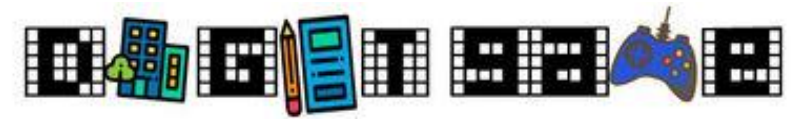




Digital Improvement by **G**ame In Teaching

DIGITgame Project

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



36 MONTHS PROJECT 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



vakifk12

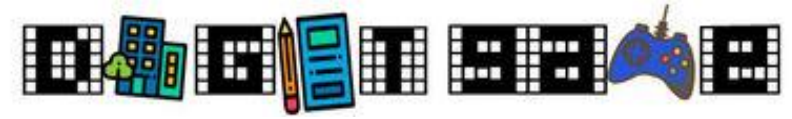
TAGES

PROJECT FINANCED BY
ERASMUS+ PROGRAMME



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

Action:
KA201 –
Strategic Partnerships for
school education



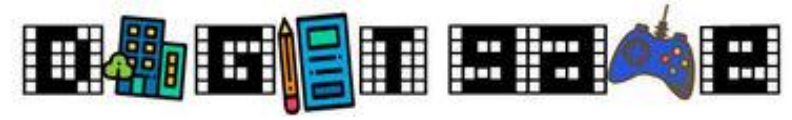
Computers and technology have influenced the nature of the "digital native citizens" life and the most recent generation of students have grown up with these technologies. (Wang S. et al. 2014)

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.



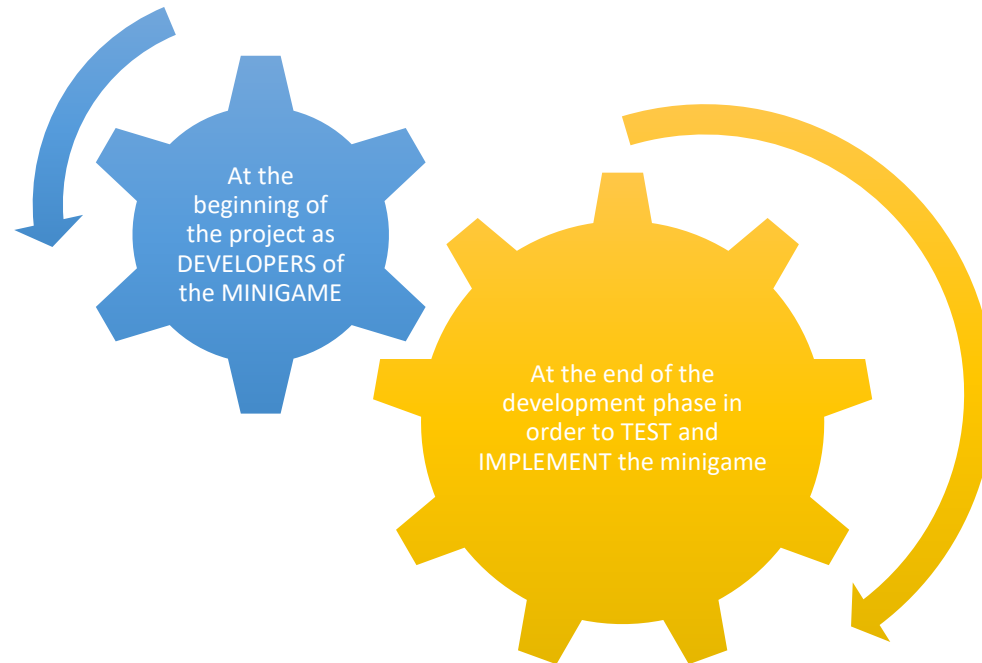
The project proposes a new approach to communicate and teach traditional topics of environmental sciences using the new thematic of **Smart Cities** and taking advantage introducing the **videogame solution**.





DIGITgame project involved students from 14 to 16 ages in Italy and Turkey.
Different students are involved in two different pilot activities:

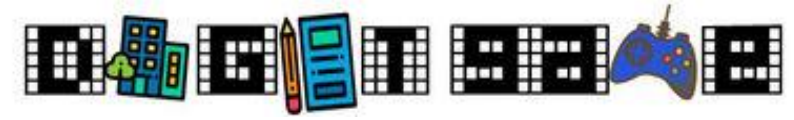
DEVELOPERS
SENSALE
K12



Students' activities:

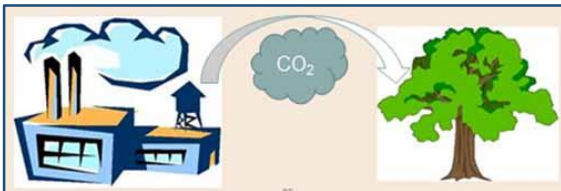
- ✓ Administration of questionnaires
- ✓ Traditional lessons on STEM subject
- ✓ Creation of minigame
- ✓ Technological and IT support
- ✓ Direct contact with other students



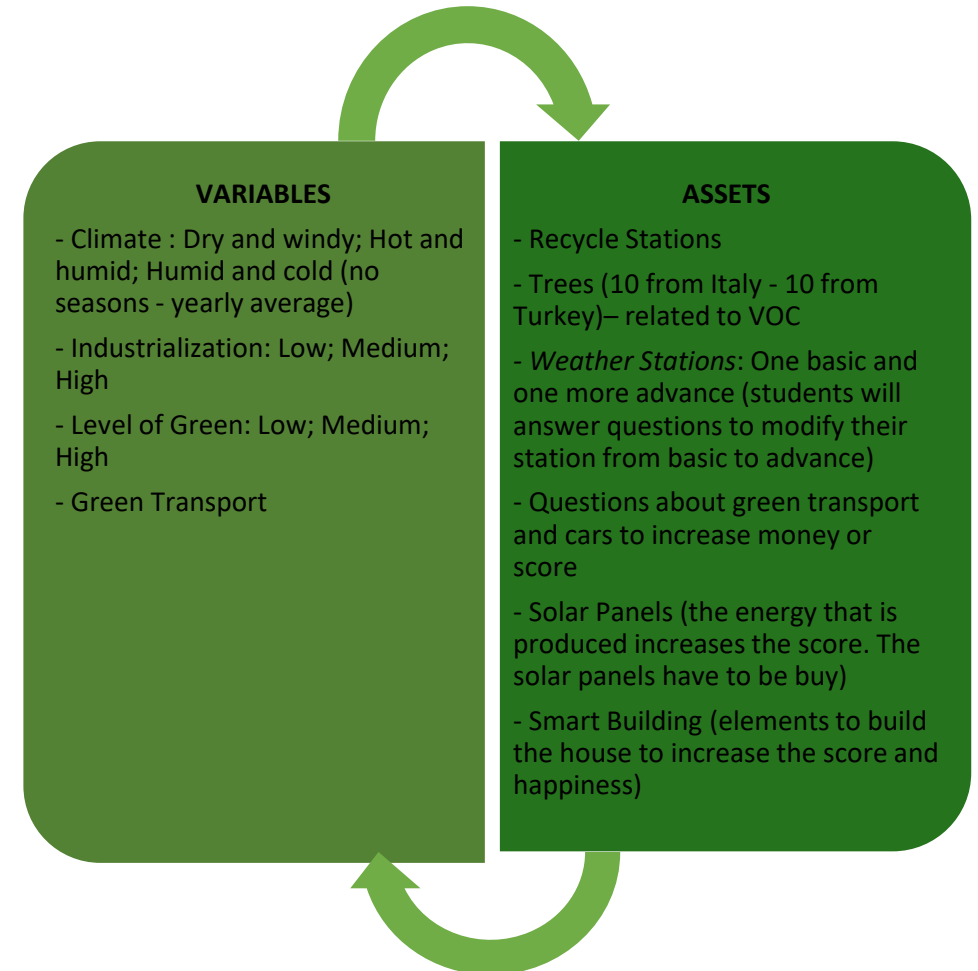


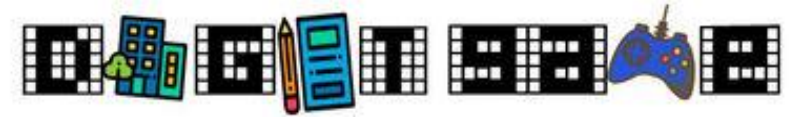
Didactic strategy designing

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**.





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

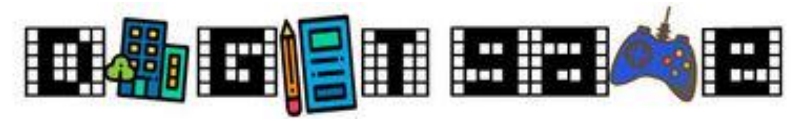


MEDIUM TOWN

MAXI



LARGE CITY

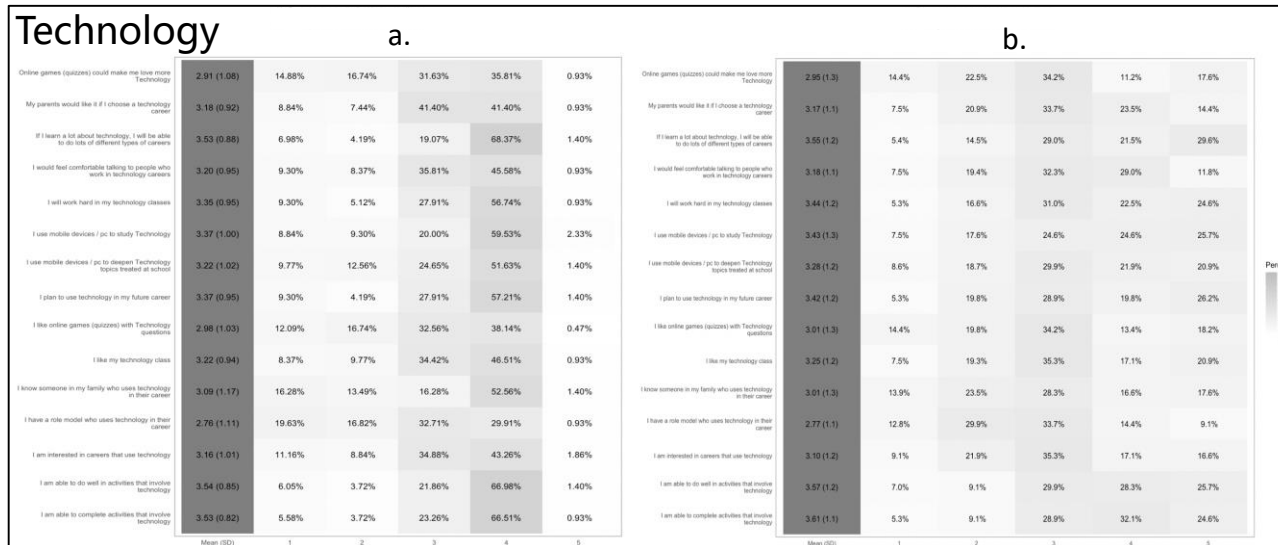
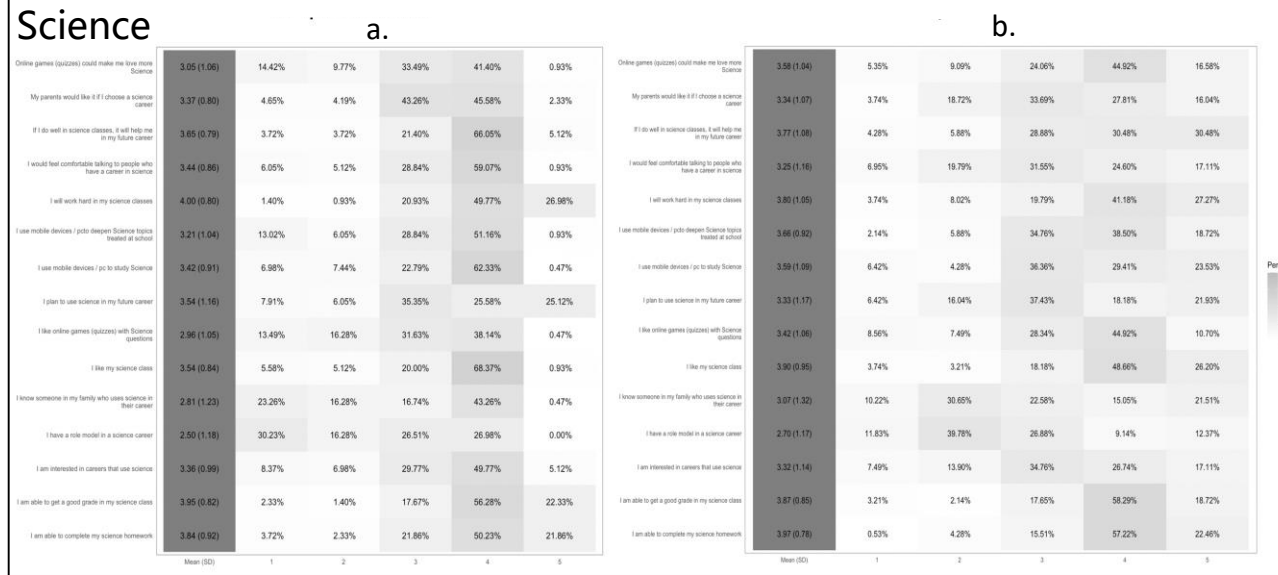
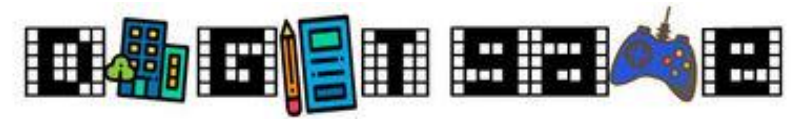


Results of the questionnaires administrated to developer and implementer schools in Italy and Turkey

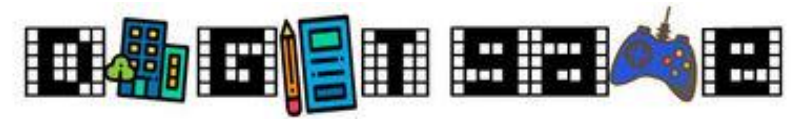
The aim of this double survey administration was to detect if the awareness and knowledge of STEM has increased as a result of the activities developed during the project.

	<i>Response</i>	<i>First questionnaire administrated N=215</i>		<i>Second questionnaire administrated N=187</i>	
		<i>n. of responses</i>	<i>%</i>	<i>n. of responses</i>	<i>%</i>
<i>Gender</i>	Male	130	60.5	115	61.5
	Female	85	39.5	72	38.5
<i>Age Group</i>	12-13	9	4.2	6	3.2
	14-15	96	44.6	81	43.3
	16-17	110	51.2	100	53.5
<i>Country</i>	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



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.



Engineering

a.

Online games (quizzes) could make me love more engineering	2.80 (1.13)	17.67%	21.40%	26.05%	33.49%	1.40%
My parents would like it if I choose an engineering career	3.23 (0.92)	7.91%	7.91%	39.07%	43.26%	1.86%
If I learn a lot about engineering, I will be able to do one of different types of careers	3.20 (1.06)	11.63%	10.23%	26.98%	48.84%	2.33%
I would feel comfortable talking to people who are engineers	3.07 (1.02)	11.18%	13.95%	31.63%	42.79%	0.47%
I will work hard on activities at school that involve engineering	3.06 (1.04)	13.49%	9.30%	33.02%	43.72%	0.47%
I use mobile devices to study engineering/for engineering activities	2.84 (1.09)	17.21%	16.28%	32.56%	33.49%	0.47%
I use mobile devices to deepen engineering topics learned at school	2.77 (1.09)	18.14%	18.60%	31.63%	31.18%	0.47%
I plan to use engineering in my future career	2.95 (1.13)	16.74%	12.56%	33.02%	34.42%	3.26%
I like online live quizzes with engineering questions/activities	2.70 (1.11)	19.07%	22.79%	28.37%	28.84%	0.93%
I like activities that involve engineering	3.13 (0.99)	11.18%	9.77%	34.42%	44.65%	0.00%
I know someone in my family who is an engineer	2.94 (1.18)	18.60%	15.81%	20.00%	44.19%	1.40%
I have a role model in an engineering career	2.53 (1.12)	24.19%	23.29%	26.37%	23.26%	0.93%
I am interested in careers that involve engineering	2.97 (1.10)	15.35%	13.49%	32.09%	37.21%	1.86%
I am able to do well in activities that involve engineering	3.19 (1.01)	10.70%	9.30%	32.09%	46.65%	1.86%
I am able to complete activities that involve engineering	3.11 (1.03)	12.09%	10.23%	33.02%	43.72%	0.93%
Mean (SD)		1	2	3	4	5

b.

Online games (quizzes) could make me love more engineering	2.81 (1.3)	18.7%	20.3%	35.3%	12.8%	12.8%
My parents would like it if I choose an engineering career	3.04 (1.2)	10.8%	22.2%	31.4%	23.8%	11.9%
If I learn a lot about engineering, I will be able to do one of different types of careers	2.99 (1.3)	12.8%	26.2%	26.7%	17.6%	16.6%
I would feel comfortable talking to people who are engineers	2.86 (1.2)	14.4%	24.1%	32.6%	19.3%	9.6%
I will work hard on activities at school that involve engineering	3.02 (1.2)	9.8%	26.7%	29.4%	20.3%	13.9%
I use mobile devices to study engineering/for engineering activities	2.78 (1.2)	16.0%	25.1%	33.2%	16.6%	9.1%
I use mobile devices to deepen engineering topics learned at school	2.75 (1.2)	18.2%	26.2%	28.9%	15.5%	11.2%
I plan to use engineering in my future career	2.64 (1.3)	25.7%	20.3%	28.9%	14.4%	10.7%
I like online live quizzes with engineering questions/activities	2.71 (1.2)	20.3%	23.0%	33.7%	11.8%	11.2%
I like activities that involve engineering	2.99 (1.2)	11.3%	25.8%	28.5%	21.0%	13.4%
I know someone in my family who is an engineer	2.93 (1.3)	14.4%	31.0%	18.2%	20.3%	16.0%
I have a role model in an engineering career	2.45 (1.2)	21.9%	38.9%	19.6%	14.4%	7.0%
I am interested in careers that involve engineering	2.72 (1.2)	15.6%	30.1%	31.2%	12.9%	10.2%
I am able to do well in activities that involve engineering	3.06 (1.2)	11.2%	18.7%	34.8%	23.5%	11.8%
I am able to complete activities that involve engineering	3.04 (1.1)	8.6%	20.3%	39.6%	21.4%	10.2%
Mean (SD)		1	2	3	4	5

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.

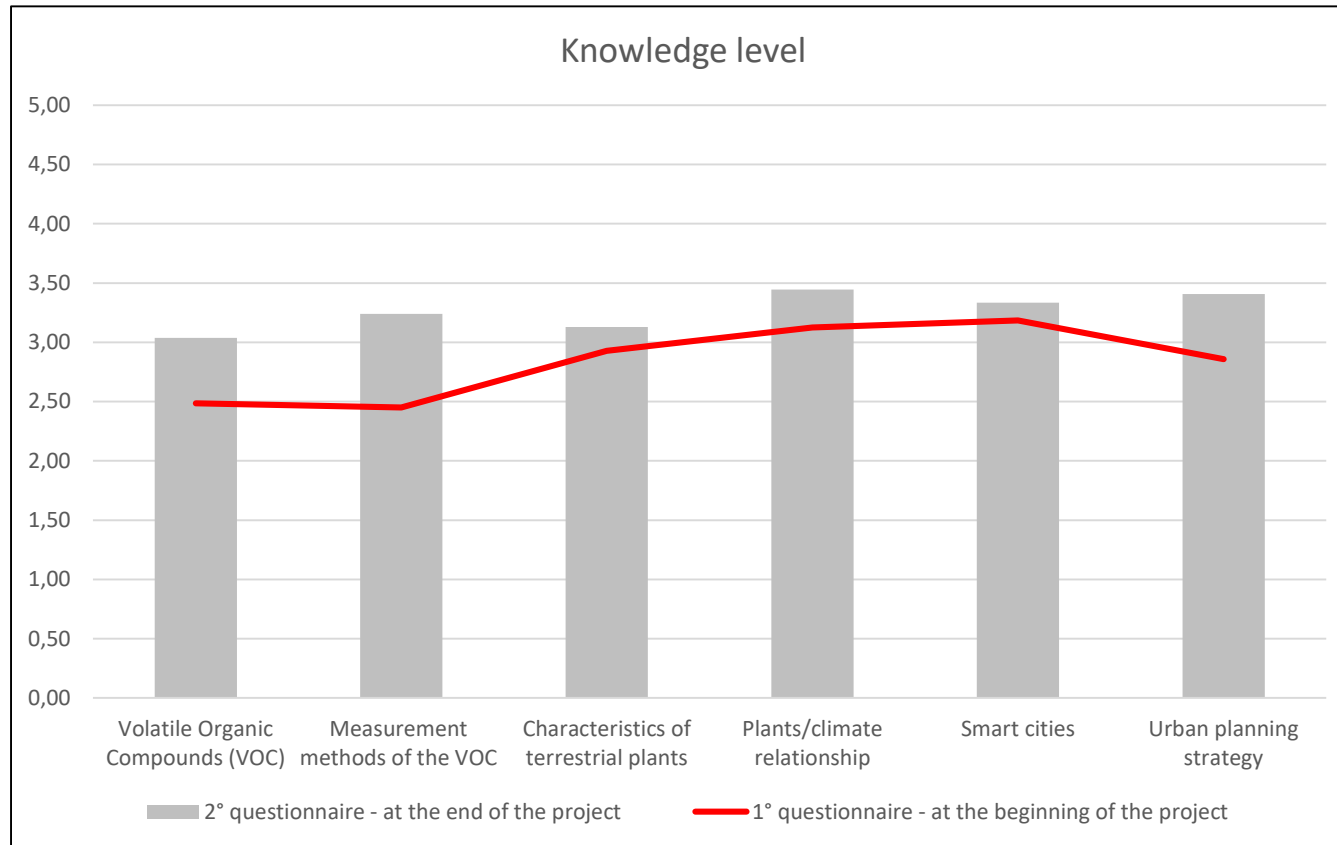
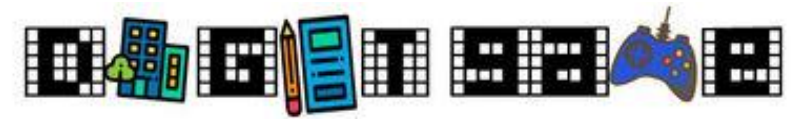
Mathematics

a.

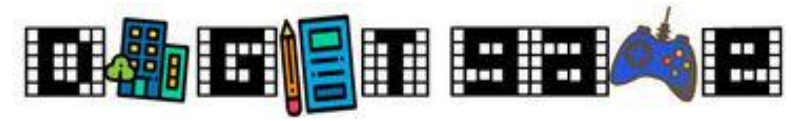
Online games (quizzes) could make me love more Mathematics	3.03 (1.05)	11.63%	18.14%	28.84%	40.00%	1.40%
My parents would like it if I choose a mathematics career	3.20 (0.88)	7.44%	6.51%	46.05%	38.60%	1.40%
If I do well in mathematics classes, I will help me in my future career	3.68 (0.72)	2.33%	3.72%	21.86%	67.91%	4.19%
I would feel comfortable talking to people who work in mathematics careers	3.27 (0.92)	7.91%	7.91%	34.88%	48.37%	0.93%
I will work hard in my mathematics classes	3.75 (0.53)	0.47%	2.79%	18.60%	77.67%	0.47%
I use mobile devices to study Mathematics	3.29 (1.04)	11.16%	9.30%	19.53%	59.07%	0.93%
I use mobile devices to deepen Mathematics topics learned at school	3.14 (1.06)	12.09%	13.02%	24.65%	49.30%	0.93%
I plan to use mathematics in my future career	3.31 (0.86)	5.12%	9.30%	36.74%	47.44%	1.40%
I like online games (quizzes) with Mathematics questions	3.13 (1.06)	10.70%	16.28%	23.26%	48.37%	1.40%
I like my mathematics class	3.43 (0.92)	6.98%	8.84%	19.07%	64.65%	0.47%
I know someone in my family who uses mathematics in their career	3.19 (1.11)	13.95%	10.70%	19.07%	54.88%	1.40%
I have a role model in a mathematics career	2.69 (1.12)	20.93%	20.00%	28.84%	29.77%	0.47%
I am interested in careers that use mathematics	3.16 (1.04)	12.09%	8.84%	32.09%	45.12%	1.86%
I am able to get a good grade in my mathematics class	3.67 (0.70)	2.79%	3.26%	19.53%	73.02%	1.40%
I am able to complete my mathematics homework	3.60 (0.80)	4.19%	6.05%	17.21%	71.16%	1.40%
Mean (SD)		1	2	3	4	5

b.

Online games (quizzes) could make me love more Mathematics	3.32 (1.19)	12.30%	9.09%	26.74%	38.50%	13.37%
My parents would like it if I choose a mathematics career	3.25 (1.07)	6.95%	14.97%	36.36%	29.95%	11.76%
If I do well in mathematics classes, I will help me in my future career	3.65 (1.08)	5.35%	6.42%	31.02%	32.62%	24.60%
I would feel comfortable talking to people who work in mathematics careers	3.27 (1.16)	9.63%	11.76%	36.90%	25.67%	16.04%
I will work hard in my mathematics classes	3.97 (0.94)	4.30%	0.54%	17.74%	48.92%	28.49%
I use mobile devices to study Mathematics	3.49 (1.06)	5.88%	11.23%	25.13%	43.32%	14.44%
I use mobile devices to deepen Mathematics topics learned at school	3.40 (1.11)	6.42%	14.97%	26.20%	37.43%	14.97%
I plan to use mathematics in my future career	3.34 (1.14)	8.02%	11.76%	35.83%	27.27%	17.11%
I like online games (quizzes) with Mathematics questions	3.42 (1.13)	9.63%	8.56%	25.67%	42.78%	13.37%
I like my mathematics class	3.79 (1.05)	5.35%	6.95%	14.44%	49.73%	23.53%
I know someone in my family who uses mathematics in their career	3.35 (1.27)	9.09%	19.72%	22.46%	27.27%	22.46%
I have a role model in a mathematics career	2.78 (1.14)	13.37%	29.41%	31.55%	17.11%	8.56%
I am interested in careers that use mathematics	3.25 (1.11)	8.56%	12.30%	39.04%	25.67%	14.44%
I am able to get a good grade in my mathematics class	3.83 (1.06)	5.88%	4.28%	17.65%	44.92%	27.27%
I am able to complete my mathematics homework	3.91 (0.96)	2.67%	6.42%	18.72%	41.71%	30.48%
Mean (SD)		1	2	3	4	5

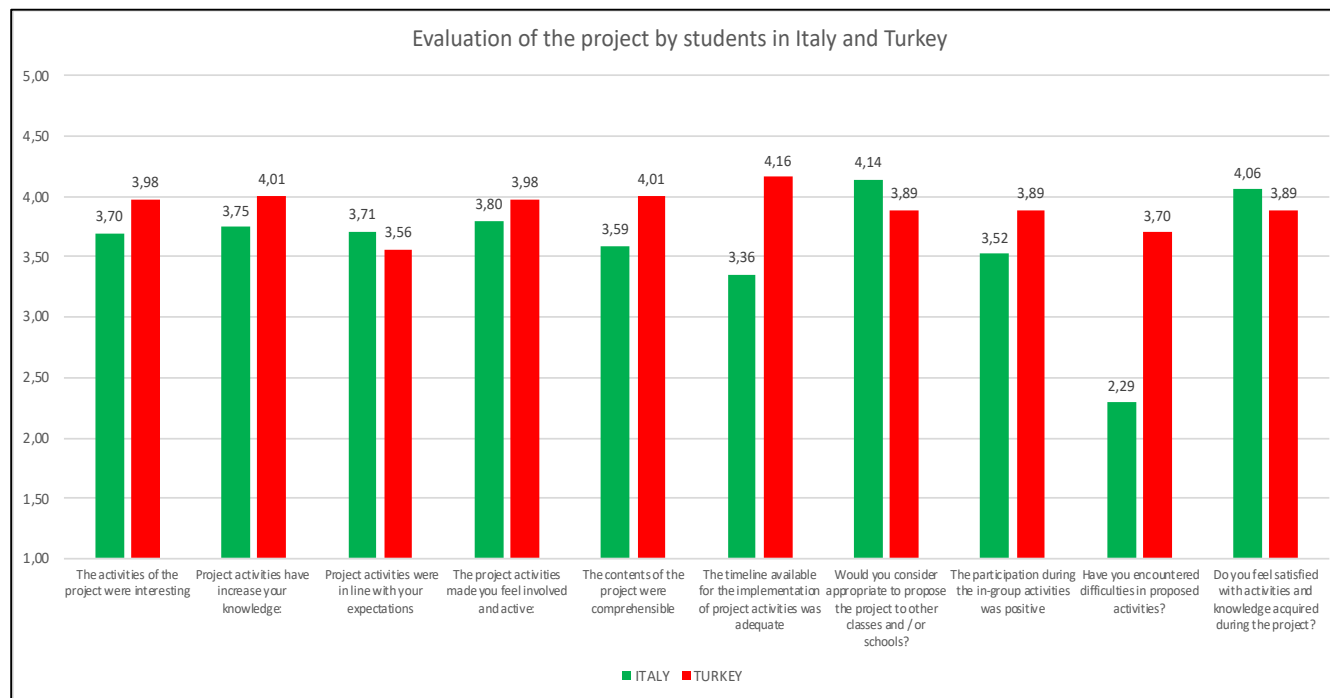


The figure shows a greater knowledge at the end of the project of the topics treated in comparison to the level of knowledge expressed during the first administration of the questionnaire at the beginning of the project. **For all topics addressed an increase in knowledge was recorded.** In particular 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%).



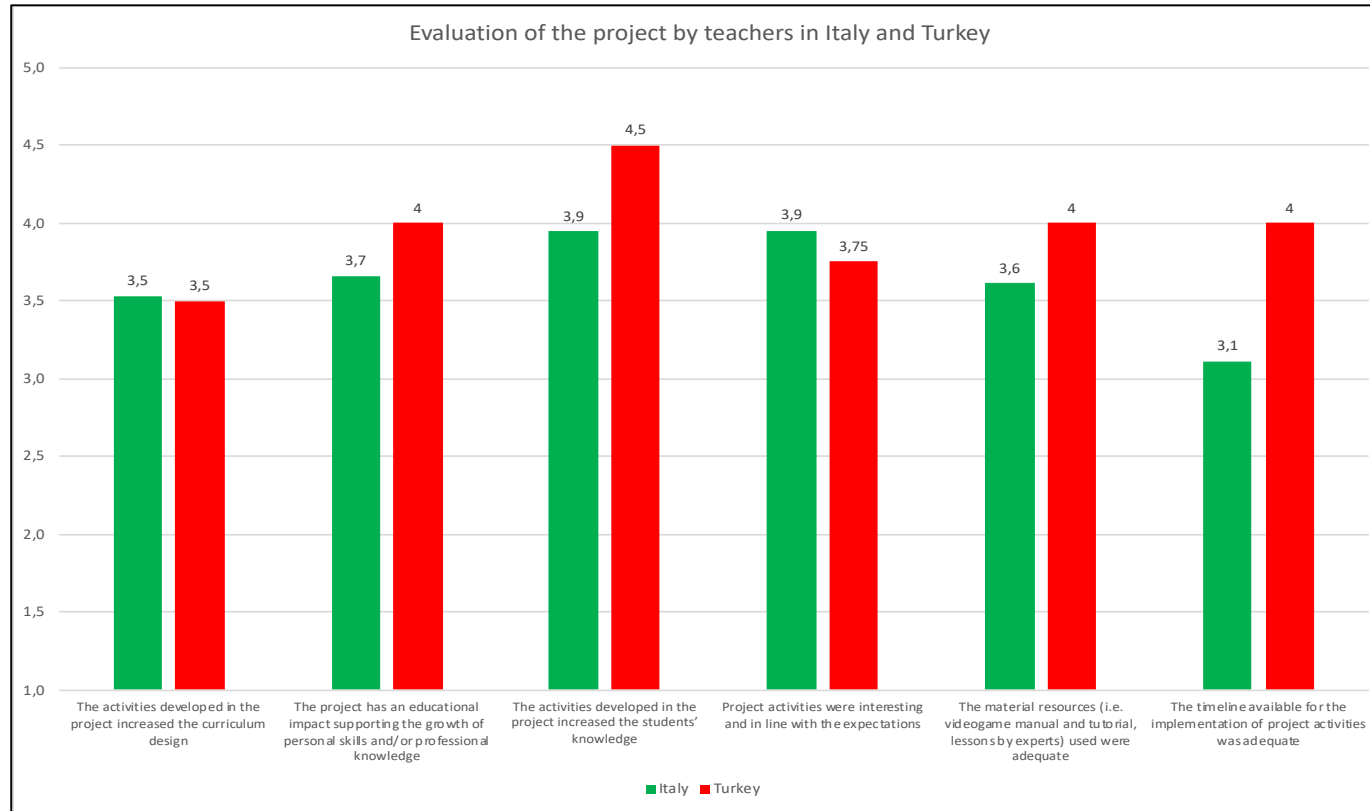
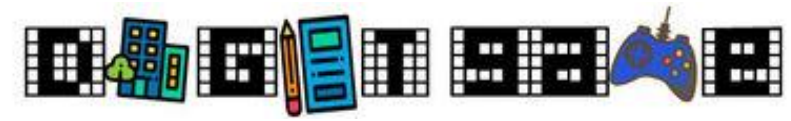
Final evaluation fo the project.

Results of the questionnaires administrated in Italy and Turkey



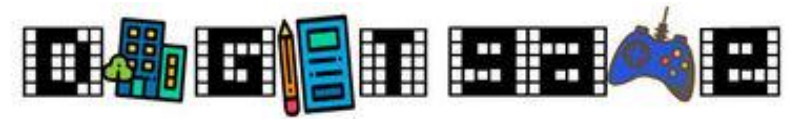
STUDENTS EVALUATION

- 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.



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.



THANKS FOR YOUR ATTENTION AND PARTICIPATION

