regions and those with strong industrial heritage, the results show overall dominance of Engineering and Manufacturing graduates, followed by the Business and Administration fields across the regions. However, regional differences exist. In the figures below, we showcase two partner regions in comparison: whereas in Silesia region almost half of all vocational school graduates are estimated to be in Engineering and Manufacturing, in Veneto region a large proportion of them are in Tourism and Hospitality (second biggest field of study). These findings help us gain a broad insight into the regional existing knowledge and skills capacities.



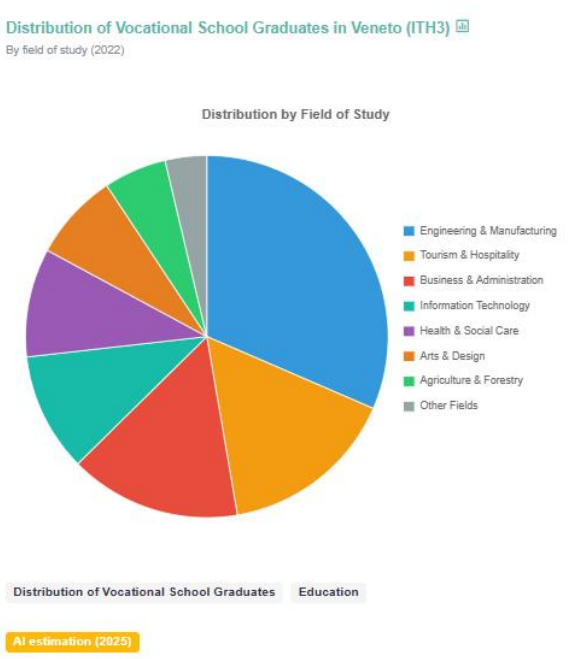


Figure 11. Vocational school grads by field, Silesia. Figure 12. Vocational school grads by field, Veneto.

CHALLENGES IN THE PERCEPTION OF EXPERT RESPONDENTS

Keeping up with digitalization was reported as the main regional challenge in Upper Austria (50%), and second most important in Prov. Limburg (44.8%) and Chemnitz (44%), which supports the argument that global transformative processes (including digitalization) are affecting regional development. Another commonly mentioned challenge is that of ***mismatch of skills and work requirements***, reported by 51.7 experts in Prov. Limburg, and 47.1% from Western Slovenia and 44.4% in Veneto (marked as top main challenge in the last two regions). This finding is interesting because these two regions are in stark contrast to each other in terms of high educational attainment ("highly skilled people") with Slovenia counting highest percentage of all partner regions, and Veneto as second lowest. But these two regions are similar in other ways like for example the important role of Tourism and Hospitality as an educational and economic field. In Sections 2 and 3 we return to this question by asking which soft skills are seen as missing and how they might help to close these gaps.

1.3. Institutional and adaptive capacity challenges

Institutional capacity is one of the key factors shaping how regions respond to multi-transformations. Throughout this report, we touch upon some quantitative indicators relevant to institutional readiness such as Research & Development investments (GERD indicator), participation in lifelong learning, and labour market activity among young people (via NEETs). These indicators give us some insights into regional adaptive capacities (and potential challenges). That is why we now turn to existing studies, our survey results, and importantly, the insights from focus group and regional concepts gathered in the period 2024-2025. We thereby aim to capture more in-depth and region-driven insights on institutional practices and challenges in the context of regional development and multi-transformations.

Institutional readiness and regional strategies

From a regional development perspective, institutional readiness refers to the ability of the governance systems to formulate coherent strategies, mobilise resources, and coordinate actors across policy domains (Crescenzi & Rodríguez-Pose, 2011; Grillitsch & Sotarauta, 2020). Research in regional development emphasises that institutional capacity and policy coherence are decisive for regions' ability to adapt to structural change and avoid being stuck in established structures, particularly in old-industrial contexts (Crescenzi & Rodríguez-Pose, 2011; Boschma, 2017). It is further suggested that skills - especially social and relational skills - can be understood not only as individual attributes but as regionally embedded capacities that support convergence, coordination, and collective learning (Leite de Castro & Azzoni, 2025; Buyukyazici et al., 2024).

Within the EU policy framework, Smart Specialisation Strategies (RIS3) are a central instrument intended to strengthen such capacities by aligning innovation, education, and regional development priorities. However, the x-Inno Radar **analysis of relevant RIS3 documents indicates that soft skills are rarely articulated as explicit strategic objectives.** Instead, they often appear implicitly or are assumed to be embedded within innovation or education measures, rather than addressed as a distinct component of regional adaptation capacity. This finding resonates particularly with the situation in **Eastern Slovakia and Northwest Czechia**, where focus group participants noted that while strategies emphasise sectoral development and technological upgrading, **soft skills receive limited attention in formal policy frameworks**. In some other regions, such as Upper Austria and Western Slovenia, the RIS3 strategies refer a bit more clearly to transversal, maker or entrepreneurial competences, mostly in the context of innovation and human capital.

Cooperation cultures and enabling infrastructures

Across the x-Inno Radar partner regions, focus group findings consistently identify **cooperation as a key institutional condition for successful transformation**, echoing research which highlights collective capacity, coordination, and trust-building as central to regional adaptation under conditions of uncertainty (Crescenzi & Rodríguez-Pose, 2011; Grillitsch & Sotarauta, 2020). Cooperation was described not as a short-term or purely interpersonal practice, but as a structurally embedded feature of regional governance that requires shared objectives, stable framework conditions, and institutional support. Focus group experts from Upper Austria and Province Limburg emphasised that **continuous cross-sectoral collaboration between public administrations, companies, education providers, and civil society actors is increasingly important** for managing demographic and technological transformation in non-metropolitan and industrial contexts.

Effective cooperation was seen to depend strongly on the availability of physical, cognitive, and organisational infrastructures that enable interaction and learning across institutional boundaries. This aligns with findings that regions' capacities to respond to megatrends depend not only on industrial structures and skills, but also on institutional capacities and innovation infrastructures (Boschma, 2017; Martin & Sunley, 2015). In Upper Austria, participants pointed to **established maker spaces, innovation labs, and hybrid cultural-industrial venues as important "translation spaces" that support experimentation and trust-building.** In Chemnitz, Veneto, and Western Slovenia, comparable infrastructures exist but were described as more fragmented and project-dependent, limiting their long-term stabilising effect. On the other hand, Northwest Czechia and Eastern Slovakia report more fragmented institutional landscapes, where cooperation relies heavily on informal networks, project-based partnerships, and cross-border collaboration to compensate for limited higher education or innovation infrastructures.

Beyond structures and networks, **regional cultures and institutional mind-sets emerged as significant challenges.** Focus group experts across Upper Austria, Veneto, Silesia, Czechia, and Slovakia pointed to **resistance to change and limited awareness of the relevance of soft skills among decision-makers** and intermediaries. This reflects broader arguments that transformation processes are shaped not only by material investments but also by cultural readiness, leadership capacities, and the ability to foster new development narratives (Huggins & Thompson, 2023, 2024).

Finally, **resource constraints and governance conditions were repeatedly identified as barriers to institutional adaptation.** In Eastern Slovakia and Northwest Czechia, limited financial and time resources, combined with administrative complexity and short-term funding cycles, were described as undermining long-term cooperation and strategic planning. Such constraints resonate with evidence that institutional capacity and policy coherence, rather than economic structure alone, shape regional abilities to implement relevant place-based transformation strategies (Crescenzi & Rodríguez-Pose, 2011; Maucorps et al., 2023). Finally, the focus group participants stressed that continuous policy support through stable funding (Prov. Limburg) and reduced bureaucracy (Eastern Slovakia), and better alignment between education, labour market, and innovation policies (Veneto) is essential for strengthening institutional adaptive capacities of industrial regions.

Challenges in the perception of expert respondents

Findings from the x-Inno survey complement the above mentioned dynamics and challenges. When it comes to the main challenges facing the regions, ***inadequate adaptation to change*** **scored relatively high in most regions**, with highest in Silesia (47.1%) and lowest in Upper Austria (13.6%). Keeping in mind the above mentioned roles of institutional aspects of transformation, this finding supports the argument of limited readiness for ongoing and future demands of multi-transformations in industrial, non-metropolitan regions. This might relate to available human resources, knowledge base and skills availabilities in respective regions, but also to **political and institutional readiness**, and existing innovation capacities and infrastructures (Crescenzi & Rodríguez-Pose, 2011; Maucorps et al., 2023).

In this section we learned from the examples of selected industrial regions that they are facing and navigating complex challenges including demographic and labour market pressures, uneven innovation and educational structures, and institutionally constrained adaptation capacities. In the next section, we move on to outline the existing soft skills landscapes, and how they are cultivated and mobilised within these challenging regional sites.

2. Regional soft skill landscapes in comparison

Now that we have mapped and identified major challenges, we turn to the core of the x-Inno Radar inquiry – exploring the role of soft skills in the context of multi-transformations and regional development challenges. Some pressing questions here relate to how soft skills can contribute to regional development, especially in the light of major challenges we have outlined in the sections above. Moreover, which soft skills in particular are considered essential here? And importantly, how and where are those skills fostered?

2.1. Soft skill development & transforming industrial regions

Demand for soft skills

Based on the x-Inno survey, in seven out of eight regions, experts report an ***increased demand for soft skill development in their work environments***, having the ongoing digital and green transformation as a backdrop (see Table 4). In the case of Western Slovenia, respondents report that the demand is same or decreasing making it a stark outlier across the eight partner regions. The percentage of respondents reporting the same need for soft skills development on the regional level is slightly higher than when considering their work environment with highest in Veneto – 55.6% and Western Slovenia – 52.9%. Highest percentage of respondents who report that the need for soft skills will decrease in their region was in Northwest Czechia – 25% and Western Slovenia (17.6%).

Region	Work Environment: % Seeing Increase	Region: % Seeing Increase
Upper Austria	90.9%	63.6%
Prov. Limburg	86.2%	79.3%
Severozápad	57.1%	50.0%
Chemnitz	80.0%	76.0%
Veneto	63.2%	42.1%
Śląskie	82.4%	94.1%
Východné Slovensko	77.8%	55.6%
Zahodna Slovenia	47.1%	23.5%

Table 4. Percentage of respondents who report an increasing demand for soft skills development in their work environment (Q5) and region (Q6).

Overall, survey results point to a ***strong perceived need for soft skills development in work and regional environments***, but it is also important to consider what experts think the outcomes of stronger soft skill capacities should be.

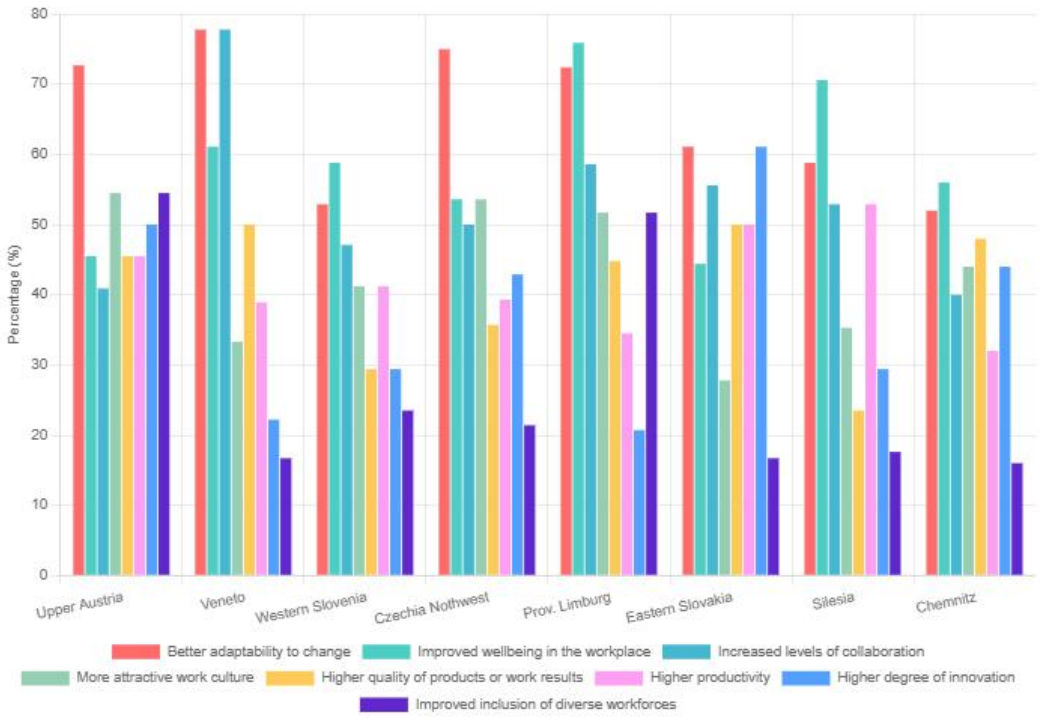
Desired outcomes of soft skill development according to experts

When asked to explain what outcomes should soft skill development ideally bring into their work environment (see Figure 13), ***better adaptability to change*** has been rated as the top desired outcome in several regions (Upper Austria, Veneto, Northwest Czechia, and Eastern Slovakia) and second most desired outcome in the rest of the regions (Western Slovenia, Province Limburg, Silesia, and Chemnitz).

This result aligns with various predictions of the future expectations from workers to adapt to a rapidly changing nature of jobs and flexibility in switching between industries, as well as with the claim that soft skills are useful in backing up successful transformation processes (CEDEFOP, 2018; Corradini et al., 2023).

Another desired outcome that scored high across the regions was ***improved wellbeing in the workplace*** with highest scores in Prov. Limburg and Silesia followed by Veneto, Chemnitz region and Western Slovenia. This could be related to the perceived lack of skilled workforce and the necessity to not only provide jobs but high-quality jobs with incentives to keep workers and employees in transforming regions. The same is true for the claim ***More attractive work culture*** which scored highest in Upper Austria, Northwest Czechia and Prov.Limburg. ***Improved inclusion of a diverse skill force*** was considered as a less important outcome of soft skills development in all regions besides Upper Austria and Prov. Limburg. This could be related to particular high immigration rates in these two regions (Eurostat) and therefore such aspect of diversity management and inclusion may be of great interest in this context. Other reasons may be related to stronger policy work on gender equality, better inclusion of people living with disabilities into the workforce and similar, yet this remains to be further investigated as it falls outside the scope of this report. Moreover, soft skills bringing ***higher degree of innovation*** scored relatively low in Veneto, Western Slovenia, Prov. Limburg, and Silesia and highest in Eastern Slovakia and Upper Austria. Interestingly, ***higher productivity*** was not rated among the top desired outcomes by experts in most regions, with the exception in Eastern Slovakia and Silesia where it scored relatively high. To see the full overview of answers per region see figure below.

Full Question: 6. What outcomes should soft skill development ideally bring into your work environment? Choose up to five entries.



Note: Multiple selections were possible. Percentages show the proportion of respondents from each country who selected each option. Showing top 8 most frequently mentioned options.

Figure 13. Desired outcomes of soft skill development according to survey respondents.

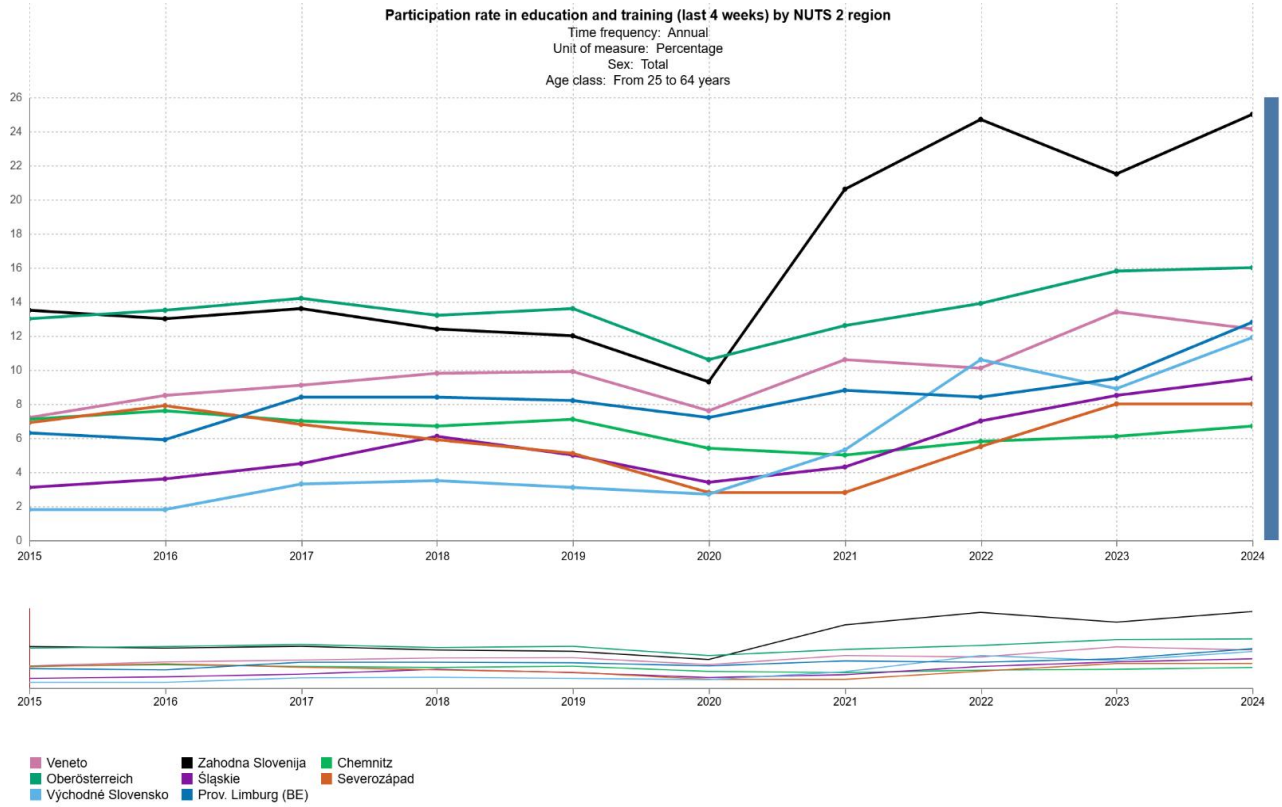
Based on the survey findings, it can be said that Upper Austria is a bit of an overall outlier, since experts place value on outcomes of the soft skill development that relate to innovation and diversity/inclusion to a higher degree than experts do from other regions. Looking back at the Eurostat data relating to GERD scores (R&D-related expenditures) it is perhaps not surprising that Upper Austria, region with highest GERD score among partner regions, considers higher degree of innovation as a desired outcome of soft skill development. However, the highest percentage of experts across partner regions (61.1%) expecting higher degree of innovation as a result of soft skill development come from Eastern Slovakia, region with second lowest GERD score. This finding could indicate that ***awareness*** of the connection between soft skill development and innovation is present regardless of the regional R&D expenditures or existing innovation infrastructures. More comprehensive research is needed to explore the exact regional discrepancies and where they stem from, which falls out of scope of this comparative overview report.

2.2. Regional soft skill capacities

Despite the increased interest in the role of soft skills in regional development, comprehensive data that could help us assess the current soft skill landscapes, especially on regional level is largely missing. We can reflect on some Eurostat data that could only give us a hunch about skills trainings.

Participation rate in education and training

One such indicator is the Eurostat ***Participation rate in education and training (in last 4 weeks)*** - a measure of lifelong learning which covers participation in formal and non-formal education and training. By looking at the figure below we see that when put in comparison, region of Western Slovenia scores highest with 25% of people aged 25-64 having participated in some form of training in the last 4 weeks, while Chemnitz region scores lowest with 6.7% as assessed in 2024. Rest of the partner regions score between 8% (Northwest Czechia, to 16% in Upper Austria). While these figures provide an impression of education and training capacities and commitments to life-long learning, there is no data explicitly showing figures for soft skills related development.



Participation rate in education and training (last 4 weeks) by NUTS 2 region [trng_lfse_04$defaultview]
Source of data: Eurostat - Last updated date: 14/04/2025 23:00
Disclaimer This graph has been created automatically by ESTAT/EC software according to external user specifications for which ESTAT/EC is not responsible. Graphic included.
General disclaimer of the EC website: https://ec.europa.eu/info/legal-notice_en

eurostat

Figure 14. Participation rate in education and training (last 4 weeks) over time, across regions.

Lifelong learning (LLL)

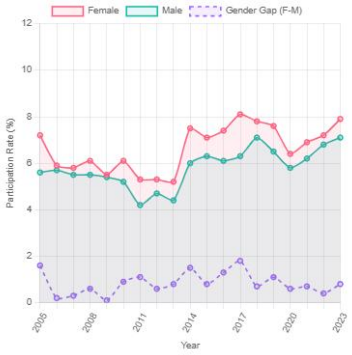
Although Eurostat data on Life-Long Learning-LLL (defined as people aged 25-64 participating in education and training/long term indicator) on regional level is missing, we got the following insights through AI estimation (see Figure 15). People identified as female show overall higher participation rates across all eight regions than those identified as male. Females in Western Slovenia (16%), Upper Austria (17%) and Veneto (12%) region count towards the highest percentage of people engaged in Life Long Learning. Males in Eastern Slovakia (3%) and Silesia (5%) count toward the lowest percentage of people committed to LLL.

Lifelong Learning Participation

DED4

Lifelong Learning Participation in Chemnitz (DED4) by Gender

Percentage of population aged 25-64 participating in education and training (2005-2023)



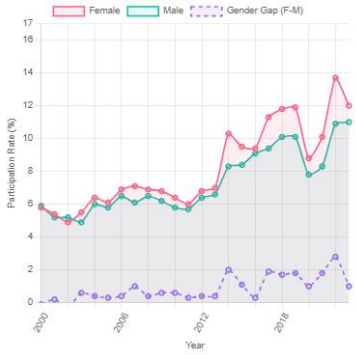
Education | Lifelong Learning Participation

AI estimation (2025)

ITH3

Lifelong Learning Participation in Veneto (ITH3) by Gender

Percentage of population aged 25-64 participating in education and training (2000-2023)



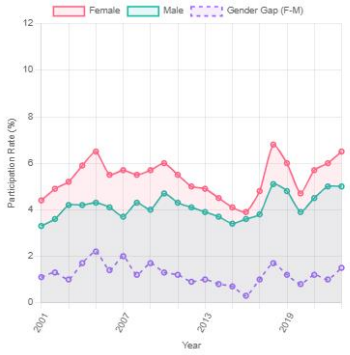
Education | Lifelong Learning Participation

AI estimation (2025)

PL22

Lifelong Learning Participation in Śląskie (PL22) by Gender

Percentage of population aged 25-64 participating in education and training (2001-2023)



Education | Lifelong Learning Participation

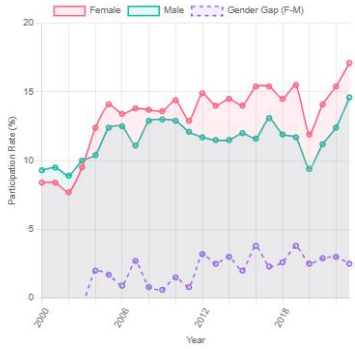
AI estimation (2025)

Lifelong Learning Participation

AT31

Lifelong Learning Participation in Upper Austria (AT31) by Gender

Percentage of population aged 25-64 participating in education and training (2000-2023)



Education | Lifelong Learning Participation

AI estimation (2025)

BE22

Lifelong Learning Participation in Prov. Limburg (BE22) by Gender

Percentage of population aged 25-64 participating in education and training (2000-2023)

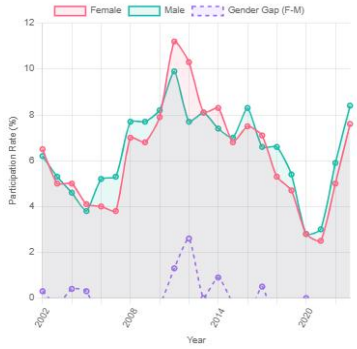
Education | Lifelong Learning Participation

AI estimation (2025)

CZ04

Lifelong Learning Participation in Severozápad (CZ04) by Gender

Percentage of population aged 25-64 participating in education and training (2002-2023)



Education | Lifelong Learning Participation

AI estimation (2025)

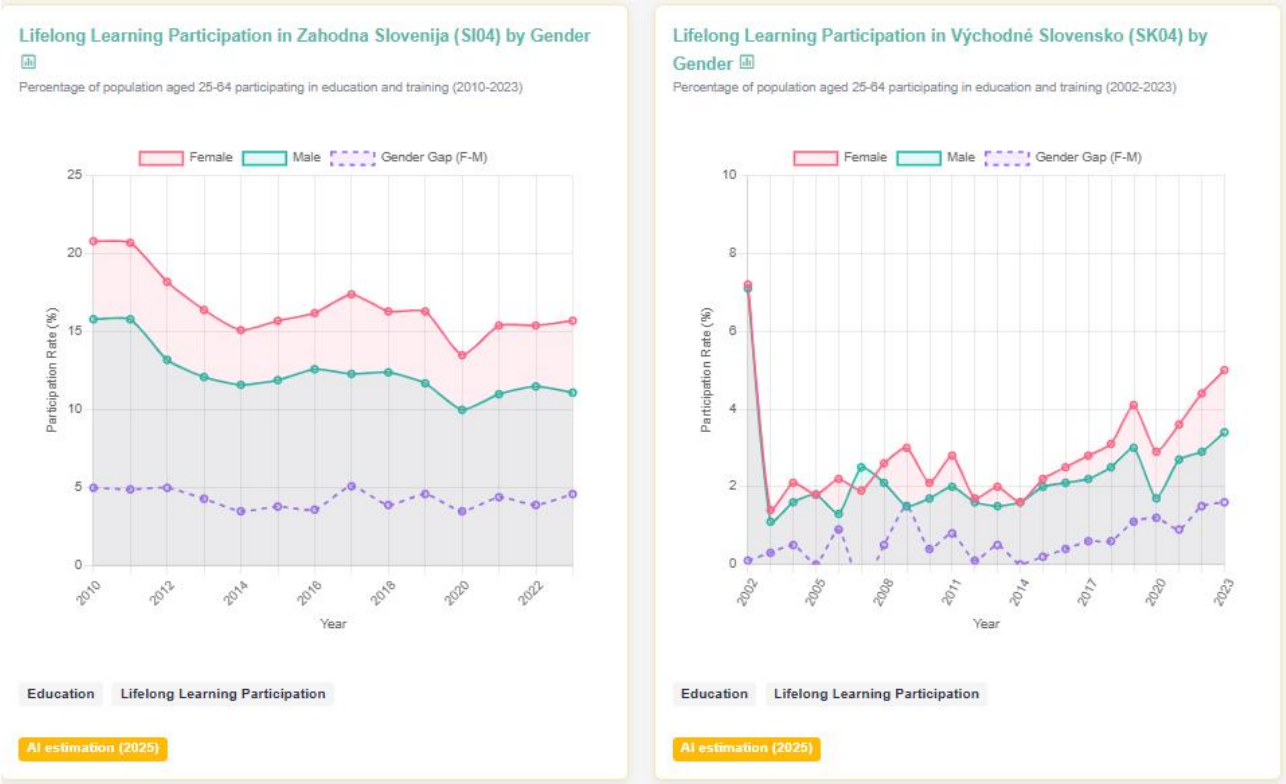


Figure 15. Estimation on Life Long Learning participation, over time, across regions.

Perceptions of regional and professional soft skill capacities

Given the limited data on skill capacities and development available on the regional level, and practically non-existent data in regards to soft skills, we hereby present the x-Inno expert survey results outlining the perceptions of regional and professional soft skill capacities in partner regions.

When asked to rate the presence of various soft skills, experts across partner regions agree that **communication, collaboration, and problem solving** are the most present soft skills, whereas **iterative design thinking, risk-taking, intercultural competence, and sustainability awareness are consistently among the least present**. This suggests that while teamwork and communication are common strengths or already in focus for longer time, more complex creative processes and risk embracing attitudes are underdeveloped in many regions (see Figure 16 for full overview).

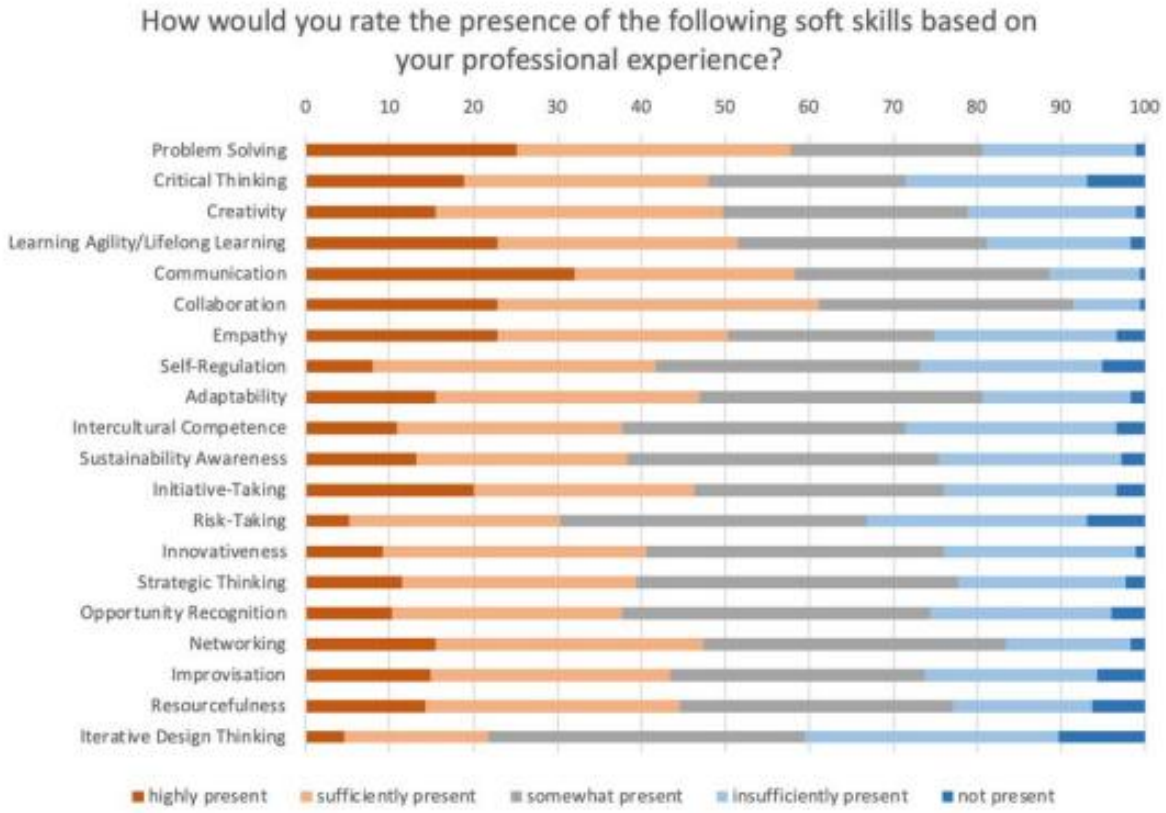


Figure 16. Perception of the presence of soft skills based on survey respondents' professional experience.

When looking at regions in comparison, we learn that across the eight regions the experts reveal a combination of strong commonalities and stark regional nuances. As mentioned above, interpersonal skills and task-oriented skills like problem-solving, collaboration and communication are reported as relatively well developed, whereas problem-solving and creativity is reported as particularly well developed in Prov. Limburg, Chemnitz region and Silesia. Learning agility (or lifelong learning), an essential soft skill for the fast-paced processes of technological transformations in industrial regions, was rated particularly high in Chemnitz, Western Slovenia and Silesia suggesting that, according to expert respondents, there is already an existing willingness to acquire new knowledge in these regions. Other transformation-oriented soft skills essential for autonomous problem solving and adaptability were reported as lacking presence in the regions. In particular, resourcefulness and self-regulation scored low in Northwest Czechia, Western Slovenia, and Upper Austria.

Regional soft skills strengths identified in Focus Groups

We supplement these findings and outcomes with the qualitative data gathered during the Expert Focus Groups in all either partner regions in the fall of 2024. These findings were first consolidated into regional expert focus group reports, and hereby analysed for patterns. When asked to identify existing soft skill related strengths in their respective regions, some of the most common answers relate to the strengths summarized in the figure bellow (across regions). When asked to reflect back to the findings from the expert focus groups in fall 2025, representatives outline the following developments (see Table 5).

REGIONAL STRENGTHS IDENTIFIED IN FOCUS GROUP REPORTS (2024)	REGIONAL STRENGTHS IDENTIFIED IN A SHORT SURVEY WITH FOCUS GROUP LEADERS (2025)
Strong regional networks and actor ecosystems	Informal networks increasingly relevant as bottom-up drivers of soft-skill activities, complementing formal structures
Existing soft skill initiatives and training programmes	Higher awareness and uptake attributed to *project-led pilot actions* and *increased regional funding* (e.g. capacity building programmes)
Culture of collaboration and openness in creative sectors	Expansion into *cross-sector innovation*, particularly linking *art and technology* as vehicles for soft skill application (e.g. ECOC influence)
Institutional engagement and public-sector support	Shift from general engagement to *concrete investment*, with more funds and programmes supporting soft-skill development in 2025
Growing awareness of lifelong and experiential learning	Moves towards *practical experimentation*, soft skills now used to *support innovation processes*, not just recognised as relevant for learning (e.g. pilot action outcomes)

Table 5: Strengths in context of soft skill development according to FG experts in 2024 and 2025 over all partner region.

Overall, these insights indicate that, while there is a solid foundation of interpersonal and intrapersonal (Zahn et al., 2024), as well as task-oriented soft skills, partner regions still face challenges when it comes to soft skill development which requires more complex and transformation-enabling qualities required for innovation, sustainability transition, and strategic adjustment to the ongoing multiple transitions (e.g. green, digital). This, in turn, can suggest that, while regional soft skills landscapes are relatively well positioned to respond to current challenges (e.g. good communication and collaboration capacities), they may lack the soft skill capacities which enable and support the regions in meeting more complex challenges drives by short and long-term transformations such as the rapid turn towards further automation enabled by advances in AI-generative technologies. These findings point to an important room for practical experimentation and strategic intervention within the x-Inno Radar project[3].

2.3. Soft skill ecosystems, formats & networks

As already touched up in the presentation of Focus Groups reflections on the existing regional strengths in relation to soft skills, we hereby present survey findings relating to the existing regional ecosystems and cooperation on soft skill development. Doing this can serve as an important starting step for a much

[3] For more information on Pilot Actions and Strategic engagement visit the x-Inno Toolbase (avaiable in 2026).

needed longer-term mapping of actors, infrastructures and cooperation models on soft skills development in partner regions and beyond.

Soft skill providers

When asked to list existing key soft skill development providers, formal education systems and non-profits seem to be crucial in most regions according to the x-Inno Radar expert survey responders (see figure 17 for full overview). Universities were indicated as top 3 providers in Veneto, Prov. Limburg, Eastern Slovakia, Silesia, and Chemnitz region. Adult education centres are notably important in Upper Austria, Prov. Limburg, Eastern Slovakia, and the Chemnitz region which strongly reflects the Eurostat indicators on lifelong learning participation in Upper Austria, but opens up further question on regions such as Eastern Slovakia which scores lowest on LLL among partner regions. Chambers of commerce play a major role particularly in Northwest Czechia (almost all respondents agree) and also in Upper Austria, Eastern Slovakia, Western Slovenia – more so than in Veneto or Chemnitz region. Non-profit associations are significant in Upper Austria, Silesia and Chemnitz. Business consultancies appear prominently in Western Slovenia and Silesia. This mix implies that effective soft skill development often involves multi-sector collaboration (public education, private sector, civil society), but each region has one or two leading sectors in this context. For example, Northwest Czechia leverages industry associations heavily, whereas Prov. Limburg mostly leans on formal education and adult learning centres according to regional expert respondents.

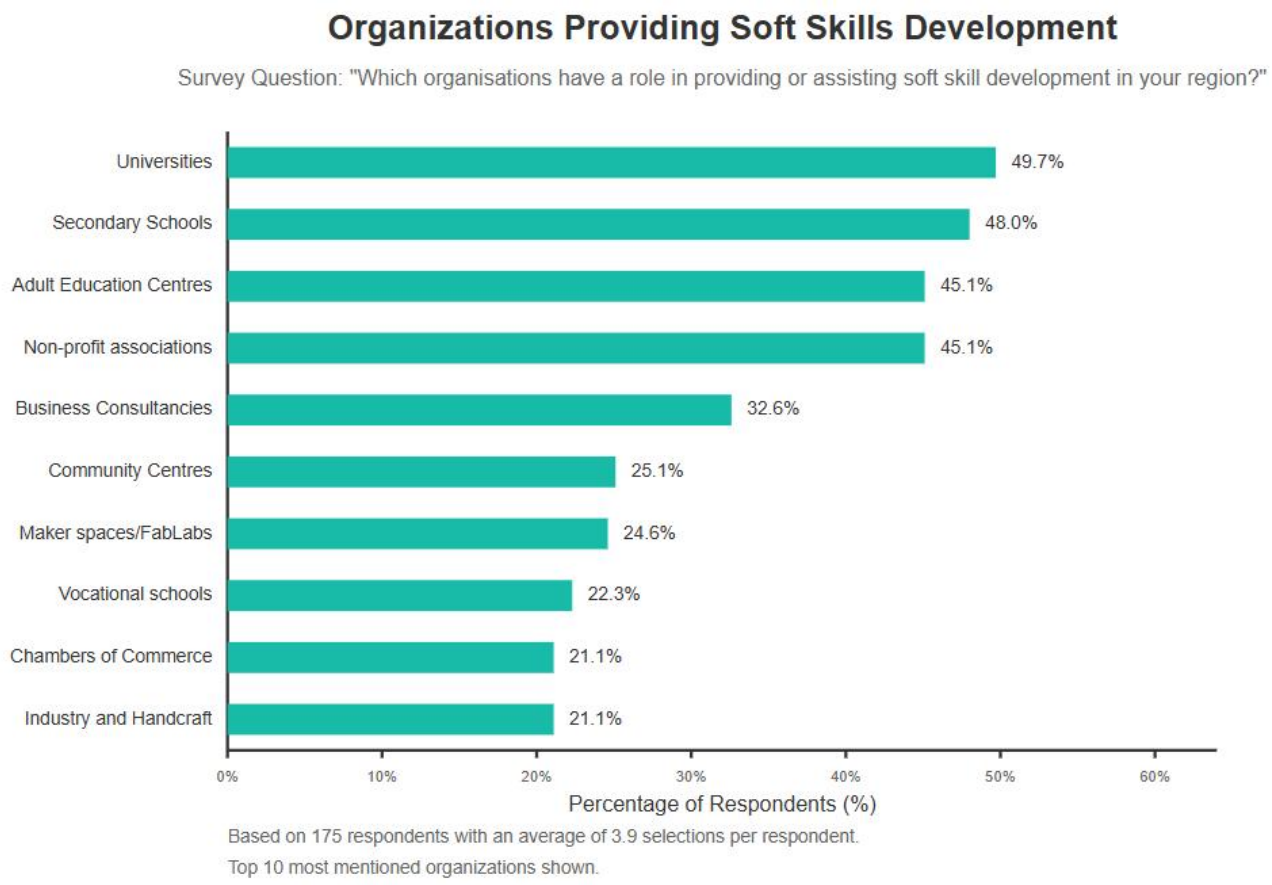


Figure 17. Organizations providing soft skill development according to survey participates.

Cooperation networks

Level of awareness among experts on existing cooperation in the field of soft skill development vary significantly across regions with most awareness located in Silesia and least in Chemnitz region (see table 6).

Region	Country	% Respondents Aware of Cooperation	% Seeing No/Don't Know
Śląskie	Poland	65%	35%
Prov. Limburg	Belgium	59%	41%
Zahodna Slovenia	Slovenia	59%	41%
Severozápad	Czechia	46%	54%
Východné Slovensko	Slovakia	50%	50%
Upper Austria	Austria	32%	68%
Veneto	Italy	32%	68%
Chemnitz	Germany	12%	88%

Table 6. Percentage of respondents who report soft skill development cooperation in their region vs no cooperation

Most expert respondents – 54.3%, however, ***do not know how*** above-mentioned actors cooperate on the topic of soft skill development on the regional level, whereas joint regional projects and working groups are mentioned as most likely formats of cooperation (see figure 18).

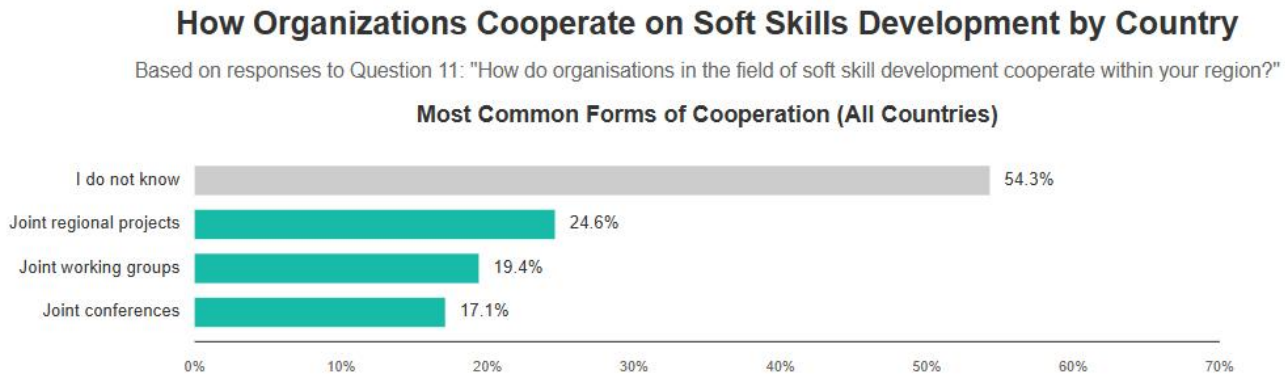


Figure 18. Perceptions on regional cooperation on soft skill development.

Available formats for soft skill development

According to the x-Inno survey, following formats are reported as most available across partner regions: seminars/workshops on soft skills, entrepreneurial support programs and business consultancy, pitching events and repair café/workshops (see Figure 19). Maker fairs were identified as the most common format in Chemnitz region, and one of the least common in other partner regions, which is an interesting finding that can speak to both Chemnitz regions' strong involvement of the maker community in soft skill development, but also might indicate a respondent bias due to narrow sampling of the survey. See figure below for overview.

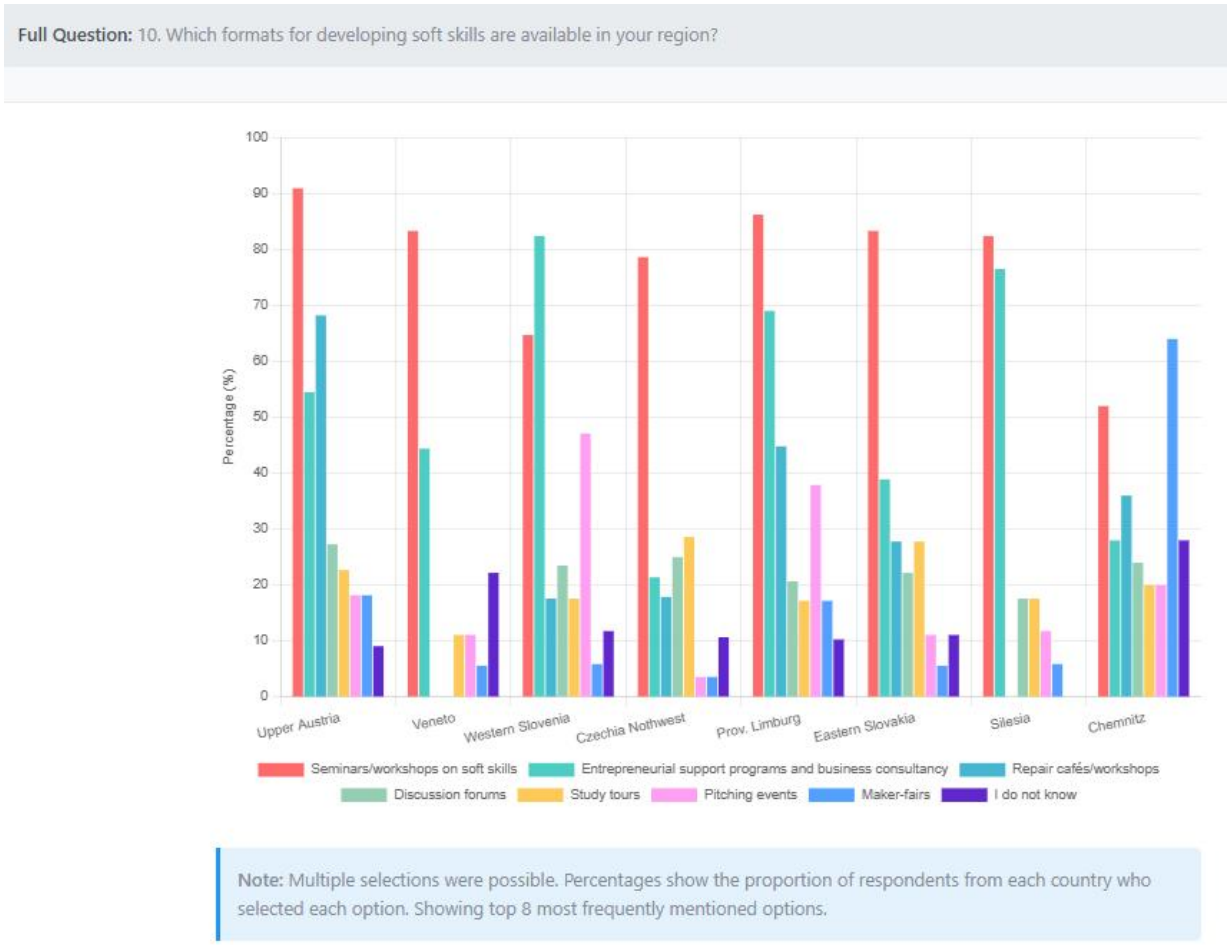


Figure 19. Reported available formats for soft skill development in the region

These patterns reveal that existing ecosystems and formats provide an important foundation for soft skill development, but that gaps in coordination, visibility, and strategic cooperation persist—issues that directly shape the soft skill gaps and needs discussed in the following section.

3. Soft skill gaps & needs

Now that we have looked into existing strengths and capacities reported in partner regions, in this section we aim to create a basic overview of what gaps and needs in soft skills development remain. As for the previous section, data on soft skills in regional contexts is scarce which is why we turn to the outcomes of

the x-Inno survey. To begin with, over 80% of the expert respondents from eight partner regions agree that people greatly differ in their soft skill capacities. This finding informs us that soft skills relate to capacities on different levels – from personal capacities and strengths, to those related to the professional work field, organization or company, all the way to regional-level strengths and capacities. This is relevant here as it directly speaks to the soft skill gaps and the need for a more individualized, person-based and needs-based efforts towards soft skills development in partner regions and beyond.

3.1. Perceived soft skill gaps in professional and regional environments

To further understand the soft skill gaps and needs, we asked the experts to rate soft skills in their professional environments based on the strongest need for development (Figure 20). Across partner regions, there is a strong consensus on needing better ***critical thinking skills***. Critical thinking skills ranked in the top two most needed skills in nearly every region, especially high in Northwest Czechia, Eastern Slovakia, and Chemnitz Region. ***Strategic thinking, communication, and empathy*** are also frequently cited skills in need across multiple regions. Interestingly, even where communication is considered a relative strength (like Prov. Limburg), it still appears as a development priority, implying that there is an ongoing, further demand for development of these soft skills. Meanwhile, some regions display unique needs like for example Upper Austria and Chemnitz whereby experts highlight the strong need for ***intercultural competence***, while in Silesia they uniquely emphasised ***sustainability awareness*** as a strongly needed soft skill. See figure bellow for overview of soft skill needs across partner regions. For a full overview of reported soft skill needs per partner region, please refer to the Survey Comparison Module of the x-Inno Toolbase.

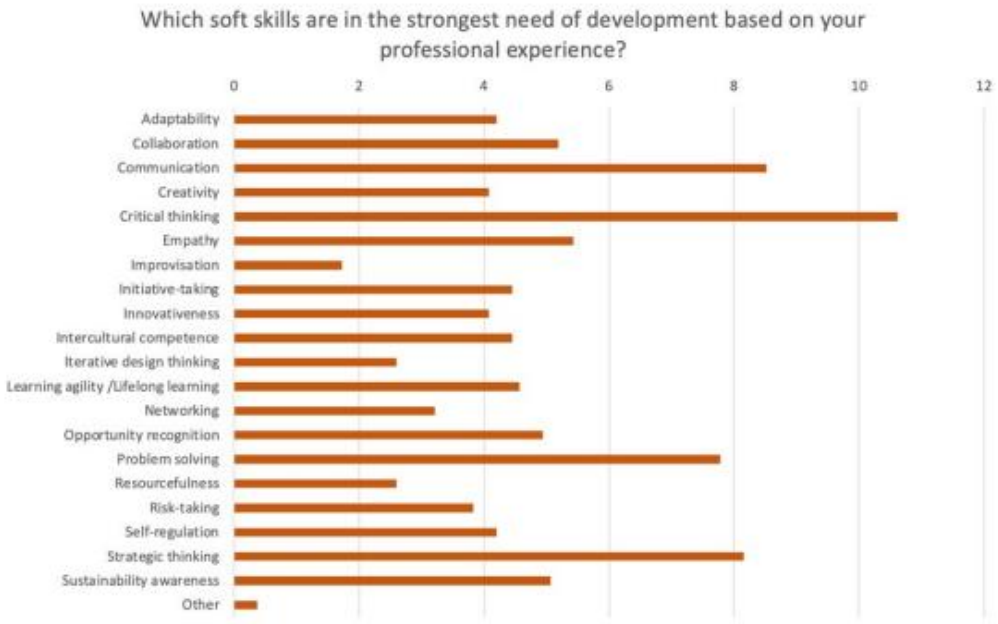


Figure 20. Soft skills in biggest need of development according to survey respondents

Overall, survey results suggest that soft skill gaps are not limited to missing competencies, but often reflect **rising expectations and changing task requirements** in the context of ongoing technological and green, transformations in industrial regions.

3.2. Structural and institutional gaps in soft skill development (focus group insights)

While survey results highlight perceived skill deficits, focus group discussions point to **structural and institutional gaps** that shape how soft skills are recognised, developed, and sustained within regions (Table 7). Namely, when asked to identify existing gaps and needs in the context of soft skill development in the respective regions, expert focus group members most commons refer to aspects outlined in the table below.

REGIONAL GAPS FROM FOCUS GROUP REPORTS	REGIONAL NEEDS FROM FOCUS GROUP REPORTS
Low awareness and prioritization of soft skills	Integration of soft skills into formal and informal education
Disconnection between education/training and labour market needs	Creation of enabling environments and spaces
Lack of entrepreneurial mind-set	Strengthening of entrepreneurial and leadership competences
Structural barriers and lack of resources	Long-term structural support and funding
Superficial or fragmented training offers	Linking technological and human skills

Table 7: Gaps and needs in context of soft skill development according to FG experts in 2024.

These findings highlight that, in order to comprehensively understand the soft skill landscapes, we need to explore soft skill gaps and needs on various levels, including the need for boosting specific soft skills, but also the need for more awareness, better learning infrastructures, long-term funding support and more. Findings from Focus Group representatives in 2025 mostly indicate that soft skill gaps and needs remain the same as in 2024, with an increased need for stronger leadership and empathy skills given the rapid AI-driven change.

Taken together, x-Inno Survey and focus group findings highlight that soft skill gaps operate across multiple, interconnected levels. At the individual level, experts mainly point to deficits in critical, strategic, and interpersonal skills. At the organisational and sectoral level, mismatches between work requirements and training provision persist. At the regional level, gaps emerge in the form of fragmented ecosystems, limited coordination, and insufficient institutional support. Addressing soft skill gaps therefore requires interventions that move beyond individual training measures and engage with organisational practices and regional governance structures.

F. Discussion

Our contributions

As outlined earlier in this report, research and practice are showing increased interest in the role of soft skills in the context of multi-transformations such as digitalization, greening of the economies, AI-driven automation and more. At x-Inno Radar we take these research inquiries as a starting point, and add new layers by examining these processes in industrial (non-metropolitan) regions, but also by examining the role of particular soft skills that are relevant for this context: transversal skills, maker skills, entrepreneurial skills. Based on the existing literature and the findings outlined above, we put forward some arguments as a way to spark further discussions on the matter.

➔ **Soft skills foster translational capacities of regions undergoing multi-transformations**

Our findings show that interpersonal skills like communication or collaboration are rated by experts as already present in professional environments and regions more broadly, whereas skills enabling transformative processes such as creativity, risk taking, or iterative design thinking are weaker. This is in line with De Propris & Bailey's argument that so-called translational capacities are essential for regional transformation under the Industry 4.0 because to successfully transform in this context requires the ability to adopt and adapt to new technologies and integrated them with the existing place-based knowledge and capacities. Simply put, mere investment in innovation and research, like it is spotted in regions of Upper Austria and Western Slovenia that have rather high GERD scores, only pays off if the relevant hard skills are combined with soft ones such as critical thinking, complex problem solving, adaptability and similar (Obermayer et al., 2023).

➔ **Mismatch between education/LLL and soft-skill development**

In this report we show that many partner regions have relatively high tertiary education attainment and established vocational schooling paths, whilst the experts still report severe mismatches between skills and labour demands and emphasized the gaps in soft skill development (e.g. critical thinking, intercultural competence). This is in line with research showing how managers tend to prioritize soft skills (e.g. entrepreneurial vision, collaboration) over technical skills (e.g. IT context) while universities and other higher education institutions continuously place emphasis on technical competencies (Goulart et al., 2021). Thus we need to be careful when interpreting data like the high tertiary education attainment in regions (e.g. Western Slovenia or Prov. Limburg), as they might point to the values and capacities for learning and skill acquisition, but they don't directly translate into a hard-soft skill balance which regions need in order to successfully adapt to multi-transformations (Goulart et al., 2021). We can go a step further to propose, that weak LLL participation, especially among men in Eastern Slovakia and Silesia, may lead to increased difficulties of adaptation in rapidly changing labour contexts. Finally, while we know that across x-Inno partner regions, formal educational systems reproduce sectoral strengths (E.g. major strength in engineering, or tourism) this might lead to underinvestment in other sectoral strengths (e.g. entrepreneurial fields) that are better suited for supporting cross sectoral mobility, evoking Corradini and colleagues' concerns about skills policy that is highly supply/demand-focused (2023).

➔ **From place-neutral skills policy to regional soft-skills strategies**

In this report we highlight that, despite some commonalities, regional challenges, soft skill needs, gaps and existing ecosystems differ across the eight partner regions. Moreover, based on Eurostat data and

survey outcomes we identify three overarching "streams" of challenges that regions face at different levels:

(1) Labour market transitions

(2) Technological and skills transformation and

(3) Institutional and adaptive capacity challenges

This resonates with research and other above-mentioned efforts calling for more place-based approaches to skill exploration and development, for more dynamic policy mechanisms that can capture the regional specificities and needs, and for more focus on systemic issues within institutional approaches (Corradini et al., 2023; EC: Issue Paper – Research & Innovation Working Group 2024). It also resonates with explicit calls for integrating (soft) skills policy into existing regional innovation and S3 programs. x-Inno Radar can, therefore, serve as a prototype working towards more for place-based regional strategies on skills development and a move away from transnational and national-level strategies only.

➔ **Towards integrated regional soft-skills ecosystems and governance**

We find in this report that, although experts from partner regions can map actors (e.g. universities, chambers, consultancies) and formats (e.g. workshops, maker fairs) that already constitute the regional soft skill ecosystem, the cooperation of actors on regional level (and beyond) appears to be fragmented, weak, or absent – based on the finding that over 50% of the expert respondents do not know how different actors cooperate. While mapping of the actors is just a small step in learning about soft skill ecosystems, the x-Inno Radar project aims to foster cross-sector collaboration among different regional partners, including a transnational collaboration and learning activities. This is also in line with arguments posed in the OECD's Regions in Industrial Transition report (2023), whereby the important role of experimental governance, cross-sector collaboration and High Impact Actions is emphasized as key to successfully navigating industrial transitions – including the questions of jobs and skills.

➔ **Inequalities in soft-skills participation and the risks of exclusion**

Last but not least, in this report we learn that it takes more than just improving regional awareness and capacities for soft skill development to enable equal access to skills training and potential benefits. Data shows that some regions have disproportionally higher number of young people not in education nor in employment - NEETs (e.g. Eastern Slovakia), and we observe highly uneven LLL participation across regions and between genders. These findings can guide us in making sure that skills strategies stress the importance of equal access to soft skill development, so that different communities and marginalized groups can benefit from it equally, and in order to avoid widening regional disparities that come along with multi-transformations (Ribeiro et al. 2025; Maucorps et al., 2023).

Limitations and future research

Beyond the research findings on the general importance of soft skills development, especially in the context of multi-transformations of industrial regions (Cedefop, 2018, 2025; De Propris & Bailey, 2021), it is important to learn about regional, place-based soft skill landscapes in order to understand the specificities and commonalities across industrial regions (Corradini et al., 2023; Píša, 2023). However, reliable and comparable **regional-level data on soft skill capacities and needs is missing.** As we outline in this report, some data such as Eurostat indicators on educational attainment, Life Long Learning, R&D expenditure, participation in education and training and similar can only give us a broad understanding of the regional skill capacities and affinities to skilling and upskilling. To the best of our knowledge, data

specific to soft skills is not available in Eurostat or comparable public data platforms. Existing indicators remain largely indirect or proxy-based, focusing on formal education, participation in training, or selected digital skills, and therefore do not allow for a nuanced, place-based analysis of soft skill capacities, needs, or development pathways across regions.

This absence of regionalised soft skill data presents **a significant challenge for understanding how industrial regions respond to demographic, digital, and green transitions**, especially given that these transformations increasingly require not only technical upgrading but also adaptability, problem-solving, and collaboration (Obermayer et al., 2024). **Without systematic indicators, it becomes difficult to identify which soft skills are lacking, which are emerging as regional strengths, and where mismatches may hinder inclusive development.** Research shows that soft skills and forms of human agency unfold differently depending on local institutional environments (Huggins & Thompson, 2023; Píša, 2023), reinforcing the need for more granular and place-based evidence.

In light of these data gaps, the x-Inno Radar survey offers only a partial and exploratory contribution. While not a scientific study in the strict methodological sense, it provides an initial step toward documenting how regional actors perceive soft skill capacities and needs. At the same time, the limited availability of robust, region-specific data highlights the need for further research capable of capturing soft skill dynamics more systematically and with greater empirical rigour. Only through such efforts can we begin to understand how soft skills shape the developmental pathways of non-metropolitan, industrial regions undergoing profound multi-transformations. Importantly, **x-Inno Radar will contribute to these future endeavours** by providing open access for all NUTS2 regions in the EU to use the x-Inno survey and begin gathering their own data, as well as by contributing soft skill datasets to the x-Inno Tool Base in 2026 (Toolbase x-Inno Radar).

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H. Appendix

Participants of x-Inno Expert survey related to NUTS-Regions

NUTS0 ID	Participants NUTS 1	NUTS2 Name	Secured Participants NUTS 2	NUTS3 Name	Participants NUTS3
AT	22	Oberösterreich	19	Mühlviertel	1
AT		Oberösterreich		Steyr-Kirchdorf	1
AT		Oberösterreich		Traunviertel	9
AT		Oberösterreich		Innviertel	
AT		Oberösterreich		Linz-Wels	8
				not filled in	3
					22
BE	29	Prov. Limburg (BE)	27	Arr. Hasselt	19
BE		Prov. Limburg (BE)		Arr. Maaseik	4
BE		Prov. Limburg (BE)		Arr. Tongeren	4
				not filled in	2
					29
CZ	28	Severozápad	27	Ústecký kraj	
CZ		Severozápad		Karlovarský kraj	27
				not filled in	1
					28
DE	25	Chemnitz	25	Vogtlandkreis	2
DE		Chemnitz		Zwickau	0
DE		Chemnitz		Chemnitz, Kreisfreie Stadt	18
DE		Chemnitz		Erzgebirgskreis	0
DE		Chemnitz		Mittelsachsen	5
					25
DE	0	Leipzig		Leipzig, Kreisfreie Stadt	0
DE		Leipzig		Leipzig	0
DE		Leipzig		Nordsachsen	0
					0
IT	18	Veneto	7	Treviso	
IT		Veneto		Padova	3
IT		Veneto		Rovigo	
IT		Veneto		Verona	1
IT		Veneto		Vicenza	
IT		Veneto		Belluno	
IT		Veneto		Venezia	3
				not filled in	11
					18
IT	1	Emiglia Romana	1		1
PL	17	Śląskie	17	Tyski	0
PL		Śląskie		Bytomski	0
PL		Śląskie		Gliwicki	0
PL		Śląskie		Katowicki	1

PL		Śląskie		Sosnowiecki	0
PL		Śląskie		Częstochowski	0
PL		Śląskie		Bielski	15
PL		Śląskie		Rybnicki	1
					17
SI	**17**	Zahodna Slovenija	17	Goriška	
SI		Zahodna Slovenija		Osrednjeslovenska	
SI		Zahodna Slovenija		Gorenjska	16
SI		Zahodna Slovenija		Obalno-kraška	1
					17
SK	**18**	Východné Slovensko	17	Košický kraj	16
SK		Východné Slovensko		Prešovský kraj	1
SK				not filled in	1
SK					18