



Europe needs to make its STEM strategy a reality now

The European sectoral social partners in the metal, engineering, chemical, pharmaceutical, plastics, rubber and technology-based industries, industriAll European Trade Union ([industriAll Europe](#)), the European Chemical Employers Group ([ECEG](#)) and the European Tech & Industry Employers ([Ceemet](#)) urge the European Commission to step up its effort to implement its European STEM¹ strategy and make it a reality in all Member States.

We welcome the strong focus the European Commission has been giving over recent years to develop solid STEM, digital, green, and transversal soft skills for both youth and adult workers across Europe. Acquiring those skills provides foundations for resilience, lifelong learning, lifelong employability, social inclusion, active citizenship, and personal development, as stressed in the 2020 Council Recommendation on vocational education and training. They also ensure our industries are equipped with the skilled workforce they require to remain competitive, innovative, to successfully navigate the twin transition, alongside retaining and creating quality industrial jobs in Europe.

The European Commission has been multiplying its announcements about upcoming initiatives aimed at increasing STEM graduates²; at promoting the development of new higher education STEM curricula for engineering and ICT³; and at making the STEM fields more attractive to women⁴. The EU is also calling on Member States to foster the acquisition of competences in STEM, and motivate more young people, especially girls and young women, to engage in STEM careers⁵. Those calls and good intentions have yet to materialise in practice. With the increased scale and pace of change in our industries, turning good wishes into concrete actions and developing the training of workers already active within the sector, as well as people who are unemployed, has become a burning priority.

We recognise that education and training remain a Member State competence, and that the EU Treaty grants no possibility for EU law to regulate in that area. However, European projects, such as the Green Deal, and global developments like digitalisation, merit a European approach. The European Commission has increased available funding in recent years for national skills strategies⁶, coordination of national and local initiatives⁷, guidance to Member States⁸, and information support⁹. As far as STEM skills are concerned, the European Commission should play a supporting and advisory role, paving the way to ensure that Europe has enough well-trained workers, employees, and researchers with STEM profiles. These are key competences for the future and crucial pillars for the successful implementation of the green and digital transitions.

¹ Science, Technology, Engineering, and Mathematics.

² See Action 7 in the 2020 European Skills Agenda for sustainable competitiveness, social fairness and resilience, <https://ec.europa.eu/social/main.jsp?catId=1223&langId=en>.

³ See the 2020 European Commission's communication on a European Education Area by 2025.

⁴ See Action 13 of the 2020 European Commission's communication on a Digital Education Action Plan 2021-2027.

⁵ 2018 Council Recommendation on key competences for lifelong learning.

⁶ Through the ESF+, Erasmus+, NextGenerationEU programmes, as well as the Recovery and Resilience Facility, for instance.

⁷ Think of the European and national Digital jobs and skills coalitions, or the blueprints and pacts for skills for sectoral cooperation between industry associations, social partners and VET providers in targeted industrial ecosystems.

⁸ See the 2020 Council Recommendation on vocational education and training for sustainable competitiveness, social fairness and resilience.

⁹ Including CEDEFOP skills forecasts.



Today, only one in five young people in Europe graduates from STEM tertiary education, which is less than two million STEM graduates every year¹⁰. To stay competitive and retain the chemical and MET industries in Europe, we need a skilled workforce - ranging from vocational excellence to PhD-level innovation talent and researchers. STEM skills are vital in responding to the (structural) changes induced, for example, by climate goals, digitalisation, or the Chemicals Strategy for Sustainability. We know already that the chemical and MET industries will face a deficit of skilled workers by 2030. The 2018 Korn Ferry study showed that the chemical industries would run an 11% labour shortage in 2030, all related to STEM disciplines. The European Centre for the Development of Vocational Training (CEDEFOP) stresses that cross-sectoral demand for STEM professionals will increase by 8% by 2025¹¹. As a matter of fact, the twin transitions will considerably change the task profiles of several occupational groups, mostly STEM-related: electro-engineering workers, machine and plant operators, other manufacturing workers, researchers, and engineers, as well as science and engineering technicians. In today's smart factories, all workers need IT skills. Employees possessing an adequate STEM background are crucial for ensuring the sustainability of industries.

Against this background, IndustriAll Europe, Ceemet and the ECEG propose a STEM strategy for the European chemical and MET industries. Such a strategy requires a clear assessment of the status quo and of future needs, and a clear description of the necessary steps to bridge the gap. It should define the roles and responsibilities of all actors, taking national or regional differences into account.

The STEM strategy must aim for social equity. Besides young people, workers already active within the sector and people who are unemployed, it should target women who are underrepresented in tech-related professions and studies: despite women making up to 52% of the European population and being the majority of tertiary graduates in the EU, only 2 out of 5 scientists and engineers are women, with just 18% of specialists in ICT. Interestingly, young girls show interest in the STEM field in school, and in some countries outperform boys. This loss of talent among women in STEM, often referred to as the "leaky pipeline"¹², highlights a significant challenge in retaining female talent in these fields. Closing the gender gap would have a positive impact on both employment and GDP¹³ and on women's confidence in moving forward in a society where they find a role commensurate with their skills.

Also, the STEM strategy within the education system is complementary to the priority missions of this sector, namely: the promotion of self-confidence, the personal development of each student, the appropriation of knowledge and know-how, the acquisition of competences allowing someone to take an active part in the economic, social and cultural life. Similarly, the social partners indicate the importance of education in view of training future responsible citizens, capable of contributing to the development of a democratic, united, pluralist society, respectful of the environment and open to other cultures.

¹⁰ https://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary_education_statistics_-_Graduates.

¹¹ <https://www.cedefop.europa.eu/en/data-insights/rising-stems>.

¹² Commission Decision on the European Year of Skills 2023.

¹³ <https://eige.europa.eu/gender-mainstreaming/policy-areas/economic-and-financial-affairs/economic-benefits-gender-equality/stem>.



The strategy may contain the following actions for boosting STEM talent development:

For the European Commission:

- Promote annual/biannual STEM labour market analyses to identify the STEM labour gap, unemployment in STEM occupations, labour demand in STEM occupations, and calculate the share of non-academic STEM occupations for the coming years¹⁴. Training and education plans must be derived from this, with accompanying information and advertising campaigns to interest people in the professions in demand.
- Promote EU-wide cross-border consortia between training and education providers (secondary schools, apprenticeship providers, higher education, and academia) and industry to boost innovation and R&D, and the fast, practical implementation of new solutions; support interested parties in the application for funding and building of partnerships.
- Advise Member States how to improve STEM training and education in schools from an early age and encourage the uptake of STEM apprenticeships and studies.

For the Member States:

- Design future-proof occupational pathways for job-to-job transitions, recognition and validation of formal and non-formal training.
- Strengthen the knowledge component in STEM vocational education programmes, to facilitate later re-skilling, up-skilling or training, and enable workers to adapt at any time to new requirements arising from the twin transitions.
- Provide access to training in STEM to all workers that need it. STEM education must be of good quality in order to lead to a qualification that is validated through transparent and clear recognition and certification systems which allow for comparability.
- Fund re-skilling and up-skilling activities related to careers in STEM, for example via sector-specific national funds¹⁵.
- Develop the training of unemployed and low-skilled persons in order to facilitate their socio-economic insertion within civil society.
- Encourage and support paid internships for STEM students as much as possible in the framework of national collective bargaining systems such as the collective agreement of the Spanish chemical industry¹⁶.
- Promote cooperation with (chemical/MET) technological companies - with the EU's financial help - to boost the development of technical solutions. Such examples exist among the universities of applied sciences in Finland.
- Boost the investment in STEM related studies and disciplines and foster STEM education from an early age.

¹⁴ <https://mintzukunftschaften.de>.

¹⁵ <https://www.vci.de/fonds/startseite.jsp>.

¹⁶ XX CONVENIO GENERAL DE LA INDUSTRIA QUÍMICA.



- Promote in accordance with national systems and traditions, nationwide STEM and/or digital awards: Germany, for example, has introduced nationwide ‘STEM friendly school’ and ‘Digital school’ awards. It also promotes an initiative called ‘Creating STEM future’¹⁷, which includes, among others, data on STEM graduates, STEM needs of the industry, etc.

For the social partners:

- Establish cooperation with primary schools to attract children towards STEM¹⁸ via interactive, tailor-made programmes.
- Get fully involved in the design, implementation and monitoring of European and national STEM strategies, including via ambitious targets for vocational learning, education and retraining and skills development.
- Use joint bodies to develop training for staff already working in the sector and low-skilled persons, for example *Co-valent* in Belgium.
- Promote skills intelligence¹⁹.
- Put in place the adequate awareness raising campaigns and use the relevant social media (TikTok, others) in order to attract women and young people to STEM and increase their interest in following STEM careers and disciplines.
- Maintain good working conditions and provide quality jobs. In a fast-changing transformation, these are key to improve the image and the attractiveness of the MET and chemicals sectors.

Europe needs to implement a STEM strategy that will strengthen skills intelligence with social partners, VET providers and public authorities, anticipate and manage structural changes, which will develop the knowledge of workers already active in the sector and attract new workers, especially women, to the MET and chemical sectors.

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¹⁷ <https://mintzukunftschaften.de>.

¹⁸ Some examples: Essenscia, Belgium ‘[We are chemistry](#)’ or “the biggest chemistry lesson”. France Chimie, regional and national competition in chemistry for high school students, [National Olympics on chemistry](#) or the Observatory for chemical industries. Federchimica, Italy, [annual events](#) at schools to attract high school students to opt for chemistry. For all examples, please consult social partners’ [toolbox](#), pp. 7_9.

¹⁹ Identifying, analysing, synthesising and presenting quantitative and/or qualitative skills and labour market information.