



ENJOY. SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS.

Results and Recommendations for classroom implementation

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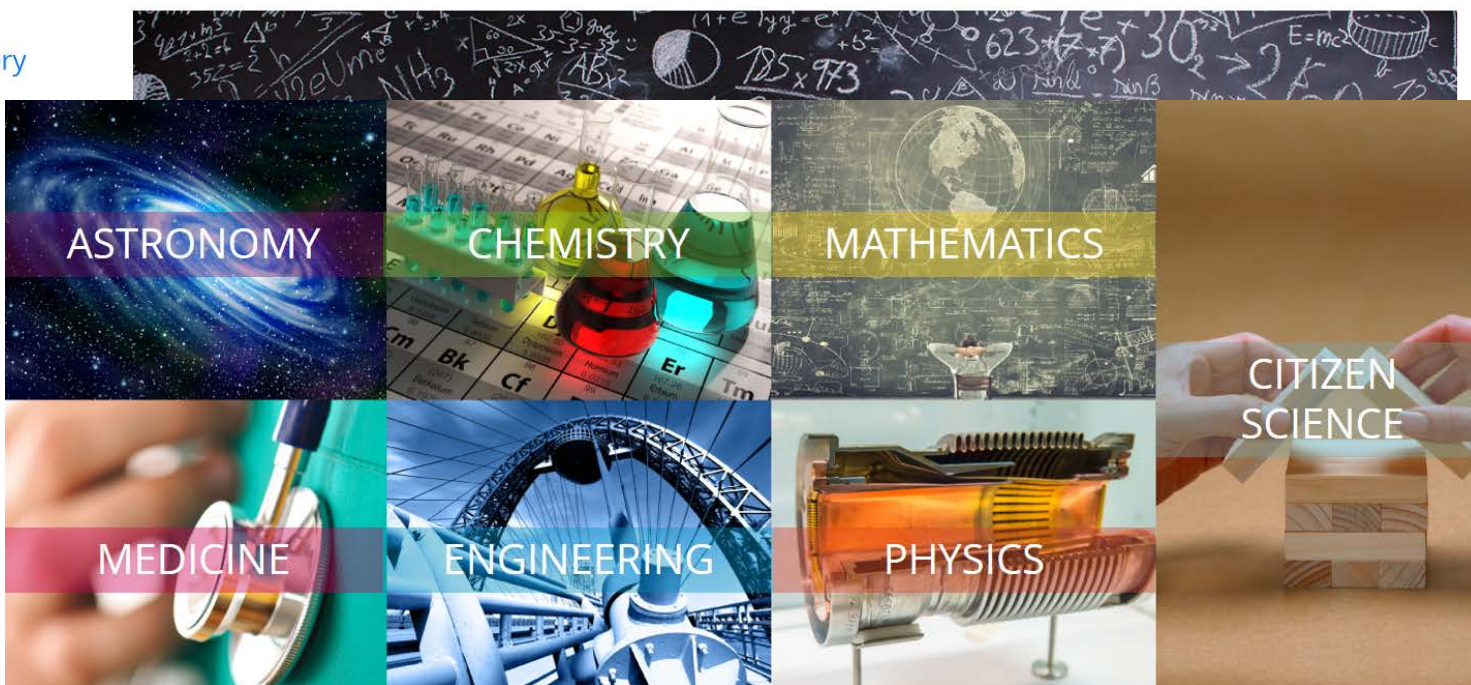


Open Learning Content Platform with different activities categorised into:

OLCMS ? Información Foro Cursos Nuestras materiales Registrarse Identificarse

Remote Laboratory

Help





We have implemented these activities across six European countries during the academic course 2017/2018:



SAMPLE DESCRIPTION

- 2056 students
- 120 teachers
- 68 schools



Method

To test the implementation of the activities, we developed several instruments including:

Student Attitudinal
questionnaires



Student semi-
structured interviews



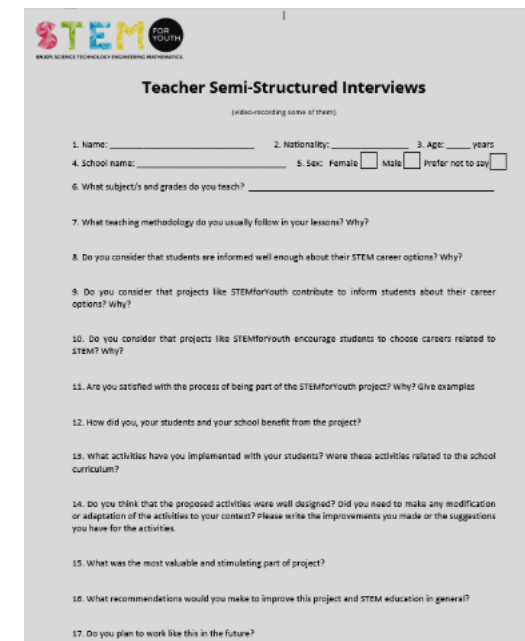
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Please provide the code number given by your teacher: _____

Student Semi-Structured Interviews
(video-recording some of them)

1. Are you satisfied with the process of being part of the STEMforYouth project? Why? Give examples |
2. How did you benefit from the project?
3. What was the most valuable and stimulating part of project?
4. Do you consider that the activities were prepared in an interesting and attractive way?
5. What activities have you done? What concepts have you learnt? Which activities did you like the most and the least? Why?
6. What recommendations would you make to improve this project and STEM learning in general?
7. Would you participate again in this project? Why?

Teacher semi-
structured interviews



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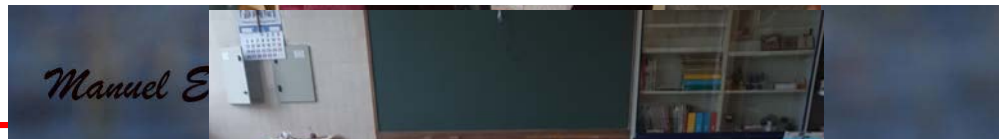
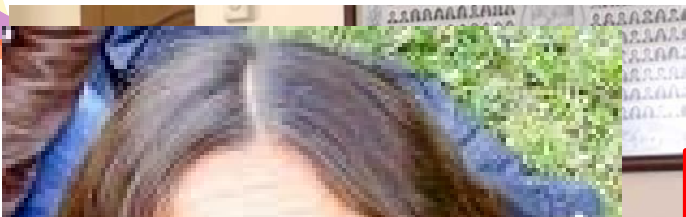
Teacher Semi-Structured Interviews
(video-recording some of them)

1. Name: _____
2. Nationality: _____
3. Age: _____ years
4. School name: _____
5. Sex: Female ☐ Male ☐ I prefer not to say ☐
6. What subject/s and grades do you teach? _____
7. What teaching methodology do you usually follow in your lessons? Why?
8. Do you consider that students are informed well enough about their STEM career options? Why?
9. Do you consider that projects like STEMforYouth contribute to inform students about their career options? Why?
10. Do you consider that projects like STEMforYouth encourage students to choose careers related to STEM? Why?
11. Are you satisfied with the process of being part of the STEMforYouth project? Why? Give examples
12. How did you, your students and your school benefit from the project?
13. What activities have you implemented with your students? Were these activities related to the school curriculum?
14. Do you think that the proposed activities were well designed? Did you need to make any modification or adaptation of the activities to your context? Please write the improvements you made or the suggestions you have for the activities.
15. What was the most valuable and stimulating part of project?
16. What recommendations would you make to improve this project and STEM education in general?
17. Do you plan to work like this in the future?

Results

- **Do STEMforYouth activities determine students' future career choice?**
 - Non-conclusive results were obtained from this project.

- **Do STEMforYouth activities influence student's motivation for learning?**
 - Yes, they do, but with some particularities. Factors such as teachers' motivation and interest are strongly affecting students' motivation for learning, regardless the teaching methodology.



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very stimulating practice for my students”

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“Hands-on activities really encouraged students
learning”



➤ **Do STEMforYouth activities significantly influence knowledge acquisition?**

- They don't influence knowledge acquisition significantly more than activities in regular lessons. However, STEMforYouth activities help to integrate, better than other activities, knowledge from different school subjects. Students also become aware of the applicability of the concepts and procedures learn at the school. (e.g. Hydraulic Arm)

➤ **Do STEMforYouth activities significantly influence the development of the Key Competences for LifeLong Learning?**

- Yes, they significantly impact the development of several of these key competences





➤ **Linguistic and Oral communication**

- Students develop the ability to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing, not only when working with their teammates but also when presenting their activities to others.

➤ **Mathematical, scientific and technological competence:**

- Students develop a sound mastery of numeracy, and an understanding of the natural world and an ability to apply knowledge and technology to perceived human needs



➤ **Digital competence:**

- The majority of the activities implied searching information on internet and the use of computers, working with different software, and also programming in different technology systems. ([e.g. Robot avoiding obstacles](#))

➤ **Learning to learn and Sense of initiative and entrepreneurship**

- Students develop the ability to plan and manage their own projects and learning by turning ideas into action through creativity, innovation, etc. ([e.g. Epigenetics Activity](#))

➤ **Social and civic competences and Cultural awareness:**

- Students participate effectively and constructively in one's social and working life and engage in active and democratic participation, especially in increasingly diverse societies ([e.g. Citizen Science Experiments](#))



Constrains and handicaps to implement the activities

➤ Time constrains

- Some of these activities are not one step problem-solving, but they are open activities that require time to be solved, not fitting within the regular educational systems schedules

➤ Resources

- Some of these activities require specific materials and/or laboratories to be developed





Constrains and handicaps to implement the activities

➤ Learning assessment methods

- Exams are normally driven the way of teaching, preparing students for specific exams that evaluate separate bits of knowledge

➤ Teachers' training

- Particularly at high school education, teachers are subject-specific often having difficulties to guide interdisciplinary activities



Some Recommendations for Implementation

- **Propose a challenge to the students. How can you motivate others with your work?**
 - Students should develop the activities to inspire others
 - It is very stimulating for them presenting their final products to others in conferences or Science Festivals, involving their families (creating a learning community)
- **Students should lead the resolution process, with teachers acting as facilitators of learning, motivating them**
- **Students may develop a power point and a video**
 - This will help them keeping track of their work and disseminating it

Some Recommendations for Implementation

- Establishing collaboration with teachers from other disciplines and researches who may help in the interdisciplinary process
- Involving teachers and students from the same school to work inside and outside of the classroom (again, creating a community)
- Never give up in the resolution process. You will face many difficulties that you will have to overcome. Reward and professional satisfaction at the end



Many thanks!

