Digital **I**mprovement by **G**ame **I**n **T**eaching

DIGITgame Project

Final International Virtual Conference & Game Award Ceremony
10 of December 2020

National Research Council of Italy
BioEconomy Institute

Co-funded by the Erasmus+ Programme of the European Union

36 MONTHS PROJCET DURATION
From 30-12-2017 to 29-12-2020
(including extension)

Intellectual Output 1
Pedagogical material

Intellectual Output 2
STEMgame Video Game platform

Intellectual Output 3
Toolkit for Players

Intellectual Output 4
Methodology for Exchange innovative experiences

5 PROJECT PARTNERS
3 COUNTRIES

National Research Council of Italy
BioEconomy Institute

Liceo Scientifico "Nicola Sensale"
Nocera Inferiore (Sa)

Clicks+Links

vakıf k12

TAGES

PROJECT FINANCED BY
ERASMUS+ PROGRAMME

Key action:
KA2 –
Cooperation for Innovation and the Exchange of Good Practices

Action:
KA201 –
Strategic Partnerships for school education

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Computers and technology have influenced the nature of the "digital native citizens" life and the most recent generation of students have grown up with these technologies. (Wang S. et al. 2014)

DIGITgame project intends to attract young people to STEM subjects by supplying an alternative way to use and apply basic and advanced scientific concepts in a technological tool very familiar and appealing as a videogame.

The project proposes a new approach to communicate and teach traditional topics of environmental sciences using the new thematic of Smart Cities and taking advantage introducing the videogame solution.

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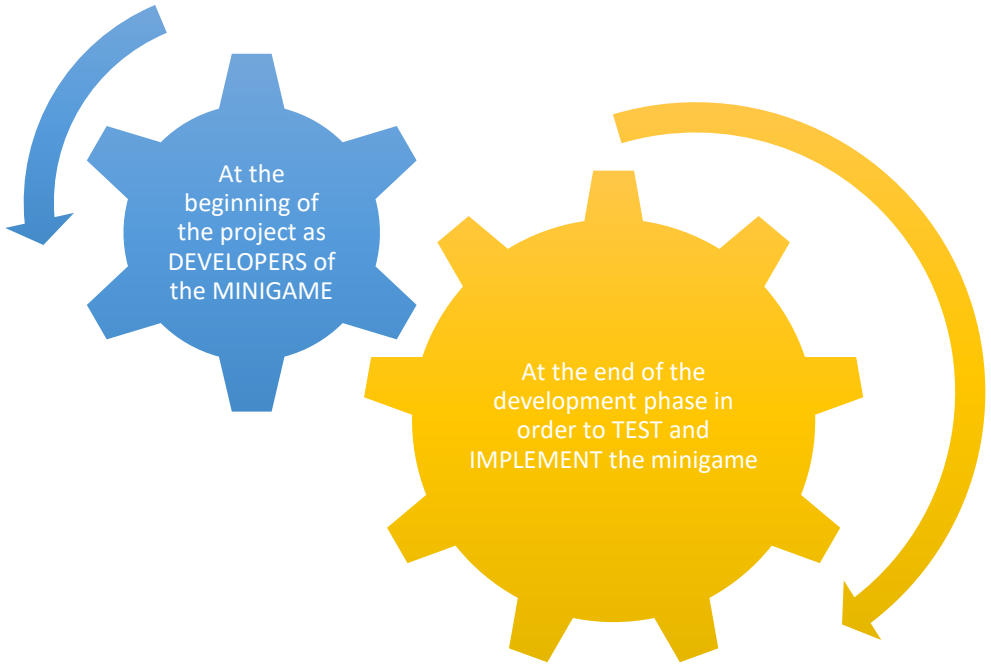
DIGITgame project involved students from14 to 16 ages in Italy and Turkey.
Different students are involved in two different pilot activities:



DEVELOPERS
SENSALE
K12

Students' activities:

- ✓ Administration of questionnaires
- ✓ Traditional lessons on STEM subject
- ✓ Creation of minigame
- ✓ Technological and IT support
- ✓ Direct contact with other students

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Didactic strategy designing

The innovative didactic idea is to involve students in build and tuning the videogames logic by making use of the scientific knowledge acquired in relation to the variables and assets identifies.

Variables are the game software structure that will be developed by the virtual world software Company. It is the general framework where students will develop the **Assets**.

VARIABLES

- Climate : Dry and windy; Hot and humid; Humid and cold (no seasons - yearly average)
- Industrialization: Low; Medium; High
- Level of Green: Low; Medium; High
- Green Transport

ASSETS

- Recycle Stations
- Trees (10 from Italy - 10 from Turkey)– related to VOC
- *Weather Stations*: One basic and one more advance (students will answer questions to modify their station from basic to advance)
- Questions about green transport and cars to increase money or score
- Solar Panels (the energy that is produced increases the score. The solar panels have to be buy)
- Smart Building (elements to build the house to increase the score and happiness)

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Didactic strategy designing

The aim of the mini-game is to combine and create a *file rouge* between entertainment education and use of entertainments features for education. The didactic strategy of the project is focused on the students' participative approach. After the identification of assets and variables the first group of students participated to the traditional lessons to deepen STEM subjects. In the same period, the software company involved in the project identified the platform that support the mini-game and developed the variables.
They have set three kind of places: small village, medium town and large city.

MINI

SMALL VILLAGE

MIDI

MEDIUM TOWN

MAXI

LARGE CITY

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Results of the questionnaires administrated to developer and implementer schools in Italy and Turkey

The aim of this double survey administration was to detect if the awareness and knowledge of STEM has increased as a result of the activities developed during the project.

	Response	*First questionnaire administrated* N=215		*Second questionnaire administrated* N=187	
		n. of responses	*%*	*n. of responses*	*%*
Gender	Male	130	*60.5*	115	*61.5*
	Female	85	*39.5*	72	*38.5*
Age Group	12-13	9	*4.2*	6	*3.2*
	14-15	96	*44.6*	81	*43.3*
	16-17	110	*51.2*	100	*53.5*
Country	Italy	113	*52.6*	103	*55.1*
	Turkey	102	*47.4*	84	*44.9*

The total sample interviewed was made up of 60.9% of male and 39.1% of female. Most of respondents have an age comprised between 16-17 (52.2%), followed by 44% from the 14-15 age group. Italian (53.7%) and Turkey (46.3%%) students was interviewed

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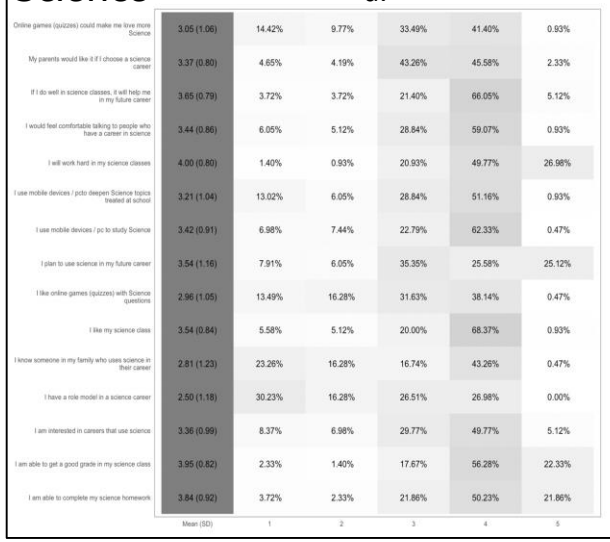
Science

a.



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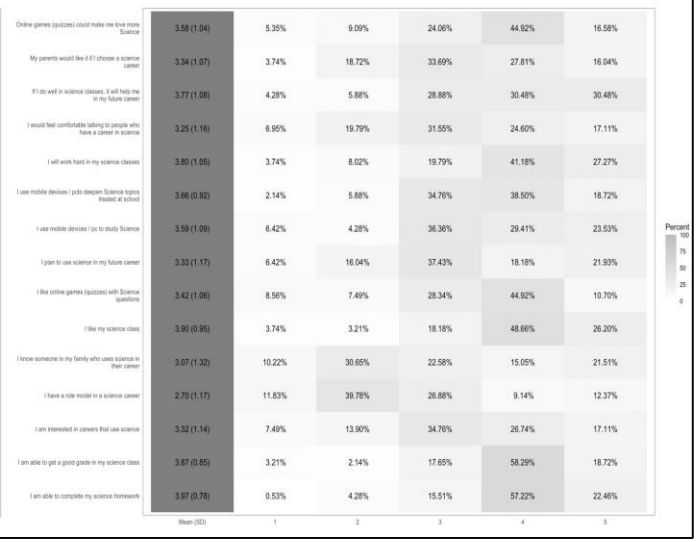
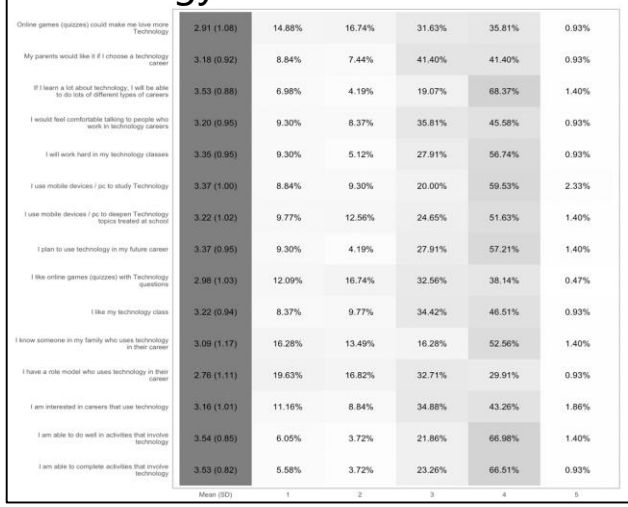


Technology

a.



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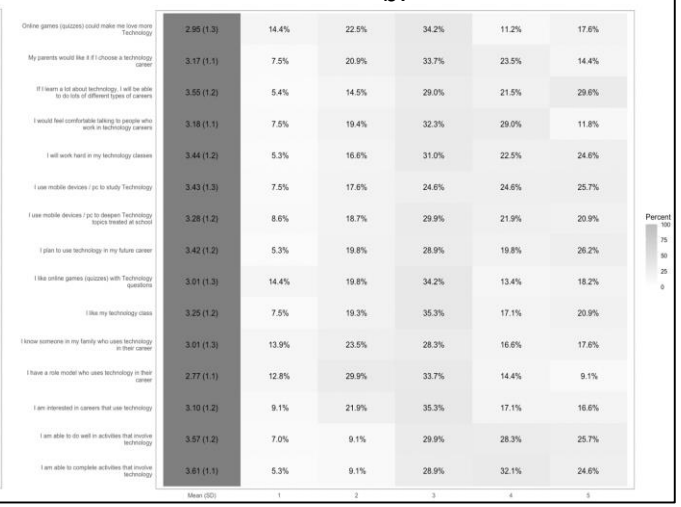

The comparison results highlight an interesting aspect related to the **increasing of knowledge** about the online quizzes and use of technologies in each STEM subjects. This result is in line with the aim of the project and activities carried out to students in Italy and Turkey. In particular, it is in line with the output IO2 which proposed a new approach to enhance the students' ability to learn scientific and ecological skills through the development of a mini-game.

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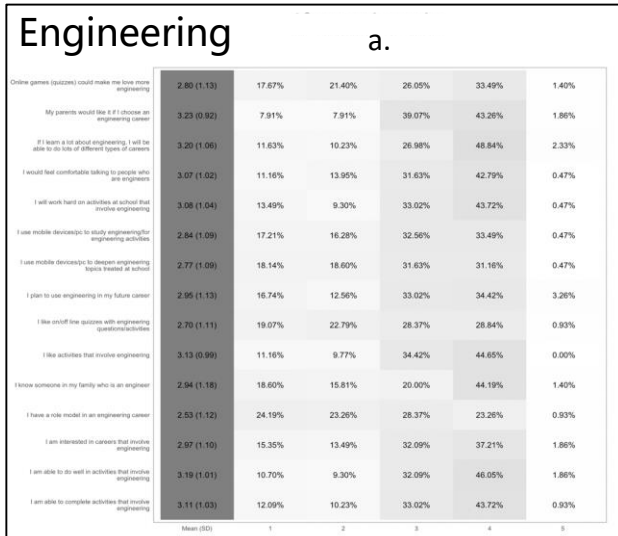
Engineering

a.



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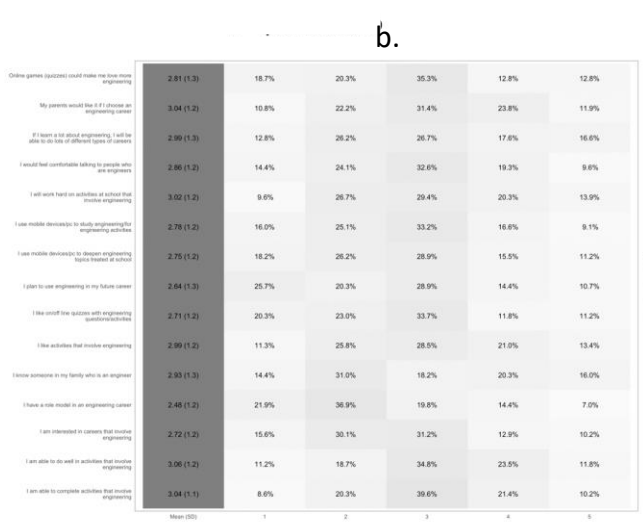
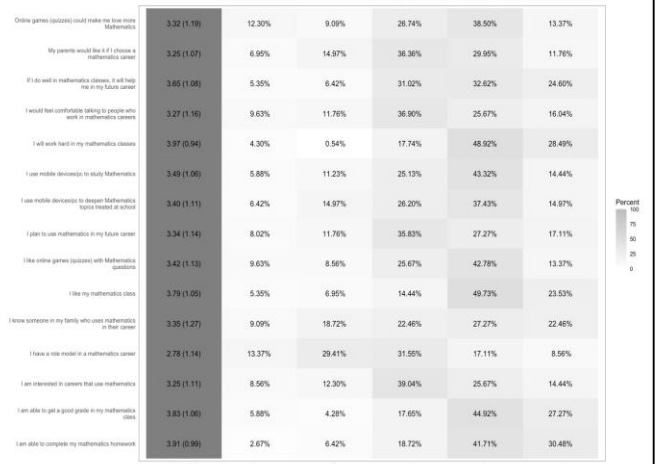


Mathematics

a.

b.



Results highlight a **lower level of knowledge in Engineering and Technology** compared to Mathematics and Science. This aspect could be related to the fact that in the Italian and Turkish schools the subject of engineering and technology are included in the scholastic curriculum, but at the same time they are not specify as subject in the schools' hours. Probably, students don't perceive these two subjects, despite being treated during schools' lessons, compared to mathematics and science which are subjects itemise in the daily schools' hours.

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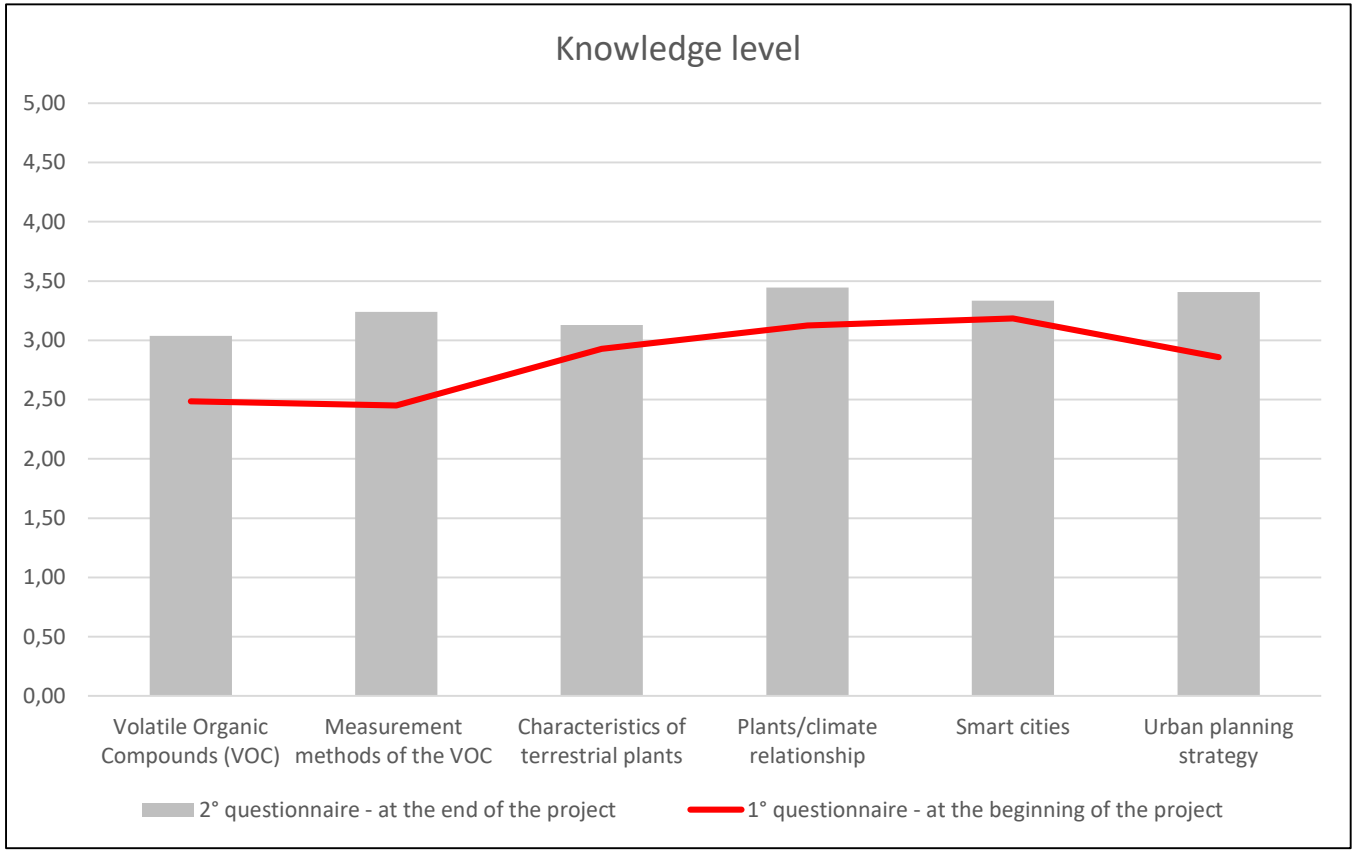

The figure shows a greater knowledge at the end of the project of the topics treated in comparison to the level of knowledge expressed during the first administration of the questionnaire at the beginning of the project. **For all topics addressed an increase in knowledge was recorded**. In particular the higher percentage of increase was emerged related to the *measurement methods of the VOC* (+0.79%), *Volatile Organic Compound* (+0.55%) and *urban planning strategy* (+0.55%).

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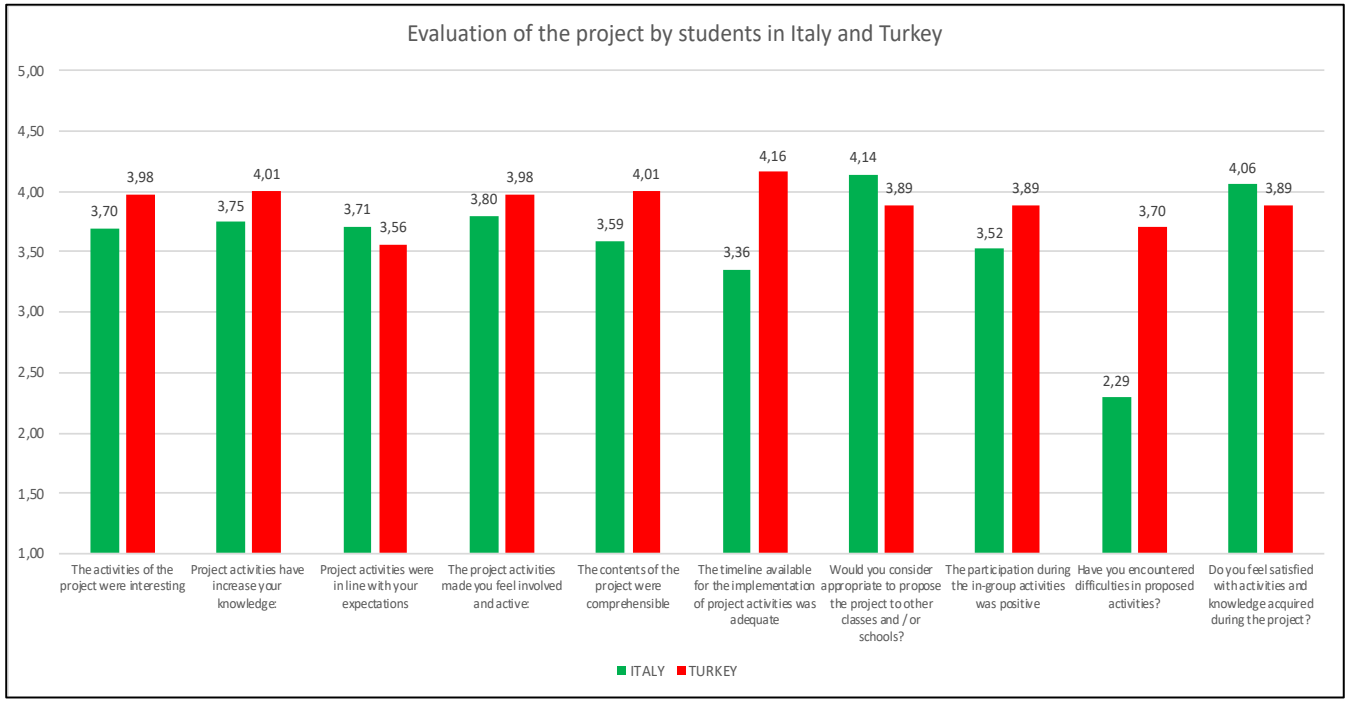
Final evaluation fo the project.
Results of the questionnaires administrated in Italy and Turkey



STUDENTS EVALUATION

- Good level of satisfaction related to all questions both for students involved in Italy both in Turkey.
- The mean of all the questions is over 3.8.
- All students declared that the activities carried out have increased their knowledge. Moreover, all of them felt involved in the activities carried out and suggest to propose the project to other classes and schools.

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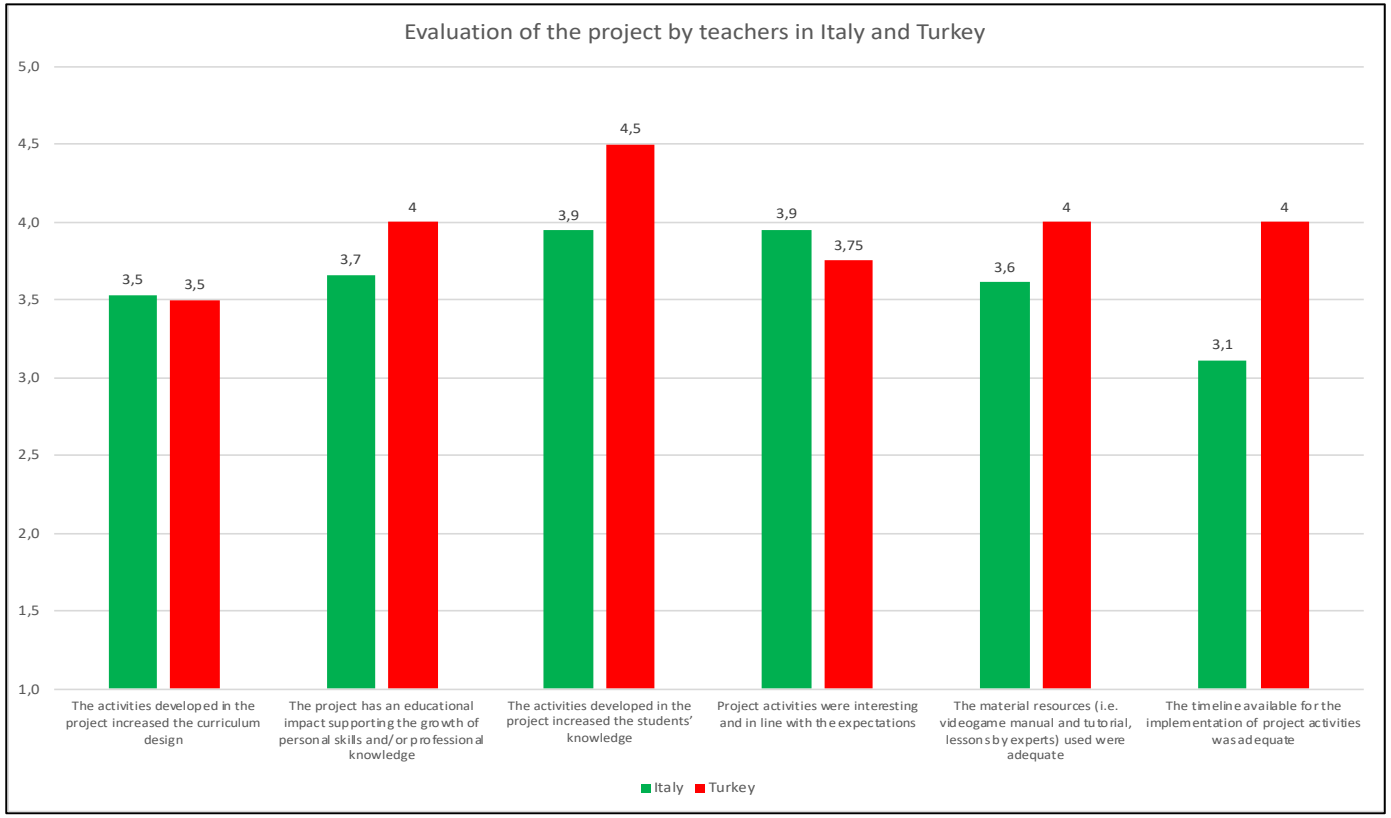

TEACHERS EVALUATION

- Good level of satisfaction for all questions.
- It's interesting to note that also professors argue that the project's activities increased students' knowledge (mean 3.9) and that material resources (such as videogame, tutorial, lessons by experts, etc.) used to carried out the project activities were adequate.

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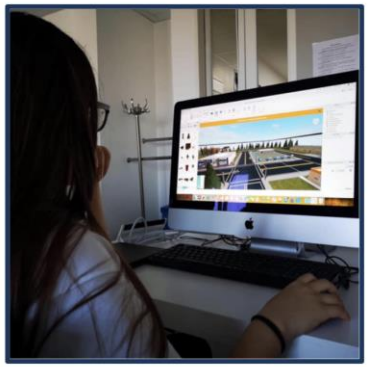
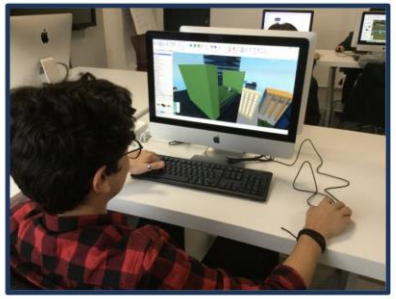
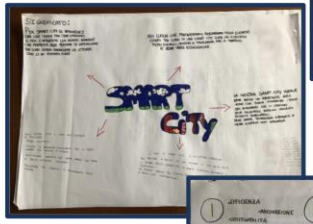
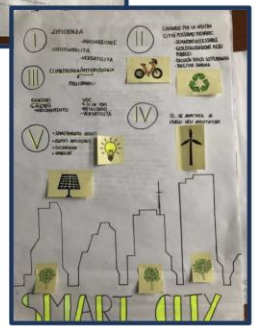
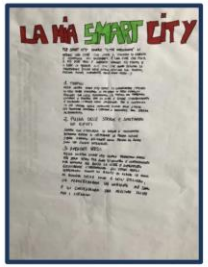
THANKS FOR YOUR ATTENTION AND PARTICIPATION











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