European Higher Education Sector Observatory (EHESO)

EHESO policy-oriented conference

From data to direction: How can EHESO support the monitoring of the Union of Skills?

12 November 2025

Summary Report

With the support of the European Commission

Contents

1. Introduction

1.1 About the conference

As part of the **European Higher Education Sector Observatory** (EHESO), a policy-oriented conference titled "From data to direction: How can EHESO support the monitoring of the Union of Skills?" on the 12th of November, 2025 at the European Education and Culture Executive Agency (EACEA) in Brussels and online. This one-day conference brought together policymakers, higher education institutions, researchers, and stakeholders to explore how EHESO data can inform policy, strengthen institutions, and support Europe's transition toward a more skilled and innovative future.

The conference was structured around four main segments, beginning with a **welcome and keynotes** by representatives from EACEA, DG EAC and the EHESO project team focused on the status of the Observatory, the data now being made available through the European Higher Education Sector Scoreboard (EHESS), and the policy objectives of the project. Through the integration of different and new sources of data it will be possible to better understand the higher education sector across the EU, which will ultimately help support the European Commission's political ambitions under the **Union of Skills**.

After the keynote speakers the agenda proceeded with three thematic sessions about *"Promoting entrepreneurship and innovation in higher education", "Fostering STEM in higher education: increasing graduate numbers and closing the gender gap"*, and *"Who benefits from graduate tracking data and how?".* These sessions each had panel discussions and expert topical presentations which allowed participants to get a better understanding of both current developments in the higher education sector in Europe as well as showcases of analysis conducted using data from EHESO. All sessions also allowed for questions from both the audience physically present, and from those joining online.

In the afternoon, the conference facilitated in-depth discussions through parallel breakout sessions focused on *"Empowering universities through EHESO-HEInnovate synergies"*, *"Driving the EU STEM Education Strategic Plan through tech-focused European University Alliances"* and *"Exploring graduate tracking use cases and strengthening impact through a graduate tracking user group".* These sessions provided valuable opportunities for stakeholders to explore topics related to the EHESO project and explore how the Scoreboard can support their specific needs and activities going forward.

The event finished with a forward-looking panel discussion *"How can EHESO best contribute to the Union of Skills?"* focused on how the Observatory and Scoreboard can best support the overall policy aims of the European Commission within education and research policy. This panel included representatives from the Commission, students, businesses and universities to provide a comprehensive perspective on the role of EHESO in the wider education landscape. Particular attention was paid to how the Observatory could evolve to better serve the needs of its diverse user base while maintaining its role as a comprehensive resource for understanding and improving European higher education.

The conference combined in-person and hybrid sessions to enable maximum participation. In addition to the EHESO consortium, EACEA and the European Commission representatives, the conference attracted 19 speakers and 32 on-site participants in Brussels, along with 88 participants joining online. The agenda outlines the programme for the launch conference of the European Higher Education Sector Scoreboard.

2. Welcome and keynotes

PART 1 **Welcome and keynotes**
Hybrid format, online participation available

09:30-09:40	**Welcome by EACEA** Florence MONDIN | *Head of Unit – Platforms, Studies and Analysis / European Education and Culture Executive Agency (EACEA)*
09:40-09:50	**Keynote by the European Commission** Susanne CONZE | Head of Unit – Higher Education / *European Commission, Directorate-General for Education, Youth, Sport and Culture (DG EAC)*
09:50-10:00	**Keynote by the EHESO consortium** Benedetto LEPORI | *EHESO Scientific Director*
10:00-10:10	**Keynotes Q&A** Mantas PUPINIS | *EHESO Deputy Project Manager*

Mantas Pupinis (EHESO Deputy Project Manager) opened the conference by emphasising the timeliness of discussions around EHESO, given that the Union of Skills and competitiveness are high on the EU policy agenda. The conference aimed to understand how EHESO can meaningfully contribute to monitoring and guiding the Union of Skills.

Florence Mondin (EACEA) emphasised EHESO's transformation from data collection to shaping policy direction. She described the shift "from data to direction", with EHESO becoming a true observatory translating complex data into actionable evidence. EHESO has expanded through new components including the Scoreboard, Benchmarking Tool, and Eurograduate integration. The Scoreboard indicators have been updated and data gaps filled. The Student Hub is developing to become a trusted reference point for students and institutions. She stressed that EHESO's value lies in providing strategic guidance for smarter decisions, with collaboration being the greatest strength.

Susanne Conze (DG EAC) highlighted that EHESO is essential for the Union of Skills' ambition. She posed critical questions about understanding STEM choices, university offerings, and whether adequate data exists to promote the right policies. Two years of intensive work have included institutional surveys combining ETER and EHESO data and the integration of Eurograduate. Various analytical tools are being developed, with emphasis on strengthening the regional dimension for understanding Europe's diverse higher education landscape. Different stakeholders require tailored ways of engaging with the data.

Benedetto Lepori (EHESO Scientific Director) provided an overview of EHESO's scale: 40 countries, 600 regions, 3,500 institutions, and data across more than 10 scientific fields. This creates both opportunities and operational challenges. He noted the trade-off between EHESO's broad scope and stakeholder requests for detailed information. The Observatory serves diverse users, from those needing microdata for research to those requiring user-friendly visualisations. Managing, validating, and harmonising diverse data sources has become increasingly demanding. EHESO represents one of the largest voluntary data collection efforts by statistical offices in Europe.

Q&A Session

Asked about EHESO's key priority for 2026, Benedetto Lepori identified Eurograduate integration as critical for understanding skills development and labour market alignment. Florence Mondin agreed whilst also emphasising the Student Hub. Susanne Conze added that EHESO must demonstrate its ability to shape EU-level policy direction.

Regarding thematic reports for non-expert users, Benedetto Lepori acknowledged their value but noted the challenge of balancing depth and clarity. Since stakeholders already produce analyses using EHESO data, it may be more effective to showcase and amplify their work rather than duplicating efforts.

3. Thematic sessions

PART 2 **Thematic sessions**
Hybrid format, online participation available

10:10-11:10

Session 1: Promoting entrepreneurship and innovation in higher education
Chaired by Ingrid RIGLER | *Deputy Head of Unit – EIT and Innovation | European Commission, Directorate-General for Education, Youth, Sport and Culture (DG EAC)*

Flávia COLUS | *HEInnovate Deputy Project Manager*

Inga POPOVAITĖ | *Principal Investigator | PPMI, part of the Verian Group*

Peter JOORE | *Chair – Open Innovation Research Group | NHL Stenden University of Applied Sciences*

Bart DERRE | *Director – Center for Entrepreneurship | HOGENT University of Applied Sciences and Arts*

Coffee break

11:30-12:30

Session 2: Fostering STEM in higher education: increasing graduate numbers and closing the gender gap
Chaired by Georgi DIMITROV | *Head of Unit – Digital Education | European Commission, Directorate-General for Education, Youth, Sport and Culture (DG EAC)*

Omar ABOZEID | *Principal Investigator | PPMI, part of the Verian Group*

Hanne SHAPIRO | *Associate – Centre for Higher Education Transformation | University of Bristol*

Duru BAYRAM | *Assistant Professor – Department of Applied Physics and Science Education | Eindhoven University of Technology*

12:30-13:30 *Lunch break*

13:30-14:30

Session 3: Who benefits from graduate tracking data and how?
Chaired by Giovanni RUSSO | Expert in Skills and Workplaces | CEDEFOP

Frans KAISER | *Senior Researcher – Centre for Higher Education Policy Studies (CHEPS) | University of Twente*

Arnaud DUPRAY | *Project Manager | Center for Studies and Research on Qualifications (Céreq)*

Katarina WEẞLING | *Senior Researcher – Research Centre for Education and the Labour Market (ROA) | Maastricht University*

Session 1: Promoting entrepreneurship and innovation in higher education

Ingrid Rigler (DG EAC) opened by noting that entrepreneurship and innovation are central to the European policy agenda. She emphasised that higher education institutions should become entrepreneurial institutions embedded across whole organisations, contributing to the EU's innovation capacity, labour market alignment, inclusive growth, and stronger regional ecosystems.

Inga Popovaitė (PPMI) presented findings from an EHESO analytical draft report revealing that no single country excels across all indicators. In general university-industry collaboration varies significantly across EU countries. European University Alliances tend to be more engaged in industry collaborations, suggesting that EUA-style networks have potential to act as concentrators and accelerators of innovation.

Peter Joore (NHL Stenden University of Applied Sciences) argued that organisations need clear direction before generating meaningful data. He described how his institution created a mutual relationship between data and direction, with HEInnovate providing a framework for comparing entrepreneurial approaches across universities.

Bart Derre (HOGENT University of Applied Sciences and Arts) emphasised that entrepreneurial universities emerge gradually through culture, people and practice. HOGENT's multi-year transformation from student entrepreneurship to broad entrepreneurial education was a major paradigm shift. He stressed normalising productive failure and noted that each university must develop entrepreneurship aligned with its own context.

Participants emphasised the need for multi-level data and validated measurement systems for entrepreneurial learning, noting current gaps in EHESO coverage. Alliances can provide strategic direction and long-term commitment, though institutions should maintain flexibility for individual needs. HEInnovate focuses on internal reflection whilst EHESO offers comparative data. The current entrepreneurship definition was deemed too narrow, focusing on start-ups rather than broader entrepreneurial mindsets.

Ingrid Rigler (DG EAC) concluded by calling for holistic design across institutions, wide entrepreneurship definitions including acceptance of failure, continuous assessment, data-driven feedback, and combining qualitative and quantitative approaches.

Session 2: Fostering STEM in higher education: increasing graduate numbers and closing the gender gap

Georgi Dimitrov (DG EAC) stressed the urgent need to strengthen STEM talent across Europe. Given current geopolitical and economic competition, particularly in artificial intelligence, he questioned whether Europe has sufficient STEM graduates to remain globally competitive. The EU's STEM Plan aims to reverse long-standing negative trends, though structural, cultural, and educational barriers persist.

Omar Abozeid (PPMI) presented findings from an EHESO analytical draft report on STEM orientation across institutions. Analysis revealed that most institutions fall into the limited category of STEM orientation. European University Alliances show shifts towards moderate STEM orientation. STEM-oriented institutions have higher shares of international staff and students, whilst maintaining persistent gender disparities.

Hanne Shapiro (University of Bristol) argued that the STEM acronym no longer serves well as disciplinary boundaries blur. Innovation increasingly occurs at intersections, requiring flexible, interdisciplinary education systems. Europe's progress remains fragmented, limiting comparability and understanding of supply and demand. She advocated for connected infrastructure supporting continuous learning between formal, informal, and non-formal education. Micro-credentials will be essential for workforce development. In general fragmentation and slow implementation hinder progress across topics.

Duru Bayram (Eindhoven University of Technology) focused on the persistent gender gap. STEM fields remain male-dominated, male graduates find employment faster, and underrepresentation persists throughout the educational and professional pipeline. Multiple factors operate at individual, contextual, and institutional levels. Interest typically begins in primary and secondary school, but leaks occur at every stage. She highlighted two policy gaps: limited family-support policies and insufficient targeted initiatives for women and girls. Non-formal initiatives help but cannot substitute for formal education reform.

Attendees pointed out that labour market relevance strongly influences STEM attractiveness, with students responding to employment opportunities. When addressing gender, interventions must start early through improved teacher training. Stronger industry partnerships, especially with regional ecosystems, are essential, though fragmentation makes navigation difficult. Scholarships can stimulate enrolment into STEM, particularly for underrepresented groups.

Broader policy points emphasised investing in data literacy, involving companies more deeply, and recognising universities' dual role in scientific advancement and workforce preparation but companies must carry part of the cost of STEM talent education and preparations for the market.

Georgi Dimitrov (DG EAC) concluded by emphasising the need for serious attention to data, noting that without robust evidence, policymakers cannot develop effective data and AI literacy initiatives.

Session 3: Who benefits from graduate tracking data and how?

Giovanni Russo (CEDEFOP) emphasised the importance of developing strong foundational skills in education that can be effectively utilised in the labour market, explaining that graduate tracking provides crucial insights into this transition from education to employment.

Frans Kaiser (University of Twente) explained that a graduate tracking user group has been established to learn from diverse stakeholder experiences including policymakers, scholars, higher education institutions, educators, and potential students. Graduate tracking provides detailed pictures of educational journeys and labour market outcomes, encompassing experiences and perceptions such as skill matches or mismatches. Whilst many countries have national systems, Eurograduate provides crucial European-level comparability, and integration of national, European, and international systems is essential for comprehensive understanding.

Arnaud Dupray (Céreq) provided an overview of the French system, which combines InserSup (administrative data) and Céreq "Génération" Survey (survey data). France has seen sharp increases in work experience implementation in higher education over the last decade. The dual system combines depth with coverage, though challenges remain around completeness, integration of different data sources, and ensuring data remains timely and relevant for policymaking.

Katarina Weßling (Maastricht University) focused on persistent social inequalities in study-to-work transitions, presenting research showing that parental education does not significantly influence unemployment rates after graduation but substantially affects income, overeducation likelihood, and occupational position. Young people from lower socioeconomic backgrounds do not necessarily struggle more to find jobs, but they earn less, have less favourable conditions, and face higher insecurity. Her research highlighted the importance of geographical factors and mobility constraints, demonstrating why survey data combined with administrative or regional data is essential, and emphasising that measures supporting mobility, including study-abroad opportunities, simultaneously reduce social inequality.

The discussion addressed several practical questions about graduate tracking applications and future development. The Eurograduate user group is open to everyone interested, with individuals able to contact Frans Kaiser directly. Regarding data alignment with policy goals, regional data exist and can be matched with survey data, though data protection issues require careful management, with national data rarely allowing aggregation below NUTS2 level.

Asked about European degrees potentially creating new inequalities, participants acknowledged this risk exists, though many initiatives include targeted grants, whilst lower socioeconomic status students often lack information about opportunities and face self-efficacy barriers. Data exist on other inequality dimensions (minority backgrounds, gender), though mechanisms differ across social groups and intersectionality must be considered.

4. Breakout sessions

PART 3	**Breakout sessions** Only available for in-person participants
14:30-14:35	**Introduction to the breakout sessions** Mantas PUPINIS | *EHESO Deputy Project Manager*
14:35-15:20	**Parallel breakout sessions** **Empowering universities through EHESO-HEInnovate synergies** – Room 13-007 Co-moderated by Marian BELKO | *Head of Entrepreneurship Education Section / European Institute of Innovation and Technology (EIT)* **Driving the EU STEM Education Strategic Plan through tech-focused European University Alliances** – Room 13-018 Co-moderated by Sophie VISCIDO | *Secretary General / EuroTech* **Exploring graduate tracking use cases and strengthening impact through a graduate tracking user group** – Room 13-222 Co-moderated by Ana DUPLAVA | *Policy and Project Officer / EURASHE*
15:20-15:35	*Coffee break*

Following plenary sessions, three parallel breakout sessions engaged specific topics. These focused discussions provided opportunities to explore EHESO applications and gather feedback for future development.

Empowering universities through EHESO-HEInnovate synergies

This session explored how EHESO and HEInnovate can work synergistically to support universities in developing entrepreneurial and innovative capacities. EHESO provides data-driven insights at country and institutional levels enabling monitoring over time, whilst HEInnovate operates as a self-assessment tool focused on eight entrepreneurial dimensions. Participants discussed practical applications, noting that EHESO enables valuable time-based comparisons for evaluation and monitoring, particularly for business collaboration and applied research. Important distinctions emerged between research and applied science universities, with participants emphasising that not all institutions should excel in identical areas but rather develop capacities aligned with their missions and strengths.

Key challenges were identified around measuring entrepreneurial capacity. HEInnovate measures entrepreneurial levels at student and institutional levels but faces challenges with data heterogeneity, requiring more granular dimensions. A gap exists in validated instruments for measuring entrepreneurial learning outcomes at scale. Gender dimensions revealed that female entrepreneurs raise substantially less funding than males even with comparable ideas, reflecting bias in grant allocation, whilst women often start interdisciplinary teams indicating future success. Domain-specific knowledge and networks prove crucial for effective support, with specialised incubators (MedTech, BioTech, Arts) providing incentives for European-level quality improvement. The EIT has engaged 500 higher education institutions, trained 118,000 students and staff, and supported 2,000 start-ups and scale-ups since 2022, though challenges include short timelines emphasising KPIs and repetition of strong partners in EIT calls.

Recommendations from the session emphasised the need for more granular, multi-level data capturing entrepreneurial development complexity at institutional, programme, and individual levels. Regional identifiers in EHESO should be strengthened to understand institutional functioning within local and regional innovation ecosystems. Whilst aggregated data is important for policy, microdata showing good practices at institutional level provides valuable learning opportunities. Consistent tools over time are essential for long-term measurement, with HEInnovate serving not as an official benchmarking tool but as a means of creating measurement culture and self-reflection. Both tools should continue evolving in ways that respect institutional diversity whilst encouraging continuous improvement and sharing of effective practices across Europe's heterogeneous higher education landscape.

Driving the EU STEM Education Strategic Plan through tech-focused European University Alliances

During this session it was examined how European University Alliances, particularly technology-focused ones, can advance EU STEM Education Strategic Plan objectives. Participants noted that alliances with thematic focus, particularly in technology, have higher capacity for linking innovation ecosystems across borders and can serve as incubators for experimental initiatives. However, alliances vary widely in composition and focus; not all are expected to contribute equally to STEM objectives, with tech-focused alliances better positioned for substantial STEM contributions. International talent attraction and retention in STEM disciplines emerged as critical, yet some countries are rolling back third-country student enrolment due to financial constraints, creating tension between needing international STEM talent for competitiveness and current funding structures. Eurostat currently does not differentiate between third-country and EU students when examining fields of study, representing a significant data gap that EHESO might help address.

Discussion highlighted the importance of student representation, experiences, and testimonies for understanding STEM attraction and retention, with alumni networks also having a key role. Promoting role models emerged as very important for addressing gender imbalance, though participants emphasised that more is needed than showcasing successful women. Alliances can in some instances also limit collaboration beyond alliance members as HEIs focus more on their existing partners but are good at establishing collaboration infrastructure from which doctoral schools can emerge. In general alliances are not a solution for everything and there is a need for clarity on what their objectives are.

Recommendations from the session emphasised that more qualitative research is needed to understand underlying patterns behind observed trends, with research into individual-level factors including psychological dimensions like self-efficacy complementing quantitative indicators. EHESO needs to ensure data completeness and higher visibility so stakeholders know what data are available. Forecasts of demographic changes should influence policy and resource allocation. The transition from university to labour market requires further investigation, particularly understanding why some women graduate from STEM but do not enter or leave STEM jobs. Understanding policy effectiveness remains largely missing from current systems; there is need to understand not just what is happening but why certain policies work in some contexts but not others. Finally, greater involvement of labour market stakeholders in policy discussions is essential to develop STEM area at HEIs.

Exploring graduate tracking use cases and strengthening impact through a graduate tracking user group

In the third session focus was on how practical applications of graduate tracking data and establishing a collaborative user group can maximise impact. Building on the user categories discussed in the plenary session, participants identified additional stakeholder groups who could benefit from graduate tracking data, including labour market agencies, provincial and regional authorities, and quality assurance agencies. Discussion emphasised the importance of not overreaching when defining the user group's scope; whilst a broad membership profile strengthens legitimacy, the group requires a clear identity that all members can relate to in order to maintain engagement and prevent dropout.

Terminology emerged as a significant consideration. Whilst "graduate tracking" accurately captures the relevant activities, namely collecting data through surveys and combining administrative sources, several potential users are unfamiliar with this terminology and do not immediately relate to it. Participants suggested considering alternative terms used in national contexts, such as "school leaver surveys," to improve accessibility. The session also noted that various organisations generate data on graduate labour market positions beyond traditional graduate tracking systems. An inventory of such data sources and generating organisations could guide users to relevant data whilst identifying overlaps and potential synergies.

Recommendations from the session emphasised the value of linking datasets for both scholarly research and policy development. Such linkages would enable more in-depth insights into labour market pathways and how these differ across social groups. Participants expressed mixed views regarding mixed methods approaches; whilst qualitative information can enrich quantitative findings, concerns remained about the robustness of qualitative data. Overall, the session highlighted the need for the user group to balance inclusivity with coherent identity, improve terminology accessibility, map existing data sources comprehensively, and explore dataset linkages whilst maintaining methodological rigour.

5. Wrapping up

PART 4

Wrapping up

Hybrid format, online participation available

15:35-15:50	**Reporting from the breakout sessions** By stakeholder representatives
15:50-16:30	**Concluding panel discussion: How can EHESO best contribute to the Union of Skills?** Moderated by David CROSIER | *Studies and Analysis Manager – Platforms, Studies and Analysis Unit | EACEA* Julie FIONDA | *Deputy Head of Unit – Union of Skills | European Commission, Directorate-General for Employment, Social Affairs and Inclusion* Johan BLAUS | *Vice Chair Taskforce Benchmark | CESAER* Katrijn VANDENBORNE | *President 2024-2025 | Board of European Students of Technology (BEST)* Nils ELOFSSON | *Adviser – Social Affairs Department | Business Europe*
16:30	End of the conference

Reporting from the breakout sessions

Marian Belko (EIT) reported from the innovation and entrepreneurship session, highlighting HEInnovate as an important tool for building coherent pictures of innovation and entrepreneurship across Europe. Institutional differences matter significantly, with focus on improving performance at institutional rather than departmental levels, using data to inform strategic decision-making.

Ana Duplava (EURASHE) reported from the graduate tracking session, emphasising new user groups identified including labour market and quality assurance agencies. Participants noted differences in graduate tracking across countries, challenges in linking European and national-level data, and the importance of international comparisons requiring tailored approaches. The discussion highlighted that different purposes and users require tailored approaches to data.

Mantas Pupinis (EHESO Deputy Project Manager) reported from the STEM session. Technology alliances vary widely; not all are expected to contribute equally to STEM objectives. Tech-focused alliances could lead the way, whilst attracting international talent remains crucial for Europe's competitive edge. EHESO's role in improving data completeness and supporting policy decisions was highlighted, with suggestions for stronger collaboration with alliances and institutions to enhance impact in STEM and innovation.

Concluding panel discussion: How can EHESO best contribute to the Union of Skills?

David Crosier (EACEA) asked participants to share insights from the day. Responses included: using data for tracking institutional progress beyond benchmarking; studying social inequality in higher education; Eurograduate best practices; considerations balancing excellence versus distribution of opportunities; and interesting practical examples presented.

Julie Fionda (Directorate-General for Employment, Social Affairs and Inclusion) explained Union of Skills' commitment to evidence-based policymaking. She expressed interest in EHESO's potential contribution to skills intelligence, particularly regarding vertical and horizontal mismatches (field and level of education), return on investment data, and recognising Europe's extremely heterogeneous labour market.

Johan Blaus (CESAER) emphasised patience in developing data systems and policy interventions. He stressed supporting universities as lifelong learning hubs, noting that data systems should help extract data to monitor this. Employers and students often stress soft skills and stakeholders need to collaborate to better design educational programmes developing these.

Katrijn Vandenborne (BEST) emphasised interdisciplinary skills beyond static disciplinary knowledge, highlighting critical thinking and project-based learning. Systemic change is needed inside universities to ensure every graduate develops these capabilities structurally.

Nils Elofsson (Business Europe) confirmed that whilst technical hard skills remain necessary, the combination with soft skills e.g. critical thinking is highly sought after by employers. One way to develop this is to include apprenticeships in education.

Discussion addressed Europe's STEM lag and gender gaps. **Katrijn** noted variation across countries and emphasised investing in teacher education, including engineers sharing work experiences with students. She highlighted normalising failure as part of learning and creating possibilities for students from lower socioeconomic backgrounds.

Julie cautioned against seeking simple answers, noting diverse supply and demand across STEM areas in different countries. Freedom of movement within the EU is advantageous but requires better skills recognition across the Union. STEM is not monolithic; different STEM fields have very different characteristics and requirements.

Regarding EHESO investigating gender dimensions, qualitative research was deemed necessary alongside drop-out rate tracking. Participants emphasised distinguishing between interdisciplinary and transdisciplinary efforts, noting willingness for interdisciplinary work may be higher amongst women, though various factors impede actualising this interest.

6. Key messages

EHESO is evolving from a data collection platform into a true observatory translating complex information into actionable insights. The shift "from data to direction" reflects maturation through expanded tools including the Scoreboard, Benchmarking Tool, and Eurograduate integration. The Observatory serves multiple purposes for different user communities, each requiring tailored approaches to data access and presentation. EHESO's success in enabling cross-country comparison whilst respecting contextual differences strengthens evidence-based policymaking across Europe.

Integration of Eurograduate as critical priority

Eurograduate integration emerged as the most important priority for EHESO's development in 2026. Graduate outcome data provides essential insights into skills development, labour market alignment, and mobility patterns increasingly important for policy decisions. Challenges remain around data completeness, methodological harmonisation, and integrating survey data with administrative sources. A graduate tracking user group can help ensure data collection and dissemination respond to stakeholder needs whilst learning from diverse national experiences.

Entrepreneurship and innovation require holistic institutional approaches

Universities' roles in fostering entrepreneurship and innovation vary considerably across Europe, reflecting different institutional missions, regional ecosystems, and policy contexts. Data reveals no single country excels across all indicators, highlighting needs for context-sensitive approaches. European University Alliances, particularly those with strong industry connections, show potential as innovation catalysts, though impact depends on genuine institutional commitment. Data gaps remain regarding entrepreneurial learning outcomes.

STEM participation requires systemic interventions

Europe faces persistent challenges in STEM participation, including insufficient overall numbers and severe gender imbalances throughout the educational pipeline. Addressing these requires interventions starting early, focusing on both teacher development and each step in the pipeline where women leave the field. The STEM acronym may no longer adequately capture interdisciplinary and transdisciplinary nature of contemporary scientific work. International talent attraction and retention are crucial for competitiveness, yet funding structures sometimes work against these objectives.

Social inequality persists in graduate outcomes

Graduate tracking data reveals social background continues affecting labour market outcomes even after degree completion, though in complex ways. Students from disadvantaged backgrounds may find employment at similar rates but earn less, experience less favourable conditions, and face greater insecurity. Geographical mobility, network access, and opportunity information all reproduce inequality across generations. Addressing these patterns requires both better data and policy interventions explicitly attending to equity alongside excellence.

Different stakeholders require different approaches

EHESO serves highly diverse user communities with fundamentally different needs. Policymakers require aggregated indicators and trend data. Researchers need microdata for sophisticated analyses. Institutions need both comparative benchmarks and detailed information about their own performance. Students need accessible information for educational choices.

Quality assurance agencies need evidence of programme quality. Regional labour market actors need localised data. No single presentation serves all effectively; EHESO must provide multiple pathways accommodating different requirements and capabilities.

Collaboration essential across all levels

Successful Union of Skills implementation requires collaboration amongst institutions, across national systems, between universities and industry partners, and between different data initiatives and policy frameworks. European University Alliances can play important roles as innovation incubators and change catalysts, recognised for their diversity rather than expected to contribute identically to all objectives. International cooperation must balance with investment in local and regional talent development.

Future directions for EHESO development

Looking forward, EHESO must continue expanding data coverage whilst maintaining quality standards and appropriate privacy protections. Strengthening regional dimensions can enhance understanding of how higher education functions within diverse local contexts. Thematic reports can help make data more accessible to non-specialist users, balancing accessibility with analytical sophistication. The Student Hub represents an important development enhancing EHESO's relevance for prospective students. Continued methodological development is essential, including indicator refinement, data linkage exploration, and developing approaches to capturing quality and equity dimensions which are difficult to measure through standard metrics.

7. Annex 1: Online Q&A

During the conference, participants had the opportunity to submit questions online. The questions reflected diverse interests from across the higher education community. Below, we provide brief responses to the asked questions:

Questions on the discussed topics

Question	Response
Directed to Inga: Do you have discussions with national experts on what the indicators mean? e.g. high number of self-employed people in Slovakia is about avoiding taxes and social contribution, not that much about entrepreneurship which is also the case for some type of companies. Also do you consider some more output indicators rather than input ones (e,g, participation at internship being input indicator)? (11:01 AM)	Yes, we have a dedicated EHESO indicators working group in which we solicit expert advice and feedback on indicators used in EHESO. In the upcoming thematic report, we indicate that this specific indicator measures all self-employment activity, not limited to entrepreneurship. Yes, we are planning to include more indicators related to innovation in EHESO – for example, data from institutional, student, and graduate surveys will have more output indicators.
Directed to Bart: How do you start the process in HEI's which are not entrepreneurial at all? How do you get the management to start to take it seriously, so that you have onboarding for teachers, which highlights that entrepreneurship is an integral part of curricula. (11:04 AM)	This process can be difficult as it requires getting a good understand of what constitutes entrepreneurial learning outcomes. There are no perfect instruments for measuring entrepreneurial learning yet but HEInnovate is one tool that can be used. Here a mixture of multi-level data is a necessity to measure the influence of the education on the personality characteristics of the students whom we want to become more entrepreneurial. The benefit of having these validated measurement systems in place is that it can be leveraged to show management how the university performs, how it compares to others, and in which areas there are room for improvement. This can create an incentive for management to prioritise the area.
Directed to Omar: Are budgets and teacher to student ratio's not simply a matter of the field? Humanities and Social sciences extract less money and are cheaper to run (with exception of art) and need a more personal approach. Additionally, is it useful to talk about STEM in general? It contains fields which are not as important today as they used to be (e.g. programmers).	The observation about field-specific differences in budgets and student-to-staff ratios is well-founded. STEM disciplines typically require higher per-student expenditure due to laboratory infrastructure, specialised equipment, and safety requirements, whereas humanities and social sciences generally operate with lower costs but often benefit from smaller group settings that facilitate seminar-based, discursive learning. These structural differences mean that comparing ratios across fields without accounting for disciplinary context can be misleading. EHESO recognises this complexity, and ongoing work aims to contextualise indicators by field of study where data permit, enabling more meaningful

Have you thought about reconsidering the concept of "STEM"? (12:00 PM)	comparisons within rather than solely across disciplines. Regarding the utility of "STEM" as a category, this question was echoed during the conference itself. As Hanne Shapiro noted in Session 2, the STEM acronym may no longer serve well as disciplinary boundaries blur and innovation increasingly occurs at intersections between fields. The term encompasses highly heterogeneous disciplines with very different labour market dynamics, skill requirements, and gender compositions. For instance, computing and engineering face acute talent shortages in many countries, whilst other STEM fields may have more balanced supply and demand. That said, STEM remains a meaningful category for policy purposes at present. It captures a broad cluster of disciplines that share certain characteristics: reliance on mathematical and scientific reasoning, relatively strong linkages to research and innovation ecosystems, and, critically, persistent structural challenges such as gender underrepresentation and skills shortages that cut across the constituent fields. Grouping these disciplines together enables policymakers to identify and address systemic patterns, such as the "leaky pipeline" for women or insufficient industry-academia collaboration, that would be harder to tackle if each field were treated in isolation. EHESO is exploring ways to provide more nuanced breakdowns where data availability allows, whilst maintaining sufficient aggregation for cross-country comparability. The tension between granularity and comparability remains a methodological challenge that the Observatory continues to address through its indicators working group.
Directed to Duru: Are the individual factors you mentioned not usually context generated? Additionally, have you considered closing the gender gap by tackling the specific needs of women? Perhaps they need specific support during their career such as accessible childcare, flexible working hours, or more support for men to stay at home with their children? (12:33 PM)	Individual factors, such as self-efficacy, attitudes, motivation, and STEM identity, are indeed influenced by both internal and external contexts. While these factors primarily relate to personal traits and beliefs, they are shaped by broader societal and cultural influences. For example, self-efficacy in STEM—defined as a person's belief in their ability to succeed in STEM tasks—can significantly impact academic and career outcomes, regardless of actual ability (Chine, 2021; Hattie, 2009; van Aalderen-Smeets & van der Molen, 2018). These personal factors are not isolated but are strongly influenced by the family context (e.g., parental education, socio-economic status) and societal factors, including persistent

	gender stereotypes in STEM fields (Balta et al., 2023; Chine, 2021). Regarding the closing of the gender gap, one of the recommendations we propose in the report is the promotion of systemic policies at both national and local levels that support families, educators, policy-makers, and scholars in adopting gender-sensitive or gender-neutral approaches. Such policies would strengthen the role of the family and broader environment, as well as the school as an institutional actor, in fostering equitable learning conditions. They should also include clear, systematic guidance to ensure consistent implementation. These policies ought to address contextual- and institutional-level factors in an integrated manner, thereby providing holistic support for students. By targeting the structural conditions that shape individual experiences, these measures can contribute meaningfully to reducing gender disparities in STEM participation and achievement.
Directed to Duru: Within the STEM area of higher education, it appears that there are a 50% loss of women within the first year of their university education. What can be done to reduce that loss? (12:30 PM)	The loss of approximately 50% of women within the first year of higher education in STEM reflects a long-documented and progressive reduction in female participation across educational and career stages, often referred to as the *"leaky pipeline"* (Shapiro et al., 2015). This phenomenon indicates that barriers are not isolated to a single moment but emerge through interconnected individual, institutional, and sociocultural influences. Research suggests that contextual factors play a significant role in shaping women's persistence in STEM. For example, a U.S. study focusing on Black women in STEM found that supportive family members had a positive impact on girls' motivation, confidence, and interest in STEM learning (Ibourk, Hughes & Mathis, 2022). A meta-analysis conducted by Šimunović and Babarović (2020) further highlights the importance of parental roles—particularly fathers—in shaping STEM-related aspirations and self-belief across multiple developmental stages. To reduce early attrition among women in higher STEM education, several targeted measures can be taken: **Strengthening early social support networks.** Initiatives that involve families—such as outreach programs, community engagement, and campaigns raising awareness of gendered socialisation—can help develop supportive home environments that encourage girls' STEM interests from a young age. **Enhancing institutional cultures and climates.** Universities can foster inclusive learning spaces by

	addressing gender biases, improving representation among faculty, increasing visibility of female role models, and creating strong mentorship programs to support women through the transition into higher education. **Building academic confidence and belonging.** Structured interventions that strengthen students' sense of belonging and self-efficacy, such as peer support groups, cohort-based mentoring, and structured feedback systems, can counter feelings of isolation and stereotype threat, which are common predictors of early dropout. **Training educators and leadership.** Professional development focused on equity, inclusive pedagogies, and gender-responsive teaching can help educators create environments where women feel valued and supported. Overall, addressing the 50% loss of women in the first year of university STEM education requires multi-level strategies that challenge systemic biases while reinforcing positive social, cultural, and educational supports. By implementing holistic interventions that span family, institutional culture, and classroom experiences, STEM fields can improve the retention and success of women at this critical early stage. I would also like to include the link to the report, as it may be useful for those who are interested: *Addressing the gender gap in STEM education across educational levels – Analytical report*, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2766/260477
Directed to Arnaud: How are the data you presented in line with the general direction France wants to pursue? How is it in line with policy goals? (1:58 PM)	What I can say from the two tracking systems presented is that the current orientation at the level of the ministry of higher education favours the roll-out of a system based on administrative data on educational and employment history to highlight the Graduates' conditions for transitioning to employment. Informing families and students and oversee the provision of study programmes are the main purposes of such a system. Large sample survey which are costly, are hampered by the substantial budget deficit which weighs in favour of restricting them. Consequently, my feeling is that they are likely to decline considering the objective of providing information of education to employment transitions of all educational leavers. However, it is conceivable that there will always be a need for

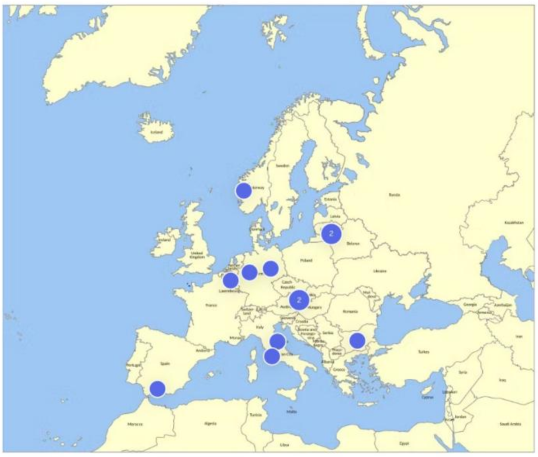
	smaller-scale sample surveys to shed light on specific issues or regarding specific fields or programmes.
Directed to Katarina: Are there data on other groups who face inequality, e.g. students of colour or with a migration background? (2:14 PM)	There are data available on a wide range of groups who face persistent inequalities e.g. both people with minority background and related to gender issues. The exact mechanisms which influence the observed inequality are not the same but there is a degree of intersectionality present in which disadvantages in one area is replicated or reinforced in other areas. E.g. women with minority backgrounds face a mixture of challenges observed in either of those categories.
Directed to Julie: Are some of the data you mentioned not already collected by the EHESO score board, such as the skills mismatch? And are there going to be more interactions or cooperation with the 2 other observatories? (4:08 PM)	Yes, EHESO does already collect data relevant to skills mismatch. Through its integration of Eurograduate, EHESO captures graduates' perceptions of how well their education prepared them for the labour market. The Eurograduate survey specifically measures both vertical mismatch (whether graduates' qualification level matches their job requirements) and horizontal mismatch (whether their field of study aligns with their occupation). Regarding cooperation with other observatories: the question is timely, as the Union of Skills initiative announced in March 2025 explicitly calls for the establishment of a European Skills Intelligence Observatory to provide real-time, granular data on skills needs and shortages. This new observatory is intended to build on and integrate existing skills intelligence work, including Cedefop's longstanding skills forecasting, the Skills Panorama, and analysis of online job advertisements. Cedefop has announced it will launch this EU Skills Observatory, which will support connecting skills with labour market demands. There is clear scope for stronger linkages between EHESO and this emerging skills intelligence infrastructure. EHESO focuses specifically on higher education inputs and graduate outcomes, whilst the European Skills Intelligence Observatory will take a broader view across all education levels and the labour market as a whole. Combining higher education data from EHESO with labour market demand forecasts and skills needs analysis from the Skills Intelligence Observatory could enable more comprehensive analyses, for instance, understanding not just graduate mismatch rates but also forecasting which fields are likely to experience shortages or surpluses. The European Students' Union has also

	noted that integration between any new Skills Observatory and EHESO should be considered to avoid fragmentation and ensure transparent access to connected data on higher education and skills development.

8. Annex 2: Responses from poll among online participants

The conference was held in a hybrid-format. During the presentations the online participants were asked additional questions using the online tool: Mentimeter. Answering these questions were not mandatory and the answers can be seen below.

Where are you joining us from? Place a marker on the map!



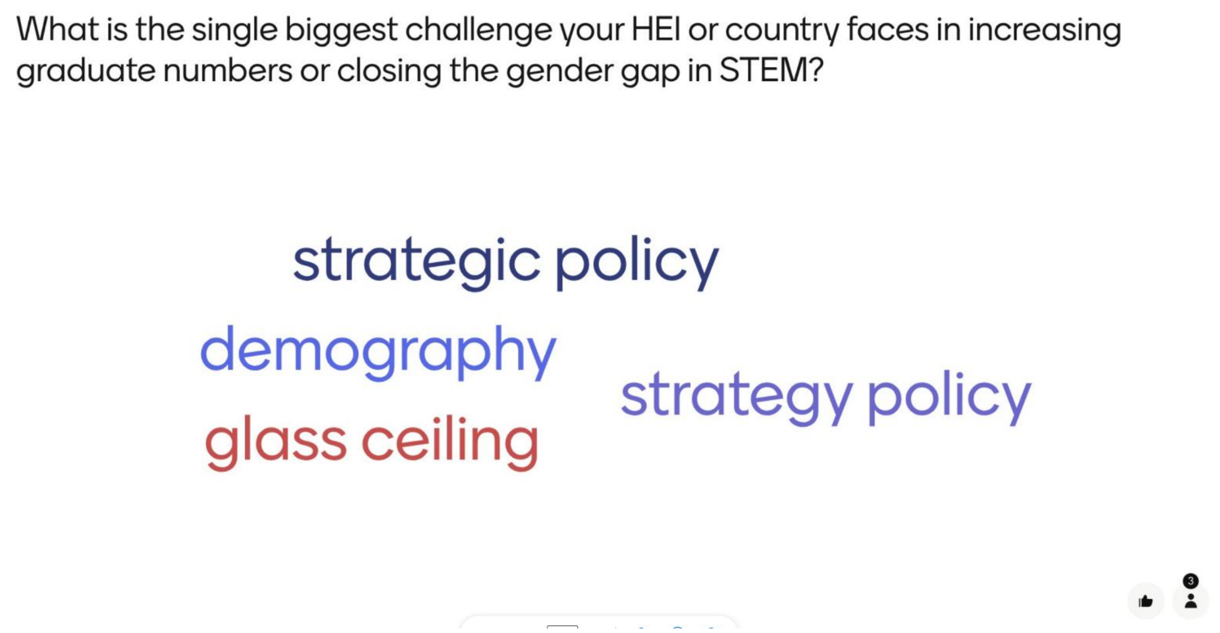
What do you think should be the top priority to foster entrepreneurship and innovation in higher education?

more internships

industry parnterships

equip heis w methodology

international mobility


What is the single biggest challenge your HEI or country faces in increasing graduate numbers or closing the gender gap in STEM?
strategic policy
demography
strategy policy
glass ceiling
3


What type of graduate outcome data do you find most valuable?
social equity
skill and job match
adjustment- horizontal fi
diversity data
4