

Section 1 - Summary

1.1 Author

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1.2 Background

I am Otilia-Maria Vasil and I teach computer science at the Simion Bărnuțiu Național College from Șimleu Silvaniei, România. I am a Microsoft Innovative Expert Educator, I am also part of the Advisory Board of Informatics teachers in Sălaj County.

1.3 Descriptive title

STE(A)M curriculum in high school

The point of this policy is the integration of STEAM education in classes who do not learn programming and make them feel confident that anyone can coding if they choose the right methods

1.4 Abstract

This educational policy applies to classes that do not study computing in theoretical high schools and beyond. The curriculum structure includes a component that is designed at the school level, in the form of a curriculum at the school's decision. This component is one in which STEAM education can be integrated, the rest of the curriculum being designed and approved at national level.

The beneficiaries of this policy are students of philology or technological profiles for whom it is desirable to acquire skills and attitudes specific to STEAM education to ensure a successful socio-professional insertion on the labor market knowing that in a few years they will practice professions that do not yet exist. .

The policy will be applied at local level, during a training cycle (4 years), 1 hour / week.

Section 2 – Goals

2.1 General goal

The general problem of education in Romania is the low share of STEAM education in the subjects currently taught modularly. The STEAM approach requires a cross-curricular and transdisciplinary approach. The school can meet the students through the curriculum at the decision of the school proposing contents that define particular learning paths.

2.2 General goal description

STEAM Designed and Enacted in School

If we look at the curriculum as a specific type of educational policy, we see that teachers are active players in the design of the curriculum, not only in its implementation

Their roles are multiple and in particular in relation to STEAM, it is via the methods they employ that they can support STEAM related objectives .

Key competences for lifelong learning

The Council Recommendation on key competences for lifelong learning from 2018

(European Commission, 2018), refers explicitly to the fact that nowadays, competence

requirements have changed with the result that technologies currently cover a crucial role in society and entrepreneurial, social and civic competences have become essential for citizens to adapt to change, and makes specific recommendation directed at Member States and the use of specific learning methodologies.

2.3 Strategic goals

1. Elaboration, by the end of the school year 2021-2022, of a structured guide for curriculum design in local development, promotion of STEAM education, specifying all contents
2. Organizing, during the summer vacation, for school teachers training programs for the development of skills needed to implement STEAM education.
3. Designing and approving the curriculum from the perspective of promoting STEAM education
4. Designing tools for evaluating and monitoring curriculum implementation in local development; collecting examples of good practice during the application of the designed curriculum (in the school year 2022-2023)
5. Establishment of an online library containing lesson plans and examples of good practice regarding the implementation of STEAM education through the curriculum at the school's decision, starting with September 2022 and until the end of the school year 2022-2023.

Section 3 – Targets

3.1 Beneficiaries

The final beneficiaries of the proposed policy are high school students with no computing background

The demand for digital skills continues to grow at a rapid pace. At European level, it is estimated that the labor market will register a very large shortage of IT professionals next year, according to a study by Codecool, one of the most important programming bootcamps in Central Europe.

According to studies, it is expected that in 2020 on the European labor market there will be a deficit of over 670,000 IT professionals. Qualified staff are now needed, more than ever, to enable Europe to strengthen its global competitiveness, given that innovation in the digital field has become a key factor.

In terms of the need to train as many IT professionals as possible, almost all of Europe faces the same challenges. Skills-based education and training are becoming increasingly important as a considerable number of new positions in the IT area require management and communication skills, as well as language skills and experience in project management in various industries, in addition to programming knowledge..

3.2 Recipients

The recipients of this policy are the same with the beneficiaries.

3.3 Special needs

In the member countries of the Organization for Economic Cooperation and Development, less than 1 in 5 IT graduates are girls, which means that a huge part of the population loses important professional opportunities.

In our classes girls are about 50%

Section 4 – Value Proposal

4.1 Value proposal

Writing a curriculum that includes STEAM principles

4.2 Results

- Guide for curriculum design at the school's decision, promoting STEAM education
- 15 teachers of our schools are introduced in the STE (A) M educational approach.
- IT application for the online library of useful resources

4.3 Impact

We propose that these courses of curriculum design at the decision of the school, promoting STEAM education to be part of the permanent offer of the school every year

Section 5 – Costs

5.1 Cost structure

- Labor (internal staff)
- Travel & Accommodations
- Rental of premises
- Furnishing
- Hardware
- Software
- Miscellaneous services

5.2 Funding opportunities

The local budget

European funds

The budget of the school unit

Section 6 – Action Plan

6.1 Activities

- Establishment, at school level, of the working groups for the curriculum program at the decision of the school (teachers from different disciplines)
- Organizing 4 workshops for the design of the transdisciplinary curriculum at the school's decision
- Organizing 3 workshops for the design of tools for evaluating and monitoring the implementation of the curriculum at the decision of the school in which the members of the design working groups and representatives of the school management will participate
- Buy or purchase necessary materials (microbits, Minecraft licenses, etc.)
- Determine where the online resource library will be (it can be a new domain or an existing one)
- Select the materials to be kept in the library

Section 7 - Risks

7.1 – Risks/Competition

For the establishment, at school level, of the working group for the Guide for the design of the transdisciplinary curriculum at the decision of the school

Risk:

Small number of offers, difficult selection, large workload for each member of the group, low quality results

b) Probability 1

c) Severity 3

d) Mitigation strategy

Resume the ad and reschedule

7.2 – Risks/Opposition

For Buy or purchase necessary materials (microbits, Minecraft licenses, etc.)

Risk:

delays in acquisitions

b. Probability 2

c. Severity 4

d. Mitigation strategy

Resumption of the procedure and looking for free alternatives

7.3 – Risks/External Menace

For Organizing 4 workshops for the design of the transdisciplinary curriculum at the school's decision

Risk:

Organizational difficulties (availability of financial and space resources)

b. Probability 1

c. Severity 2

d. Mitigation strategy Reprogramming