

STEAM

Terms of Reference

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I. Objectives

The core topic covered by the group is STEAM and the implementation of a STEAM-driven agenda in European Universities and beyond. This includes identifying existing approaches to STEAM in HEIs, the potential for knowledge and experience transfer between HEIs participating in European Universities and devising policy-driven initiatives that can foster a STEAM agenda on the European Level. This proposal supports a novel approach that departs from the Arts to touch upon STEM methodologies and approaches.

The STEAM Topical Group has the following objectives:

- Foster the adoption of a STEAM agenda and related priorities by European Universities Alliances and across the European Higher Education and Research areas more broadly;
- Set up collaborative networks that allow for the strategic and structural formation of innovative collaboration that can drive the adoption and piloting of STEAM activities;
- Promote the dissemination of knowledge and best practices on the use of STEAM by European Universities;
- Promote joint activities that empower HEIs that are interested in STEAM with the appropriate training, network and resources to support ground-breaking new pedagogical innovations and artistic research activities and results.

Short Term

Create and foster a collaborative and supportive space for exchanging knowledge, best practices, challenges, and opportunities related to STEAM. The group will provide a shared platform for:

- Supporting exchanges and collaborative learning by disseminating know-how, methodologies, solutions, success stories, identified challenges, and models of cooperation related to STEAM. It will also promote skill-building by offering group members information and access to selected activities organized by the Alliances.
- Supporting common approaches and strategies to empower Alliances to address STEAM agenda.
- Mapping of best practices that can be shared across alliances
- Mapping different narratives on STEAM.
- Define topics with specific focus.

Mid-term

- Raise awareness of and enhance visibility of STEAM approach.
- Map topics to concrete actions – STEAM Roadmap for the future.
- Supporting Alliances, and their HEIs, in embedding STEAM in strategic and operational frameworks.
- Organization of events on STEAM.
- Publication STEAM toolkit/policy document, including case studies.
- Facilitate joint efforts among University Alliances to, based on the exchanged knowledge and practices, build a shared understanding, and co-develop approaches that highlight the transformative impact of STEAM in European Higher Education and Research—informing policy and advocacy at a broader level.

Long-term

- Promote a paradigm shift in thinking around the STEAM approach in higher education by fostering the adoption and spread of effective STEAM-based teaching and research practices within and beyond University Alliances. This will be achieved in close cooperation with WP3

(Policy Dialogue), WP4 (Communication and Dissemination), and other European higher education stakeholders and policy makers.

- STEAM becomes a transversal topic for Alliances.
- Training resources are available to Alliances.
- A network on STEAM is established and operational.

The work in the topical group on STEAM is firstly targeting several internal audiences: these are the members of the topical group itself and their institutions, teachers, staff, students and associated partners.

Furthermore, it is anticipated that the topical group will also target through the FOREU4ALL Community of Practice other European Universities alliances and their partner institutions, teachers, staff, students and associated partners. An important goal of the topical group will be the exchange of good practice with regards to STEAM in the various alliances.

Given that the STEAM approach is relevant for policy development in higher education at large (see the reference to STEAM in the recent Union of Skills document), there are also external audiences that will profit from the work in the topical group: these are European key policymakers in the European Commission, European Parliament and national representatives, as well as members of FOREU4ALL's External Advisory Board and through them higher education institutions in Europe not affiliated with any European Universities alliance, University associations, NGOs and other relevant EU networks and institutions.

II. Background

STEAM stands for Science, Technology, Engineering, Arts, and Mathematics. It is an educational approach that equally integrates these disciplines to promote critical thinking, creativity, and problem-solving skills. The A in STEAM aims to be more than mere visualization but ensures to cover other ways of knowing and thinking.

STEAM bridges analytical and creative thinking, fostering these interdisciplinary connections with quantitative problem-solving skills. The value of adding the arts to the acronym STEM and thus transforming it to STEAM is based on the insight that it is not sufficient to equip learners with skills in science, technology, engineering, and mathematics in order to make them fit for the job market of the future, unless this goes hand in hand with the creativity, critical thinking, and drive for innovation which artistic disciplines provide.

STEAM touches all dimensions of Universities' mission, from education to research and innovation, promoting interdisciplinarity and the arts as propellers of innovative pedagogical approaches and a greater integration of artistic practices and critical thinking in research activities. STEAM is closely aligned with the European Universities initiative of promoting profound transformations of higher education institutions in Europe, their pedagogical approaches and how they conduct research and impact society.

Recently, the importance of the 'transversal skills' has been supported in the European skills agenda for sustainable competitiveness, social fairness and resilience (European Commission 2020) and the Creative Pact for Skills (C-P4S) Manifesto (Creative Pact for Skills 2022). The new Union of Skills also acknowledges the need for more holistic approaches to skills. Moreover, the key role of creativity as part of the

competences for the green transition is specifically stressed by GreenComp: The European sustainability competence framework (JRC 2022).

Additionally, the EC Directorate-General for Research and Innovation report ‘Fostering Knowledge Valorisation through the Arts and Cultural Institutions’ outlines several ways in which the arts can play a pivotal role within knowledge ecosystems and in research and innovation (R&I) (European Union, 2022). Conversations on the value of the arts in an interdisciplinary context are also featured in the New European Bauhaus initiative of the European Commission.

This view of STEAM and the key contribution of the arts is not new to the European Commission. In fact, the Commission Communication on a Renewed EU Agenda for Higher Education (European Commission, 2017) reads: “The evolution from STEM to STEAM reflects recognition within higher education of the increased importance of interdisciplinary approaches. The interaction between STEM and art and design is driving substantive innovation and creativity.”

A STEAM agenda will allow European Universities to integrate cross-cutting themes that enhance learning and application:

1. Innovation & Entrepreneurship – Encourages bridging creative problem-solving and business thinking in STE(A)M fields.
2. Sustainability & Environmental Awareness – Links science and engineering with eco-friendly solutions.
3. Digital & Computational Literacy – Strengthens skills in coding, artificial intelligence, and big data with experimental creative thinking
4. Ethics & Social Impact – Explores ethical considerations in technology, science, and art.
5. Interdisciplinary Collaboration – Promotes teamwork across multiple STEAM challenges.

Furthermore, a STEAM agenda also integrates scientific research-related aspects with artistic research outcomes. Artistic Research (AR) is practice-based research in the arts which has developed rapidly in the last twenty years globally and is a key knowledge base in Higher Education Institutions (HEIs) for education in the arts and humanities.

III. Work plan and working modalities

Work Plan and Provisional Timeline

Our working modalities are designed to foster collaboration and knowledge exchange in an inclusive and flexible environment for all participants through a combination of virtual and in-person engagements while ensuring cost efficiency:

Online Regular Meetings and Collaboration, including:

- During the Bi-Monthly online STEAM topical group meetings the general coordination and strategic planning will be discussed. In these meetings specific topics will be identified and initiated.
- The discussion on the specific topics will be further prepared for the next STEAM topical group meeting by a dynamic working group of interested members of the topical group. These working groups operate autonomously in a flat and open structure and can initiate additional meetings.

Live Workshops: In-person events, held alongside pre-planned meetings and events within participating alliances and/or as one of the FOREU4ALL annual workshops with transversal topics, with an opportunity for hands-on workshops, interdisciplinary discussions, and engagement with external experts. Additionally, the event will strengthen network-building and deepen collaboration beyond virtual interactions.

New members and alliances can easily join the STEAM topical group, fostering continuous growth and inclusivity. Decision-making processes remain transparent, with clear documentation and open access to working materials. Collaborative digital platforms (FOREU4ALL MS Teams environment, SharePoint, Padlet, Forms etc) are used for document sharing, communication, and knowledge exchange.

The work plan is divided into four key stages, spanning 6 months each, that correspond to our strategic pathways to impact:

1. Agreement on priorities of a STEAM agenda for European Universities: This phase is focused on establishing a shared vision for a STEAM-driven agenda within European Universities. It involves consultations with participating alliances to define core priorities, key focus areas, and interdisciplinary synergies, ensuring broad alignment with the needs and expectations of higher education institutions.
2. Drafting a proposal for a preliminary STEAM agenda to be piloted by participating alliances, based on the agreed priorities. This will involve structured discussions, mapping existing STEAM approaches, and defining key implementation strategies.
3. Pilot testing and implementation of elements of the STEAM agenda in real-world educational and research settings by participating alliances, with feedback and discussion inside the group. This phase includes collecting primary information from pilots and analysing secondary case studies to refine the approach based on feedback from the community.
4. Knowledge sharing and dissemination phase, focused on broader dissemination of insights and best practices through initiatives such as: Annual STEAM Forum, fostering dialogue and collaboration, STEAM knowledge centre, such as an online repository of case studies, methodologies, and resources, and STEAM white papers, synthesizing findings to guide policy recommendations and institutional adoption.

This work plan is devised in articulation with the proposed structure of topics, incorporating in each of these stages a three-folded approach addressing education, research and institutional transformation, to ensure that STEAM not only covers, but enhances all areas of transformation of European Universities, making it relevant for any HEI participating in the initiative.

Considerations on Equality & Diversity in organisational modalities

Equality and diversity are key aspects of a STEAM agenda, and the group will integrate this from its onset, not only in terms of constituency, but also by integrating the topics as one of its priorities. Although it cannot be seen as the sole driver, STEAM has recently been viewed as a means to bridge the gender gap within the STEM fields.

A good example of this is its inclusion in the Horizon Work Programme 2023–2024 Coordination and the Support Action Calls HORIZON-WIDERA-2023-ERA-01 and HORIZON-CL2-2023-HERITAGE-01-08. One of the expected outcomes of HORIZON-CL2-2023-HERITAGE-01-08 was to increase understanding about the benefits of integrating artistic, cultural, and social scientific approaches in STEM education, research, and innovation. The call included a focus on STEAM as a means to increase participation by women in STEM disciplines assuming that closing the gender gap is related to competitiveness and innovation in HE.

From this follows, by defining the promotion and adoption of a STEAM agenda as one of its main objectives, this group is ensuring that equality and diversity are at the centre of everything we do.

IV. Inputs to WP3 Policy Dialogue & WP4 Communication and Dissemination

- **WP3:** We plan to produce white papers and advocacy documents on the relevance of STEAM and we expect to be able to disseminate this via the Community of Practice website and via publication coming from WP3.
- **WP4:** The topical group will map several best-practices that can be shared through the WP4 Best Practices platform. We also intend to use other tools made available such as newsletter/social media posts to disseminate our achievements.

V. Members

The group member profile is very broad, ranging from mid-academic management to education or research leaders who want to foster a STEAM agenda, but also other participants, such as PhD students or educators interested in the topic of STEAM. This very open structure will, in our view, foster participation and ensure greater visibility of the group through ensuring greater impact of the FOREU4ALL community.

The structure of the group is horizontal with the chair and vice-chair taking the core managerial roles, with a possibility of forming (informal) focused groups, consisted of members of various alliances, addressing specific topics, such as STEAM-informed pedagogies, the role of (artistic) research in STEAM approaches, or on STEAM policies.

Members can therefore contribute in different ways:

- In the GCT, selected in the first meeting (See: IV. Group Chairing Team (GCTs).
- As representatives of European Alliance Communities interested in exchanging on and taking the discussion on STEAM further, promoting a culture of STEAM culture across alliances.
- In the bi-monthly meetings which can be organised around a specific focus, potentially acting as working sessions to engage in discussion on issues that will be addressed in a yearly final white paper with guidelines and proposals coming from discussions on specific topics.
- In the annual in-person meetings on STEAM open to all alliances and with contributions from all alliances. This forum will be a clear manifestation of our community of practice but also a core venue for different Alliances to showcase outcomes and success stories related to STEAM.
- Contributing to the “knowledge centre/centre of competence” on STEAM that will both make available all White Paper/Position papers coming out of the work of the TG’s work, as well as best practices and case studies collected, along with a toolkit and guidelines that can support the integration of STEAM and push for its growing relevance in terms of EU policies. The key objective here is to position the group and our community of practice as a reference point in terms of EU policies on STEAM. This knowledge centre can also take the form of an online page and associated repository, embedded within the FOREU4ALL community and platform. Open source will be used for all development and implementation and no specific funding is required for this.