EU STEM COALITION

Position paper EU STEM Coalition

on the STEM Education Strategic Plan

May 2025

Introduction

The EU STEM Coalition welcomes the publication of the STEM Education Strategic Plan and strongly supports the European Commission's recognition of STEM education. Prioritizing STEM on the European agenda will support the EU in achieving its goals related to education, skills, and other key areas, and we are pleased to see this commitment reflected in the plan. Its strategic focus provides a valuable opportunity for member states and stakeholders to align their existing efforts and to raise the visibility of STEM-related issues at national, regional, and local levels.

Europe is currently navigating a wide range of complex and interconnected challenges - ranging from the need to strengthen strategic industrial sectors and adapt to the rapid pace of digitalisation, to addressing climate change and responding to evolving defence and security needs in an uncertain geopolitical landscape. While these challenges are diverse in nature, they share a common requirement: innovative, STEM-driven, and crossover solutions. Investing in high-quality, inclusive, and future-oriented STEM education is not only desirable, but essential for securing Europe's long-term competitiveness, resilience, and social cohesion. This requires not only increasing the STEM talent pool, but also improving basic STEM competencies across the general population.

While we strongly support the ambitions of the STEM Education Strategic Plan and its emphasis on preparing young people to meet the challenges of our time, we believe the narrative places too much emphasis on students as instruments for solving societal and economic problems. Young people are not merely tools to be shaped for the labour market or mobilized to close skills gaps. They are individuals in the process of becoming curious, critical, and creative people. They deserve educational spaces that support their development as whole human beings. STEM education should not only be about what young people can do for society, but also about how it can empower them to explore their passions, ask difficult questions, and build meaningful lives. The EU STEM Coalition believes that, in the long run, a society that invests in the full development of its young people will ultimately reap the benefits of their growth, insight, and humanity.

In the following paragraphs, the members of the EU STEM Coalition highlight the key priorities they believe are essential for the next steps toward implementing the STEM Education Strategic Plan. These suggestions are grounded in the extensive experience and expertise of this broad European network.

1. One size does not fit all: finding the right fit between bottom-up and top-down

A consistent observation which has been noted by the members of the EU STEM Coalition since the network's start has been that top-down programs yield far less than their intended results. Initiatives which attempt to implement activities across wide ranges of national or regional borders tend to fail due to the fact that an approach which may work in one given context does not necessarily work in another. The coalition has observed that success or failure of initiatives aimed at developing education will depend to a large degree on local variables such as culture, administrative structures, and specific stakeholder ecosystems. For this reason, top-down one-size-fits-all approaches do not work.

Instead, we have discovered that grassroots initiatives close to schools and companies are far more effective at achieving their goals. By empowering local STEM platforms to interpret and implement STEM development approaches themselves, activities become tailor-made for their specific contexts. We recommend the European Commission to utilize existing and active networks, such as the EU STEM Coalition, for the implementation of current and future policies and initiatives. This will provide access to an otherwise decentralized collection of actors in the field.

One example of a bottom-up approach can be seen in the case of a project striving to promote creativity, problem solving and collaboration through programming and other tech activities. One such exemplary bottom-up approach can be seen in the case of the Science on Stage. This initiative directly involves local educators in activities to promote effective means to teach STEM subjects, as well as in science competitions and festivals. Further, science on stage is organized and governed through a bottom-up approach. The basis of the initiative is the Science on Stage community in the participating countries. Each country then has a national steering committee which represents the country in question to an elected executive board.

Furthermore, we believe that another effective means of supporting a decentralized approach would be to make more funding opportunities specifically available for regional actors. The support framework offered by such programs as Erasmus+ and Horizon Europe allows for contextual adaptation. By offering more project funding specifically to regional actors working towards the betterment of STEM education through programs such as these, the Commission would be utilizing the actors with the best adapted and most relevant knowledge in the field more.

Lastly, we would welcome the opportunity to be part of the European STEM Executive Panel, as we believe our strong bottom-up approach offers valuable insights. By engaging directly with stakeholders at all levels, we are able to provide practical, grounded perspectives and recommendations on key issues regarding European STEM development and education. Further, our approach fosters meaningful school, industry, and government cooperation, which aligns with the panel's mission to drive strategic, actionable recommendations for enhancing STEM education and skills development across Europe.

2. From experience to excellence: sharing success stories

Across Europe, STEM platforms, as well as stakeholders in education more generally, have come up with innovative approaches to enhancing STEM education in their national and regional contexts. These approaches contain valuable best practices and lessons learned which are relevant to any organization with an interest in supporting European STEM education. The EU STEM Coalition has compiled an extensive collection of information on these approaches which focuses on their applicable adaptability. One of the key activities of the Coalition is the sharing and interpretation of best practices, not only on paper but also through in-person discussions during our biannually General Assembly organized by one of our partners. Our data base on STEM initiatives is the source from which we match and align our best practice recommendations. Its broad geographic representation, as well as diversity of topics, allows us to select examples which are well suited to a wide range of circumstances.

An example of such a best practice is the case of the Quadruple Helix Approach in Flanders, Belgium. This method brings together the educational and research world with businesses and extracurricular activities in civil society, the efforts of which are then facilitated by local authorities toward the betterment of STEM education. The Quadruple Helix Approach has proven to be adaptable and effective time and time again, and is one widely promoted by the EU STEM Coalition.

The collection of best practices has been a valuable asset to the work of the EU STEM Coalition over the years and is essential for taking a more bottom-up approach to the support of European STEM education. For this reason, we propose that the sharing of best practices be upscaled in such a way that both increases the scope of the activity as well as enhances its effectiveness. Therefore, the EU STEM Coalition proposes the formation of a task force on developing a holistic compilation of informational profiles on STEM educational activities in Europe.

2.1 Partnering for progress: supporting national STEM profiles

Task 1: Best practices collecting and sharing

Since education and skills policy fall outside the direct competence of the European Union, as they are primarily managed at the national or regional level. As a result, they are shaped by diverse perspectives and closely connected to other policy domains such as labour, economic, and social inclusion. This diversity reflects the wide variation in education systems, traditions, structures, and curricula among EU member states.

The European Commission is currently in the process of developing informational profiles on the member states which provide an overview of the state of STEM education in specific national contexts. This is being done with the awareness that efforts to develop STEM education by the European Commission will be considerably more successful if they cooperate with and support national/regional policies, rather than operating separately from them. The EU STEM Coalition fully agrees with the motives underlying such an undertaking, and further, the coalition gladly offers its support in the formation of such profiles. One way in which the EU STEM Coalition could contribute to this effort is through the contribution of its collection of best practices. Since its inception, the EU STEM Coalition has compiled a comprehensive and detailed collection of best practices from its members. This collection could easily be upscaled and elaborated upon using the Coalition's network and the systems in place through which the collection is currently being cultivated.

Task 2: Facilitating knowledge sharing through organized sessions

The development of national STEM profiles would be well-served by input from the full spectrum of stakeholders in the field. Such individuals possess a first-hand perspective on the real-world application of educational strategies and practices in their countries, and would lend to the formation of more accurate and holistic profiles.

The EU STEM Coalition's European-wide network of stakeholders in STEM education could additionally support the formation of national STEM profiles by organizing focus group meetings on topics related to STEM education in the European member states. The bottom-up nature of the coalition positions it ideally to bring relevant representatives and experts together with the goal of forming a clear picture on the state of STEM education in any given country or context.

Task 3: Strengthening STEM policy through comparable data

We welcome the 2030 targets for STEM education set by the European Commission, as they provide a clear direction. Moreover, these targets will help our EU STEM Coalition members put the importance of STEM education on the agenda at our national ministries, but also at regional and local level. However, we stress that the data of the targets are lacking.

With this deficiency in mind, we propose that national STEM profiles have a particular focus on comparable date. Such data is essential both to understand our current position and to effectively track progress toward the 2030 targets. Without a solid evidence base, it becomes difficult to assess the impact of interventions or identify where additional efforts are needed. To use these targets effectively, up-to-date data across all levels of education is required at the EU-level.

At present, such data remains limited and/or insufficiently coordinated to fully inform evidence-based policymaking. However, The EU STEM Coalition has the network resources and inherent perspective to collect this vital data, and include it in the development of the national/regional STEM profiles. This addition would vitally support the inclusion of comparable STEM data for the design and tracking of future STEM initiatives. Furthermore, the Coalition would develop a sustainable framework to ensure the continuous collection of data for the future.

The inclusion of thoroughly documented best practices, input from national stakeholders, and comparable data are essential for facilitating the bottom-up approach which is needed to achieve the goals laid out by the European STEM Education Strategic Plan. The EU STEM Coalition is willing and able to contribute by providing these informational resources.

3. Championing inclusion and diversity

The EU STEM Coalition welcomes the focus on girls and women in the STEM Education Strategic Plan. Many of our partners are already actively engaged on this topic and have seen promising results, though there is still a lot to accomplish. We fully support the inclusion of a gender component in all of the 2030 EU-level STEM targets, as increasing the participation of women in STEM fields does not only tackle labour shortages, it also improves the field by bringing in diverse perspectives. Encouraging more women into STEM education will help address persistent gender imbalances and unlock the full potential of Europe's talent pool. However, while these targets are a step in the right direction, we strongly believe that achieving lasting change requires a more structural and sustainable approach. Inclusion and diversity should be embedded into every layer and initiative of the STEM Education Strategic Plan, from early education through to their participation in the workforce. Setting goals alone is not enough. We must create an environment that actively supports and empowers underrepresented groups at every stage of their educational and professional journey.

For example, the new 'Girls go STEM' initiative aims to train one million girls in STEM by 2028. This is a commendable and ambitious goal to increase female participation in STEM education. However, while impactful in the short term, such initiatives risk falling short if not embedded within a broader, long-term strategy.

Furthermore, we encourage the creation of initiatives such as mentorship programs and STEM skills foundries as they provide students with real-life experiences and insights as to whether a STEM career would suit them. We would further encourage the integration of gender-inclusive elements to such programs with mentorship activities connecting specifically girls with women working in STEM, as it would be an impactful initiative. Visible role models and mentors can play a transformative role in building self-confidence, breaking down stereotypes, and helping girls envision a future for themselves in STEM. These kinds of initiatives can make STEM feel more accessible and inclusive, especially for those who may not otherwise see themselves reflected in the field. The EU STEM Coalition stands ready to further support the integration of girls in STEM education and is eager to assist the Commission in creating meaningful, long-term impact. With extensive experience in initiatives aimed at increasing female participation in STEM education, the EU STEM Coalition has a wealth of proven practices, supported by a large network with ongoing projects and evidence-based success stories to build upon.

Finally, we would like to highlight the fact that inclusion does not only entail the better involvement of girls and women, but also of other underrepresented groups. While including girls in STEM is certainly an essential goal, everyone will be needed to meet the challenges posed by the labor shortage. Recent immigrant communities, lower income families, ethnic minorities, and people from rural areas should all be given due consideration when supporting inclusion in STEM education. The best approaches to involving a fuller spectrum of underrepresented groups, as well as the matter of which groups warrant specific attention, are very contextually dependent. Different regions will require uniquely adapted strategies, the nature and details of which are best known by actors in the countries in question. For this reason, the EU STEM Coalition would like to further emphasize the importance of supporting a decentralized approach to inclusion in STEM. Empowering a wide variety of regional actors and incorporating contextually specific approaches will yield the most appropriate results.

4. Microcredentials: fast tracks on strong foundations

Microcredentials are a promising tool for enabling flexible, targeted learning and for responding quickly to emerging needs in the labour market. They allow individuals to deepen or expand their expertise in specific areas, making them particularly valuable for working professionals who need to upskill or reskill in response to sectoral developments. This can significantly boost the EU's economic adaptability and competitiveness.

Although microcredentials can be a powerful supplement to formal education, we stress that they should not be seen as a substitute for it. Their effectiveness depends on the presence of a solid educational foundation that equips individuals with broad knowledge and critical thinking skills. Microcredentials can refine and extend this base, but they cannot replace the depth and coherence of a comprehensive educational trajectory. Ensuring that microcredentials remain anchored in a well-rounded learning path will be essential for creating not only a flexible workforce, but a thoughtful, capable, and resilient society.

Therefore, microcredentials are most effective when used for what they are particularly well-suited to: targeted upskilling and reskilling in response to evolving professional demands. However, to truly unlock their potential, it is important to recognise that they are not a standalone solution. Without being grounded in a strong and coherent educational foundation, there is a risk that microcredentials may become fragmented or lack the necessary depth for meaningful, long-term development. Their lasting value and impact depend on being part of a broader, well-rounded learning trajectory that supports both personal growth and professional adaptability.

Conclusion: driving implementation in and with member states

Recognizing the ever-growing necessity for enhanced European STEM education, the members of the EU STEM Coalition enthusiastically welcome the creation of the European STEM Education Strategic Plan. Further, we fully agree with the points and ambitious goals contained within. Beyond applauding such an initiative, the suggestions we would like to make towards Europe's STEM education strategy pertain to its implementation. In particular, we believe it is essential that the Commission utilizes a bottom-up approach in its development activities and to use existing best practices. Additionally, it is vital to embed the inclusion of all underrepresented groups in efforts to develop European STEM Education.

Finally, the EU STEM Coalition would like to reiterate its eagerness and ability to contribute its knowledge, network, and resources towards supporting the implementation of the STEM Education Strategic Plan. We kindly suggest considering the inclusion of one or more of our members on the executive STEM panel.