



NEXT STEP 02

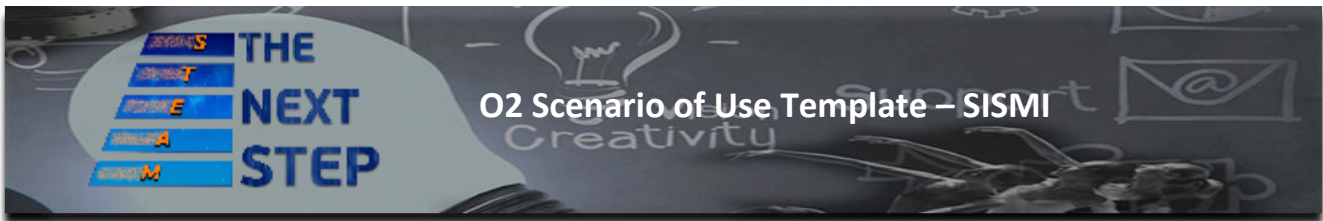
NEXT STEP SCENARIO

SISMI Educational Scenario



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Short Description:

Steam Ideas Squared Musical Instrument #1 enables its users to record sounds in their surroundings and compose music out of those sounds. Such sounds could be tapping of fingers on a table, a bird singing or beating a hollow item with a rock. The recordings can then be played on the device in different pitches, acting as a musical instrument. The notes are programmed in an easy to use “grid” style music sequencer on the touch screen of the device. This Template focuses not only on the artistic side of music but also the engineering side of building an instrument and the mathematics of composing.

You can use these pics to indicate the Disciplines of your Activity in the tables below





Table of Contents

1. Introduction	4
2. Essential Features of the STEAM IDEAS' Square	4
3. NEXT STEP Scenario Identification	6
3.1. Scenario of Use in a Secondary School	6
3.2 Scenario Identification Card	7
3.3 Scenario Identification Image	8
3.4 SISMI	8
Feel Step	8
Imagine Step	10
Create Step	11
Share Step	12
4. References	13





1. Introduction

Main aim

The NEXT STEP project is proposing a whole school approach to science learning. Building on previous successful European open schooling and STE(Arts)M initiatives, the project will bring about the NEXT STEP in education by providing a roadmap for the transformation of school classrooms into open and creative learning spaces. NEXT STEP methodological approach exceeds the state of the art regarding existing creative approaches and STEAM initiatives. In this framework the NEXT STEP project will design and set in operation the STEAM IDEAS' Square, an innovative learning environment which will be the nucleus of the school's activities. NEXT STEP will demonstrate how these environments a) can offer opportunities for deeper learning of STEAM, b) can improve the innovation and creative capacities of learners, c) can support the new role of teacher as a coach of the learning process, d) can facilitate effective cooperation with external stakeholders and e) can inspire policy-makers, school heads and school staff to imagine the schools of tomorrow.

Vision of the Project

The NEXT STEP vision for a creative and innovative school is the development of the creative and innovative classroom of tomorrow, the STEAM IDEAS' Square, in which education relies on an interdisciplinary, arts-based methodology within an entrepreneurship and design thinking framework.

STEAM IDEAS' Square - (SIS) which will be the main core of the school's creative and innovative activities will have two substances: digital and physical. In its premises and via its digital tools in-school interaction between STEM and other disciplines schoolteachers and among all the relative stakeholders (students, educators, parents, artists, scientists, local community authorities, industrial stakeholders, and policy makers) will be established with purpose to run complex and exciting real-life educational world projects. Teams of students (from the same or different classes) can also work and cooperate under SIS umbrella.

By connecting curious minds and specialists and lead them to think "out of the box" will help to speed up the flow of ideas to **transform the school and its classrooms to** a unique creative space for educational innovation and STEAM education.

Through collaboration and the appropriate pedagogies will be established prototyping, pedagogical innovation, creativity (along with distance learning opportunities) and well-being at school.

In addition, the capacity to work with external organizations so as to explore how such partnerships and networks can be built through a long-term strategy-based on trust and common objectives they contribute to key competence development.

A way to implement and use the ideas of NEXT STEP project is through developing a series of scenarios of use that are in line with the proposed approach and involve schools in a series of creative and innovative activities for the improvement of the local cities, settlements, and communities' physical and built-up environments, while engaging key stakeholders (experts, researchers, local communities, businesses etc.) in the process. Different scenarios about different school typologies will be created and these with the help of the right Strategies will help schools to evolve

One of these scenarios that is suitable for a STARTER school (according to our typology) is the one presented later in this document.

2. Essential Features of the STEAM IDEAS' Square





The development of key competences is further facilitated by the provision of context from other disciplines and can:

- a. offer opportunities for deeper learning of STEAM,
- b. improve the innovation and creative capacities of learners,
- c. support the new role as a coach of the learning process,
- d. facilitate the effective cooperation with external stakeholders and
- e. inspire policy makers, school heads and school staff to imagine the schools of tomorrow.

All the above in total in the context of a functional NEXT STEP STEAM IDEAS' square will drive to overcome the organizational and technical barriers and to integration of creative and innovative culture in every day school practices and to aggregate and create projects and activities customized to the specific needs of schools.

Deeper Learning Competences, as **defined in the Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning (2006/962/EC)** as described by the Hewlett Foundation model (Pellegrino & Hilton, 2013) can be adopted in order to define the exact indicators needed to measure the efficiency of the project's objectives. A selection of certain deeper learning competences that correspond to a range of ages wider than the high school students (which is the main target group of the deeper-learning competences model) can be classified in the following three groups (Frans & Andreotti, 2018):

Group A: Cognitive competencies

- (1) Mastering rigorous academic content - A1
- (2) Thinking critically - A2

Group B: Interpersonal competencies

- (3) Working collaboratively - B3
- (4) Communicating effectively - B4

Group C: Intrapersonal competencies

- (5) Learning to learn (C5)
- (6) Developing academic mindsets - C6

As defined in the Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning (2006/962/EC):

- F1) Literacy competence (GA1)
- F2) Multilingual competence
- F3) F3M.Mathematical competence and F3S. competence in science, F3T. technology and F3E.engineering, F3MS, F3ST, (STEM=F3)
- F4) Digital competence - F4
- F5) F5P.Personal, F5S.social and F5L.learning to learn competence (C5)
- F6) Civic competence
- F7) Entrepreneurship competence
- F8) F8C. Cultural awareness and F8E.expression competence

We use the Competences as Features taxonomy from the European Parliament and the Council's recommendation in our scenario.



3. NEXT STEP Scenario Identification

- 3.1. *Scenario of Use in a Secondary School*

The school that has been tried out for this implementation is a Norwegian secondary school. You could use it in the primary school as well. Its recommended 4-5 students per SISMI. If they are younger students then they maybe should have even smaller groups.



3.2 Scenario Identification Card


Category	Description
Title	<i>SISMI</i>
Teaching theme/problem	<i>Music development through sound and engineering</i>
Keywords	<i>Music development, Terminology, Dynamics, Time, Tempo</i>
Language	<i>English</i>
Thematic classification	<i>Music education</i>
Learning/Teaching main objectives:	<ul style="list-style-type: none"> ● <i>Music education</i> ● <i>Composing</i> ● <i>Terminology understanding</i> ● <i>Physics</i> ● <i>Engineering (Building an instrument)</i> ● <i>Collaboration</i>
Suggested age group	<i>Students from primary to university-level, teachers, researchers, artists and scientific institutions</i>
Estimated level of difficulty	<i>Easy-Advanced. Adjustable to the group and school.</i>
Material and technical infrastructure needed	<i>A SISMI instrument and STEAM IDEAS' Square in form of a presentation space.</i>
School - Stakeholders Synergies	<i>Field trip to local surroundings and invitation of local researchers on the topic.</i>
Typical intervention time	<i>1-2 days (4-10h)</i>
Teaching level	<i>Adapted to local curricula and opportunities.</i>
Level of interactivity	<i>High</i>
Type of interactivity	<i>Music in the making</i>
Authors, Publisher name	<i>Johannes Mario Ringheim, Magdalena From Delis, Inger Berit Hagen</i>
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3.3 Scenario Identification Image

3.4 SISMI

Feel Step


					
Act	Description of activities, strategies, methods, means, resources and synergies		Learning goals Learning outcomes - Features	STEAM Disciplines Place and Estimated Duration	
A1	Teacher	Actions Planning inspirational sessions with sound and engineering in focus. Can we use other objects to develop and create sound? Encourage students to come up with ideas about what kind of sounds could work as musical instruments. Explain and preferably demonstrate the differences between what kind of “audio” is best suited as percussive or melodic.	Educational Method	<ul style="list-style-type: none"> ● Music understanding ● Doing field research about sound and music. Put it into context with science and engineering. ● Building instruments 	Place Classroom Duration 20 m
	Tools What you need to build different sound objects. (SISMI#1)				
	Students	Actions Present different types of music they get inspiration from and build instruments.		<ul style="list-style-type: none"> ● Sound study ● Building Planning ● Build instruments ● Music and engineering understanding 	Place Classroom Duration 40 m
STEAM Ideas' Square (SIS) Operation School Community		Educators of STEAM Ideas Square and design thinking (art-music, science, history, tech - teacher's) or other school members will collaborate and gather the information findings. Collected questions and answers in the Ideas Square to be organized later in the process. To start with the Art, the Teacher, in this case the music teacher, is setting up an inspirational design thinking environment. Students can share what they listen to or get inspiration from. What can music be and what does it do to us?		Place Classroom Duration 60m	



<p>Synergies</p>	<p>Science teachers work with the presentations of sound use examples of what sound does to your ears individually and also in society. Connecting with the The Engineering teacher to get a better understanding on what effect sound stands for and electricity required to operate the instrument. An idea is to study dolphins and their sound language.</p> <p>Technology educators present different ways of building sound and instruments ex.: https://www.youtube.com/watch?v=yrCEqdMfbno and with the help of Math and craft teachers develop instruments and put them to the tests of sound and rhythm to get an inspirational way of looking of what sound can be.</p> <p>For masters and advanced schools they can even build their own SISMI#1</p>	
<p>School-Stakeholders Synergies</p>	<p>Invite musicians from the community to have music jam, with the built instruments. And also invite specialists in sound shaping engineering for landscaping. To get inspired by what sound can do for us as individuals but also for architecture in society. .</p>	<p>Place Classroom Duration 60 m</p>




Imagine Step

					
Act	Description of activities, strategies, methods, means, resources and synergies			Learning goals	STEAM Disciplines
				Learning outcomes - Features	Place and Estimated Duration
A2	Teacher	Actions Demonstrate what SISMI#1 can do and how to use it.	Educational Method	<ul style="list-style-type: none"> Collaboration over fields SISMI#1 Be in the imagine phase means that you need to educate yourself beside the students of what the other fields are working on. 	Place Classroom Duration 20 m
		Tools The SISMI#1 device			
	Students	Actions Study and learn how to use the SISMI#1 device. Come up with ideas on which sounds to record. Find and record sounds in outdoor and/or indoor surroundings.		<ul style="list-style-type: none"> Collect sound Using music apps Using digital technology to compose music Know how to use the SISMI#1 	Place Classroom Duration 20 m
STEAM Ideas' Square (SIS) Operation School-Stakeholders Synergies		In the Imagine stage all should stay open and curious of all the presented knowledge. Science teachers playing with different types of sound wat they can represent or connecting it to nature to imagine how to build a imagine sound landscape.Assize of the SISMI#1 device Technology educators can let students play and explore the app that is with in SISMI#1. For an advanced or master school the students can also try to build a device with The Engineering as an base. Art Teacher in this case the music teacher and the Math teachers should show how the two fields of music and math are connected and build on the same foundation. Playing around with rhythms and different forms.			Place Classroom Duration 60x2h Outdoor/indoor surroundings
School Community Synergies		Specialists can present their work as in building instrument. Booth in and as an app and if wanted through coding. And also someone that is working with authentic instrument building. Making field trips is a good idea. How to develop an instrument?			Field trip is recommended



Create Step


					
Act	Description of activities, strategies, methods, means, resources and synergies			Learning goals Learning outcomes - Features	STEAM Disciplines Place and Estimated Duration
A3	Teacher	<p>Actions Instruct students to put the SISMI#1 device and record sounds and put them in to a sound landscape through design thinking. Instruct students to compose melodies using the sounds they recorded in the imagine fase.</p>	Educational Method	<ul style="list-style-type: none"> • Collaboration making place for all involved fields. • Guide the students to put everything i forms and a presentation form. • 	<p>Place Classroom or outdoor surroundings Duration 10m</p>
	Students	<p>Actions Use as melodic or percussive musical instruments and melodies that were developed and designed in the imagine. Put it together to make the sound landscape become developed as the students visions it.</p> <p>Tools The SISMI#1 device plus other instruments.</p>	<ul style="list-style-type: none"> • Basic composing skills • Basic skills on electronics and programming for students building the SISMI#1 <p>Learn how any sound recording can be used as a musical instruments. What kind of sounds are best suited for melody or percussion? Put it into systems. The instruments and sound collection from imagine put in to an “performativ” system. Collaboration</p>		
STEAM Ideas' Square (SIS) Operation		All fields and teachers, Science, Technology educators, The Engineering, Math teachers should work together to make all the fields be represented in an natural way. Working the way to a presentation. Study how to upload and share			Place Classroom or outdoor surroundings



O2 Scenario of Use Template – SISMI

School-Stakeholders Synergies	developed music. The Art Teacher in this case the music teacher should have an overall view of what sound landscapes are being developed and represented.	Place the SIS The STEAM ids Square
School Community Synergies	Here we could invite music producers and composers to give feedback to the students. Giving them keys to put their sound landscape	Place Classroomor SIS Duration 20 m

Share Step

				
Act	Description of activities, strategies, methods, means, resources and synergies		Learning goals Learning outcomes - Features	STEAM Disciplines Place and Estimated Duration
	Actions	Educational Method	<ul style="list-style-type: none"> • Host skills • Reflection 	Place the SIS/classroom



A4	Teacher	Manage sharing of songs via email, cloud storage or similar to other users of SISMI#1			The STEAM idea Square Duration 60m
		Tools : STEAM Ideas' Square			
	Students	Actions Export/save songs created on the SISMI #1 device to USB stick and hand them to teacher for sharing		<ul style="list-style-type: none"> ● Building an presentation space ● Hosting and representing an invent ● Present their work 	Place the SIS The STEAM idea Square Duration 60m
		Tools The SISMI#1 device and other aintims they need to have a presentation of their work.			
STEAM Ideas' Square (SIS) Operation		Art Teacher in this case the music teacher should have a director approach to the share phase. Looking for the presentations bigger picture. The sound landscape should be presented in the STEAM Idea´s Square (SIS). All the other teacher, Science teachers, Technology educators, The Engineering, Math teachers should back the students in hosting the event.			Place the SIS The STEAM idea Square Duration 30 m
School-Stakeholders Synergies		To invite community workers, parents other students to a show and tell of their work with SISMI#1 and sound landscaping.			
School Community Synergies		The community workers are invited to be a part of the event. School administration team and other teachers.			Place the SIS The STEAM idea Square Duration 30 m

4. References

User guide and build instructions for SISMI: <https://prosjekt.hvl.no/nextstep/>

5. Abbreviations, short terms, apps used in Scenario of Use

Instruments in making: <https://www.youtube.com/watch?v=yrCEqdMfbno>

Sputter Music Sequencer, the sequencer software running on the SISMI: <https://play.google.com/store/apps/details?id=info.casualcomputing.sputte>

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NEXT STEP Partnership



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