SENSE. The New European Roadmap to STEAM Education

D7.2 First version of the SENSE.STEAM wiki

February 2024

Statement of intent

The first version of the SENSE.STEAM wiki is a tool for gathering and disseminating preliminary results of the SENSE. consortium's work. Building on the design principles, it helps to gather material for the educational toolkits' digital hub collaboratively and iteratively with a centralised and user-friendly web-based platform.

The wiki sits as a part of the project website, at first used internally by the consortium before being more widely shared.

Table of Contents

List of Figures

1. Introduction

1.1. Purpose of the document

The purpose of this document is to describe the first version of the SENSE.STEAM wiki, explain the process for arriving at the chosen solution and provide a pathway for its ongoing use.

1.2. Intended readership

The intended readership of this document is all partners of the SENSE. consortium, and particularly those involved with creating, editing, and amending the SENSE. Wiki as well as the digital hub and learning materials.

1.3. Structure of the document

This document is structured in three further sections:

- Section 2 sets out a brief background on wikis and their relevance to the SENSE project.
- Section 3 the technical solution of the first version of the SENSE. wiki.
- Section 4 draws conclusions and outlines next steps for implementation.

1.4. Relationship with other deliverables

The Wiki is part of the *Consolidation of the STEAM Roadmap* work package (WP7), which is made based on the methodology (WP3) with activities and practices to be tested in the labs (WP4) while considering the cross-cutting issues of Space (WP5) and Social Inclusion (WP6).

Additionally, this deliverable makes use of the Design Principles outlined in Deliverable 2.3, which in turn are based on materials produced in Work Package 3, in particular *D3.4 Report on knowledge and practices for a New European STEAM education* and *D3.5 The SENSE.STEAM educational model and pedagogy,* and informed by principles and approaches documented for the cross-cutting issues in *D5.1 Scoping report on STEAM spaces* and *D6.1 Scoping report on social inclusion and gender in STEAM.*

The wiki will in future feed into D2.6 *STEAM Academy Digital Hub* and can also provide input for *D4.3 SENSE.STEAM evaluation of the four specific areas* and *D4.4 Recommendations for the Roadmap and the learning companion.*

The wiki can contribute material to *D5.3 Self-experimentation toolkits and design principles for STEAM spaces* and *D6.3 Toolkits for social inclusion and gender awareness through and for STEAM education.*

2. First version of the SENSE.STEAM wiki's technical solution

The following section introduces the primary characteristics of wikis before linking these to the needs of the SENSE project and describing the technical solution of the SENSE. wiki.

2.1. What is a wiki?

A wiki is a web-based collaborative platform for creating, modifying, and storing content. Being web-based gives the ability to link related pages with hyperlinks. As well as being used in institutional (public and private sector) situations for intranets, wikis are extensively utilized for project management, knowledge management, and community collaboration. Wikis are also popular for fan communities to document and organise information in their shared area of interest (Hanna, 2024).

2.2. Why create a wiki for SENSE.?

The SENSE. Wiki serves as part of implementing and applying the Design Principles created as part of deliverable 2.3, which states the wiki should serve as a participatory tool for gathering learning materials from across the consortium as they are created and tested throughout the labs (specialised learning environments for implementation of SENSE.STEAM) and generating the roadmap. If possible, this should be expanded beyond the consortium to members of the public.

The wiki helps to implement the three design principles as follows:

Be generative – wikis are intended for creating and growing content. Cross-linking encourages new content to be continuously added.

Be inclusive – as anyone in the user base can create and edit posts while being light on rigid rules, the format promotes inclusion.

Go beyond digital – while wikis are by their nature digital, the SENSE. wiki can serve as a tool for documenting non-digital activities such as a STEAM learning activity carried out with students in a classroom workshop or and artistic practice taking place outdoors. Being low-barrier it can also help to engage those otherwise afraid of digital solutions.

As materials are gathered, they can be adapted, expanded in response to the experiences gained during implementation.

2.3. Approach to developing the SENSE.STEAM wiki

The SENSE. wiki was created as an extension of the existing website created as part of online outreach tools and visual identity (D2.1). The layout of wiki articles is the same as articles in the *News* section of the project website (sense-steam.eu). The landing page of the wiki is also similar to that of the news section landing page. This means the overall visual appearance will remain consistent with the project's visual identity. Additionally, navigation through the wiki is more intuitive, which will reduce barriers to uptake and use within the consortium. Finally, this means that in time opening the wiki to the general public will be simplified.
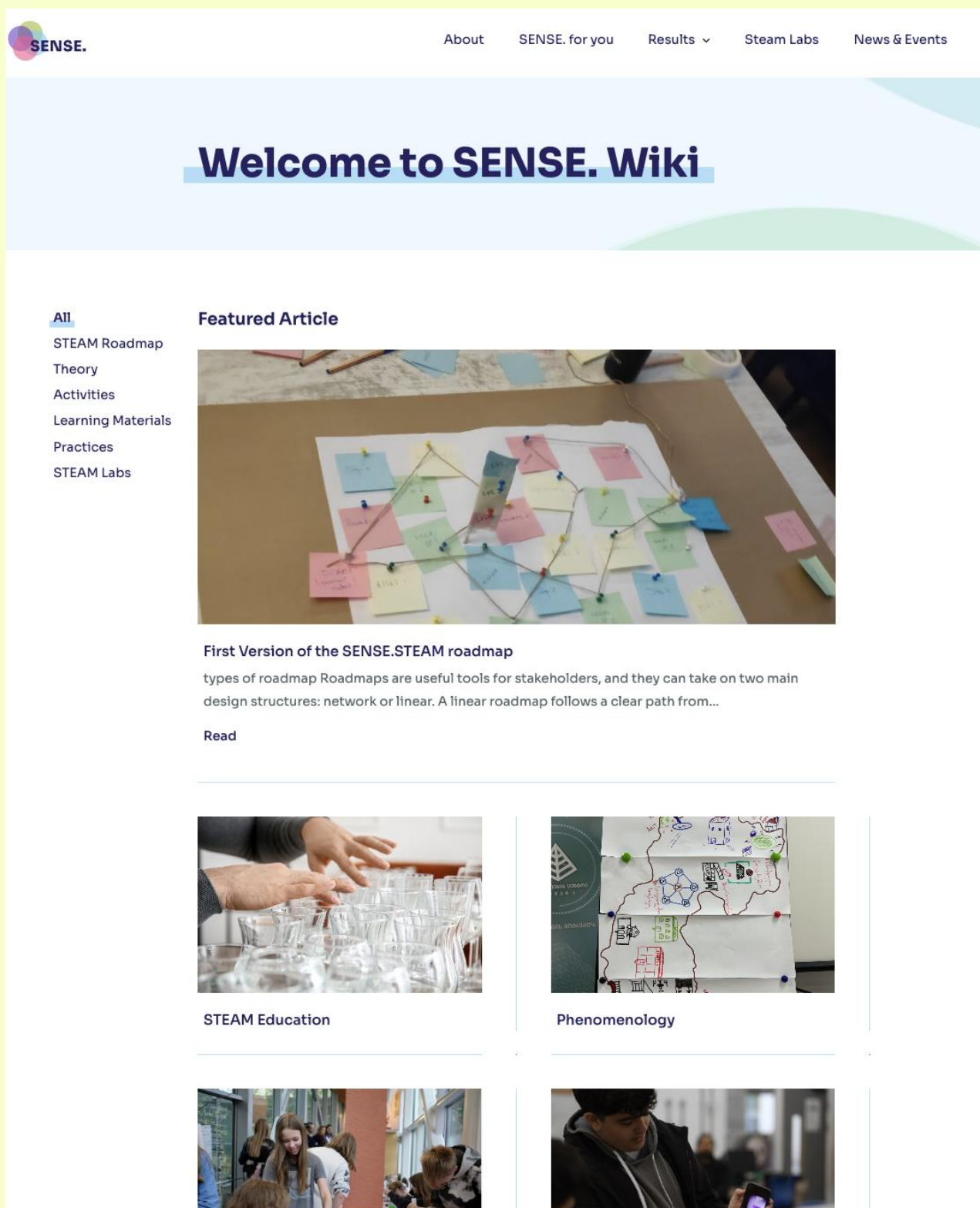
2.4. UI and UX – user interface and user experience

The wiki's user interface (UI) and user experience (UX) is made up of three basic parts:
1) The wiki's landing page
2) Article categories
3) Articles and their content

2.4.1. Wiki landing page and categories

The landing page of Wiki (Figure 1) features a large banner *Welcome to the SENSE. wiki.* Visually this makes it clear to viewers, that they are currently navigating the wiki while still tying it in with the overall website and project's visual identity.

Figure 1: screenshot of SENSE. wiki landing page and category 'sticky menu'.

The page then begins with a featured article. This can be changed in the content management system and gives flexibility to highlight topics of choice.

Beyond the featured article by default all posts are shown in chronological order. This allows more frequent users to see fresh content and keep up to date with what has been recently added.

On the left of the page a 'sticky' tabbed menu allows browsing between different categories. When categories are selected, the landing page is updated to only show articles of the corresponding category (Figure 2).

Figure 2: screenshot of SENSE. Wiki filtered for the 'STEAM Roadmap' category
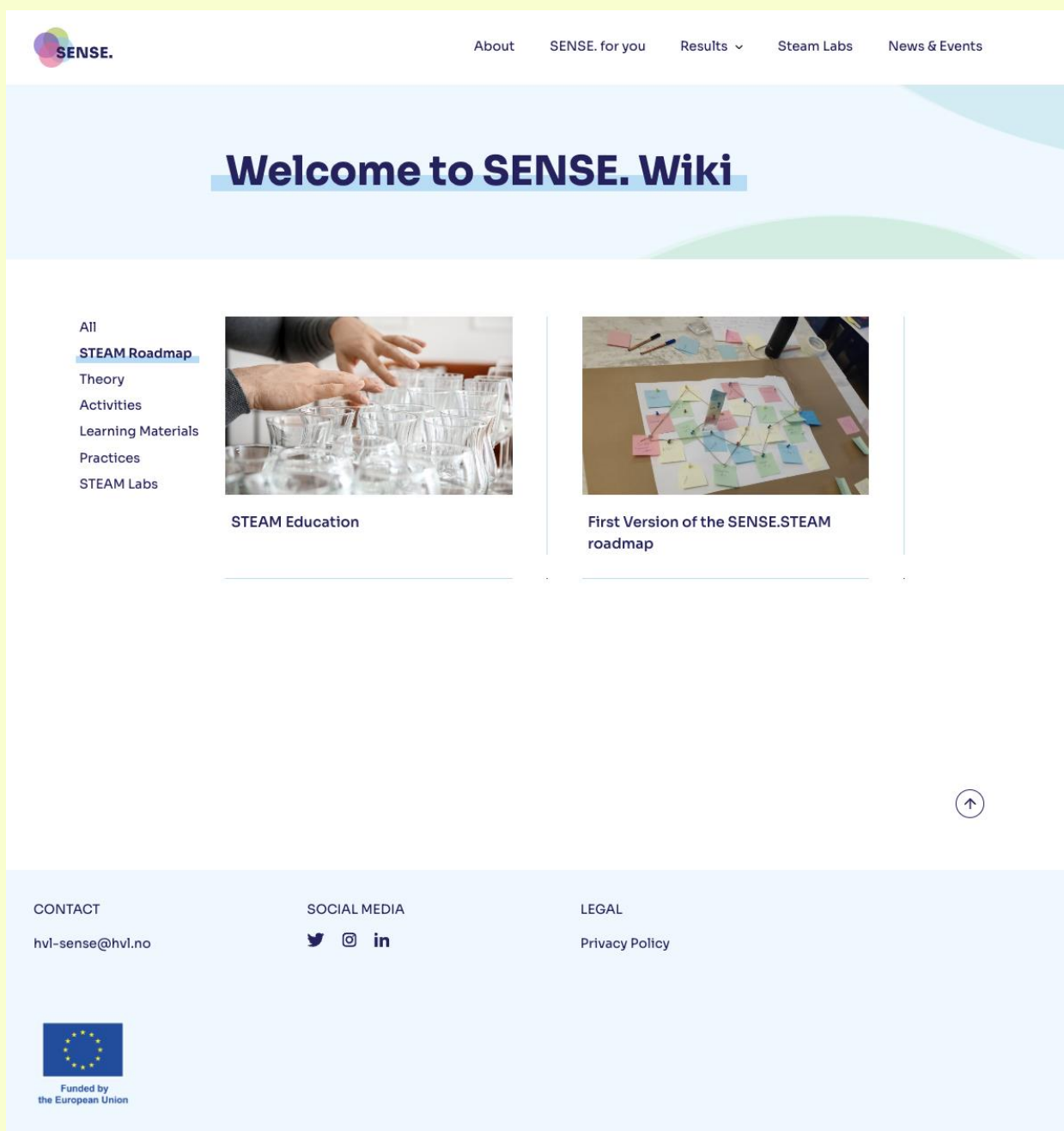
2.4.2. Wiki article

Wiki articles (Figure 3) begin with the *SENSE. wiki* banner to ensure visitors are oriented within the wider website – including when they have arrived directly at the article from an external link (for example via shared social media post).

At the top of the page a 'back to SENSE Wiki breadcrumb directs interested users to further articles on the same topic.

After the title a block with the contents of the wiki article allow for an overview of the content and quick navigation to topics of deeper interest via hyperlinks.

The main content of the wiki article then follows and can include text, images, and videos. Text can be formatted with headings, lists and tables. Finally, references are shown at the end of the page.

Figure 3: screenshot of SENSE. Wiki article template including in page navigation, heading and body.

2.4.3. Content management system (CMS)

The content management system (CMS) of the wiki is built on WordPress and included as part of the SENSE website (see also Deliverable 2.1).

The Wiki section of the CMS includes four main functional categories:

All Wiki Articles – gives the user an overview of all Wiki Articles that have been created. These can be sorted by title and date modified as well as being searchable.

Add New Post – takes the user directly to the post editor in order to create a new wiki entry.

Wiki Categories – allows the user to create and manage wiki categories which appear on the wiki landing page.

Wiki Page – allows the user to change the featured article appearing on the wiki's landing page.

Creating new wiki articles
Users can create new pages in the CMS with a user-friendly template that allows creating the post's title - see (1) in Figure 4, entering various content template blocks (2,3,4) and categorising as desired (5). Users can control the featured image visible at the top of the article and list view on the landing page (6).

Figure 4: screenshot of wiki article creation content management system.
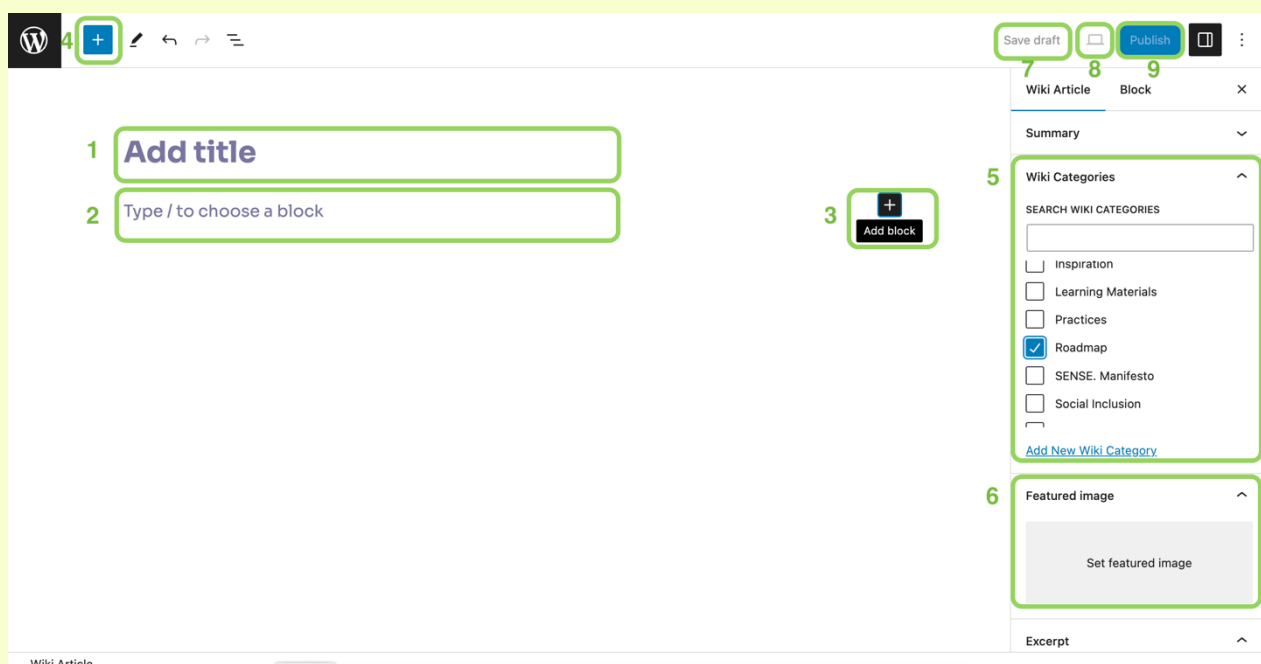
While editing articles the text editor keeps a simple and clean layout similar to common word processing software. A preview button opens the draft article in a new browser tab to show how the post will look on the web (8).

Managing content and the wiki
The *wiki categories* and *wiki page* sections allow for further curating and management of content. Administrators can add, remove, and rename categories as needed as well as adding hierarchy. The *wiki page* section gives a simple interface for managing the featured article.

3. Steps for implementation and ongoing use

The wiki should serve as a participatory tool for gathering project information, explanations of theories and concepts, learning materials and practices from across the consortium as they are created and tested throughout the labs and generating the roadmap. This can later serve as a reference resource for the digital hub. This section outlines next steps on how to further develop the wiki's first version and explores needs and opportunities across the project, including how it can support and benefit from the efforts of other work packages.

3.1. Rollout and Intended user base

Implementation and ongoing us of the wiki will occur in three steps:

Step 1 - Pilot: populate the wiki with 10-20 preliminary articles to pilot within the consortium.

Step 2 – Gather: train consortium members in using the CMS and begin using the wiki as a resource within the consortium – the wiki is on the website but hidden from the public. The wiki will be launched during project workshops in Bucharest in April 2024 to help create early enthusiasm and explicitly link use of the wiki to wider project work on the roadmap and learning materials. This will be followed up with trainings and support via video calls, instructions are documented and shared.

Step 3 – Disseminate: make the wiki available to the general public by cross-linking form the website and adding it to the main navigations' menu. This step should be agreed by the consortium when there is suffcient material of good quality.

Additionally, the consortium should explore the possiblity of using the wiki as a resource for collaboration with the associated Atlas of Roapmaps projects *RoadSTEAMer* and Seer.

3.2. Feeding into the digital hub, educational materials and toolkits and STEAM roadmap

WP4 STEAM labs: Learing from STEAM Labs
As the STEAM labs are carried out, they feed into creating educational materials and toolkits (Task 4.2) as well as a report on implementation activites (D4.2), evaluation (D4.3) before completing recommendations for the learning companion (D4.4). As the reporting and evaluation work is being carried out, the wiki presents a means for documenting initial results and recommendations to other members of the consortium in a collaborative and accessible way. As the primary audience at this stage is other consortium members and there is no formal assessment, pressure is lower and initial ideas can be shared and tested with colleagues

WP5 Space and WP6 Social inclusion: A resource for Space and Social Inclusion
The cross-cutting issues of Space and Social Inclusion provide a range of topics to be collaboratively documented. Being open to all, a wiki is by defualt inclusive and its less rigd structure reduces barriers to participation. In particular the wiki can provide a digital space for developing and sharing versions of *Self-experimentation toolkits and design principles for STEAM spaces* (D5.3) and Toolkits for social inclusion and gender awareness through and for STEAM education (D6.3). Additionally, the wiki may provide a way of sharing findings documented in policy recommendations (D5.4 and D6.4) in a more informal way.

WP2 Dissemination: and WP7 Roadmap: Educational materials and the digital hub

As Task 7.3 is carried out to create digitised educational materials and toolkits, the wiki can provide an easily accessible way to compile preliminary versions of these materials and test out how they work in an online context while gaining input from across the consortium.

As the digital hub is completed (D2.6) together with the completed version of the roadmap, the wiki will already be a resource for drawing content and a place to reference to point users to for additonal material after the conclusion of the project.

<u>A note on the Implementation of the Dissemination, Communication and Exploitation Plan (DCEP):</u>

Content published to the wiki can serve as a resource for carrying out dissemenation under Task 2.2. More specifically information published in the less rigid format of the wiki may be able to serve as content for social media posts or further fleshed out into news articles.

3.3. Conclusion

In summary, the first version of the SENSE. Wiki is intended as a tool for members of the consortium to generate, collaborate and share. By using this digital tool, preliminary input for later work on various reports, recommendations and toolkits can be gathered with reduced barriers while also providing input for future educational materials and toolkits to be included within the digital hub. As well as potential for aiding dissemination during the project, beyond the life of the project the wiki can continue to serve as a reference.

4. References

Hanna, Katie Terrell. n.d. 'What Is a Wiki? – TechTarget Definition'. *WhatIs*. Retrieved 26 February 2024 (https://www.techtarget.com/whatis/definition/wiki).

5. Formalities

Project information

Project acronym:	SENSE.
Full title:	The New European Roadmap to STEAM Education
Grant agreement:	101058507
Programme and call:	Horizon Europe, HORIZON-WIDERA-2021-ERA-01
Project coordinator:	Lydia Schulze Heuling, Western Norway University of Applied Sciences
Contact:	HVL-SENSE@hvl.no
Project duration:	36 months (1 September 2022 – 31 August 2025)
Project website:	www.sense-steam.eu

Deliverable information

Deliverable number	D7.2
Deliverable title:	First Version of the SENSE.STEAM Wiki
Dissemination level:	PU
Deliverable type:	R
License:	CC BY-NC-SA 4.0
Status:	Submitted
Due date:	29/02/2024
Submission date:	29/02/2024
Work Package:	7 Consolidation of the SENSE.STEAM Roadmap
Lead Beneficiary:	Velvet

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European

Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

Revision History

Date	Version	Author	Comment
24/01/2024	V0.01	Joseph Sturm, Velvet	Creation of document outline.
15/02/2024	V0.02	Joseph Sturm, Velvet	First draft content of Section 1 and 2.
25/02/2024	V0.03	Joseph Sturm, Velvet	Content of Section 3.
26/02/2024	V0.04	Joseph Sturm, Velvet	Final draft.
27/02/2024	V0.05	Adelina Dragomir	Review.
28/02/2024	V0.06	Joseph Sturm, Velvet	Final version.
28/02/2024	V0.07	Risk and Quality Manager, HVL	Final check and approval for submission.
29/02/2024	V1.0	Coordinator, HVL	Final check and submission to the granting authority.

Author List

Institution	First name and Name	Contact information
Velvet	Joseph Sturm	joseph@velvet.ee

Abbreviations and acronyms

Abbreviation or acronym used in this document	Explanation
CMS	Content Management System – the user interface for creating and editing content on the web
STEAM	Science, Technology, Engineering, Arts and Mathematics
UI	User interface design
UX	User experience design
WCAG	Web Content Accessibility Guidelines

Glossary

Term	Definition used or meaning in the SENSE. project	Reference or source for the definition if applicable
Content Management System	User interface for editing, managing and visualising web page content – specifically Wiki Articles	Section 2.4.3
Design principle	value statements that describe the most important goals that a product or service should deliver for users and are used to frame design decisions	Deliverable 2.3
Design process	A process to guide understanding of design issues and effective communication of solutions.	www.designcouncil.org.uk
Digital hub	An online repository of learning materials to enable and empower learners to carry out STEAM activities tested and validated in the SENSE. project	Ongoing work in work packages 2 and 7
Roadmap	Roadmap is a strategic planning technique that helps to communicate to all the	DoA

	stakeholders of STEAM education the SENSE. project's goals, and their respective major deliverables over time which also supports them in defining their respective action plans	
STEAM labs	A specialized learning environment for the implementation of SENSE.STEAM, featuring diverse participant panels and addressing specific needs in varied social, cultural, geographical, and economic contexts.	D4.1
SENSE. Manifesto	A living document that succinctly articulates the partners' shared principles, values, and goals, serving as a guiding framework that unifies members' efforts and communicates their distinctive perspective or transformative vision to a broader audience. This manifesto provides a clear direction that fosters cohesion and resonance within the collective, while signalling its distinctive contribution to STEAM to the larger discourse.	D3.4
STEAM Stakeholder	STEAM stakeholders encompass a broader range of entities such as students, companies, or policy makers. Each of these groups has distinct interests and roles in the success of a STEAM initiative. For example, educators contribute to the design and delivery of STEAM curricula, while policymakers influence funding and	D3.3

	educational policies related to STEAM education.	
three levels of SENSE	moving beyond a mere juxtaposition of art and science to explore, understand the world around us and to facilitate changes towards a more inclusive and sustainable life.	Sense-steam.eu
Wiki	a web-based collaborative platform for creating, modifying, and storing content.	Tech Target
Wiki Article	A webpage in article format where users can create and edit text and multimedia material as well as linking and categorising within the wider wiki.	Section 2.4.2

The SENSE. Project

There is a widespread understanding that the future of a prosperous and sustainable Europe depends to a large extent on the quality of science education of its citizens. A science-literate society and a skilled workforce are essential for successfully tackling global environmental challenges, making informed use of digital technologies, counteracting disinformation, and critically debunking fake news campaigns. A future-proof Europe needs more young people to take up careers in science related sectors.

Research shows that interest in STEM subjects declines with increasing age. This effect is particularly pronounced among girls and young women; even those of them who take up science studies gradually forfeit their motivation. But despite all image campaigns and efforts to remove the awe of science only "one in five young people graduates from STEM in tertiary education" and only half as many women as men, according to the European Skills Agenda.

The disinterest in science is striking and evokes the question of its causes. Stereotypes and lack of female role models seem to be only a part of the explanation. Nor is there a lack of career prospects that could explain a reorientation despite initial interest.

SENSE. has identified two major problems in current science education that need to be addressed: a) A distorted teaching logic that progresses from abstract models to procedural applications ("reverse ontology") and b) The inability to implement a learner-centred pedagogy linking students' everyday knowledge to science-based knowledge, thus promoting motivation, self-directed and life-long learning.

SENSE. advocates for the development of a high-quality future-making education that is equally accessible to all learners and promotes socially conscious and scientifically literate citizens and professionals. SENSE. aims at radically reshaping science education for a future-making society. By promoting the integration of all human senses into exploring and making sense of the world around us we will challenge conventional ideas of science and science education. Considering the pitfalls of current science education practices and the advantages of artistic and aesthetic activity, this innovative approach also considers social inclusion and spatial design as core components for a new STEAM education paradigm. With 'SENSE.STEAM' future science learning will be moving away from the standardised classroom shapes and furniture layout entering new learning landscapes.

The project seeks to develop an accessible educational roadmap promoting socially conscious and scientifically literate citizens and professionals. It addresses outdated perceptions of current science education as well as gender stereotypes by integrating the arts, social inclusion, and spatial design as its core components. SENSE. will establish 13 'STEAM Labs' across Europe to develop and evaluate the

'SENSE. approach' to STEAM subjects alongside students, educators, teachers, businesses, and other stakeholders.

The 'New European Roadmap to STEAM Education' will take the shape of a STEAM learning companion to support tomorrow's educators and learners – be it in the classroom, in a museum or on a drilling rig. A digital hub will be established, where practitioners from all ages and backgrounds across Europe will be able to access tried and tested educational practices to increase engagement within these subjects.

The SENSE. consortium

Høgskulen på Vestlandet	Inndalsveien 28 P.O Box 7030 5020 Bergen, Norway	https://www.hvl.no/en/
odyssea	Karditsis 8A Athina 104 40, Greece	www.odyssea.org.gr
Pädagogische Hochschule Weingarten	Kirchplatz 2, 88250 Weingarten, Germany	www.ph-weingarten.de
CREDA ONLUS	Via Mulini Asciutti 2, Parco Monza 20900, Monza, Italy	www.creda.it
wecf	Kote Elisabethstraat 6, Utrecht 3511 JG, Netherlands	www.wecf.org
geyc	Strada SF Elefterie 31 Corp a et 2 AP 3, Bucuresti 050524, Romania	http://www.geyc.ro
LOUVRE	Quai Francois Mitterand 34/36, Paris 75001, France,	www.louvre.fr
Hawkins\Brown	22 Elyplace, Dublin D02 AH73, Ireland	www.hawkinsbrown.com
VELVET	Telliskivi 60a/5, Tallinn 10412, Estonia	www.velvet.ee

UNIVERSITAT DE BARCELONA	Gran Via De Lescorts Catalanes 585, Barcelona 08007, Spain	www.ub.edu

The SENSE. Associated Partners

VILVITE	Thormøhlensgate 51 5006 Bergen, Norway	www.vilvite.no
TRELLEBORG	Johan Kocksgatan 10 P.O. Box 153 231 22 Skåne län, Trelleborg, Sweden	www.trelleborg.com
FUNDACIÓ BOFILL Educació per canviar-ho tot	Provenca 324 08037, Barcelona, Spain	www.fbofill.cat
S·H·E	Irisvej 36 Anette Schulz P.O. Box 000 7100, Velje, Denmark	http://www.schools-for-health.eu/she-network
Primăria Municipiului Câmpina	Bulevardul Culturii Nr 18 105600 Sud – Muntenia, Campina, Romania	www.primariacampina.ro
THE UNIVERSITY of EDINBURGH	Old College, South Bridge EH8 9YL, Edinburgh, United Kingdom	www.ed.ac.uk