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SENSE. IMPACT REPORT

SENSE.
The New European Roadmap to STEAM Education

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OVERVIEW

“SENSE., The New European Roadmap to STEAM Education”, is an international and interdisciplinary project funded in the call HORIZON-WIDERA-2021-ERA-01-70 by the REA (European Research Executive Agency) which designed an art-integrative science education approach, grounded in a sensory and participatory methods make STEAM learning accessible and future-oriented.

Project Goals

The overall aim of the project was to develop, deliver and disseminate a STEAM roadmap for science education in Europe. This aim is carried by the main outputs and outcomes, such as resources and materials produced throughout the project distributed via the digital hub, an interactive platform and repository designed to support STEAM stakeholders in co-creating and taking forward educational innovation.
Ultimately, SENSE. promotes a new standard of interactional, transdisciplinary inquiry manifested in the unique pedagogical model cross-connected with educational materials and policy recommendations and disseminated through a variety of actions and events.

The SENSE. consortium and associated partners consisted of 17 (later 14) parties from various professions and nations, which bring considerable experience in the field concerned. This enabled a high quality of exchange, progress and results as well as a truly co-creative approach across disciplines, perspectives and contexts.

Summary

The SENSE. project (2022-2025) developed a “New European Roadmap for STEAM Education” by integrating the arts into science learning to foster creativity, inclusion and real-world inquiry. Across three years and seven work packages, the consortium co-created an innovative approach, tested it in 13 STEAM Labs across Europe **directly** engaging over **4.000 participants** and reaching **100.000 in total.** Outputs include sustainability efforts and products such as learning activities, two toolkits, and policy recommendations, all distributed via the SENSE. Digital Hub, an open platform for resources and collaboration. The project demonstrated adaptability to contexts and beneficiaries with promising evaluation results and feedback. Beyond direct outcomes, SENSE. shows potential for institutional and structural change toward more inclusive, innovative, interdisciplinary, and sustainable education in Europe.

Highlights

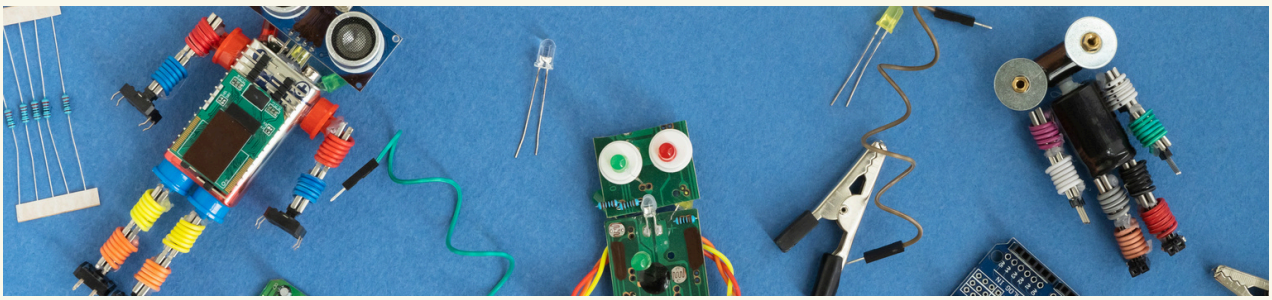
- 3 years, 7 Work Packages, 35 Tasks, 11 Consortium Partners, ONE Vision
- 12 STEAM Labs conducted 244 Implementation Activities
- Over 500 Early Adopters in 29 Events
- 22 Learning Activities, 2 comprehensive Toolkits
- Over 4000 direct beneficiaries
- Over 100000 indirect beneficiaries

Audience

This impact report is for the public and for current and future stakeholders of STEAM education: educators, curriculum designers, decision and policy makers, and anyone interested in teaching and learning.

Note: Further on, deliverables are referenced by number, for example “D2.2”. Full deliverables are available on the project website.

OBJECTIVES



Europe's future depends on citizens and professionals who understand and value science. Yet, too few young people, especially girls, pursue science careers, and many lose interest during growing up. Despite investments in various initiatives and projects, previous approaches have failed to compensate for the declining enthusiasm youth displays in science education. SENSE. Identifies two core problems in current science education:

- Teaching often starts with abstract models, followed by applications, a 'reverse ontology' teaching logic leaving little room for real inquiry.
- Despite efforts, learner centeredness is often not achieved. Pedagogy can lack connections to students' lives, experiences, and concerns.

As a result, science education focuses on reproducing models without noticeable relation to the phenomena and challenges provided by the real world, while providing only limited opportunities for authentic inquiry, problem-solving, creativity and ownership.

SENSE. proposes a paradigm shift: integrating the arts into science education to activate all senses, foster creativity, and reconnect abstract concepts with real life. Artistic processes and approaches enable learners to experience and comprehend scientific ideas in new ways, entangling sensory perception with curiosity and deeper understanding.

The ambition is a new European approach to STEAM education that improves (science) education, fuels talent, drives innovation, and prepares young people for future challenges.

Target Group

SENSE. wanted to actively involve those who should benefit from a new approach for STEAM education by engaging these so-called 'STEAM beneficiaries' throughout the project. In conclusion, SENSE. addressed a wide array of target groups with specifically tailored tools and communications serving their interests, needs and ambitions:

Beneficiaries	Description
Students 13-18	Students aged from 13 to 18 years old, who need to make decisions on their future studies.
Students 19-25	Students 19-25, who need to decide about further study and/or choose a professional career.
Girls	Girls who are afflicted by gender stereotypes limiting their access to science-related studies and professions.
Parents	Parents, who are involved in supporting the education and decision-making processes of their children at various stages of the educational life-course.
Employers & businesses	Private and public sector employers and businesses: who need to have work ready and creative students matching new job profiles related to digital and green transitions.
Schools, teachers, educators	Schools, teachers, educators, in formal and informal settings as well as science museums who need to be equipped with hands-on pedagogical tools to implement STEAM in curricula.

Target Group

→ Cultural & artistic institutions	Cultural and artistic institutions as spaces for the learning of science in relation to society. We want to bring to the fore and make explicit their role as legitimate and powerful informal learning spaces where science and the arts can productively meet.
→ Academic staff	Academic staff in higher education and research, to promote and integrate STEAM inquiry and research methodologies in PhD programmes and research projects including Horizon Europe.
→ Policy-makers & decision-makers	Policy makers and decision makers who derive education policies and curricula embedding STEAM throughout the learning continuum.
→ The general public	The general public: the development of a scientific literate citizenry is a fundamental goal of SENSE. that believes that social challenges are best dealt with by informed and scientifically literate citizens who have made lifelong learning their way of life.

Objectives

To develop a new European roadmap for STEAM education that is tailored to the needs and interests of SENSE.'s target groups, but also enhances interdisciplinary science education and knowledge across contexts, four overarching objectives were formulated:

01

Create the "SENSE.STEAM Methodology", a change-making educational model and pedagogy grounded in knowledge, practices, and stakeholders' needs.

02

Establish STEAM Labs as specialized learning environments across Europe to implement the methodology, analyze applicability, replicability, and transferability, and improve activities and the model.

03

Mainstream social inclusion and spatial design as cross-cutting issues across all stages.

04

Consolidate findings into a Roadmap for STEAM Education with tools, actions, and content, and disseminate it.

The transformational power of SENSE. lays in specifically addressing areas that potentially contribute to tackling European challenges and issues such as accessible high-quality education, gender equality, rethinking spatial design in education or raising stakeholders' awareness for global processes.

STRATEGY & ACTIVITIES

Project Design

The SENSE. Project unfolded in three consecutive phases, each lasting one year.

YEAR 1 focused on co-creating the comprehensive SENSE. Methodology, drawing on research, knowledge and experiences of stakeholders and consortium partners.

YEAR 2

brought the methodology into practice through cross-country STEAM Labs, each tailored to specific topics and target groups based on the coordinating organization.

Implementation included:

- Practices and learning sequences
- Strategies for spatial design and social inclusion
- Dissemination and communication actions

YEAR 3 consolidated insights from the Labs, refining the methodology and integrating all results into the European Roadmap to STEAM Education and the SENSE. Digital Hub. Findings and outputs were widely disseminated for visibility, accessibility, and long-term impact.

7 work packages organized responsibilities and synergies. Two WPs were dedicated to mainstreaming the cross-cutting issues space and social inclusion, a unique contribution of SENSE.

Co-Creation

The Roadmap was built on the needs and perspectives of stakeholders. SENSE. engaged beneficiaries in co-creation, from manifesting the methodology to needs analysis and implementation, and shared knowledge throughout. Local networks and synergies with other projects supported sustainable cooperation, exploitation, and visibility.

This approach had as a result:

- Profound models, strategies, actions, and results
- Widespread awareness and actions
- Expansion on existing networks and cooperation
- Stakeholder ownership and advocacy

SENSE. approach

The approach integrates the arts into STEM and rests on four building blocks:

STEAM inquiry

transdisciplinary methods across science, technology, engineering, arts, aesthetic education, and mathematics, focusing on multisensory perception with each learner as subject.

Learner centeredness

learners as active creators of knowledge, promoting self-directed learning and empathy.

Citizen science and art practices

integration that enhances public liaising, facilitates engagement with scientists and artists, and thematizes community matters.

Reflective feedback

arts as entry points to improve knowledge, skills, attitudes, and understanding of STEAM practices.

The approach is a holistic framework positioning STEAM as a driver for change. It combines artistic creativity and scientific inquiry to inspire imagination, innovation, and empowerment. It focuses on environment and space, social inclusion and gender equality, and the cultural value of the arts, offering concrete entry points for curricula, policy, and practice. It underpins the Roadmap and shapes an innovative, inclusive European educational landscape. (D3.5)



SENSE. Practices and Strategies for the Cross-Cutting Issues

In Year 1 SENSE. collected and analyzed STEAM practices aligned to the pedagogy, producing a repository for implementation in the Labs.

Space

A WP explored the cross-cutting issue of space, analyzing spatial conditions through reviews and stakeholder interviews, creating a “Spatial Awareness Kit” as a loose guide that helps structure an informed reflection on the impact of the physical environment was created. It served as a strategic tool for the Labs to understand, analyse and eventually manipulate the spatial aspects of the fieldwork. (D5.1, D5.2)

Social inclusion

A WP examined dimensions of social inclusion, gender, and intersectionality, resulting in a framework, general guiding principles, and strategies to amplify inclusion in Labs. Inclusivity aspects were aligned with space strategies to operationalize gender and social inclusion, with self-reflection exercises and 20 practical aspects to practically guide the Labs in considering social inclusion as a fundamental aspect of STEAM education. (D6.1, D6.2)

Implementation and Evaluation

The STEAM Labs were established in 12 locations, each being launched via a multi-stakeholder event to raise awareness and promote upcoming actions amongst the Labs' target groups. The Labs have been highly active, with a total of 244 implementation activities carried out across 13 countries. These activities fall into two broad categories: hands-on learning sequences (145 instances) and dissemination actions & discussions (99 instances). On average, each STEAM Lab conducted about 19 activities, reflecting a robust engagement effort per site. Here is a summary of the scale of these activities and the reach of participants:

Learning Sequences

145 sessions (~11 per Lab) involving ~3,236 participants. These are the actual application of SENSE., involving SENSE. practices guided by the methodological framework and tailored to specific needs and aims of the participants and the facilitating organisation, carried out differently from single actions up to larger events.

Dissemination Actions & Discussions

99 events (~8 per Lab) reaching ~109,528 people (including outreach via media)

Overall Implementation

244 activities in total, with 112,764+ cumulative participant engagements

- **145 sessions** ↑
- **3236 participants** ↑
- **99 events** ↑
- **109,528 reached** ↑
- **244 activities** ↑
- **112,764+ engagements** ↑

Notably, the counts above include large-scale outreach efforts (e.g. launch events, public exhibitions, social media campaigns) where exact audience numbers are estimates. In **188** of the activities, detailed participant data was collected, accounting for **4,302** direct participants in total. This indicates that beyond in-person workshops, the Labs' dissemination initiatives have extended the project's reach to tens of thousands across Europe. (D4.2)

Implementation and Evaluation

To deepen insights into the impact and measure the progress and potential of SENSE., a comprehensive co-evaluation process was established and applied alongside the implementation in order to pursuit a high quality of outputs and outcomes. It focused on the Roadmap's first vision's key principles (Create Awareness, Take Action, Advocate) and on advancing key EU policy priorities (Health, European Green Deal, Digitisation, Work Readiness). The key findings underlined the high potential and quality of the SENSE. approach, that proved to be a flexible and adaptable methodology which addressed participants' needs across different contexts. (D4.3, D4.4)

Key Messages from Evaluation

The SENSE. approach resonates particularly well with female participants.

SENSE. is designed to engage learners of all ages equally

SENSE. reduces boredom in STEAM learning experiences by making them more engaging.

SENSE. Generates awareness of key policy areas, achieving work readiness and heightened awareness of environmental issues.

SENSE. Provides practical strategies to sustain engagement, such as partnerships with employers.

SENSE. Offers diversified suggestions for science education beyond the classroom, enhancing inclusion among different groups.

SENSE. Is socially just, demonstrating applicability in diverse countries and contexts.

SENSE. Can be aligned with national school curricula, covering topics like optics, sound, scientific instrument handling, data analysis, technological design, biodiversity, and climate.

SENSE. Addresses the learning continuum by being successfully implemented in schools, higher education, vocational education, and informal education settings like museums and science centres.

Simultaneously, strategies (i.e. the "kits") for spatial design and social inclusion were applied, evaluated, and analysed, led by the experts from the dedicated WPs and under involvement of all STEAM Labs, to ensure extensive mainstreaming of the pertinent cross-cutting issues. These efforts resulted in a comprehensive, flexible, and fertile toolkit for each "Space" and "Social Inclusion". (D5.3, D6.3)
The extensive active participation of all relevant stakeholders was a key aspect throughout implementation, ensuring SENSE.'s future outputs and outcomes are proven in practice, tailored to stakeholders' needs, actively co-created and efficiently applicable across contexts.

Multiplier & Networking Events

The STEAM Labs contributed to building a growing, open community of SENSE. STEAM beneficiaries, by supporting the uptake and sustainability of the project through dissemination actions and the progressive creation of inputs for the SENSE. Digital Hub, serving as evidence base of SENSE. Besides the implementation of learning sequences, a range of ~100 dissemination/communication actions took place within and about the Labs. While the opening events (STEAM Lab Launches) acted as initial multiplier events, further actions included needs assessments with local stakeholders, presentations to potential advocates, creation of digital and print materials promoting Lab activities and the project, and discussions with participants and experts. (D4.2)

Networking was pursued within the consortium and with partners, for example weekly dialogues, cooperative implementations, and strategic discussions during biannual assemblies. Collaboration with other institutions and projects and presentations at international conferences and to the European Commission sustained community building and reach.

Early Adopter events in pre-final stages, designed as cross-curricular workshops for or by potential advocates, yielded insights based on authentic user experience, local community building, and dissemination to key stakeholders.

The Final Event on 2 July 2025, a cooperative effort by three parallel roadmap projects (SENSE., The SEER, RoadSTEAMer), ensured international visibility, displayed synergies, and disseminated approaches and results among leading voices across Europe pursuing the future of STEAM through creativity, inclusion, and collaboration.

Dissemination and communication

Initial uptake strategies established visual identity and branding and set up channels including the website (sense-steam.eu) and social media on Instagram and LinkedIn, supported by content plans across the consortium. SENSE. ensured visibility through multi-channel actions: digital posts on project and partner channels, press releases and newsletters to media and networks, professional articles in open access journals, and deliverables, reports, and tailored stakeholder information packages. Content was produced by Lab events and by policy briefs, recommendations, and theoretical inputs. (D2.3)

IMPACT

By design, SENSE. has collected impact related data such as KPIs, activity and participant numbers, or stakeholder involvement, as well as other details of conducted activities and events. These data provide an empirical footprint of the project and verify that the project has addressed the relevant stakeholder groups and beneficiaries initially envisaged. Additionally, Roadmap and Digital Hub provide a sustainable framework for continuing and further developing project related content and activities.
The project produced a body of learning sequences, use cases, toolkits, and foundational considerations. Current evidence of impact is primarily based on materials generated within the project, with opportunities for validation through comparative studies ahead. Expected effects can be derived from project experiences.

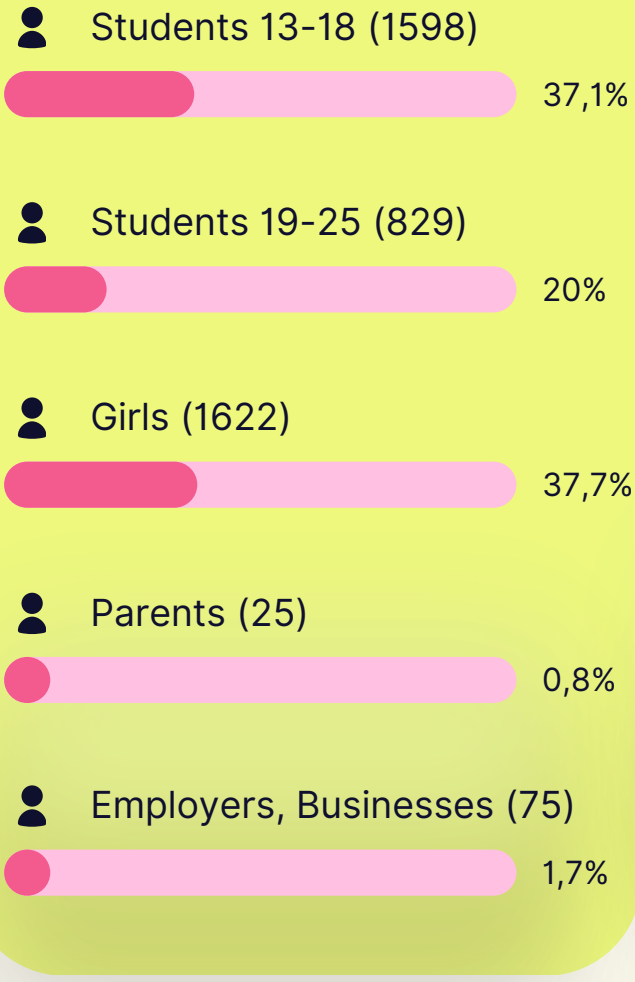
Footprint and Sustainability

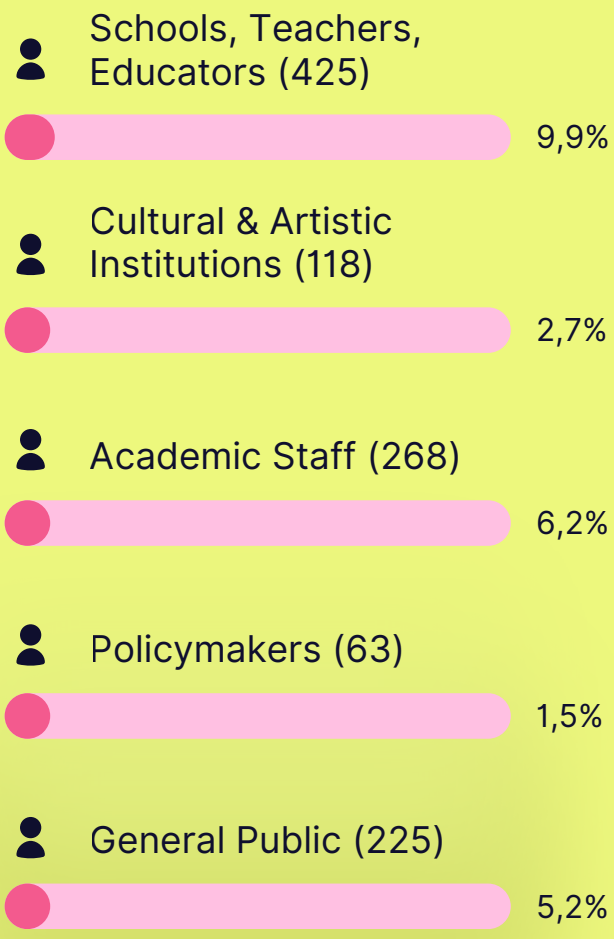
Impact Data

The footprint of SENSE. can be illustrated through different quantitative indicators that demonstrate the project's engagement and reach, providing evidence of implementation, dissemination, and stakeholder engagement. (D4.2, D2.4)
In the implementation phase, 244 activities were conducted in sum reaching more than 100.000 (non-unique!) people. For 188 of those activities detailed data on the 4.300 participants was gathered, resulting in the following compilation of beneficiaries in implementation (absolute and percentage). It is important to note that one participant can be assigned to more than one group of beneficiaries.

Footprint and Sustainability

Results





Footprint and Sustainability

In order to ensure the approaches of co-creation and multi-stakeholder engagement throughout the implementation phase, the KPI 2.2 from the project objectives (in SENSE.'s "Description of the Action") states a foreseen minimum stakeholder involvement. The table below shows the actual numbers of representatives from each stakeholder involved in the numerous activities.

External Stakeholder	Aim	Involved
Schools	30	136
Research Institutions	20	75
Policy-Making Initiatives	12	25
Companies	10	37
Municipalities	15	33
(Science) Museums	12	22
Artists / Art Collectives	25	27

Footprint and Sustainability

Lastly, the following dissemination statistics shall provide insights into the outreach SENSE. partners could collaboratively achieve:

Dissemination / Communication / Exploitation Goal	
100 early adopters (individuals / organizations) involved in actively testing the roadmap	**500+ in ~30 events.**
Over 1500 followers on our social media accounts.	**750 Linkedin, 750 Instagram**
Over 300 posts on our social media accounts.	**Both Linkedin and instagram**
Over 10000 individual website visitors.	**Throughout the lifetime of the project**
Over 40 media outlets reached.	**Both national and local**

The data above highlights that the **primary audience was students**, both secondary school age (13-18) and young adults in tertiary or vocational education (19-25). Together these age groups accounted for well over half of all participants. In fact, a large portion of activities specifically targeted **girls and young women**, who represented ~38% of participants (often overlapping with the student groups). This reflects SENSE.'s emphasis on **inclusion of girls in STEAM**, an important goal of the project's roadmap. Other stakeholder groups were also involved in significant numbers: nearly 10% of participants were **educators** (teachers or school staff), who often participated as learners or facilitators in the Labs. Smaller fractions of attendees came from cultural institutions (e.g. museum staff), academia, policy-making bodies, and the general public, indicating that the Labs reached beyond the classroom to engage the broader community.

Footprint and Sustainability

The **qualitative feedback** from these diverse participants was very positive. Teenagers often reacted with “proactive engagement” when experiencing the arts-infused STEAM activities, showing enthusiasm to take part and even co-design parts of the learning process. “Many of the girls... were inspired by the activities and reacted positively to creative tasks as well as conversations,” fostering a sense of ownership over their learning and community improvements. Educators who took part noted important takeaways for their own practice, some teachers reported shifts in their teaching approach after seeing SENSE. methods in action, emphasizing “the primacy of the process over the product” and the value of creativity and collaboration in STEM learning. Even representatives of groups like policymakers and cultural institutions appreciated the experience: they valued the interdisciplinary discussions and gained insights into integrating these novel STEAM approaches in their work. Participants highlighted the creation of “**safe spaces**” for exploring new ideas and valuing different perspectives, with young people and families being highly involved when activities tied into issues they care about.

Sustainability Efforts

The SENSE. Roadmap is the main sustainable product, providing a strategic framework for integrating STEAM education into practice. It outlines pathways, principles, and recommendations that remain accessible for SENSE. beneficiaries beyond the project, being of special interest for educators, institutions, and policymakers.
Supporting the roadmap, the SENSE. Digital Hub serves as multimodal hybrid platform, where all project outputs remain available in an interconnected and user-friendly way. It ensures long-term availability of resources and content, fostering knowledge exchange, community building, and collaboration. (**D7.1**)
Together, they secure the project’s footprint beyond its duration by providing both guidance and a lasting digital infrastructure. Their sustainability is reinforced by the high quality of the project’s processes and outputs, because of the co-creation approach, multi-stakeholder engagement, feedback from experts such as an International Advisory Board, and thorough evaluation of implemented activities making them proven practices.

Products

Beyond strategic frameworks, SENSE.'s footprint is reflected in a portfolio of concrete products, which are ultimately recommended to anyone thinking about implementing STEAM education by making use of the SENSE. approach, as they are designed for direct use and transfer:

22 SENSE. Learning Activities, each thoroughly described and enriched with practical details as well as example applications (case studies)

The Space Toolkit, offering a dive into the relationship between physical space and (STEAM) education complemented by reflections and concrete experiments

The Social Creativity Toolkit, offering strategies to focus on matters of social inclusion and gender within educational contexts, from reflections to approaches to guidelines

Policy-Briefs consolidating experiences and recommendations specifically targeted at decision-making bodies in education

26 public Deliverables (reports) outlining key concepts and phases of the project, offering in-depth insights in theory, progress, and praxis

A STEAM Wiki as an interactive glossary of relevant terms

A series of informational packs addressing in a tailored way the project's stakeholders

(D7.2, D7.3, D2.5)

Evaluation Outcomes: Engagement, Learning and Inclusion

To grasp SENSE.'s impact, an extensive co-evaluation was conducted (D4.3) focusing on how the project affected learner **engagement**, educational **learning outcomes, and inclusion** of diverse groups. The evaluation combined surveys, creative feedback methods, and observations across all STEAM Labs. Key findings from the evaluation include:

Learning

SENSE. proved effective across **all age groups**, showing that its sensory-rich, arts-integrated pedagogy can engage both youth and adults in learning. Participants demonstrated improved understanding of STEAM concepts and greater ability to connect those concepts to real-life contexts. Moreover, SENSE.'s content was adaptable to formal curricula, Labs aligned their activities with school subjects from optics to environmental science, and SENSE. can be aligned with national school curricula in various countries.

This means teachers could integrate SENSE. methods into their classes without sacrificing required content. Importantly, SENSE. also addressed the **learning continuum**: it was successfully implemented in settings ranging from primary and secondary schools to universities, vocational training centers, museums and science centers.

This versatility shows the approach can bridge formal and informal education, encouraging lifelong learning. Participants frequently reported that the SENSE. activities helped them "make sense of" abstract school knowledge by linking it with sensory experiences and creative exploration.

Evaluation Outcomes: Engagement, Learning and Inclusion

Engagement

The SENSE. approach made STEAM learning notably **more engaging** for participants. Many learners reported reduced feelings of boredom and increased enjoyment during activities, attributing this to the hands-on, creative nature of the sessions. In particular, "SENSE. reduces boredom in STEAM learning experiences by making them more engaging." The project also put in place strategies to **sustain engagement** over time, for example, several Labs formed partnerships with local employers and community organizations, which helped participants see real-world applications of their projects and stay involved.

Inclusion

"the SENSE approach resonates particularly well with female participants," helping to bridge the gender gap in STEAM fields. Many girls and young women who joined the Labs felt empowered to take on STEAM projects, often working with female role models and blending artistic expression with science. More broadly, SENSE. offered **diversified learning pathways beyond the classroom**, which enhanced inclusion of different groups. Activities were often community-based, hands-on, and flexible, allowing youth of various backgrounds (including those who might feel alienated by traditional teaching) to engage on their own terms. SENSE.'s emphasis on co-creation and dialogue contributed to a sense of inclusion: participants felt their voices mattered. Many Labs reported that previously disengaged youth (including those from marginalized groups) became active contributors, designing projects that reflect their identities and concerns.

SENSE. has proposed a flexible, effective approach that fosters engaged learning and inclusion. As a roadmap for future STEAM education, it shows promise in **sparking curiosity and co-creation** among learners, **reducing boredom** by blurring the line between art and science, and **opening STEAM to underrepresented groups**. The SENSE. approach helped participants not only gain knowledge but also develop a "reflective consciousness of their role in their local environment," empowering them to become active citizens in addressing community challenges through STEAM. These outcomes strongly support the project's aim of redefining STEAM education to be more **creative, inclusive, and connected to real life.**

Transformative potential

Facilitator and beneficiary experiences show transformative potential. Learning sequences were conducted across contexts and beneficiaries and proved adaptable. These experiences are assumed to scale.
Usability and efficiency of the Learning Companion and related materials were validated through prototype testing with more than 500 early adopters in about 30 events. Feedback confirmed that the methodology offers accessible and attractive ways of engaging with scientific topics through sensory and creative exploration. Early adopters can serve as advocates.

Impact on institutional changes

Community growth, networking, dissemination, and implementation indicate potential for institutional change. Two physical long-term STEAM Labs in Italy and Norway are key examples of embedding in organizational or curricular contexts. SENSE. supports institutional change through practical materials, a theoretical framework, scaffolding structures, and cross-institutional partnerships. The SENSE. Manifesto and co-creation approach, combined with digitized materials and toolkits, will inform future educational planning beyond project partners. (D7.4, D3.5)

Impact on structural changes

Across three levels: exploitable outputs, contribution to Horizon call objectives, and added value to broader EU goals and policy areas. Major exploitable outputs include the Roadmap, Digital Hub, policy recommendations, evaluation results, deliverables, datasets, and professional articles. These provide entry points for further use, backed by community and anchoring processes and the approach's transformative potential.

SPOTLIGHT ON ROMANIA:

STEAM Lab implementation and outreach activities by GEYC

One of the most dynamic SENSE. STEAM Labs was in **Romania**, led by GEYC. This Lab not only operated in the capital city but also ran outreach activities in several regions, providing an excellent example of how SENSE. was implemented on the ground.

In the core STEAM Lab activities alone, GEYC facilitated **14 sessions across 5 cities, Bucharest, Câmpina, Gătaia, Lugoj, and Timișoara**, reaching more than **110 youth and educators** with hands-on STEAM experiences. These participants were mainly young people (secondary school students and teenagers aged 13-19) from diverse backgrounds, including rural and small-town communities beyond the capital. Many were girls and young women, reflecting GEYC's focus on bridging the gender gap in technology and science in line with geyc.ro/STEAM

This mix of participants created a rich collaborative atmosphere, for example, in some workshops high schoolers worked alongside their teachers, and in others youth engaged with community leaders to address local issues.

Participants and Profile:

The Romanian STEAM Lab engaged over **500 participants** through various workshops and outreach events.

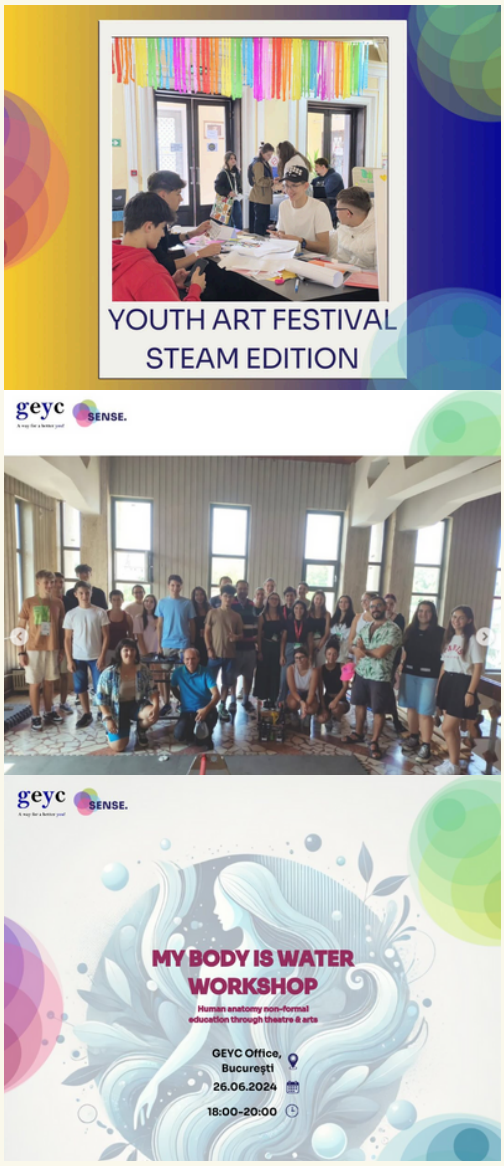
The Lab also involved **teachers, youth workers, and local officials**: its launch event in October 2023 featured live presentations to students, local **authorities and press**, highlighting a broad stakeholder involvement from the start.

Location and Activities:

GEYC adopted a **decentralized approach** for its STEAM Lab. While anchored in Bucharest, outreach activities for the Lab went "on tour" to other localities as part of a **"SENSE. Caravan"**, a mobile STEAM initiative. The SENSE. Caravan alone connected **over 300 young people, teachers, art institution representatives, and policymakers** in the Banat region of western Romania. In these events (often styled as science fairs or interactive demos), rural or small city youth who had little prior exposure to STEAM got to experiment with creative activities.

Another highlight was **YOUth Art Festival: STEAM edition**, 3 days of STEAM related activities that brought together over **200 participants** from Câmpina and its surrounding which ignited excitement among local students by turning science challenges into an adventure.

Back in Bucharest and other towns, the Lab outreach sessions took many forms: robotics and coding workshops, environmental science experiments, artistic projects, podcasts with women in STEAM and more. For instance, GEYC organized a **robotics session at the "House of Science" in Câmpina** where students built and programmed simple robots. In Bucharest, GEYC ran **"My Body is Water,"** an eco-art workshop blending biology and visual art to enhance youths' environmental awareness through sensory experience. GEYC also partnered with Politehnica University of Bucharest to offer a **hands-on 3D printing session**, giving teenagers a taste of digital fabrication technology. As an online effort, among others, GEYC ran a **podcast series** to highlight Romanian women in STEAM. It had 6 episodes and reached over 60000 people across all platforms.



Through such varied formats, from high-tech experiences to creative arts workshops, GEYC's STEAM Lab and outreach activities in Romania have successfully engaged and educated a wide spectrum of learners, illustrating the **scale and variety** of SENSE. project interventions in the country.

Facilitation Strategies

A key strategy in Romania was to make STEAM learning accessible and non-formal. Rather than a traditional classroom, GEYC often used community venues like libraries and youth centers. **Flexible use of space** was deliberately employed:

During one series of meetings in a local library, facilitators re-arranged the furniture, creating cozy corners and utilizing outdoor areas so participants could move around and feel at ease. This stood in stark contrast to the typical rigidity of school classrooms and helped participants "let their guard down" and engage more freely.

The facilitators in Romania placed heavy emphasis on **co-creation and feedback.** Many sessions followed a cycle where youth would try out a STEAM activity, then discuss in groups what worked or what they would change, and even adapt the activity in real-time.

This approach echoes the SENSE. methodology's participatory vision, in Romania, "young participants... often took agency of their learning," providing input that directly shaped the workshops.

For example, in the "**House for a Fairy**" design challenge, students first built small model houses, then exchanged feedback and iterated on their designs, learning from each other in the process. Such techniques not only taught STEAM concepts but also empowered the youth as co-designers rather than passive learners.

Reflections and Impact

The **Romanian STEAM** Lab yielded inspiring reflections from its participants and facilitators. As noted in the project's evaluation, giving teenagers a voice in **re-imagining their community** had profound effects. In one activity, when mapping their favorite and least favorite places in town, Romanian students brought up serious issues, e.g. pointing out "lack of lighting in the streets" or areas with troubling signs of drug use. These discussions revealed a "great need to find spaces and opportunities for [youth] to discuss" community problems. The STEAM Lab became that space: a forum where young people could not only learn science and art, but also voice concerns and brainstorm solutions together with peers and adults. Facilitators observed that this process **built confidence and civic engagement.** One facilitator from GEYC remarked that the activities "proved to be an accessible way to develop technical as well as imaginative competences," effectively closing the gap between what students learn in school and the real world around them. For the educators involved, seeing youth so invested was eye-opening, teachers noted that some students who were normally disengaged in class were enthusiastic when doing experiments in a park or creating art in a makerspace. This reinforced the idea that **learning can happen outside the classroom** in more playful, participatory environments.

Reflections and Impact

Perhaps most telling are the personal transformations. Romanian girls who participated gained the confidence to consider futures in STEM fields they previously thought “weren’t for them.” The Lab’s inclusive setup (girls-only sessions, women mentors, etc.) helped “challenge stereotypes... of STEM as the domain of the powerful and the masculine”. As a result, several girls from the GEYC Lab later volunteered to lead mini-workshops themselves, becoming role models for their younger peers. Moreover, the local authorities who attended the launch in Bucharest gained “valuable insights” into interdisciplinary education and indicated interest in supporting similar initiatives in schools.

In summary, the Romania STEAM Lab demonstrated how **SENSE. can catalyze community-driven STEAM learning**: by meeting youth in their own spaces, involving them in creative problem-solving, and linking educational activities to real societal issues, the Lab in Romania achieved strong engagement and planted the seeds for lasting change in attitudes toward science and learning, sometimes even with the help of local or community role models. As the project moves forward, these Romanian experiences, from the SENSE. Caravan’s large-scale outreach to the intimate library meetups, serve as a compelling model of **STEAM education that is fun, inclusive, and empowering** at the local level.

CONCLUSION

SENSE. has achieved its objective to design, deliver, and disseminate a European roadmap for art-integrated STEAM education. Over three years and seven work packages, the consortium co-created the SENSE.STEAM Methodology, mainstreamed social inclusion and spatial design, and translated this approach into practice through 12 STEAM Labs. Implementation comprised 244 activities, with detailed data for 4,302 direct participants and a non-unique reach of about 100,000 people, complemented by more than 500 early adopters engaged across roughly 300 events.

The project's outputs now provide a complete pathway from vision to use. The Roadmap and the SENSE. Digital Hub make resources accessible and connected, including 22 learning activities, the Space Toolkit, the Social Creativity Toolkit, policy briefs, 26 public deliverables, and a STEAM Wiki. Co-evaluation across Labs reports higher engagement, reduced boredom, strong resonance with girls and young women, alignment with national curricula, and successful uptake across the learning continuum, from schools and universities to vocational training, museums, and science centers.

Community building and visibility have been priorities throughout, from weekly cross-partner exchanges and collaborations with employers, cultural institutions, municipalities, and researchers, to the joint Final Event on 2 July 2025 with The SEER and RoadSTEAMer. With two long-term STEAM Labs established in Italy and Norway and an open digital infrastructure that supports collaboration and reuse, SENSE. leaves a durable foundation for inclusive, creative, and transdisciplinary STEAM practice across Europe.

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IMPACT REPORT