



NEXT STEP O4

NEXT STEP Guide Of Good Practice



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Short Description:

The proposed innovation process (design and operation of the creative, innovative and inclusive activities in the STEAM IDEAS’ Square environment) was monitored during the whole period of school involvement in the proposed activities. Applying the NEXT STEP approach in local settings did in deed make it clear that schools have much to gain by fostering connections between formal and informal learning, between existing providers of education and new entrants. The NEXT STEP Guide of Good Practice is a set of guidelines that was informed from the O3 findings and supported the schools that were involved in the Operation of the STEAM IDEAS’ Square activities as well as is available in order other interested schools to start implementing the proposed approach.



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1. Introduction

NEXT STEP is a project introducing the idea of a hub that fosters STEAM education. A STEAM IDEAS' Square encourages every idea that embraces innovative practices in STEAM teaching by involving teachers and students across Europe in the development of various innovative and creative activities. As two sides of the same coin the Arts and the Sciences offer a unique blend of approaches that foster 21st century skills including teamwork, creativity, entrepreneurship, ICT skills, critical thinking as well as emotional intelligence.

This guide will help you to be part of this initiative.

2. Why to follow the NEXT STEP Approach

Why should schools, teachers and the community invest in and implement the NEXT STEP Approach? It is big question with a lot of answers, but the overarching answer is because it is the embodiment of the school of the future. To implement STEAM education and the STEAM IDEAS' Square is to build bridges of knowledge within the community, with school leaders, between teachers all for the good of students. This is always the focus on the school of tomorrow. With the fundamentals of interdisciplinary, arts-based methodology within an entrepreneurship and design thinking framework, we can measure and use the tools of the NEXT STEP to keep developing and improving. By following the strategies and suggested plans of the NEXT STEP, we become richer in both time and knowledge.

For the community it is an opportunity to share their expertise and actively be a part of the school and support teachers with self-growth and educational knowledge that they crave in different times. The community is the school and the school is the community of the future. For the teachers they will have a support system that can guide them by supplementing their knowledge. It is the perfect opportunity to self-invest and develop and at the same time work systematically together with co-workers with an interdisciplinary focus. That in the end realises more time and gives deeper knowledge for teachers and students. For the school leaders they get a measurement tool that gives concrete guides to develop the teachers and the school, reach the desired results and set goals, both within the school, but also outside the school. This saves both time and resources.

The NEXT STEP provides recommendations to school leaders for strategic holistic school improvement. More specifically, the recommendations are:



- Specific STEAM principles to be incorporated into the School Development Plan and recommendations regarding particular accelerators that are relevant to local social issues. In this context, the accelerators will align local challenges facing the community that hosts the school with particular science education scenarios and the ability of the school and its community (teachers, students, etc.) to take up such tasks. Recommendations on the development of effective cooperation with organizations like universities and research centres, informal learning centres (e.g., museums and science centres), enterprises, industries and the local communities.
- Potential partner schools with similar (or complementary) profiles so as to support collaborations and mutual improvement. Such activities are heavily supported in the European context within a range of initiatives, including ERASMUS+ staff mobility (e.g., teaching staff shadow teaching), eTwinning (e.g., joint teaching projects) and ERASMUS+ strategic partnerships (e.g., teaching staff formal training activities).
- Professional development courses to meet the specific competence needs of the teaching staff. This recommendation type will match the competence profiles of teaching staff and the descriptions of professional development courses in terms of competences they cultivate so as to identify targeted training opportunities.
- Improvement of the use of ICT in the teaching practice (i.e., educational designs) employed in the school. This recommendation type could analyze the educational designs used in the school in terms of the level/type of ICT exploited and generate potential recommendations for enhancing this level in case of low ICT use. Additionally, these recommendations should also take into account the teaching staff ICT competence profiles, so as to provide personalized suggestions that the teaching staff will be competent to employ Recommendations of educational designs. This recommendation type could suggest educational designs employed in one school to the teaching staff of another school, based on the similarity of school innovation profile. In that way, teaching staff will be able to select educational designs which have been successfully employed in schools with similar innovation profile to their own (Sergis & Sampson, 2016). Furthermore, these recommendations should also take into account the teaching staff ICT competence profiles, so as to provide personalized suggestions that the teaching staff will be competent to employ.

The school leaders should be able to explicitly define which recommendations they actually implemented, so as to (a) provide a means to validate the recommender system's impact on school improvement and (b) provide a means to build open school pathway templates. These templates will be formulated based on the specific actions that schools implemented (supported by the provided recommendations) towards improvement and could be shared for streamlining the adoption from other schools with similar initial profiles. This kind of open innovation streamlining is highly required to replicate successful innovation development in a wider scale.

The activities to be adopted at this level will have all the qualities of complete scenarios guiding student-led projects. However, and since in these cases we are dealing with school that are innovative and generally open, the basic ingredient is a set of the most up-to-date STEAM guidelines supporting schools not only to study and incorporate local issues into their science teaching to attempt a long-lasting impact in their communities. In this



context, Gender equality is not only a principle that must govern the schools' profile and/or science teaching for example (female role models in science), but must be a fundamental element of increasing collaborations with parents, local groups, business, etc. in which (the collaborations) the school plays a pivotal role in the offering solutions and tools to stakeholders to improve their own uptake of such a principle. In other words, these schools with these types of accelerators will be in a position to enlighten, train, support through their own projects, local stakeholders in need of such change.

Altogether students will be the winners, being a part of a bigger community filled with knowledge of tomorrow. Having structured, motivated teachers that are growing and collaborating, supported by the school leadership and connected to the local authorities, the community and all the stakeholders will achieve this aim.

3. Operate the STEAM IDEAS' Square approach

3.1 STEAM IDEAS' Square approach

STEAM IDEAS' Square is an innovative learning environment which will be the nucleus of the school's creative and innovative activities. Must have two substances: digital and physical. In its premises and via its digital tools in-school interaction between STEM and other disciplines educators and among all the relative stakeholders (students, teachers, parents, artists, scientists, local community, industrial stakeholders, and policy makers) will be established with purpose to run complex and exciting real-life educational world projects.

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.

For the purposes of the NEXT STEP Project, we are elaborating the specific Design Thinking Methodology adapted for educational purposes in the Open Schooling Model (Sotiriou, S. et. al. 2017) by following the 4 phases of Feel, Imagine, Create and Share (see also to [NEXT STEP Conceptual Framework](#)). The main aim at this level will be for students to understand and create a new way of thinking in order to take advantage of science notions and develop future solutions. To this end, NEXT STEP is introducing the STEAM IDEAS' Square: a hub in each participating school which becomes the heart of the school as it invites interaction between STEM and other disciplines: students, teachers, artists, scientists, industrial stakeholders and policy-makers meet here to negotiate the complex and exciting real-life educational world which the NEXT STEP project navigates.

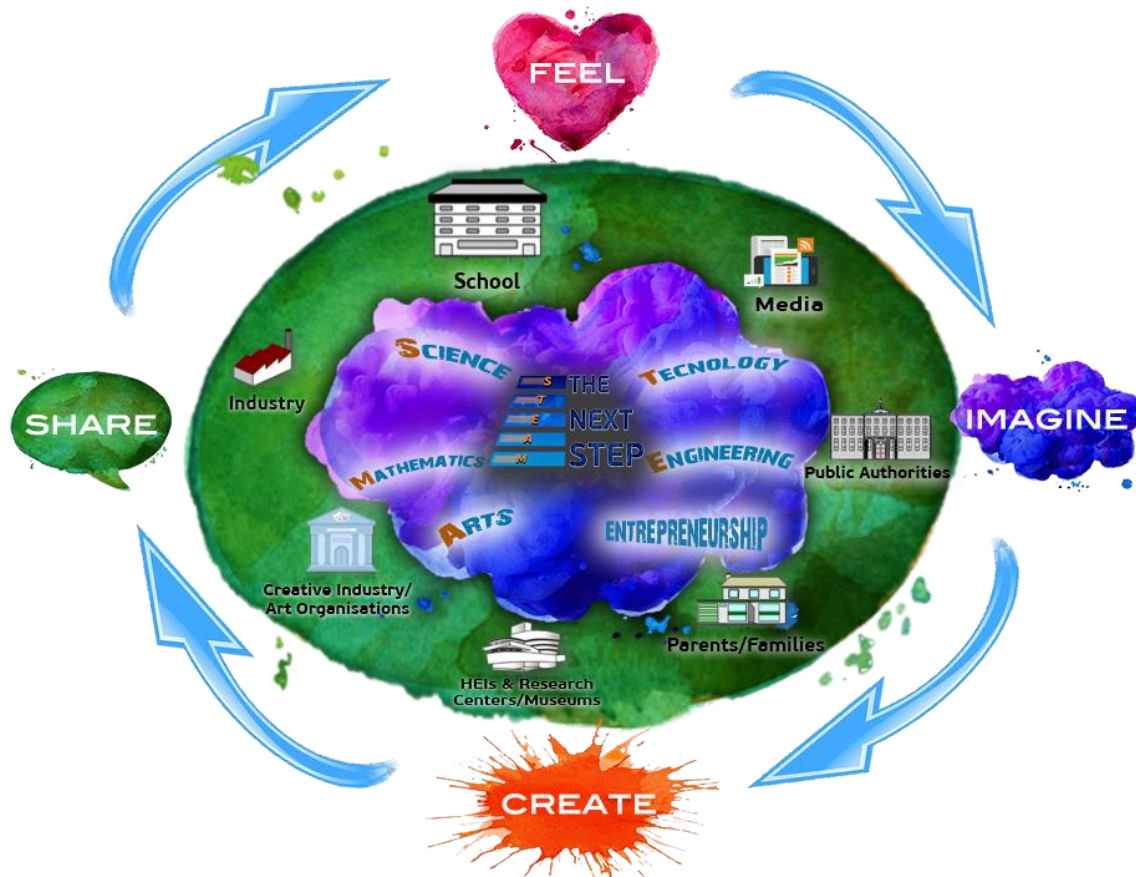


Figure 1: NEXT STEP's STEAM IDEAS' Square will be a place, a facility, a meeting place. It's a place between science, art and the society to connect all the stakeholders and draw ideas that will be realised with a common purpose, the well-being of the local/national/international community. It will FEEL societal needs, will explore and IMAGINE novel solutions for the future so to CREATE these within the school and SHARE it with the community. It's a facility designed to generate new ideas in an open and collaborative environment, to promote experimental innovation and rapid prototyping for art/science-related projects

You can visit our web tool - <https://srt.the-next-step.eu/> (also through our project's website - <https://www.the-next-step.eu>) and start discovering all elements that will help you (and your school) define your status in implementing STEAM. Through this process, and as new schools and practices are added to the system, the enrichment of the experience of interaction with innovative practices and schools that apply them, shape step by step, the landscape of this STEAM square.

You will discover a corpus of innovative scenarios of use that will help you not only enhance your STEAM competencies but also inspire you to create your own. Visit the [NEXT STEP Scenarios of Use](#) to see an overview of the proposed scenario-titles and study the competences tackled through your practice. There are already 13 Scenarios of Use to cover all the school Typologies (see below Section 3.2.1).

STEAM IDEAS' Square is about sharing the idea of discovery and innovation.

3.2 Be part of the community and start the journey

By registering and completing your profile in the [NEXT STEP Self-Reflection Tool](#) (NEXT STEP SRT), you are effectively participating in the project community.

To be part of a STEAM IDEAS' Square Community means to be supported in every step of the way, by accessing a set of community building tools to facilitate cooperation and networking between the participating schools. The sharing of resources and experiences is encouraged in order to promote collaboration and maximize resources, besides learning from others and gain knowledge that we may not have otherwise. Aside from cooperation between teachers and students, it is encouraged the connection and participation of artists, local communities, industry and researchers. This can create a positive learning environment that promotes students' engagement with their peers and an active role in their education. The focus is not only on the integration of external resources into syllabi, but also on subsequent adoption of the modernization of the school organization, school cooperation with external players as well as the teachers' professional development.

The Community Support Environment (<https://srt.the-next-step.eu/>) not only introduces you to best practices proposed by the project but also to the ones generated by you. This content is in line with the proposed approach and introduces you to practices that engage key stakeholders. School-based projects and activities are the key elements of this environment.

The main steps that the school will need to take following the proposed NEXT STEP's Journey to STEAM education will be the following:

1. The school unit will need to identify the STEAM Status at the specific period (Using the NEXT STEP Self-Reflection Tool)
2. According to the status will have to follow the proposed strategies (see section 6)
3. The School Unit should develop a plan in order to achieve the strategy that needs to be followed
4. The School Until should develop or follow scenarios / activities in order to achieve and improve its status and follow the specific strategy
5. After a period of at least 6 months (recommended to be a full school year) the school until will have to measure its status again in order to identify the improvement (Using the NEXT STEP Self-Reflection Tool)

The steps above are illustrated in Figure 2.



STEAM IDEAS' Square Operation: The School's Journey

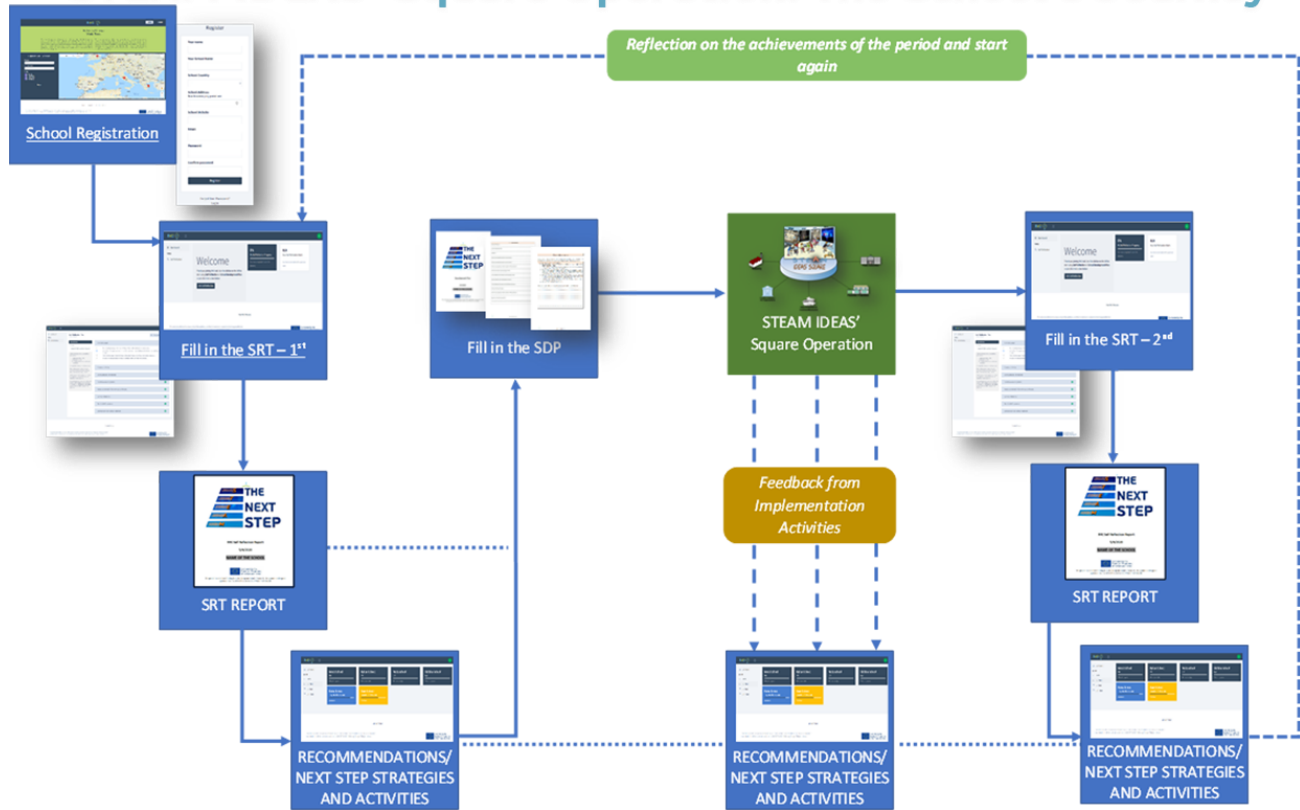


Figure 2: The STEAM IDEAS' Square Operation

3.2.1 Define the School Unit Status

As a first step it is important to understand the status of your school unit (The School Typology). The School Typologies are identified by filling in the NEXT STEP SRT according to approaches that the school is following at the specific moment in 3 levels: **Management, Process and Teachers Professional Development.**

There are four school typologies that NEXT STEP project had proposed and tested during the project with 10 schools from the 4 participating countries (Norway, Greece, Ireland and Portugal). These school typologies are presented in Table 1. Schools, according to their reflection, will be characterized according to their STEAM status to four categories: Starter, Enabled, Advanced or Master.

Table 1: The four school typologies according to the STEAM characteristics

STARTER	ENABLED	ADVANCED	MASTER
Schools that are planning to incorporate STEAM educational in their classrooms.	Schools that have implemented at least one STEAM education activity by means of collaboration between teachers of various STEAM disciplines.	Schools that have achieved a high degree of STEAM education, by actively promoting collaboration between teachers of various STEAM disciplines in e.g., a project-based learning approach. ICT tools are integrated in their practices. Cooperation with community stakeholders and other external partners on specific STEAM activities/projects has been established	Schools that have STEAM learning as a common practice among their teachers and can provide best practice examples as well as recommendations on how to implement relevant activities. These schools can act as agents of STEAM Education. The school has established systematic collaboration with community stakeholders and other external partners on specific STEAM activities/projects.

The project offers you the ability to dynamically start your progress towards upgrading your level to MASTER from any level you start.

3.2.2 Register to the NEXT STEP SRT

Steam Ideas Square (SIS) requires a reflection process that helps you understand your status. In order to track your progress, a registration of School unit is needed from one teacher that we suggest to be the Head of the School Unit.

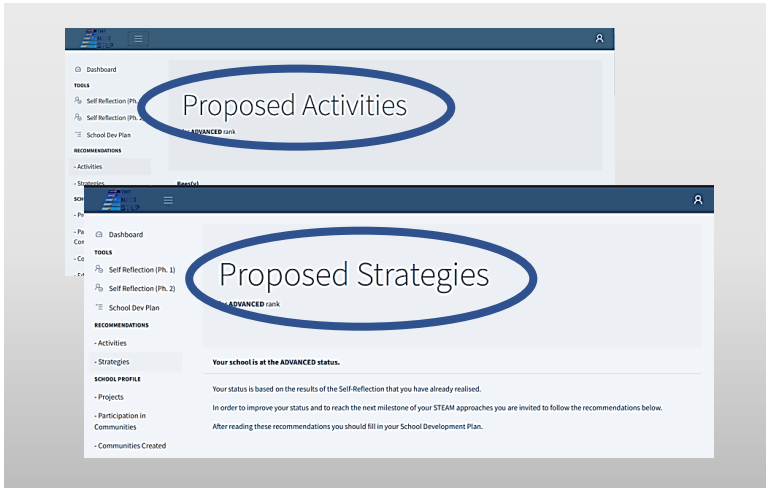
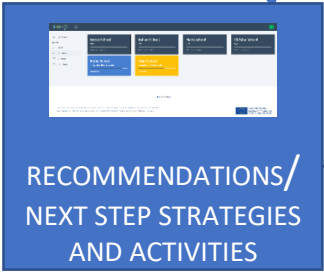
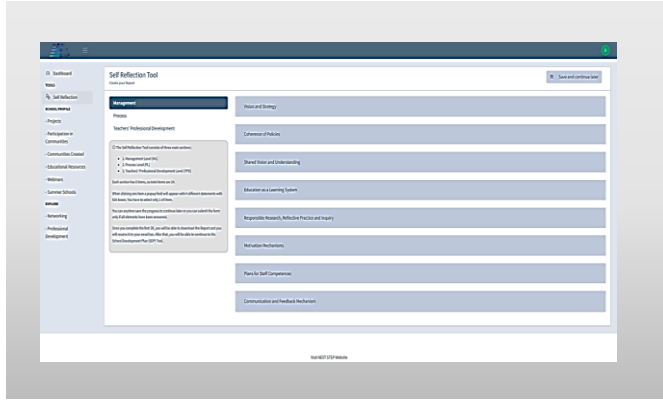
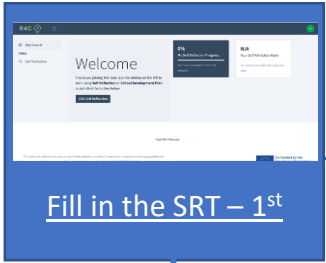


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Visit our [quick guide](#) that helps you to register and after that click the corresponding links to visit the proposed activities and strategies as shown in the screenshots.



3.2.3 Prepare the School Development Plan

Schools are living spaces. Sometimes it is hard to go up the stream. But towards this, the project offers you predefined descriptions on the profile of the status you are to the status you wish to become. Think on how you can adopt your approach in the process of pursuing your achievements by writing down your plan in bullet-points.

Fill in the SDP

Update your school status and follow the online tool that guides you to each step of the way to define your school development plan (SDP)

**RECOMMENDATIONS/
NEXT STEP STRATEGIES
AND ACTIVITIES**

Area	Current status		Next milestone
Vision and Strategy	The school's 2018/19 School Improvement Plan (SIP) approach is implemented in curriculum and in example, within all school. Students and teachers are able to implement and reflect on areas with high quality of innovation between the 2018/19 Education. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone You are already at this level.
Coherence of Policies	The school's policy review and aligns its policies with major changes to curricula, assessment, school organization and teaching quality assurance etc. An innovation team is in place to guide the school's education 2018/19 approach to improve the school's performance. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone The school will review policy review and education organization in an open and regular dialogue with the goal of increasing policy coherence and to specify the school's mission and vision. The school will conduct a strategic plan for the next year and update the school's strategy. Enhanced learning 2018/19 opportunities will be integrated in teachers' daily practice, to encourage and support opportunities for all students. The school will engage in research on the latest research on the topic of 2018/19 to inform and improve teaching practice.
How are you planning to reach next milestone?			
Shared Vision and Understanding	The school's vision and strategy for Curriculum Professional Development, the school considers learning needs of school and school staff with a focus on the school's professional development and school staff. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone You are already at this level.
Education as a Learning System	The school's vision and strategy for Curriculum Professional Development, the school considers learning needs of school and school staff with a focus on the school's professional development and school staff. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone You are already at this level.
Responsible Research, Reflective Practice and Inquiry	The school's vision and strategy for Curriculum Professional Development, the school considers learning needs of school and school staff with a focus on the school's professional development and school staff. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone You are already at this level.
Motivation Mechanisms	The school's vision and strategy for Curriculum Professional Development, the school considers learning needs of school and school staff with a focus on the school's professional development and school staff. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone You are already at this level.
Plans for Staff Competences	The school's vision and strategy for Curriculum Professional Development, the school considers learning needs of school and school staff with a focus on the school's professional development and school staff. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone You are already at this level.
Communication and Feedback Mechanism	The school's vision and strategy for Curriculum Professional Development, the school considers learning needs of school and school staff with a focus on the school's professional development and school staff. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels. The school has a dedicated support team to monitor the 2018/19 School Improvement Plan and ensure it is implemented across all year levels.	→	Next milestone The school communication plan will use the school's communication strategy to ensure the school and staff community, including other stakeholders, value and practice. The school will conduct a strategic plan for the next year and update the school's strategy. Enhanced learning 2018/19 opportunities will be integrated in teachers' daily practice, to encourage and support opportunities for all students. The school will engage in research on the latest research on the topic of 2018/19 to inform and improve teaching practice.
How are you planning to reach next milestone?			

3.2.4 Select or Develop a Scenario of Use (STEAM Activity)

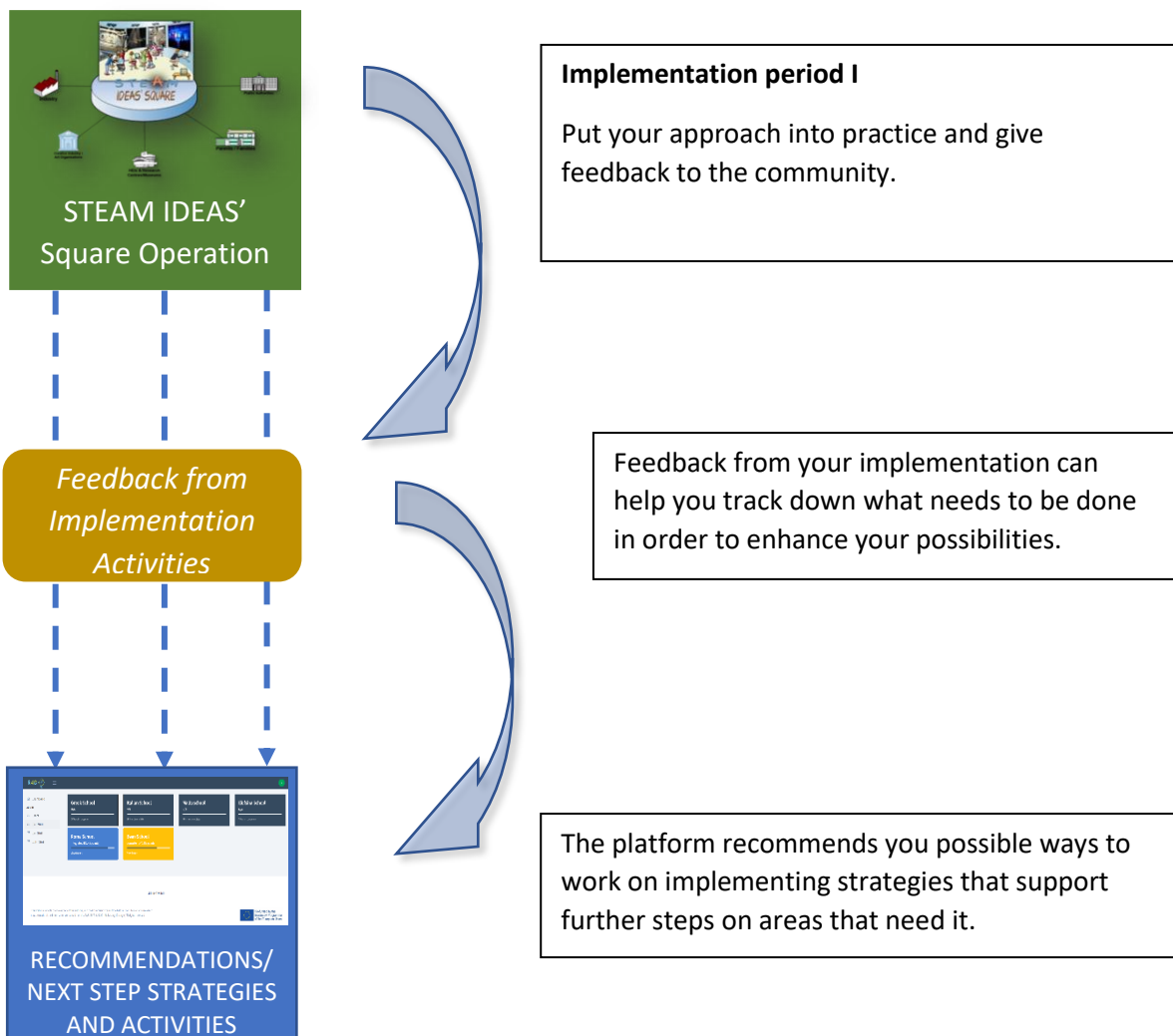
Start thinking on how you can enhance your teaching strategies. There two ways you can either use individually or combine:

- **Start from scratch.**
Study the principles of design thinking, and see how you can adapt the needs of your class to the proposed procedure. Choose the timespan of your approach and start filling-in the fields of your own scenario into the [NEXT STEP Scenario of Use template here](#).
- **Build on a proposed approach**
Follow the activities of a proposed approach that the project has to offer. You can adapt on the way and enhance the contents of any activity as long as it respects the design-thinking elements that the project

suggests. All the proposed scenarios of use, according to the status that you will identify from the Self-Reflection procedure, can be found [here](#).

Once you are settled, you're ready to implement your approach into your school.

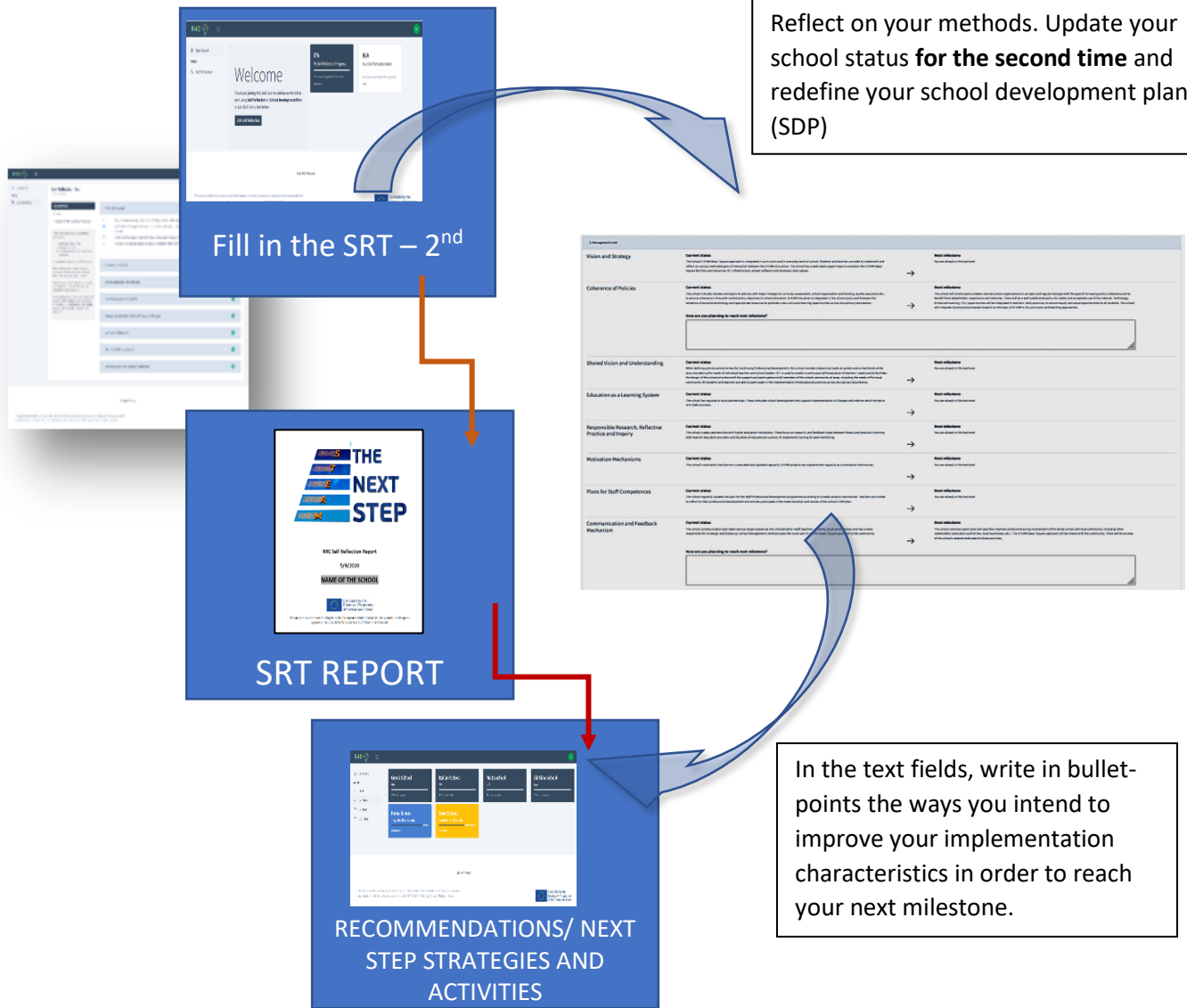
3.2.5 Operate the STEAM IDEAS' Square in the School Unit / Classroom



3.2.6 Redefine the School Unit’s status by filling in the Self-Reflection again
 Make your Next Step by reflecting upon your approach.

Implementation period II

Reflect on your methods. Update your school status **for the second time** and redefine your school development plan (SDP)



4. Lessons Learned

After testing the NEXT STEP approach in 10 schools from the 4 participating countries we have conclude that this approach helped the school units to improve their STEAM integration and approaches.

Of courses, it is not possible to provide secure statistical results from a sample of 10 schools that we believe that these are representative. It is the aim of the NEXT STEP project to continue supporting more schools to follow the proposed approach as the results were very positive.

There were 10 schools as presented below in the Figure 3. 4 schools from Greece, 2 schools from Norway, 2 schools from Ireland and 2 schools from Portugal. In the 1st measurement the average results (statuses) of the participating schools were 50,37% while we observe an improvement of 15,60% after the 2nd Measurement that the schools achieved 65,97%.

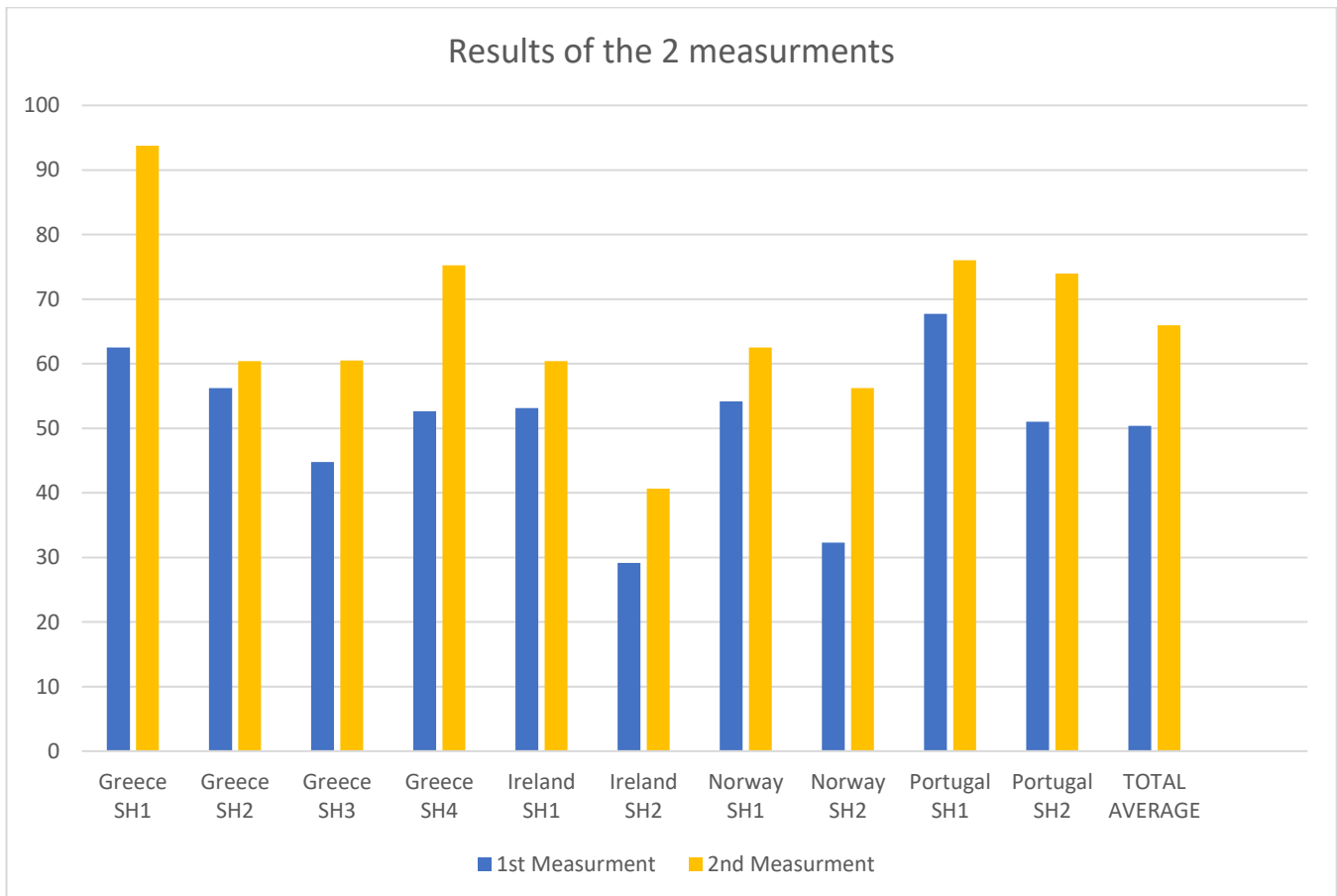


Figure 3: The Results from the 1st and 2nd Measurements of the participating School Units.

This increase of 15,60% can be consider as very important and give proves that the proposed NEXT STEP approach, the STEAM IDEAS’ Square is a reliable approach for schools to start their journey and achieve STEAM integration in their educational activities.



5. References

NEXT STEP Conceptual Framework: http://www.project-case.eu/wp-content/uploads/NEXT_STEP/O1_NEXT_STEP_Deliverable_IO1.pdf

NEXT STEP Scenarios of Use: <https://www.the-next-step.eu/next-step-scenarios-of-use/>

Implementation Plans and Report: http://www.project-case.eu/wp-content/uploads/NEXT_STEP/O3_NS_IO3_Implementation_Plan_FINAL.pdf

NEXT STEP Self-Reflection Tool and Community Support Mechanism: <https://srt.the-next-step.eu/>

Sergis, S., & Sampson, D. (2016). Towards a Teaching Analytics Tool for supporting reflective educational (re)design in Inquiry-based STEM Education. In Proceedings of the 16th IEEE International Conference on Advanced Learning Technologies. Available from: https://www.researchgate.net/publication/318966327_Investigating_the_impact_of_Flipped_Classroom_on_students%27_learning_experiences_A_Self-Determination_Theory_approach [accessed Mar. 15 2023].



NEXT STEP Partnership



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