STUDY

Decoupling Infrastructure and Talent

Insights from Finland

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Tech analysis and policy ideas for Europe

interface

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Executive Summary

As small European nations compete for AI leadership, Finland's experience offers critical lessons. This study examines the dynamics impacting AI workforce development in Finland, including a €200M supercomputer investment, pioneering ethical frameworks, and strategies for attracting and retaining talent in a peripheral market.

Drawing from analysis of nearly 25,000 AI talent profiles and interviews with professionals working in the field, we uncover how infrastructure excellence and progressive policies interact with talent attraction challenges.

Finland has established itself as a European leader in AI computing infrastructure. The country hosts LUMI, the world's ninth-fastest supercomputer, and has secured billions in data centre investments. Finland also leads Europe in gender equality within AI, with the highest female representation in its AI workforce, and has pioneered ethical AI policy frameworks that set standards across the continent.

Yet Finland's talent pool remains modest compared to EU hubs in France and Germany. With approximately 25,000 AI professionals, the workforce is concentrated heavily in Helsinki and has proven challenging to grow despite targeted attraction policies. Language barriers, geographic peripherality, and competition from larger European tech markets constrain talent development.

For European policymakers weighing investments in AI Factories, Gigafactories, and compute capacity, Finland offers critical insights into what infrastructure alone can and cannot achieve. Finland's experience reveals a growing gap between top AI talent hubs and infrastructure-rich regions across Europe. Without purposeful policy interventions, infrastructure investments will not translate into stronger national capacity, and this gap will continue to widen.

Finland's case demonstrates that computing infrastructure positions countries as critical nodes in Europe's AI ecosystem, but attracting and retaining talent requires integrated strategies that address language accessibility, geographic peripherality, and competition from larger markets.

Introduction

The European AI strategy increasingly centres on compute infrastructure. AI Factories, supercomputing capacity, and data centre investments dominate policy discussions as member states compete to host the physical foundations of AI

development. The European Commission's April 2025 AI Continent Action Plan explicitly frames infrastructure as a talent attraction mechanism, stating that "the availability of powerful computing resources is an important element for attracting academic, technical, and industrial talent and is essential for enhancing the AI ecosystem." This assumption, that building compute capacity will draw the workforce needed to leverage it, underpins billions in EU infrastructure investment.

Finland's experience offers a critical examination of this policy logic. The country hosts LUMI, Europe's fourth-fastest supercomputer, and has secured substantial computing infrastructure. Yet its AI talent pool remains modest at approximately 25,000 professionals. Finland's case thus poses essential questions for European policymakers: Does compute capacity automatically attract talent? Can ethical frameworks and progressive policies compensate for challenges like language barriers and market size? What role do regional dynamics play in turning infrastructure investments into workforce development?

Finland presents a particularly instructive case. Since launching one of Europe's earliest national AI strategies in 2017, the country has consistently prioritised both technological infrastructure and ethical frameworks. It hosts LUMI, operates multiple supercomputers, and maintains some of Europe's lowest energy costs and highest renewable energy shares. The country also leads its European peers in gender equality within the AI field, with women comprising nearly 40% of its AI workforce. Its policies on work-life balance, parental leave, and ethical AI development are regularly cited globally as models.

Despite these advances, Finland faces similar challenges faced by other European countries. Its AI talent pool is increasingly concentrated in Uusimaa, the southern region that is the country's most populous and economically significant area. Helsinki, the capital city of Finland and the Uusimaa region, hosts nearly half of the country’s AI professionals. While some talent concentration is inevitable, creating more geographically distributed talent pools helps more evenly distribute expertise and economic benefits related to AI. Additionally, international recruitment remains challenging despite targeted programmes. The question facing European policymakers is not whether Finland's approach is successful,as it has clearly achieved important objectives, but rather what lessons its specific combination of successes and challenges offers for other member states.

This paper represents the second in interface's series of European AI talent case studies, following our examination of Italy's talent dynamics. While previous interface research on Europe's AI workforce identified Finland's leadership in female representation and fundamental research capacity, this study examines the mechanisms behind these outcomes and suggests that infrastructure investment has not translated into proportional workforce growth, and should be coupled with

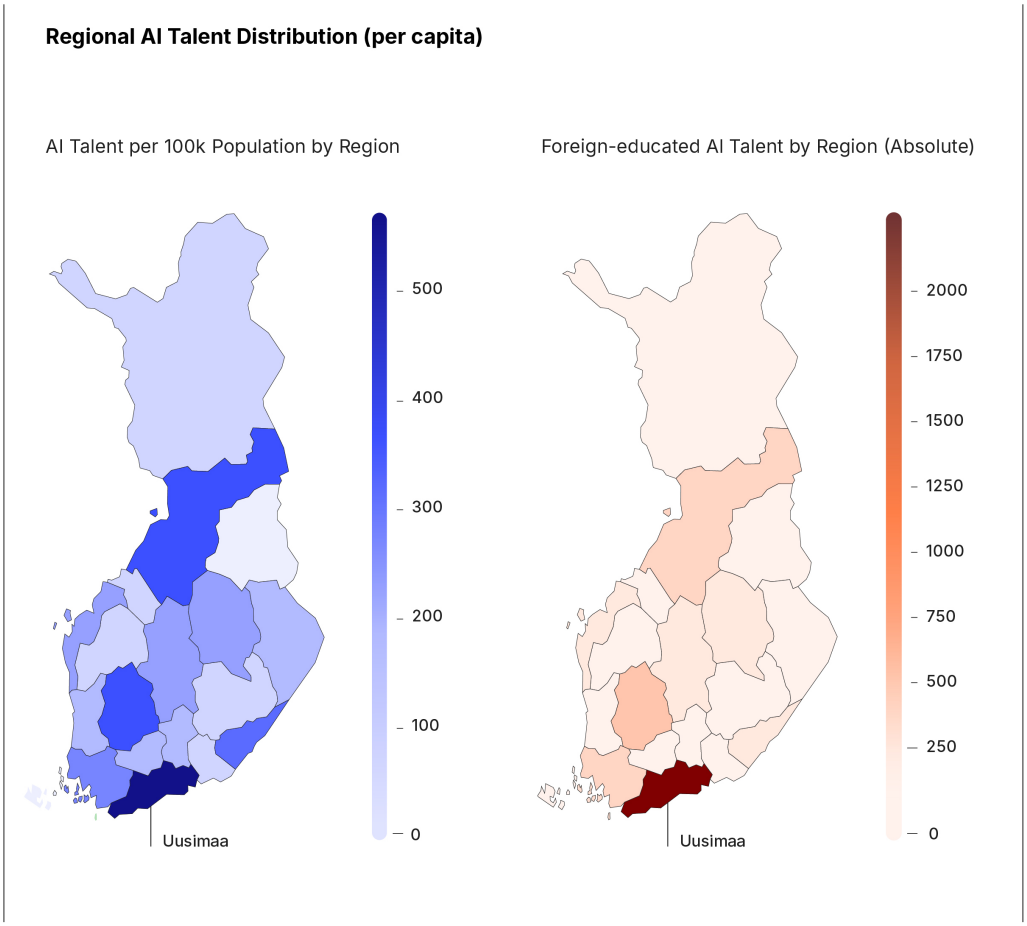
other targeted talent development programs.

Our analysis draws from Revelio Labs, a workforce insights company's data on Finland's AI labour pool, supplemented by semi-structured interviews with professionals across academia, industry, and government. We examine three interconnected dimensions: regional talent distribution and attraction policies, gender equality achievements and their drivers, and computing infrastructure investments and their workforce implications. Together, these reveal both replicable successes and structural challenges that persist despite policy innovation.

Findings

AI Talent Landscape

a) Regional Distribution of Talent



Finland's approximately 25,000 AI professionals are concentrated in Uusimaa Region, which holds nearly 9,000 individuals, almost half of the national total. This concentration reflects broader demographic patterns: Uusimaa contains roughly one-third of Finland's population and jobs, and includes both Helsinki and Espoo, the country's two largest cities. The region committed to investing 5% of GDP in research and development, which may reinforce talent clustering. Nearly a fifth of

this talent works in Information Technology Services, with the next most common sectors being education and financial services.

Beyond the capital region, Pirkanmaa hosts just over 2,000 AI professionals, supported by Tampere University's AI Hub, which provides free services to local companies seeking to leverage AI competitively. North Ostrobothnia shows the next highest concentration, which can perhaps be explained by its long history of ICT innovations, and first-ranked status among regions in Finland for RDI investment. Global ICT companies like Nokia have their offices in North Ostrobothnia, which borders Kainuu, the location of the LUMI AI Factory. However, a notable finding is that the Kainuu region, where LUMI supercomputer is located, itself shows limited talent presence in our data, a finding that warrants careful interpretation.

The LUMI talent anomaly: Despite hosting the LUMI supercomputer at CSC's Kajaani data centre, Kainuu shows minimal AI talent in our dataset. As CSC has its main offices in Espoo, this likely reflects how distributed research infrastructure operates rather than a genuine talent gap. LUMI supercomputer is also governed by a consortium that includes partners from Finland, Belgium, Czechia, Denmark, Estonia, Iceland, the Netherlands, Norway, Poland, Sweden, and Switzerland. LinkedIn profiles of LUMI-associated employees show locations across Denmark, India, and other countries, not necessarily Finland. The supercomputer functions as shared infrastructure that researchers access remotely, meaning physical location reveals little about the talent actually leveraging these resources.

LUMI held the title of Europe's fastest supercomputer between 2022 and 2024, but newer systems have since surpassed it; an expected outcome in the rapidly evolving computing landscape. Although LUMI will remain highly usable for years by academia and industry, countries must also be aware of this critical constraint: infrastructure has time-bound advantages and notoriety on a global scale, even when long-term research applications continue outside of rankings. Maintaining relevance in the AI landscape requires constant and considerable reinvestment, as compute performance depreciates rapidly. Countries cannot rely on supercomputers alone to drive talent attraction or retention when newer, more powerful systems are continually being built elsewhere.

This finding carries significant implications for AI Factory policy. If Europe's most powerful research supercomputers are designed for remote access by distributed talent, infrastructure placement becomes decoupled from workforce development. Building compute capacity in a region does not automatically build local talent pools. Moreover, the rapid pace of infrastructure advancement means the location of world-class compute constantly shifts, as explored in the following section.

b) Who is using the compute infrastructure?

Compute for Talent: The AI Continent Action Plan positions infrastructure as central to growing Europe's AI ecosystem, making it critical to examine how infrastructure investment shapes talent pool growth. Following the government's commitment to invest 4% of GDP in research, development, and innovation by 2030, the Research Council of Finland adopted plans to invest in research infrastructure while "facilitating skills upgrading." Finland also operates multiple public supercomputers, including the LUMI-AI, part of a broader EU-wide supercomputer network. Although LUMI-AI expanded Finland's AI workforce by directly recruiting new AI experts, Finland demonstrates that infrastructure alone cannot reliably attract top talent. Moreover, building more infrastructure for compute will not magically expand AI market share; rather, market researchers are finding that labour, both within the field and in relevant industries like utilities and energy, is increasingly a bottleneck for the rapid expansion of compute.

LUMI-AI provides training and capacity-building for researchers and industrial actors, but its design does not exclusively concentrate talent in Finland. Hybrid and flexible training occurs at "a main hub on grounds of Aalto University, together with ELLIS Institute and a network of satellite hubs in partner countries," which ensures that talent development is not limited to those who can attend in-person, according to Interviewee F. They also noted that while most individuals currently using AI Factory programmes are students and researchers already at Finnish universities, LUMI-AI's hybrid model allows it to support talent development across Finland and Europe. .

Similarly, many of LUMI-AI's capacity-building initiatives for researchers and industrial actors occur remotely or at distributed satellite hubs, meaning participants access Finnish infrastructure without joining the Finnish workforce. So far, LUMI-AI's service centre has trained hundreds of people and is actively working to engage companies, higher education institutions and the ELLIS institute.

Even world-class infrastructure faces adoption barriers beyond technical capability. Interviewee F shared that potential users sometimes believe the supercomputer is "only reserved for extraordinary cases, like you have to solve climate change or cancer treatment or super peak topics," when LUMI is available "for other kinds of research questions or R&D development as well." This perception gap reveals that infrastructure communication matters as much as technical accessibility. Organisations may underutilise available resources not due to cost or capability constraints, but because they don't recognise their use cases as legitimate applications of research infrastructure.

Because of this, LUMI-AI ensures accessibility and high user engagement through user support structures. The facility offers "try and buy" systems allowing companies to test LUMI free for 1-2 months, paired with Interviewee F's response: "They can always just contact our experts, and they will get an answer almost immediately and they know that this is the person with their name. Rather than just some anonymous IT support."

This personalised, low-barrier approach has consistently resonated with users, particularly industrial users transitioning from cloud-based systems to HPC batch systems. As Interviewee F noted: "This has been one of the key factors why we have had really many success stories on LUMI." The lesson: infrastructure investments should allocate resources for dedicated user support and trial periods. Technical excellence alone does not ensure adoption.

c) Infrastructure Ownership and Strategic Autonomy

Finland's ecological conditions make it exceptionally suited for data centres and supercomputers. The country offers renewable energy access, the EU's lowest energy prices for non-household consumers, and naturally cool climates. Finland derives 43% of its energy from renewable sources, the second-largest share in the EU, leveraging cool climates to reduce cooling costs while maintaining stability for reliable operations. Northern regions provide particularly stable cool climates without extreme temperature drops, creating ideal conditions for large-scale computing operations. For example, LUMI operates on 100% hydropower, with waste heat repurposed to heat homes in Kajaani. These advantages have driven significant private sector investment: Google built its first seawater-cooled data centre in Finland in 2009 and has since invested over €4.5 billion in data centres and compute infrastructure across the country.

Despite hosting numerous data centres and receiving extensive investment, Finland does not own much of this infrastructure. Many of the world's biggest tech companies, including Google, TikTok, and Microsoft, have spent millions of euros purchasing land across Finland to host critical infrastructure. While these data centres contribute to Finland's role in a globalised digital economy, they generate limited job growth and minimal impact on the Finnish AI industry. The existing Google campus in Hamina employs 400 people total, ranging from engineers to security guards and electricians. TikTok plans to hire 200 employees for its Kuovola centre, but despite the intention to hire locally, challenges remain around total talent availability.

"That's just because of our climate and certain other things like this, our core infrastructure of what are the pipelines and stuff, but they are actually owned by like U.S. companies, [...]they are really not owned by us even if we like to think that 'oh,

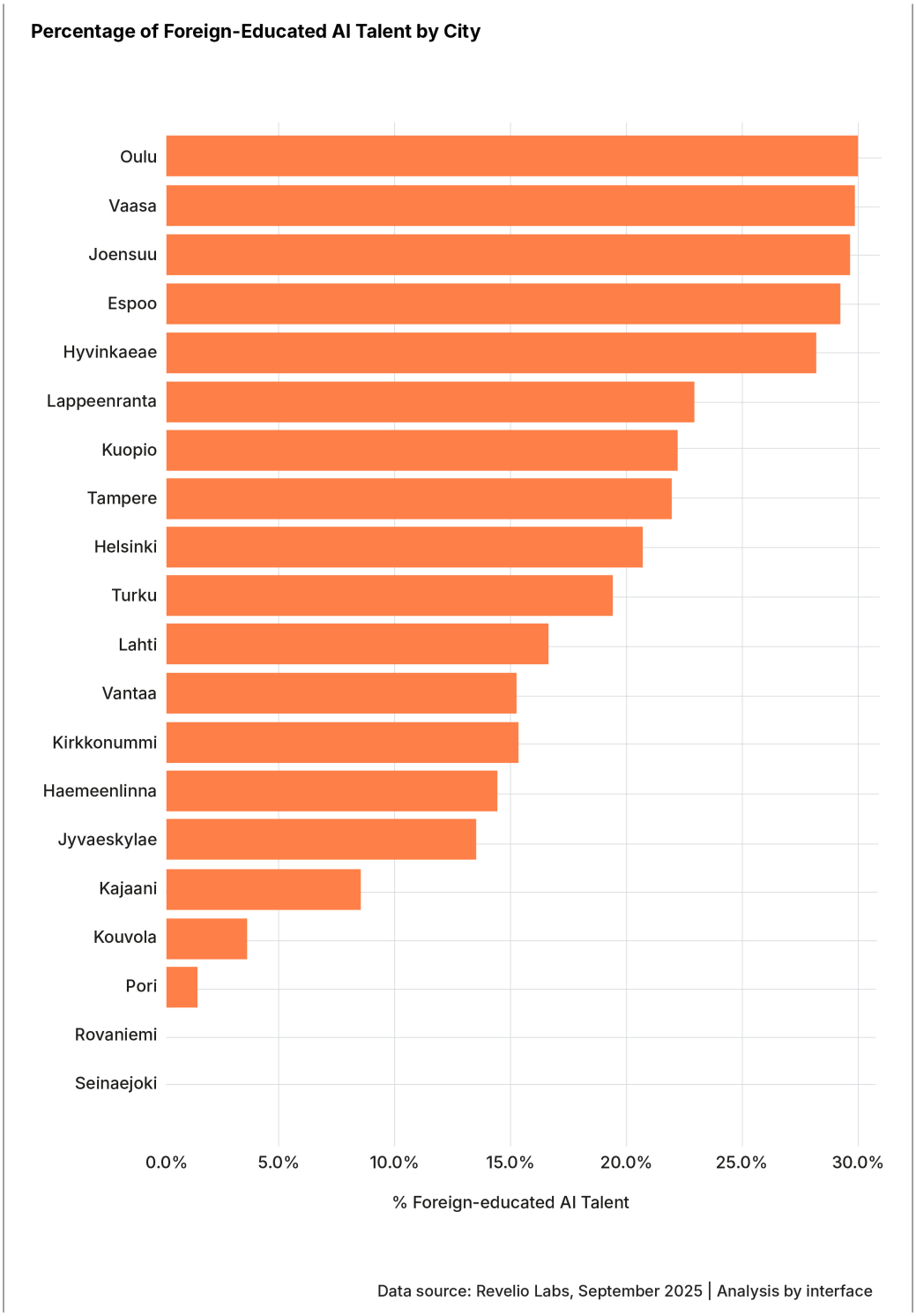
we in Finland have all these data centres,' but they are not really owned by us unfortunately" (Interviewee A, 2025).

While ownership by the Finnish state would not wholly change the talent landscape, this observation highlights a critical distinction between hosting infrastructure and owning it. Data centres and supercomputers alone cannot build talent that drives the economic growth that makes AI companies so desirable, and having a strong infrastructure footprint alone does not generate national economic returns on par with those of tech companies. Finland has secured the physical presence of compute capacity without capturing many of the associated economic benefits or strategic autonomy, which would allow it to shape how infrastructure could be leveraged for commercial development, industrial growth, and subsequent talent development. Moreover, it reflects the challenge of translating leadership in hosting compute infrastructure into significant talent growth: compute infrastructure requires minimal employee footprints, making it harder for regions to capture purported labour market benefits.

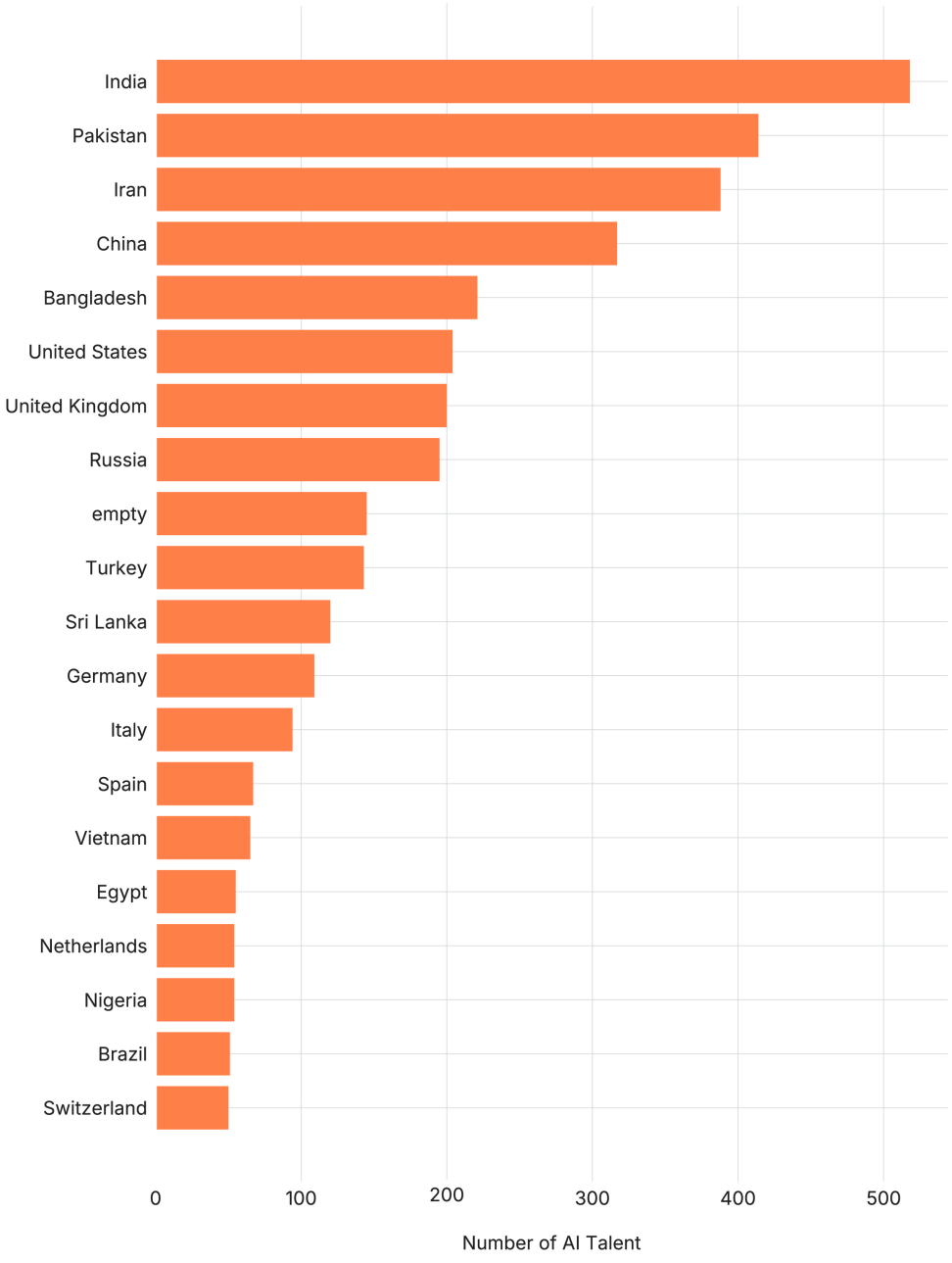
Beyond ownership challenges, data centres and supercomputers function as tools that researchers and AI talent access remotely. Large computing infrastructure investments do not require talent to physically relocate to engage with the Finnish ecosystem.

Finland's experience reveals that computing infrastructure investments create research capacity and position countries as critical nodes in European AI ecosystems, but do not automatically attract proportional talent pools. Infrastructure designed for remote access achieves broad European participation at the cost of localized workforce development. European policymakers investing in AI Factories and supercomputing must explicitly design for workforce outcomes if talent attraction is a goal; infrastructure excellence alone will not achieve it. Additionally, hosting infrastructure without ownership limits both economic capture and strategic autonomy, suggesting that infrastructure investment policies should consider ownership structures alongside technical capabilities.

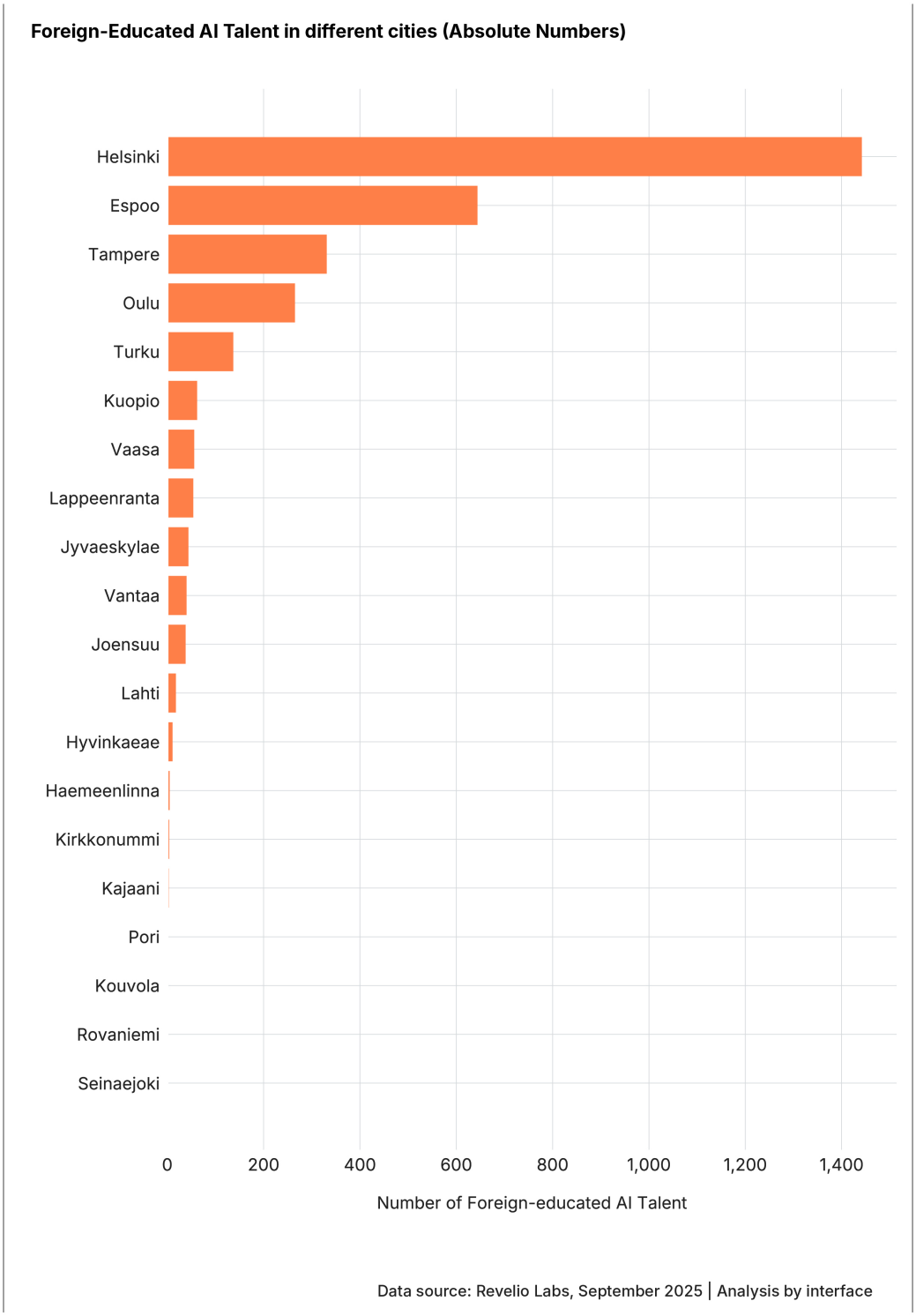
d) International Talent Attraction



Sources of Foreign-Educated AI Talent



Data source: Revelio Labs, September 2025 | Analysis by interface



Talent attraction programmes: Recognising workforce shortages, Finland launched its Talent Boost Programme in 2023. The programme focuses on EU/EEA talent and targeted international recruitment from India, Brazil, Vietnam, and the Philippines. Key initiatives include:

- Automating residence permit issuance to under one month for work-based permits

- Expanding English-language early childhood education
- Supporting Swedish and Finnish language learning during studies and careers
- Reducing bureaucratic barriers for immigrants

These efforts show results in Helsinki: our data shows that Helsinki has more than twice the AI talent of Espoo, the next highest city. This talent primarily comes from India, Pakistan, and Iran, reflecting a largely international rather than Scandinavian talent pool. While cities in regions like North Ostrobothnia and Ostrobothnia have over a third international AI talent, Helsinki's international talent represents just over a fifth of the total AI talent pool. National statistics confirm this pattern: Greater Helsinki's entire population growth derives from foreign-language speakers (those not speaking Finnish, Swedish, or Sami). The region now hosts half of all foreign-background residents in Finland. ICT-related job growth continues to concentrate in urban areas, increasing demand for both domestic and international AI talent.

Many interviewees echoed the need for foreign talent in the Finnish AI ecosystem. As one explained: "In general, I think it's clear that Finland needs foreign talent. We are a small country with ageing population and it's impossible to think that we could manage the upskilling need just by[...] or the skill gap just by upskilling the Finnish people." (Interviewee B, 2025)

Barriers to attraction: Compared to many European countries, Finland has a shorter history of international migration, with most migration prior to the 1990s consisting of return migrants. This means diaspora communities that create robust support networks for international talent may be less present in Finnish society, creating additional challenges for immigrants navigating a new country. Previous OECD research identified language as a barrier for immigrants seeking professional opportunities and integration. Despite common English proficiency among professionals and in cities like Helsinki, Finnish interviewees echoed linguistic barriers for international talent: "It [Finland] feels far away, very hard, with difficult language [...] I would say that those are the kind of reasons because also the language is very, very difficult and I know for example that the people don't realise it's quite easy still to live here with [knowing] English. Of course it's a little bit different, but for most of the people we have been able to hire, they have had a spouse or some kind of relationship here." (Interviewee C, 2025)

This observation reveals that successful international recruitment often depends on personal connections to Finland rather than professional opportunity alone. The perception of language difficulty and geographic remoteness persists even when English-language living is functionally possible.

Finland's experience demonstrates that targeted recruitment programmes can drive

growth in primary urban centres but face structural challenges in achieving broader geographic distribution. Infrastructure investments in regions outside major cities do not automatically create local talent pools when that infrastructure is designed for remote access. Workforce development strategies must explicitly address concentration dynamics rather than assuming infrastructure placement will organically distribute talent.

Beyond geographic and linguistic barriers, organisational culture patterns may constrain AI adoption despite infrastructure availability. Finland's corporate culture presents a paradox: while organisations may claim non-hierarchical values, many maintain strong hierarchies where leadership typically cannot command but must ask employees. One professional described this as: "even though we call ourselves non-hierarchical, we still operate with the kind of understated hierarchy common in Finnish organisations " (Interviewee E, 2025).

This cultural pattern intersects with AI adoption in specific ways. One interviewee estimates 80-90% of leadership in Finnish tech organisations skews heavily toward engineering backgrounds, while organisational composition shows inverse proportions, with 80-90% of employees in non-technical roles. A study by the Academic Engineers and Architects in Finland (TEK) confirms this pattern: the majority of those responsible for adopting AI tools in engineering or technology-based workplaces are men, primarily in "management, middle management, or highly demanding IT expert roles." This creates what Interviewee E characterised as "the biggest gap in interrogating and creatively applying AI, particularly as much of the essential meaning is often lost between technical and non-technical groups who operate with different conceptual languages. This disconnect reduces psychological safety, limits shared understanding and ultimately undermines organisations' ability to adopt AI effectively. "

Additionally, post-war development of comprehensive safety nets has cultivated what some describe as a "safety-oriented" culture: "Instead of enabling genuine agility, our extensive safety nets tend to encourage a cautious approach. Although they were created to support stability, they often end up limiting experimentation" (Interviewee E, 2025). These patterns particularly affect large corporations:

" A central issue in large Finnish corporations is the deeply rooted structure of hierarchies and silos. This creates a circular dilemma in which it is unclear where change should begin or how it should be prioritised. As a result, organisations remain locked into established practices despite recognising the need for new approaches. In practice, responsibility for driving change often falls into a gap: it is rarely included in anyone's budget or mandate, which pushes the issue upward to the C-level - where it competes with more immediate pressures and easily becomes deprioritised due to being noone's mandate. The magnitude and diffuse ownership

of the transformation required make it appear as a change process that may span an entire generation." (Interviewee E, 2025)

Finland's ability to create pathways for talent attraction and retention remains among its largest challenges. The increasingly globalised race for top AI talent is competitive, and Finland's robust compute infrastructure alone cannot incentivise talent to choose the country for work.

Ethical AI Leadership: Necessary but Insufficient

Finland is a leader in exploring and centring ethics in the development of technology, which research suggests can help attract workers or create meaningful work for employees. Finland first established national digital competency strategies in the 1990s, creating decades of policy continuity around technology adoption. This long-term approach positioned Finland as an early global leader in comprehensive AI policy. In 2017, the country enacted Tekoälyaika (Finland's Age of Artificial Intelligence) after research ranked Finland second only to the United States in economic growth potential from AI. Former Minister of Economic Affairs Mika Lintilä convened a working group to position Finland as a leading country in AI application.

The 2017 strategy identified priorities that remain relevant: supporting AI adoption across industries regardless of implementation stage, promoting data construction and utilisation in both industry and public sectors, and investing in talent through attraction and education programmes. Finland updated this strategy in 2019.

AI 4.0 and industrial transformation: The 2020 Artificial Intelligence 4.0 programme focused on expediting AI adoption, strengthening digitalisation, and promoting the fourth industrial revolution to position Finland as a leader in both digital and green transitions. AI 4.0 emphasised cross-sectoral cooperation and digital skills development, particularly in small and medium enterprises. The programme explicitly aligned with European digitalisation objectives and served as an economic response to the coronavirus pandemic.

AuroraAI and public sector innovation: Also launched in 2020, AuroraAI worked "to prepare Finland for a human-centric and ethically sustainable society in the age of artificial intelligence." The three-year programme connected services, AI models, and applications across public services, establishing a digitised public administration ecosystem. Rather than relying solely on regulation, Finland demonstrates AI ethics through implementation.

Addressing algorithmic bias: In 2021-22, the Finnish Ministry of Justice launched

the "Avoiding AI Biases" research project to address algorithmic discrimination throughout the AI development cycle from conception through deployment. This project-based approach complements broader strategy documents with targeted interventions.

Public AI literacy: Academic institutions have played leadership roles in expanding AI understanding. The University of Helsinki partnered with learning company Reaktor to launch "Elements of AI," an open online course in 2018. During Finland's 2019 EU presidency, the country opened the course to all member states with the goal of educating 1% of European citizens about AI. Translated into all member state languages, the course has enrolled over one million students globally, with over 60% of Finnish participants being women.

If ethical environments help drive employee satisfaction and create conditions towards meaningful work, one might expect that Finland would have an extraordinary level of AI experts clambering to work in the country. Instead, while the country's leadership in policy has created global awareness, this has failed to initiate a widespread workforce development process. This reflects the challenges of attracting AI workers in a globally competitive landscape, where many factors are weighed with varying levels of importance to each worker, their families, and the lives that they seek to build.

Additionally, the relationship between literacy initiatives and workforce supply remains complex. Previous interface research found that more than half of all AI vacancies in Finland were for AI-literate or AI-curious roles rather than technical positions. While public literacy initiatives succeed in building awareness, they may not translate directly into workforce supply for technical roles. Participants may remain in sectors or roles that do not typically engage with AI, leaving technical vacancies unfilled. This may also reflect changing demand for baseline AI literacy applicable across sectors.

The pedagogical challenge runs deeper than enrolment numbers suggest. Training providers working with over 2,000 participants across 18,000 hours of AI education identify resistance to AI adoption as primarily emotional rather than technical. As Interviewee E explained:

"Our findings suggest AI literacy should not default to 'tech-first' explanations: for many non-technical professionals, starting with use cases, data literacy, and practical value lowers the barrier to adoption and can later spark interest in deeper technical understanding."

Most AI education in Finland is designed by engineers who assume baseline technical thinking, creating what practitioners describe as "lost in translation problematics" for non-technical professionals. When courses successfully lower

psychological thresholds by demonstrating practical benefits without technical prerequisites, adoption accelerates rapidly:

"Once people see how AI benefits them directly, they begin to recognise its wider possibilities. This often sparks interest in the underlying theory - even complex aspects such as how AI works - and encourages them to consider the importance of data literacy. These shifts create momentum at scale and mark the beginning of a potentially meaningful AI transformation process, provided it is intentionally guided and supported. These shifts create momentum at scale and mark the beginning of a potentially meaningful AI transformation process, provided it is intentionally guided and supported. This is the unglamorous part of GenAI: capability-building costs money and takes time. Based on training approximately 2,000 non-technical professionals in 2025, I'd argue minimum 2–3 years to build baseline literacy and working norms, and ideally a 3–5 year transformation programme, so everyone can actually participate. Without that, we risk arriving in 2030 with stronger tools but a wider adoption and responsibility gap and likely much less economic value." (Interviewee E, 2025)

This suggests that the gap between AI literacy initiatives and workforce participation stems partly from pedagogical approaches rather than solely from participant motivation. Workplace hierarchies may also reinforce tech-forward approaches to AI applications, disincentivising non-engineers from exploring how they can apply technology in their daily work.

Research excellence: Finland already has multiple initiatives for developing and nurturing top AI research talent. The ELLIS Institute Finland is a research hub that contributes to a concerted European effort in basic research in machine learning, focusing on topics like probabilistic modelling and Bayesian inference and privacy-preserving machine learning, among many others. The Foundation Post Scriptum is another initiative that aims to strengthen Finland's AI research ecosystem, funding academic positions and supporting research to help the country and Europe attract top talent and become a global leader in AI.

Additionally, Finland Centre for AI (FCAI) gathers experts from institutions including University of Helsinki and Aalto University to conduct research on "new types of AI" that bring AI models and systems closer to human needs and real-world performance. This work explicitly emphasises trust, ethics, data efficiency, and understandability, ensuring AI functions as a tool augmenting human capabilities without compromising fairness, trustworthiness, or privacy.

As one professional noted: "Our infrastructure and how secure our country is and again the trust point, people really can trust the officials and the press." (Interviewee A, 2025)

Private sector collaboration: Finland has secured private compute investment through the Nvidia AI Technology Centre (NVAITC), a joint research centre between FCAI, Nvidia, and Finnish IT Centre for Science CSC. NVAITC accelerates research, education, and AI adoption in Finland, with **CSC** contributing considerable computing power at its Kajaani data centre.

"There's kind of strong traditions within the collaboration between the private sector and academia, which also I'd say is one of the strengths." (Interviewee C 2025)

From policy to practice: Finland's ethical AI leadership demonstrates that long-term policy continuity, public-private collaboration, and practical implementation projects can establish credibility and expertise. However, this leadership in ethics and policy innovation has not translated directly into proportional talent attraction or workforce growth. Ethics and trust represent necessary but insufficient conditions for building large-scale AI talent pools.

Moreover, Finland's policy leadership may not fully extend to business implementation. Practitioners report that companies "are still quite unaware of these regulation stuff and they will only understand it when they start implementing their own solutions." More concerning, a prevalent attitude exists of "hey, we will first implement this entire AI product, and we will deal with regulation stuff later," (Interviewee A, 2025) which may require complete project redesigns if ethical and regulatory requirements were not considered from the beginning.

The deliberate, consensus-driven approach that enables Finland's ethical leadership creates trade-offs in adoption speed. Interviewee D, who has experience across both Finnish and US ecosystems observed: "In Miami, I see that executives are probably jumping faster on testing things and they might be failing fast and it's OK. Whereas I see in Finland again, it's responsible, it takes longer time." This difference reflects deeper cultural patterns where Finnish organisations prioritise building strong foundations and achieving broad stakeholder alignment before implementation. While this approach produces more responsible and sustainable AI deployment, it may disadvantage Finnish companies in rapidly moving markets where speed confers competitive advantage. The challenge for Finland is maintaining its ethical standards while creating more space for controlled experimentation: as one expert put it, "Build that little sandbox to start experimenting, you do need the space to explore and learn what creates real value." (Interviewee D, 2025)

Many also raised deeper questions about the attention AI's supply chain and data economy receive in business contexts: "We need to move toward a stronger sense of self-awareness and understanding when using AI tools. What does their use mean - not only for me, but for my organisation - and what does the broader AI supply chain look like? Who benefits, and in what ways?" One professional cautioned: "If

we do not address these questions soon, we may face a situation similar to the late 1990's Naomi Klein's 'No-Logo' critique, but in the context of AI. This discussion needs to begin rapidly. If Finland aims to position itself as an ethical, equitable, and responsible country in the AI era, then we must take leadership in addressing these issues" (Interviewee E, 2025).

This gap between policy excellence and business practice suggests that regulatory frameworks and ethical guidelines require active implementation support, not just documentation. Companies need practical tools for assessing AI supply chains, understanding data economy implications, and embedding ethical considerations from project inception rather than treating them as compliance afterthoughts. European countries can replicate Finland's policy approaches while recognising they must be coupled with other attraction mechanisms and sustained implementation support.

Gender Equality in AI Workforce

Finland's AI labour market achieves nearly 40% female representation, leading both European and global peers. Historically, the country boasts strong foundations in gender equality**.** Finland's Parliament (Eduskunta) was the first in the world to grant women voting and candidacy rights in 1906, leading to the world's first elected women parliamentarians in 1907. The constitution prohibits sex-based discrimination, and a 1995 amendment to the Equality between Women and Men Act obligated authorities to actively promote gender equality rather than simply prohibit discrimination.

Decades of gender mainstreaming policies have driven strong structural support for women's workforce participation and academic attainment: Finland ranks third among OECD countries for women's higher education attainment, with over half of women aged 25-64 holding higher education degrees. Women complete 59% of all university degrees. Finnish girls significantly outperform boys in mathematics and science, and Finland shows the largest gap in reading performance between girls and boys, with nearly a fifth of girls reaching highest proficiency compared to 9% of boys.

Maternal employment and policy support: The strong participation in the AI labour market may also be affected by family support policies and strong maternal employment rates. According to OECD data, 77.1% of Finnish mothers are employed: 60.8% of mothers with children aged 0-2, rising to 79.0% for mothers with youngest children aged 3-5, and reaching 86.5% for mothers with children aged 6-14, far above the EU average of 79.6%. In 2021, 60.8% of mothers were working full time. Women with higher education typically return to work faster than women

without, likely due to longer employment contracts and greater job security.

Finland provides 160 days of paid parental leave per parent, provided leave is taken before the child turns two. Parents may transfer up to 63 days to the other parent. Since the policy's 2022 expansion, fathers take an average of 78 days of leave, up from 44 days in 2021, a doubling in paternal leave uptake. The 2022 reforms also expanded pregnancy allowances, special pregnancy allowances, and partial parental allowances.

"One of the pros of the Finnish business life is the work-life balance. That is quite good here and as a female, it's still quite normal that women do more in terms of the household and children*, for example, it is easier when you have a good work life balance. At the same time what we've seen during the past years is that men are taking a greater responsibility when it comes to having parental leaves. It's quite normal here that that dad stays at home for three to six months."* (Interviewee B, 2025)

Despite achieving nearly 40% female representation, AI's organisational positioning may limit the full realisation of this equality. Industry leaders consistently report that "AI is still used in IT and it's driven by IT," with organisations struggling to attract professionals from marketing, HR, sustainability, and other business functions to AI initiatives. Another observed: "As long as it's in IT, it will be male's area" (Interviewee A, 2025). The challenge is not representation within AI overall but ensuring that Finland's achievement in gender balance extends across all AI functions from technical development to strategic implementation, adoption, and governance.

"Finland has been already such a pioneer of equality for such a long time, and that would, if you would look every industry, you see the same pattern. So now I'm happy that it's in AI. And again, since we are such as mighty but powerful, gentle power within the Finland of, like, let's get this done, it has picked up so fast the women interest and what I truly see is the non-technical leadership coming into the women" (Interviewee D, 2025)

Finland's gender equality in AI demonstrates that long-term structural policies around education, work-life balance, and parental leave create conditions for equitable workforce participation. The success in achieving nearly 40% female representation shows that policy interventions work when sustained over decades and embedded in broader social infrastructure. However, concentration of early school leavers among women and potential seniority gaps suggest that even strong policy frameworks face implementation challenges. European countries seeking to replicate this success must commit to comprehensive, long-term policy packages rather than isolated interventions.

Recommendations

Based on Finland's experience building AI infrastructure, developing ethical frameworks, and attracting talent, we offer five key recommendations for European policymakers:

1. **Separate infrastructure investment from workforce development strategy**
   While compute capacity can generate new skills, networks of expertise, and job opportunities, it cannot be considered the silver bullet for broad labour attraction at a time of high demand for talent. Finland hosts world-class supercomputers that serve distributed European researchers remotely, valuable for collective capacity but insufficient for large-scale national workforce growth. Member states investing in AI infrastructure must design explicit workforce development mechanisms: co-locate training facilities with physical infrastructure, require infrastructure operators to hire locally, create on-site research positions, and develop regional educational partnerships before deployment. Critically, countries should evaluate ownership structures in infrastructure investments, as hosting provides some benefits, but ownership determines strategic autonomy and economic capture.
2. **Commit to comprehensive, long-term gender equality policies**
   Finland's achievement of nearly 40% female AI workforce representation required decades of coordinated policy across education (encouraging STEM participation from early stages), work-life balance (generous parental leave for both parents), and cultural normalisation of shared caregiving. Isolated interventions will not replicate this success. Member states must implement multi-decade policy packages that address structural barriers comprehensively while monitoring retention patterns across career stages to identify and address mid-career attrition points.
3. **Design talent attraction for retention, not just recruitment**
   Language barriers and cultural integration challenges persist despite functional English-language working environments. Finland's most successful international recruitment involves personal connections, spouses or existing relationships to the country. Member states should expand English-language services beyond workplaces to include childcare, schools, and healthcare; build international communities to reduce isolation; and develop partner programmes for recruited professionals' families. Recognition that long-term integration support matters more than one-time recruitment incentives.
4. **Address regional concentration explicitly**
   Half of Finland's AI talent concentrates in Helsinki, reflecting patterns where international talent settles in the most internationally connected city. Without regional distribution strategy, talent attraction reinforces capital-region dominance. Member states should develop multiple regional tech hubs with critical mass of opportunities, create specialised expertise clusters giving regions distinctive identities, and ensure quality of life extends beyond capitals, while accepting that some concentration is inevitable.
5. **Bridge AI literacy initiatives to workforce pipelines**
   Finland's Elements of AI course succeeded in building public awareness (1 million+ enrolments, 60% women among Finnish participants) but persistent vacancies for AI-literate roles suggest awareness does not automatically translate to workforce participation. Member states should create explicit pathways from literacy programmes to technical training, design intermediate skill-building opportunities between basic and advanced technical roles, track participant trajectories to identify transition failures, and target literacy efforts toward populations most likely to convert

awareness into AI careers.

Conclusion

Finland has secured world-leading computing infrastructure, developed comprehensive ethical AI frameworks, and achieved exceptional gender equality in its AI workforce, yet its talent pool remains modest, geographically concentrated, and challenging to expand. These outcomes reveal what different policy interventions can and cannot achieve.

For European policymakers debating AI Factory and Gigafactory investments and workforce strategies, Finland's experience offers three critical insights. First, infrastructure and workforce development require separate, coordinated strategies. Building computing capacity creates research capability but does not automatically attract talent, particularly when infrastructure is designed for remote access. Second, progressive policies on gender equality and ethical AI represent genuine achievements requiring decades of sustained commitment across multiple domains, no single intervention solves complex challenges. Third, even successful talent attraction concentrates in capital regions without explicit distribution strategies, and infrastructure placement alone cannot overcome this dynamic.

Finland demonstrates that building AI capability requires coordinating infrastructure, policy, education, and talent strategies over long timelines. The country's strengths in gender equality and ethical frameworks show what sustained policy commitment achieves. Its challenges in talent attraction and regional distribution illuminate what infrastructure investment alone cannot solve. As Europe weighs compute capacity investments, Finland's case underscores the need to distinguish between collective European capacity-building and national talent development, both are legitimate objectives, but they require different approaches and should not be conflated.

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The views and any errors in this work remain solely those of the authors.

Appendix

Methodology & Data Sources

This study utilises comprehensive workforce data provided by Revelio Labs, a workforce intelligence company that aggregates publicly available professional profiles, job postings, and related sources. The dataset from 2025 encompasses 616 million individuals in the global workforce.

Semi-Structured Interview Methodology

This study utilised six semi-structured interviews for qualitative primary data collection, primarily with members of academia, government officials, leaders in industry, and students pursuing advanced degrees like masters or PhDs. Sets of questions were developed for three groupings of interviewee identities: academia, industry, and HR professionals. Interview question sets were selected depending on which group best matched the role of the interviewee.

All interviews have been anonymised for the protection of participants who shared critical thoughts about institutions, policies, and cultural elements in Finland. Select individuals who allowed their names or institutions to be included are acknowledged in the acknowledgements section.

The transcripts and recordings from these interviews were analysed using inductive thematic analysis, manually coded along the following themes: academia, collaborations, finance, gender, geopolitics, leadership, talent, and quality of life. An additional set of codes related to integration, Helsinki, ethics, and historic industries was also included.

Data Validation and Limitations

Our data may miss individuals due to outdated online profiles or profile deletion. The seniority metric combines information about current job (including title, company, and industry), job history (duration of previous employment and seniority of past positions), and age to generate individual scores averaged into a continuous seniority metric, then converted to seven ordinal levels from Entry Level to Senior Executive Levels. Gender was determined using the Revelio gender classifying algorithm, which makes assumptions on names and the associated gender, which is not always accurate across different countries and languages.

We also used the country of an individual's undergraduate degree serves as a proxy for their origin, based on the assumption that most people pursue their early education in their country of origin. This method is generally reliable, as seen in these OECD data cases.

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