Section 1 - Summary

1.1 Author

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1.2 Background

I am a teacher and expert, recognized by the Italian Ministry of Education in the field of digital skill, Mathematic and and Science. I am the oldest Mathematic and Science teacher of my school. I usually propose creative paths in Mathematics and Science focused on reality tasks, through the use of digital tools.

1.3 Descriptive title

STE(A)M vertical and horizontal paths

1.4 Abstract

My school is characterized by disciplinary experiences usually carried out by a single teacher. Teachers’ collaboration rarely takes place. This leads to the fragmentation of knowledge and the absence of shared paths between teachers of the same order of school and between teachers of different orders of school, such as kindergarten, primary school and secondary school.

It is necessary to build a path on STE(A)M vertically and a curriculum for transversal skills. It is necessary that several teachers design and carry out tasks of reality and that the evaluation is carried out through shared criteria and evaluation headings.

The students of the entire institute will benefit, as a project anchored on a vertical curriculum will be realized, guaranteeing a holistic approach to knowledge.

A minimum of one years is necessary to allow the training of teachers and an initial experimental approach of the activities.

Section 2 – Goals

2.1 General goal

The problem concerns the teacher training, the increase in the teachers’ collaboration of the same order on shared STEAM activities, the absence of a vertical curriculum and a shared evaluation.

I propose a plan that concerns both teachers and students, based on didactic innovation and collaboration.

2.2 General goal description

The self-assesment report (RAV) provides a representation of the school through an analysis of its functioning and constituites the basis for identifying the delopment priorities toward which to direct the improvement plan. The RAV must be completed by all state and peer educational insitutions.

Our RAV shows the need to have a vertical curriculum, to improve collaboration among teachers in carrying out shared pratices and to have an evaluation system in all disciplinary areas based on evaluation rubrics.

2.3 Strategic goals

- Activate a capacity building program on the STE(A)M approach for teachers of 20 hours at the beginning of this school year.

- Propose 3 workshops of one hour each held by teachers of our school , in which experiences of STEAM practices already previously carried out are shown during the four months at the bedinning of this school year.

- Carry out a" welcome project" for the first classes involving STEAM and civic education lasting 2 weeks, starting the first day of this school year.

- In every level of school, kindergarden, primary and lower secondary level, create a commission of teachers that elaborates reality tasks and authentic tasks based on STEAM, throughout the whole current school year.

- Activate a commission made up of one teacher for each discipline and for each school levels that draws up a vertical curriculum starting from this school year, by the beginning of the next school year.

- Sharing the evaluation rubrics already developed by some our disciplinary departments and elaborating evaluation rubrics on shared criteria, starting from the beginning of this school year in the first three months of school.

Section 3 – Targets

3.1 Beneficiaries

The beneficiaries are both the teachers who will improve their methodological practice and the collaboration with their peers, and the students who will experience new experiences based on the real needs of the community to which they belong.

- We hope that the INVALSI results achieved in Italian Language, Mathematics and English improve by 5 %.

- We think that there will be a 10 % increase in the number of students enrolled in scientific high schools.

3.2 Recipients

The recipients are the beneficiaries.

3.3 Special needs

The school improvement plan provides for the inclusion of pupils with special needs and the disabled. Their involvement in the activities will be mediated by students with the function of tutors in the case of students with special needs and by the presence of both tutors and specialized support teachers in the case of students with disabilities. They will participate in the activities because the STEAM paths by their nature are flexible, adaptable and highly inclusive. They will allow all pupils to participate in school life and to discover their talents and their attitudes that can guide them in their future working life.

Section 4 – Value Proposal

4.1 Value proposal

New methodology for a holistic, flessible and inclusive approach to knowledge.

4.2 Results

- 40 teachers of my school will be introduced to the STEAM educational approch.

- At least 10 STEAM activities will be developed in our school.

4.3 Impact

- We aim to make a STEAM activity per each class group every year

- We hope to carry out a final workshops per year in which the teachers of the different classes show the activities carried out and the students show their products. In addition, the activities will be archived through a shared template and disseminated on the school website through multimedia presentations.

- During the open days, STEAM activities will be presented to new students who will enroll in our school during the open days.

Section 5 – Costs

5.1 Cost structure

Keep the entries in the below list that are appropriate for your polices:

- Labor (internal staff)
- Hardware
- Software
- Scientific laboratory equipment

5.2 Funding opportunities

- PON - National Operational Program "For the School - Skills and Learning Environments"

The PON program for the school is divided into AXES, each axis in ACTIONS: 1st AXIS - EDUCATION: Fight against early school leaving, Key competences, Orientation, School-Work alternation, qualification of school

staff, adult education. 2nd AXIS - INFRASTRUCTURE FOR EDUCATION: Vocational workshops, Digital School, School Building. 3rd AXIS - INSTITUTIONAL AND ADMINISTRATIVE CAPACITY: Open data and Transparency, Governance and school system. BUDGET: 3 billion Euros co-financed by the European Structural Funds (ESF and ERDF) and by the Italian State. BENEFICIARIES: Schools in all Italian regions, including preschools. ADDRESSEES: Students, teachers, school staff, adults in the area, officials and managers- Mention recurring public call at any level and explain why it makes sense to apply.

Section 6 – Action Plan

6.1 Activities

- Exposition of the STE(A)M plan to teachers and Headmaster by the STEAM Project Manager (1 h)

- Discussion on possible changes (15 ')

- Time planning of the project for the current year (30 ')

- Establishment of working groups for the different school levels that will develop transdisciplinary activities and soft skills (15 ')

- Establishment of the working group for the whole school that will elaborate the vertical curriculum (10 ')

- Establishment of the working group for the different school levels that will elaborate the evaluation rubrics (10')

- Proposal, by expert teachers on STE(A)M, of a first "Welcome project" on STEAM to be started in the current school year (20 ')

- Discussion on the implementation of the "Welcome project" by each group of teachers per class (1h)

- Launch of the welcome project entitled "The key to WELL-BEING at school" (2 weeks)

- Teacher self-training activities through MOOCs and training through the shared experience of school teachers with experience on STEAM (25 h)

- Planning of one horizontal STEAM activities for each class (15 h per activity)

- Vertical curriculum planning (30 h)

- Elaboration of the evaluation rubrics starting from the existing ones (15 h)

- Implementation of planned activities (20 h per class)

- Evaluation of activities through satisfaction questionnaires for students and self-evaluation questionnaires for students and teacher focus grops for teachers (3 h)

- Analysis of the results with the identification of strengths and weaknesses

- Multimedia documentation of the activities, to be published on the school website (15 h)

- Compilation of a form to archive the activities and make them available for the future (2 h)

- Exhibition of students' products and activities carried out at the end of the school year to citizens (2 h)

- STE(A)M activities will be presented to new students who enroll in our school during the open days (December-January - 6 h)

- Monitoring of INVSALSI evaluations and trends over the years (10 h)

Section 7 - Risks

7.1 – Risks/Competition

a. Risk description

Time is a competing element because teachers often have a tendency to focus their attention on a large amount of disciplinary content and students have many activities to carry out at school and outside school.

The list of activities is shown in 6.1 Activities.-

b. Probability

Probability : 2

c. Severity

Severity: 2

d. Mitigation strategy

Most of the STE(A)M activities will concern disciplinary contents, so teachers will propose a new methodological approch instead of the traditional lessons based on the centrality of the teacher, so that time will not represent a risk, because teachers would not need additional time. The activities will be carried out mainly at school, so as not to pose a problem for the afternoon extracurricular activities of the students.

7.2 – Risks/Opposition

a. Risk description

The list of activities is shown in 6.1 Activities.

Some teachers could oppose the methodologic change and they could show difficulty of adopting new approch, because they are used to a traditional lesson.

b. Probability

Probability: 3

c. Severity

Severity: 2

c. Mitigation strategy

The STE(A)M Project Manager of the school, will be available to teachers in difficulty and will support those who are skeptical in carrying out the activities.

7.3 – Risks/External Menace

a. Risk description

The worsening of the pandemic situation due to Covid-19 could lead to non-attendance in presence by students and online lessons. Experimental activities in the laboratories could not be carried out.
Any blockage in the financing of PON could lead to the impossibility of purchasing materials and digital equipment.

b. Probability

Probability: 2

c. Severity

Severity: 3

d. Mitigation strategy

We could choose and carry out experimental activities that make use of easy-to-use materials available at home.
We may use the funds of our school for Science and digital equipment.