STREAMING GIRLS AND WOMEN INTO STEAM EDUCATION, INNOVATION AND RESEARCH

STREAM IT

D2.3. Needs-based Concept and Methodology for gender-and diversity inclusive hands-on activities and sustainable collaborative networks

31.10.2024

STREAM IT

Project full title

STREAMING GIRLS AND WOMEN INTO STEAM EDUCATION, INNOVATION AND RESEARCH

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D2.3 Needs-based Concept and Methodology for gender- and diversity-inclusive hands-on activities and sustainable collaborative networks

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1.0	28.09.2024	First draft	Katalin Oborni (HETFA)
1.1	22.10.2024	Incorporating input collected at the 2nd Co-creation Lab, incorporating preliminary research results	Katalin Oborni (HETFA) Emese Dányi (HETFA)
1.2	28.10.2024	Quality Assurance review	Bridget Burger (STEM Ísland)
1.3	29.30.2024	Finalising deliverable	Katalin Oborni (HETFA)

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List of abbreviations

ERC	Early research career
HEI	Higher Education Institutions
NIH	National Inspiration Hub
STE(A)M	Science, Technology, Engineering, (Art), Matematichs
STEM	Science, Technology, Engineering, Matematichs
VMS	Virtual Makerspace

EXECUTIVE SUMMARY

This deliverable, titled “Needs-based Concept and Methodology for Gender- and Diversity-Inclusive Hands-on Activities and Sustainable Collaborative Networks,” serves as a comprehensive guide for developing gender-sensitive methodologies that engage girls and young women in STEAM education while fostering sustainable collaborative networks across Europe.

The document builds on prior project results, including the D2.1 Research Report, which analysed gender disparities in STEAM education, as well as concept notes from Work Packages 3, 4, and 5. It also incorporates preliminary research findings and insights from the brainstorming session held during the 2nd Co-creation Working Lab of the STREAM IT project.

Drawing from an analysis of these earlier findings and recommendations, this deliverable provides practical guidance for project partners on developing gender- and diversity-inclusive STEAM methodologies for various project activities.

In conclusion, the document identifies six key areas where intervention is necessary, offering targeted recommendations for the educational and networking activities to be implemented within the STREAM IT project. All of these recommendations are designed to break down barriers and create more equitable opportunities for girls and young women in STEAM education and careers.

INTRODUCTION

The aim of this deliverable is to present a comprehensive set of recommendations for developing gender- and diversity-inclusive methodologies for the activities implemented under the Work Package 3, 4 and 5 of the STREAM IT project.

These recommendations are derived from the analysis of previous project deliverables, preliminary research results for the cross-country research conducted within Work Package 2, the outcomes of the second Co-creation Working Lab of the project, as well as the output derived from the meetings with project partners.

This deliverable serves as a key milestone in the project, as it consolidates the insights, research findings and the guidelines that were collected in the STREAM IT project until this stage. By publishing this deliverable not only the development and ideation phase of all the work packages will be finalised in the project but this deliverable provides useful recommendation for enhancing the accessibility and inclusivity of STEAM fields for girls and young women in the educational, networking and policy activities the STREAM iT project intends to implement.

The deliverable builds upon the following key project deliverables that was already submitted in STREAM IT project:

D2.1 Research Report on Previous and Ongoing Initiatives on STEAM Education and Gender Equality: This report provided a thorough analysis of existing research and ongoing initiatives within the European Union related to gender equality in STE(A)M fields. This report synthesised findings from a comprehensive desk review, project mapping, and qualitative interviews with key stakeholders involved in gender equality initiatives across Europe. The research identified numerous barriers, including societal stereotypes, institutional biases, and funding gaps, which disproportionately affect girls and women in STE(A)M fields. The report highlighted the importance of creating inclusive educational environments, where both boys and girls are equally encouraged to explore and pursue STE(A)M careers. Key challenges such as the perpetuation of gender stereotypes in educational content and the lack of gender-sensitive teaching methodologies were identified. D2.1 emphasised the importance of providing teachers and educators with the tools and training necessary to adopt gender-inclusive practices in their classrooms.

D3.4 Concept Note for Implementing Work Package 3: This deliverable provides a framework for developing gender-inclusive toolkits and hands-on activities in the STREAM IT project. The 3 toolkits to be developed are designed to 1) facilitate hands-on activities targeting young girls, particularly those aged 14-18, to encourage their engagement in STEAM subjects, 2) facilitate hands-on activities in science centres and museums with a focus on gender sensitive methodology, and 3) support the implementation of Mentoring Programme for STEM university and PhD students with the aim of supporting the first steps of their career, to become visible as talents. The deliverable outlines the pilot activities that would test these tools in various educational contexts and project countries, aiming to enhance skills development and foster a supportive learning environment for girls and young women in STEAM fields. The toolkit's flexibility allows for diverse applications, accommodating different learning formats, durations, and geographic contexts.

Table 1: Summary of tasks and activities in Work Package 3

TASK/ACTIVITY	DESCRIPTION OF TASK	MONTH / DUE DELIVERY DATE	PARTNER(S) INVOLVED/RESPONSIBILITIES
Task 3.1. Nurturing Talent - Workshop series for supporting girls to orient towards STEM (M8-M33) **Lead partner:** SV STP **Participants:** RAPIV, CESIE, BRIT, NATE, TECHPARK, UBU, AWB, ADDSEN, MIR, WIT, SI In T3.1, Partners develop an after-school programme, Talent Nurturing Workshop for girls (for 14-18 ages) to attract girls into STEM fields and support those who are interested in STEM but not yet committed to going further in this direction (tertiary education). The exact content, methods and agenda will be built up on the outcome of WP2 and PPs' previous initiatives. The workshop programme (40-50 hours, within a 4–5-month period) can include hybrid events, training, workshops, visiting makerspaces/ science centres/ incubators/ meeting with role models/ project ambassadors. A Toolkit will be developed to share experiences beyond the project. The development of the draft toolkit is led by SV STP with the support of partners by M12. The toolkit is piloted in 12 countries, then after assessing impact, adding case studies, SV STP updates the Toolkit.			
Activity 1	Draft concept note	August 31, 2024	SVSTP, ADDSEN, NATE
Activity 2	Collecting PPs' previous initiatives	September 30, 2024	All partners [ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT]
Activity 3	Evaluation of PPs' practices & WP2	September 20, 2024	SVSTP, UBB

	results, updating concept note if needed		
Activity 4	Drafting the framework for Talent Nurturing Programme (TNP)	Oct 31, 2024	SVSTP
Activity 6	Partners discuss the TNP, make suggestions for improvements	Nov 15, 2024	ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 7	Quality evaluation & Final version of TNP framework	Dec 31, 2024	SVSTP, UHE
Activity 8	Partners develop the TN programme	Nov'24-May'25	ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 9	Localising the TN programme	June' 25-Oct'25	ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 10	Registration forms, reporting, pre and post survey templates developed for the Nurturing Talent workshops / overall programme	Oct'25	SVSTP, HETFA
Activity 11	Promo campaigns & recruiting participants	Oct'25-Jan'26	ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 12	Running the pilots round of TNPs	Feb - May, 2026	SVSTP, ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 13	Impact assessment	Feb -July, 2026	SVSTP, ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 14	Partners sharing feedback, discussing updates	June, 2026	SVSTP, ADDSEN, AWB, BRIT, CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 15	Partners updating local	July-Sept,	SVSTP, ADDSEN, AWB, BRIT,

	programmes & STREAMIT Toolkit	2026	CESIE, MIR, NATE, RAPIV, SI, TECHPARK, UBU, WIT
Activity 16	Finalising output, quality evaluation & online presence	Oct 31, 2026	SVSTP, UHE, f6S

Task 3.2 Hands-on activities at science centres and museums (M8-M33),

Lead partner: ADDSEN

Participants: BRIT, TECHPARK, UHE, UBU, WIT, ReadLab, SI, IMP

Partners will develop hands-on activities (few-hours programmes, hackathons, experimentation shows, summer camps, at least 5 events per partner) in which each involved partner includes a specific methodology to engage and enable the self reflection of girls. Toolkit for the science centres and museums is developed to share experiences beyond the project. The development of the draft toolkit is led by ADDSEN with the support of partners by M12. The toolkit will be piloted in 8 countries, then after assessing the impact, adding case studies, ADDSEN will update the Toolkit by M33.

Activity 1	Concluding the concept note	August 31, 2024	SVSTP, ADDSEN, NATE
Activity 2	Collecting the best practices (activity sheets, 3 per partner)	Sept 30, 2024	ADDSEN, BRIT, TECHPARK, UHE, UBU, WIT, ReadLab, SI, IMP
Activity 3	Evaluation of PPs' practices & WP2 results, updating concept note if needed	Sept 30, 2024	ADDSEN
Activity 4	The first version of the 3.2 toolkit prepared for testing	Nov 30, 2024	ADDSEN
Activity 5	Scheduling events and their preparation	December 31, 2024	ADDSEN, BRIT, TECHPARK, UHE, UBU, WIT, ReadLab, SI, IMP
Activity 6	Impact assessment tool and instruments are developed	February 2025	ADDSEN, HETFA, SV STP
Activity 7	Starting promoting events, enrolling participants,	January 2025 - June 2026	ADDSEN, BRIT, TECHPARK, UHE, UBU, WIT, ReadLab, SI, IMP

	organisation of events, evaluation of events		
Activity 8	The final version of the toolkit 3.2 ready for the quality check	August 31, 2026	ADDSEN
Activity 8	The final version of the toolkit 3.2 ready for submission	September 15, 2026	ADDSEN

Task 3.3. Mentoring Programme empowering young talents in STEM education (M8-M33),

Lead partner: NATE

Participants: ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT

A Mentoring Programme (appr. 40 hours) will be organised for STEM university and PhD students (all genders, at least 40% of women) with the aim of supporting the first steps of their career, to become visible as talents. During the Programme, it is also the aim to address bottleneck moments in young STEM professionals/ researchers' careers, support science communication and nurture a community of young talents through developing and presenting project ideas. The toolkit will be drafted by NATE in M12 and updated based on the piloting period in M33. This activity will be carried out in 10 countries, and national and international competition (Budapest in M30) will be its closing activity. Intensive online campaign accompanies the promotion of the call and the events by NATE. The winner is supported for initiating collaboration, travel to summits, workshops, conferences, events relevant in STEM.

Activity 1	Developing the Concept Note WP3	August 31, 2024	SVSTP, ADDSEN, NATE
Activity 2	Collecting evidence from research and practice	September 30, 2024	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT, NATE + WP2
Activity 3	Developing the first version of mentoring programme and the framework for science communication competitions	November 30, 2024	NATE
Activity 4	Planning online campaign to promote mentorship programme and science communication competitions	December 31, 2024	NATE with F6S
Activity 5	Supporting the adaptation process. Online workshop for project coordinators	January 2025	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE

	organised by NATE		
Activity 6	Adaptation of toolkit in the relevant country and university context	January 2025 – March 2025	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE
Activity 7	Impact assessment tool is developed	February 2025	NATE, HETFA, SVSTP
Activity 8	Online campaign to promote mentorship programme and science communication competitions	January 2025 – May 2026	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE + WP6
Activity 9	Recruiting mentors and mentees	February 2025 – May 2025	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE
Activity 10	Organising online international workshop for all recruited mentors	May 2025-August 2025	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE
Activity 11	Piloting mentorship programme in partner countries	September 2025 – March 2026	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE
Activity 12	Organising national science communication competitions in each partner country	March–May 2026	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE
Activity 13	Organising international science communication competition held in Budapest (Hungary)	June 2026	NATE
Activity 14	Evaluation of mentorship programme and science communication competitions	September 2026	ADDSEN, AWB, BRIT, MIR, RAPIV, SV STP, TECHPARK, UBU, WIT + NATE + WP2
Activity 15	Update and finalisation of the toolkit for mentorship programme and science communication competition	September 2026	NATE
Activity 16	Dissemination	September 2025 – November 2026	NATE, HETFA, All PPs

D4.5 Concept Note for Implementing Work Package 4: This deliverable introduced the work plan for implementing sustainable networks aimed at upskilling educators and fostering collaboration within STEAM education communities. The document elaborates on the concept and work plan for establishing the 1) National Inspirational Hubs (NIHs) in

various project countries to support STEAM educators by fostering peer-to-peer learning and community building, and 2) Virtual Makerspaces (VMS), which connect national hubs and encourage cross-border collaboration.

Table 2: Summary of tasks and activities in Work Package 3

TASK/ACTIVITY	DESCRIPTION OF TASK	MONTH / DUE DELIVERY DATE	PARTNER(S) INVOLVED/RESPONSIBILITIES
TASK 1. **Gender and diversity inclusive non-formal teaching and training tools** (M6-M36), lead partner: **CESIE** Participants: **NATE, UHE, UBU, IMP, ADDSEN, SVSTP, ReadLab Brussels[2], SI** CESIE elaborates a Best Practice Guide for STEM Educators, which defines the main aspects of the identification of best practices (a template is used for best practices). The Guide will also contain a conceptual framework for applying STEAM approaches in STEM education. The Guide will be updated by M33 on the outputs of WP3 and additional searches for innovative STEAM approaches. **D4.1 Best Practice Guide for STEM Educators of Gender- and diversity inclusive non-formal teaching and training tools, methods and practices**			
ACTIVITY 1	Development of the template for the collection of best practices.	M6/ 30.06.2024	CESIE
ACTIVITY 2	Collection of best practices	M10/ 31.10.2024	NATE, UHE, UBU, IMP, ADDSEN, SVSTP, ReadLab Brussels, SI
ACTIVITY 3	Elaboration of the first draft of the Best Practice Guide for STEM Educators.	M12/ 31.12.2024	CESIE
ACTIVITY 4	Continuous adaptation of the Guide, including a Workshop for discussing the experiences of using the Guide.	M12-M32	CEISE, All PPs (in this task) contribute
ACTIVITY 5	Finalisation of the Best Practice Guide for STEM Educators based on Impact assessment.	M33/ 30.09.2026	CESIE
TASK 2. **National Inspiration Hubs for STEM Educators** (M8-M36), lead partner: **STEM ICELAND** Participants: **HETFA, RAPIV, CESIE, BRIT, NATE, TECHPARK, UHE, UBU, IMP, ADDSEN, EIT FOOD CLC NE, SV STP, MIR, ReadLab Brussels** The aim of the National Inspiration Hubs is to establish an online networking group (through Basecamp for online collaboration) for STEM teachers and communities, focusing on capacity building. These hubs will facilitate activities for sharing and exchanging expertise, experiences, lessons learned, and potentially transferable good			

[2] formerly 'CANDIDE'

and best practices. They will also promote project results and events beyond the project's duration. To facilitate collaboration and peer-to-peer learning among STEM teachers and communities, the National Hubs will organise webinars (at least six per country during the project's lifetime, each lasting 60-90 minutes) and at least one international teachers' training session (a webinar attended by at least 15 teachers/educators) developed and organised by STEM ICELAND.

The concept behind the National Hubs is to develop the capacity of secondary school STEM teachers, university educators, and educators from other organisations and institutions, with a particular focus on deconstructing gender stereotypes and bias in teaching. These hubs will also address real case scenarios of applying STEAM approaches in teaching.

D4.2 Toolkit for the establishment and maintenance of the National Inspiration Hubs

Activity 1	Administer a survey to query partners on status of NIH in their country, and analyse results.	M7/ 31.07.2024	SI
Activity 2	Develop a handbook for NIHs with emphasis on removing barriers to girls and women in STREAM. Organising workshop to PPs for introducing Handbook and discussing the establishment of the NIHs.	M10/ 31.10.2024	SI, as organiser of the workshop, All PPs (in this Task) participate
Activity 4	Engage partners in promoting NIHs and populating Basecamp sites.	M36/ 31.12.2026	SI, HETFA, RAPIV, CESIE, BRIT, NATE, TECHPARK, UHE, UBU, IMP, ADDSEN, EIT FOOD CLC NE, SV STP, MIR, ReadLab Brussels
Activity 5	Assist partners with planning webinars and workshops within their inspiration hubs.	M36/ 31.12.2026	SI, HETFA, RAPIV, CESIE, BRIT, NATE, TECHPARK, UHE, UBU, IMP, ADDSEN, EIT FOOD CLC NE, SV STP, MIR, ReadLab Brussels
Activity 6	Steering meetings are organised every 3 months for PPs to have an overview of the NIHs maintenance and discuss challenges, share experiences of running the hubs.	M13-M36	SI, HETFA, RAPIV, CESIE, BRIT, NATE, TECHPARK, UHE, UBU, IMP, ADDSEN, EIT FOOD CLC NE, SV STP, MIR, ReadLab Brussels

Task 3.
Virtual Makerspace for STEAM approaches
(M10-M36), lead partner: **ReadLab Brussels**

Participants: **HETFA, RAPV, NATE, TECHPARK, UHE, IMP, ADDSEN, MIR, STEM ICELAND**

The Virtual Makerspace will function as a European-level open educational and networking platform for the National Inspiration Hubs and will be accessible to other stakeholders beyond the project. Its aim is to connect teachers, researchers, policymakers, and industry parties to promote STEAM education and STEAM approaches in Europe. As an international networking platform, it provides information, resources, and tools for embedding (digital) STEAM approaches into STEM education to improve gender equality and intersectionality. It also aims to bring stakeholders together for new collaborations.

The platform will share the activities of the National Inspiration Hubs and provide know-how on creating and establishing collaborative networks at the national level. This will encourage communities in any EU country to establish their own hubs. Additionally, the platform will announce a prize for the "Outstanding Hub of the Year" in the project's second and third years.

D4.3 The Virtual Makerspace for STEAM approaches

Activity 1	Develop the basic functionalities of the Virtual Makerspace, including the technical development of the platform	M10	ReadLab Brussels
Activity 2	Upload the Best Practices Guide for STEM Educators on the Makerspace & Upload template to collect further Best Practices.	M12	ReadLab Brussels, (Best practices to be provided by NATE, UHE, UBU, IMP, ADDSEN, SVSTP, SI)
Activity 3	Finalise the Forum's structure and functioning	M13	ReadLab Brussels
Activity 4	Translate the Makerspace to all projects languages	M13	ReadLab Brussels, all PPs
Activity 5	Workshop organised for PPs to introduce how the Virtual Makerspace works.	M13/M14	ReadLab Brussels, all PPs involved in this Task
Activity 6	Continuously populate and update the Virtual Makerspace with events and new resources.	M36	ReadLab Brussels, all partners
Activity 7	Keep the Forum active while moderating its content.	M36	ReadLab Brussels, HETFA, All PPs contribute by providing input
Activity 8	Development of the Strategic Exploitation Plan, including data collection phase and workshop with PPs collecting their recommendations to the Plan.	M35	RAPIV, All PPs contribute by providing input

D4.5 Concept Note for Implementing Work Package 5: This deliverable outlines how the project will contribute in the promotion of the "The European Manifesto for gender-inclusive STE(A)M education and careers," by fostering ongoing policy dialogues trough webinars and making recommendations aimed at supporting gender equality in STEAM education. Work package 5 also includes the impact assessment of the project activities.

Table 3: Summary of tasks and activities in Work Package 5

TASK/ACTIVITY	DESCRIPTION OF TASK	MONTH / DUE DELIVERY DATE	PARTNER(S) INVOLVED/RESPONSIBILITIES
T5.1 Impact assessment (M6-M33) T5.1 aims to provide a scientifically reliable assessment of the activities implemented by ST(R)E(A)M IT (project evaluation will be part of the Quality Assurance in T1.4). Impact assessment is based on the results of WP2, WP3, WP4. Data will be also collected on the groups targeted, its gender, age (in case of students). Shifts of approaches as impacts of activities will be assessed with regard to students, teachers, institutional actors of the STEM education ecosystem, and parents. Based on the data gathered, the assessment is carried out by HETFA continuously. The results of the deliverable will feed policy dialogue and also the finalisation of the toolkits (D3.1, D3.2, D3,4 and D4.1)			
ACTIVITY 1	Consultations with the WP and Task leads of WP3 and WP4	30 June 2024	HETFA, WP3 lead and task leads, WP4 lead and task leads
ACTIVITY 2	Finalisation of the design of evaluation methodology and evaluation tools	TBD depending on the exact timing of the intervention we will evaluate	HETFA *with the support of WP3 and WP4 leads and Task leads*
ACTIVITY 3	Implementation of the Assessment of T3.1	M32	*13 PPs piloting the toolkit + task lead* (HETFA, RAPIV, CESIE, BRIT, NATE, TECHPARK, UBU, ABW, SI, SVSTP, ADDSEN, MIR, WIT, CANDIDE)
ACTIVITY 4	Implementation of the assessment of T3.2	M32	*PPs piloting the toolkit + task lead* ADDSEN, BRIT, TECHPARK, UHE, UBU, WIT, ReadLab, IS, IMP
ACTIVITY 5	Implementation of the assessment of T3.3	M32	11 PPs (10 countries) involved in the mentoring

			programme *+ task lead* (HETFA, NATE, RAPIV, BRIT, TECHPARK, UBU, ABW, ADDSEN, SVSTP, MIR, WIT)
Activity 6	Implementation of the assessment of T4.1 and T4.2	M32	*PPs implementing national hubs* (HETFA, BRIT, NATE, TECHPARK, UHE, UBU, IMP, ADDSEN, EIT FOOD CLC, NE, SV STP, MIR, CANDIDE)
Activity 7	Implementation of the assessment of T4.3	M32	HETFA, CANDIDE
Activity 8	Preparation of D5.1	M32	HETFA
T5.2 Policy recommendations for national/regional and EU stakeholders contributing to wider EU policy objectives and 'The European Manifesto for gender-inclusive STE(A)M education and careers' (M8-M36), lead partner:Steinbeis Participants: HETFA, RAPIV, UBB, IMP, EIT FOOD CLC NE, MIR, WIT, CANDIDE, SI This task organises policy dialogue webinars at least 6 times during the lifetime of the project on policy issues relevant to increasing GE in STEM education, R&I, and contributing to the development and implementation of the 'Manifesto. Webinars will also be good occasions for collecting input for the Project's Roadmap and making synergies with previous initiatives. This ongoing web-based dialogue will be ended by a hybrid Final Conference in Brussels back-to-back with the Final GA Meeting M35. The main aim of the conference is to present the project deliverable European Roadmap for supporting the implementation of the 'Manifesto' (D5.2) elaborated by S2i. The Final conference will bring together policy decision-makers, STEM education providers, and industry stakeholders from national/regional and EU levels from fields covered by the project. HETFA will organise, and Candide will host the Final Conference.			
Activity 1	Provide overview of the WP5 in written form as **Concept note**	M5	Steinbeis, HETFA
Activity 2	Organise topic finding workshops for the webinars	M9, M15, M26	Steinbeis, Participants: HETFA, RAPIV, UBB, IMP, EIT FOOD CLC NE, MIR, WIT, CANDIDE, SI
Activity 3	Based on findings, design content and framework for webinars.	25 days before the event	Steinbeis, Participants: HETFA, RAPIV, UBB, IMP, EIT FOOD CLC NE, MIR, WIT, CANDIDE, SI
Activity 4	Brief the webinar hosting partners on how to organise the webinars	25 days before the event	Steinbeis, Participants: HETFA, RAPIV, UBB, IMP, EIT

			FOOD CLC NE, MIR, WIT, CANDIDE, SI
Activity 5	Coordinate with implementing partners to compile findings	Within 40 days of the event	Steinbeis, Participants: HETFA, RAPIV, UBB, IMP, EIT FOOD CLC NE, MIR, WIT, CANDIDE, SI
Activity 6	Write report on policy dialogue	M35	Steinbeis
Activity 7	European Roadmap for Supporting the Implementation of 'The European Manifesto for Gender-Inclusive STE(A)M Education and Careers	M35	Steinbeis, Participants: HETFA, RAPIV, UBB, IMP, EIT FOOD CLC NE, MIR, WIT, CANDIDE, SI
Activity8	This ongoing web-based dialogue will be ended by a hybrid Final Conference in Brussels back-to-back with the Final GA Meeting. The main aim of the conference is to present the project deliverable European Roadmap for supporting the implementation of the 'Manifesto' (D5.2) elaborated by S2i. The Final conference will be brought together. Policy decision-makers,STEM education providers, and industry stakeholders from national/regional and EU levels from fields covered by the project. HETFA will organise, and Candide will host the Final Conference.	M35	Steinbeis, HETFA, CANDIDE, All Participants

Preliminary research results: one of the main sources for this delverbae comes from the research conducted within Work package 2. The research collected empirical data regarding the existing opportunities and obstacles young women face when embarking on STEAM studies and activities. It aims to address the structural characteristics of these male-dominated fields of study and research. Throughout the data collection process, the contributing partners used quantitative and qualitative social science methods: desk research of previous STEAM-related projects and initiatives, literature review, expert and semi-structured interviews to understand stakeholders' experiences

and views concerning their own and women's attempts to find their ways in a male-dominated field.

2nd Co-Creation Working Lab: A key component of this deliverable is the integration of outcomes from the Second Co-Creation Working Lab, which was held on October 11, 2024. The project partners collaboratively developed recommendations for the educational streams to be implemented in Work Package 3. Participants shared their insights on gender-sensitive and inclusive methodologies and best practices, which were then refined through joint ideation sessions.

1. Recommendations derived from the D2.1 Research Report on Previous and Ongoing Initiatives on STEAM Education and Gender Equality

This deliverable reviews the current state of gender inclusivity in STEAM education through an analysis of initiatives across Europe. The research highlights ongoing gender disparities in STEAM, stressing the need for continued efforts to dismantle institutional and societal barriers. Tailored educational programs that promote diversity and inclusivity, particularly targeting girls at the primary and secondary levels, are essential for fostering early interest and sustained engagement in STEAM. Additionally, teacher training, parental involvement, and community engagement are critical in shaping positive perceptions and experiences for girls in these fields.

Key findings show that gender disparities in STEAM persist due to societal stereotypes, the lack of female role models, and gender biases in educational and professional environments. Despite efforts to promote gender equality, these barriers continue to hinder the participation of women and girls. Initiatives presented in the deliverable demonstrate that targeted interventions can improve recruitment and progression for women in STEAM, but challenges, such as engaging women long-term and addressing the needs of those for instance with migration backgrounds, remain.

A critical insight is the need for gender-sensitive teaching approaches that address the unique needs and interests of girls. Projects which involve adolescents in designing activities, have proven effective in promoting gender diversity in science careers. Parental and community involvement is also essential in challenging stereotypes and encouraging girls to pursue STEAM careers.

Many of the representatives of the investigated projects emphasised that collaborative and inclusive learning environments break down gender barriers and foster community. Initiatives are needed for advocating for hands-on learning, supporting the development of both technical knowledge and soft skills. Integrating arts and humanities into STEAM can also make these subjects more accessible.

The deliverable presents recommendations for promoting STEAM education and careers among all students, emphasising inclusion, practical experience, and systemic support across various educational levels. The recommendations aim to break down gender barriers, enhance early exposure to STEAM, encourage collaborative learning, and integrate STEAM with arts and humanities. Additionally, adapting programs to local contexts, providing continuous professional development for teachers, and engaging communities and parents are highlighted as crucial factors in ensuring the success and inclusivity of STEAM education.

In the following, we provide the main outcomes of analysing the research results and recommendations presented in the D2.1. The below-listed recommendations are especially relevant to consider for the activities implemented in the Work Package 3, 4 and 5.

1. **Fostering Early Education in STEAM:**

Early education on STEAM through hands-on, engaging activities is critical for building a foundation of interest in STEM subjects among young learners. Incorporating STEM concepts into early childhood education can be achieved through interactive activities such as coding games, building projects, and experiments. The role of parents is seemingly important in early STEAM education, therefore family and community involvement in activities like workshops and science fairs are recommended activities, as they help reinforce the importance of STEAM.

2. **Encouraging a Collaborative Learning Environment:**

Collaborative learning promotes inclusivity and helps break down gender barriers by encouraging students to work together on group projects. This approach develops teamwork, communication, and problem-solving skills, and fosters a sense of community among students. Creating an inclusive atmosphere ensures that all students feel valued and supported, leading to more equitable participation.

3. **Integrating STE(A)M with Other Disciplines:**

A STE(A)M approach, combining STEM with arts and humanities, creates a holistic learning experience. Integrating creative disciplines into STEM education can make subjects more accessible and engaging for students who may not traditionally be drawn to STEM fields.

4. **Adapting Programs to Local Contexts:**

Tailoring educational programs to the specific cultural, educational, and social contexts of different regions enhances their effectiveness. This requires assessing and recognizing the local attitudes, values, and educational needs of the students. As a result, the locally adapted tailed programmes will be more relevant and engaging for students.

5. **Providing Continuous Professional Development for Teachers:**

Continuous professional development ensures that educators stay up-to-date with the latest STEAM teaching methodologies and emerging trends in technologies, as well as learn on how to apply gender sensitive methodology within their programmes.

6. **Engaging Communities and Parents:**

Engaging parents and communities is essential for fostering positive attitudes toward STEAM and challenging traditional gender stereotypes. Workshops and informational sessions can empower parents to support their children's interests in STEAM fields. Partnerships with local businesses and community organisations can enrich educational experiences by providing real-world connections, internships, mentorships, and hands-on projects.

2. Research results on Stakeholders' recommendations

A total of 85 interviews were conducted across 14 countries, including Hungary, Bulgaria, Romania, Spain, Poland, Ukraine, Iceland, Slovenia, Slovakia, Italy, North Macedonia, Croatia, Lithuania, and Serbia. The interviewees consisted of a diverse group, with two-thirds being women and one-third men. They represented various professional backgrounds, covering all fields of STEAM as well as educational management. Participants held roles at different educational and policymaking levels, providing a broad

perspective on the challenges and opportunities surrounding gender inclusivity in STEAM education.[3]

The interviewees responded to several key questions focusing on how to encourage girls' interest in STEM, effective interventions for increasing this interest, and whether dedicated support is necessary at different educational levels. They also discussed gender equality plans, existing support programs, and the roles of different stakeholders in promoting gender inclusivity.

The expert interviews highlighted a multi-faceted approach to encouraging girls' participation in STEM. Key strategies include early skill development, gender-sensitive teacher training, hands-on and creative learning methodologies, exposure to female role models, financial support, and dedicated programs for girls. Equally important is the need to involve parents, teachers, and the community to create a supportive environment that fosters gender inclusivity in STEM. The identified collection of recommendations implicate that systematic, institutional-based efforts that include tailored interventions, inclusive policies, and practical learning opportunities are essential for building a more diverse and inclusive future in STEM education and careers. The recommendations identified from the expert interviews can be grouped into 5 distinct subgroups:

1. Skill Development

A key theme across interviews was the importance of developing specific skills that boost girls' confidence and interest in STEM fields. Problem-solving, research skills, and leadership were identified as critical areas for fostering a strong foundation in STEM for girls.

Specific recommendation for methodologies applied in educational activities implemented within WP3:

- Encourage problem-solving and leadership skills early on, as these competencies are essential for girls to gain the confidence needed to pursue STEM studies at higher levels.
- Promote activities where girls can take initiative and lead projects, which helps build confidence in their capabilities.

[3] This chapter is based on the research results introduced in D2.3 Research Report on obstacles and supports for gender equality and inclusiveness in STEM education, R&I, Chapter VI.4

Expert Quote: "Well, I believe the central focus should definitely be on building problem-solving skills early on. Girls need to see that their ideas can lead to real solutions." (Hungarian respondent)
Expert Quote: "They take tremendous initiative, they finish everything, and they do it on their own—this should be encouraged more often, giving them leadership roles in projects." (Romanian respondent)

2. Teacher Training

Another prevalent theme was the crucial role that teachers play in shaping girls' attitudes towards STEM. Many of the respondents strengthened that teachers often unknowingly reinforce gender stereotypes, which can deter girls from pursuing STEM careers.

Specific recommendation for methodologies applied in educational activities implemented within WP3, as well as the activities enhancing tecagers's knowledge and awareness within WP4.

- Implement teacher training programs that focus on gender-sensitive pedagogies, helping educators identify and avoid reinforcing stereotypes. Such training should not only focus on STEM content but also on how to present STEM subjects in a way that dismantles gender biases.
- Equip teachers with innovative teaching methods that appeal to both genders, ensuring that girls do not feel alienated by STEM content.
- Actively train teachers to know the signs of microaggressions, and to know how to handle them and thereby create safe spaces for girls.

Expert Quote: "Not to reinforce that little girls are like, 'we don't do that kind of work,' it starts with the teachers. Training teachers is crucial." (Bulgarian respondent)
Such training should not only focus on STEM content but also on how to present STEM subjects in a way that dismantles gender biases.

Expert Quote: "It's completely hands-on; something is always happening. Teachers need to keep it dynamic and engaging for everyone, not just the boys." (Serbian respondent)

3. Methodology: Creative and Hands-On Learning

A recurring suggestion across countries was the need for innovative and hands-on learning methodologies that make STEM subjects more accessible and enjoyable for girls. The interviewees also emphasised the importance of ensuring that programs and events

aimed (not only) at girls are not only informative but also entertaining. This point was particularly stressed in relation to the education of younger age groups, with several respondents arguing that at this stage, it is sufficient to spark interest in STEM fields, and learning theories and formulas can come at a later time. The integration of real-world applications into STEM curricula was another strategy highlighted for making the subjects more appealing to girls.

Specific recommendation for methodologies applied in educational activities implemented within WP3:

- Encourage creative and hands-on pedagogies that bring STEM to life in ways that resonate with girls' learning styles. Project-based and experiential learning were noted as particularly effective.
- Focus on real-world applications of STEM, making subjects relevant to students' lives, particularly girls, by addressing issues they care about.

Expert Quote: "Creative pedagogy is essential. When girls are given the freedom to think creatively and work on projects, they start seeing STEM as something they can excel in." (Icelandic respondent)

Expert Quote: "We need to show them (girls) that STEM isn't just about abstract maths and physics—it's about solving real-world problems that they care about." (Spanish respondent)

4. Role Models

Interviewees stressed the significance of role models in motivating girls to pursue STEM careers, as they argued, the access to female STEM professionals helps girls envision themselves in these fields.

Specific recommendation for methodologies applied in educational activities implemented within WP3 and for policy ideation within WP5:

- Facilitate opportunities for girls to meet and interact with successful women studying or working in STEM to break down stereotypes and offer tangible examples of female success in these fields. Such role models should be featured in school events, mentorship programs, and community outreach initiatives to reinforce that STEM careers are attainable for girls.

- Engage parents and teachers in this process to build a supportive ecosystem around girls interested in STEM.

Expert Quote: "Here, parents, teachers, the environment, the media, everyone plays a role. Girls need to see successful women—they need these role models to break the stereotype that STEM is for boys." (Lithuanian respondent)

Expert Quote: "When parents and teachers are involved, girls feel more supported. It's not just about meeting role models—it's about creating an environment that encourages them to follow that path." (Slovenian respondent)

5. Financial Support

Financial barriers were noted as a significant factor in limiting girls' access to STEM education, especially for those from disadvantaged backgrounds. Offering free or subsidised programs could dramatically increase participation rates and provide critical exposure to STEM subjects.

Specific recommendation for policy ideation within WP5:

- Provide financial support for after-school STEM programs targeting girls, ensuring that all students, regardless of background, can participate in STEM activities.

Expert Quote: "Additionally, when discussing disadvantaged individuals, financial support for after-school programs is key—it's not just about providing the opportunity, but making sure they can access it." (Croatian respondent)

6. Dedicated Support for Girls in STEM

There was consensus among many interviewees on the importance of providing dedicated support for girls at both secondary and tertiary educational levels. Some respondents, however, cautioned against isolating girls through girls-only programmes, recommending instead gender-sensitive approaches that integrate boys as allies. The idea behind this type of argument is that by offering both dedicated spaces and inclusive environments, girls are encouraged to thrive in STEM without feeling isolated from their peers.

- Develop targeted support programs for girls in secondary and tertiary education, while fostering an inclusive environment that encourages boys to be supportive.

Expert Quote: “Yes, dedicated support is important, but we can’t separate them too much from the boys—we need to work on making the boys understand why it’s important too.” (Ukrainian respondent)

7. Community and Parental Engagement

Engaging communities and parents was identified as a powerful tool in sustaining girls’ interest in STEM. Community programs and family involvement were seen as essential in breaking down societal barriers.

- Involve parents in workshops and programs to help counteract gender stereotypes and encourage girls' pursuit of STEM.
- Create community-based initiatives that promote STEM education for girls, including science fairs, local clubs, and public events.

Expert Quote: “Parents are often the ones who unconsciously discourage girls from pursuing science. Involving them in these discussions is key to changing the mindset.” (North Macedonian respondent)

Expert Quote: “We’ve seen huge success when the entire community gets involved—local businesses, parents, teachers all come together to support STEM learning.” (Polish respondent)

3. Co-creation working lab - recommendations collected by Partners

The 2nd co-creation working lab for the STREAM IT project included an online brainstorming session, where partners gathered recommendations for the educational activities to be implemented within the framework of the Work Package 3. This session was organised in an interactive format, allowing participants to work in three distinct groups, each focused on a specific education stream (Task 3.1, 3.2 and 3.3) of the project. Room 1 discussed the Talent Nurturing Programme, Room 2 focused on hands-on activities at science centres and museums, and Room 3 focused on the mentoring programme and science communication competitions. Each group was tasked with generating ideas and recommendations based on prior presentations of the concept for the educational activities under Work Package 3 and the preliminary research results. Once the brainstorming was complete, each group presented their recommendations, which were then further

discussed. Table 1, 2 and 3 present the results of the collected recommendation of the rooms.

Breakout Room 1

In the Breakout Room 1, skill development, availability of tools and equipment, teachers, role models and creating supportive environments were identified as relevant recommendations for T.3.1. Talent Nurturing Programme (TNP).

A strong emphasis was placed on fostering both hard and soft skills. In particular, soft skills such as problem-solving, leadership, communication, and analytical thinking were highlighted as essential for empowering girls and boosting their confidence in their knowledge and abilities (also noted in Good Practices collected by partners). Co-creation was identified as an effective method for cultivating these skills. Discussions revealed that understanding the profile of the target group is crucial, especially since the intended age range of 14-18 may be too late for introductory STEAM activities. Focusing on less advanced STEAM target groups is important to engage and motivate them toward pursuing tertiary education in STEAM. However, there is a notable risk that these individuals may feel overwhelmed and drop out when faced with peers who have had significantly more exposure to STEAM prior to university. This raises critical questions about the goals of the TNP and how to accurately define the target group. Conducting surveys and possibly interviews for programme admission will be necessary to better understand the participants' backgrounds and needs.

The integration of digital skills into the program was also a significant topic of discussion. Combining online and face-to-face experiences, along with the incorporation of digital tools like TikTok, Instagram, AI, coding apps, and web design, was deemed vital. However, a concern was raised regarding the accessibility of certain digital tools for girls under the age of 14, which could pose challenges for the TNP if the target audience is not appropriately defined.

The importance of teachers and role models in the programme was emphasised, ideally having individuals who embody both roles. However, given the existing gaps in teachers' education around gender-sensitive pedagogies and the persistence of stereotypes, it is crucial to provide workshops or webinars focused on gender-inclusive teaching methods. These sessions should equip teachers with strategies to observe and reflect on girls' engagement in STEAM subjects. Additionally, incorporating role models as teachers,

mentors, speakers, or even historical figures can enrich the programme and inspire participants.

To foster a safe and encouraging atmosphere, it is essential to establish girls-only groups, involve female teachers and role models, and provide prior training for educators on gender-sensitive methodologies. Emphasising the importance of making mistakes and reducing competitiveness can further contribute to a supportive learning environment.

Table 4: Nurturing talent workshop

Breakout room 1 results

Recommendation 1: Skill development Co-creation: come and ask first Develop soft skills alongside technical skills Focus on communication, presentation, and leadership training alongside technical skills to help girls feel more confident in their knowledge and abilities	
In what way do the recommended methods, tools, etc. apply to the framework, idea of the STEAM approach?	Assessment questionnaire / interview
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Girls only group - reflect on their interest Safe environment
Feasibility	Selection criteria are important Experiments in labs
Examples, experiences (short descriptions, links)	Improved skills, satisfaction & engagement in STEAM, decision for further steps made
Recommendation 2: Availability of tools and equipment Digital tools (TikTok, Instagram, AI, coding apps, web design) Interactive collaboration tools	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	TNP combines online and fčf meetings Emphasise that mistakes are ok
Feasibility	If we target girls below 14Ys - some digital tools could be not open for them and we will face difficulties!
Examples, experiences (short descriptions, links)	Girls who Code
Recommendation 3: Teachers	

Teacher's' role in motivating Teachers could present success cases of ex-students and even invite them to tell their story	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Requires intentional strategies to overcome gender stereotypes, build confidence, and create a supportive learning environment. Hands-on Projects and Experiments: Encourage Participation Equally: Gender-Inclusive Teaching Methods
Feasibility	Webinar for teachers on how to work with girls in steam. Encouraging teachers to organise workshops specifically for female students - invite female role models and mentors.
Examples, experiences (short descriptions, links)	TechGirlz Develop example workshops for teachers

Recommendation 4: Role models Thematic meetings with successful women in STEM - interactive session Personal meetings with role models	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Show diverse career paths to inspire girls and showcase the achievements of women across all STEAM fields. Set up peer support groups where girls can collaborate on projects, fostering teamwork and mutual encouragement. Task to present a story of famous, inspiring role models Could be organised some workshop with the Role model with active involvement of girls - some experiments in Lab, so they could feel what is
Recommendation 5: Creating a supportive environment Also tackling gender stereotypes and discussing it with girls Qualified Instructors: Access to trained educators and professionals who can lead workshops and provide mentorship.	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Girls only groups

Breakout Room 2

In this room, participants collected recommendations on applying gender-sensitive methodologies/approaches for educational activities that will be implemented within Task 3.2 Hands-on activities at science centres and museums. The recommendations collected in this room highlight the importance of making STEAM education accessible, engaging, and inclusive for all participants.

In general, interactive activities and workshops were recommended as a base for the educational activities, as the methodologies applied by workshops usually apply learning by doing. Although not explicitly gender-targeted, these workshops are designed to be inclusive, ensuring that girls feel just as capable of participating in STEAM activities. Another recommendation is the Promotion of Girls in STEAM through events like International Girls Day, where schoolgirls are invited to visit ICT companies and meet inspiring women in leadership positions. This approach directly supports gender awareness by providing young girls with role models and encouraging them to consider careers in STEAM fields.

Additionally, one participant recommended incorporating the topic of environmental awareness into the STEAM educational activities. This method links STEM subjects to broader societal and environmental narratives, and makes it possible to include gender perspectives.

They participants also shared their experiences of programmes they have already implemented and advised to adapt them into STREAM IT programme:

1) AI Workshop: This hands-on activity involves using tools like "Teachable Machine," which allows participants to develop simple neural networks based on photos, sounds, and body positions without requiring programming skills. The workshop integrates technology, maths, and science by teaching children how neural networks function and how AI can be trained to recognize specific patterns. Importantly, this recommendation seeks to break down stereotypes about AI being a male-dominated field, thus contributing to a gender-sensitive approach.

2) Playful Methods, such as using LEGO Serious Play, Canvas, and Sprint (Prototyping): These tools combine creativity with engineering principles, allowing participants to explore abstract concepts and create physical models through playful methods. This approach fosters inclusivity by validating diverse perspectives, making it a gender-sensitive method.

Table 5: Hands-on activities at science centres and museums
Breakout room 2 results

Recommendation 1: AI Workshop: Neural Network Creation Hands-on training on creating simple neural networks to identify objects (e.g., bananas vs. oranges). " Teachable Machine" program that allows you to create your own neural network based on photos, sounds and body position without programming skills. Computer, camera	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Integrates technology, maths, and science by teaching children how neural networks work and how to train AI to recognize specific patterns
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Breaking down stereotypes around AI being a male-dominated field.
Feasibility	Medium (requires laptops and internet access and teacher skills)
Examples, experiences (short descriptions, links)	In the New Energy Science Museum (Ivano-Frankivsk, Ukraine), children created neural networks to detect objects and audience applause. This coolly shows children that neural networks can not only be used, but also created themselves
In connection with the recommendation, what can be evaluated, measured, observed, asked, surveyed, assessed during the education activity?	Accuracy of artificial intelligence model, understanding of artificial intelligence concepts

Recommendation 2: Interactive activities / workshops Hands-on activities, learning by design, workshops (depends on the topic)	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Inspire and encourage young girls to try something new. To see that they can do it.
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	No, it is for everyone (girls can do it too!)
Feasibility	Yes

Examples, experiences (short descriptions, links)	In UHE we organise workshops that include making experiments out of simple materials that can be found at home
In connection with the recommendation, what can be evaluated, measured, observed, asked, surveyed, assessed during the education activity?	Number of participants, Topics explored, New skills learnt, Survey on the experience.
Recommendation 3: Playful methods Playful tools: Canvas, Lego Serious Play, Sprint(Prototyping)	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Combines creativity with engineering principles, allowing participants to explore abstract concepts and create physical representations using LEGO
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Promotes an inclusive environment by validating diverse perspectives
Feasibility	High (Requires LEGO sets and trained facilitators, but is highly adaptable)
Examples, experiences (short descriptions, links)	Companies like Google have used LEGO Serious Play and others. NGO BRIT uses these methods in its projects and teaches businesses, teenagers and children how to use them for their goals

Recommendation 4: Organisation of promotional events for school girls on the occasion of international Girls Day which includes visits to the ICT companies and inspiring meetings with women managers Creation of publication that complies biographies of women engineers in company Cooperation with the primary schools, Association of Business Managers Cooperation with HR department in the selected company	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Through providing role models for girls and their professional careers
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Yes
Feasibility	Yes

Examples, experiences (short descriptions, links)	International Girls Day in Serbia link is available: https://poslovnezene.org.rs/dan-devojcica-u-ikt-sektoru/
In connection with the recommendation, what can be evaluated, measured, observed, asked, surveyed, assessed during the education activity?	Number of girls participated Number of companies involved Number of visits and inspiring meetings
Recommendation 5: Incorporate environmental / societal awareness Incorporate STEM issue experimented with into a wider context of environmental narrative	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Bringing in the A in terms of humanities as part of the overall environmental narrative
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Not ensures if gender-sensitive per se
Feasibility	Could perhaps be enriched with some gender sensitive elements

Recommendation 6: Hands on classroom programs Interactive STEM lessons for students 1st to 4th grade	
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Allows working in smaller groups, personalised approach
Examples, experiences (short descriptions, links)	With 2 programs for grades 1-4, muzeiko hands on school programme outreach covers a wide variety of science topics including a lot of demonstrations

Breakout Room 3

In this room, participants discussed how gender-sensitive methodologies can be applied for a university mentoring program, T.3.3. Mentoring Programme & Science Communication, which is aimed for STEM MA and PhD students, and with a focus on improving mentees' skill on science communication. The core skills identified for improvement were communication, critical thinking, creativity, visualisation, and collaboration.

For communication, the suggested methods included elevator pitch sessions and storytelling workshops, both designed to help students express ideas more effectively. To improve critical thinking, participants recommended techniques such as problem tree analysis, immersive experiences like spending a day in the role of a professional within a company, and evaluating good and bad practices. When it came to fostering creativity, the group proposed organising design thinking and creative thinking workshops, as well as gamification sessions to encourage innovative problem-solving. lit was also suggested to train students to use visualisation tools, such as Canva, to enhance the quality of their presentations, as well as incorporating mind mapping exercises.

Participants also focused on 'improving cooperation, diverse teamwork' among the mentees, therefore proposed methods such as creating mixed-gender groups, organising hackathons to promote real-world collaboration, and setting up meetings with research communities. Additionally, they suggested creating opportunities for students to engage with professionals in research labs and businesses, broadening their view on career paths and fostering collaboration in a professional context.

The recruitment of mentors emerged as a crucial factor for the success of the program. The participants emphasised the importance of involving female mentors, particularly those with prior experience in STEM fields. They also highlighted the need for mentors who not only possess professional expertise but are also knowledgeable about effective teaching methodologies. Such mentors would serve as strong role models, guiding students not just academically but also in their personal and professional development.

Table 6: Mentoring Programme empowering young talents studying at HEIs. (BsC, MsC, PhD, ERC) Breakout room 3 results

Recommendation 1: Mentors selected: experience in STEM and teaching/mentoring skills	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Job shadowing
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Meeting careers presenting (in research labs and business)
Recommendation 2: Communication	

In what way do the recommended methods, tools etc apply to the framework, idea of the STEAM approach?	Elevator pitch Storytelling workshop
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Meeting research communities Good/bad practice / successful
Recommendation 3: Visualisation	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Mind mapping Visualisation tools that enhance quality of presentations

Recommendation 4: Critical thinking	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Problem tree (analysis) One day in the shoes/ seat of...
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	STEAM templates
Recommendation 5: Creativity	
In what way do the recommended methods, tools, etc., apply the framework, idea of the STEAM approach?	Design thinking
Recommendation 6: Research Methodologies	
Is it a gender-sensitive approach, in what way? How does the recommended methodology, tool contribute to incorporating a gender perspective into STEAM education?	Research ethics (maybe ethical use of AI tools?) Research methodology

Conclusion

The recommendations presented in this deliverable are a synthesis of all the aforementioned inputs, combining the insights of previous deliverables, some preliminary research results and practical experiences that partners shared during a collaborative brainstorming session organised within the 2nd Co-creation working lab. These recommendations aim to provide support for the partners going to implement activities within Work Package 3, 4 and 5. The recommendations presented in this deliverable are framed around the following key areas:

1) Teacher training and their professional development for applying gender-sensitive approaches

One of the most critical components of promoting gender inclusion in STEAM is equipping teachers with the necessary skills and knowledge. The recommendations call for comprehensive training programs that focus on gender-sensitive pedagogies, inclusive curriculum development, and gender bias-free classroom practices. Teachers should be trained to recognize and challenge gender stereotypes in both the content they deliver and the interactions they have with students. Teachers should be trained to know the signs of microaggressions, and to actively be trained how to handle them and thereby create safe spaces for girls. Additionally, continuous professional development should be offered to ensure that educators stay updated on best practices in gender-inclusive education.

2) Inclusive Curriculum and Learning Materials

To encourage more girls to pursue STE(A)M careers, the curriculum itself must be inclusive. This means not only ensuring that female role models are represented in educational content but also that the teaching materials are designed to engage all students, regardless of gender. The recommendations suggest the development of a curriculum that highlights the contributions of women in STE(A)M and offers hands-on activities that appeal to a broad range of learning styles.

3) Hands-On Learning and Real-World Applications

Recommendations in connection to the educational activities to be implemented in Work package 3 reveals that hands-on learning is a powerful tool for engaging girls in STE(A)M subjects. The recommendations encourage educators to incorporate more experiential learning opportunities, such as science experiments, engineering challenges, and field trips to companies. These activities should be designed to show the real-world applications

of STEAM fields and how they can be used to solve pressing societal challenges, and which often resonate with girls' interests.

4) Mentorship and Role Models

Mentorship will be a key project activity in supporting young women in STE(A)M fields. The recommendations emphasise the importance of creating mentoring programs that connect the young women university students/PhD students with women who are currently working in STEAM careers. These mentors can provide guidance, support, and inspiration, helping to break down the barriers that young women often face when considering a career in male-dominated fields.

5) Institutional Support and Policy Development

At the institutional level, there must be a commitment to fostering an inclusive environment that supports gender- and diversity inclusion in STEAM education. The recommendations and also the concept note of Work Package 5 call for the development of policies that promote gender equality, such as equal access to resources, opportunities for leadership roles.

6) Sustainable Collaborative Networks

Building on the work of the Concept note for Work Package 4, it is highly recommended to create sustainable networks that support peer-to-peer learning among educators and the sharing of best practices across borders. National Inspirational Hubs and Virtual Makerspaces should be expanded beyond the partnership to facilitate ongoing collaboration among STE(A)M educators, researchers, and institutions. These networks should also include private sector partners, who can provide real-world insights and opportunities for young women in STE(A)M fields.

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D2.3 Research Report on obstacles and supports for gender equality and inclusiveness in STEM education, R&I

D3.4 Concept note for implementing work package 3

D4.5 Concept note for implementing work package 4

D5.2 Concept note for implementing work package 5

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