

- This format will have to be completed by those teachers who will implement the experiences regarding the project STEM: ENGINEERS OF FUTURE 2015-1-TR01-KA201-022304
- The format will then have to be uploaded on the specific e-twinning space or sent to your contact person for loading on the e-twinning-space.
- In order to document the project it will be important to upload photos and videos documenting the work done

TOPICS TO BE COVERED in 8 sparse WEEKS max.

1- NATURE OF STEM 2- ENERGY CONVERSION 3- SENSE AND RESPONSE 4- CONTROL- LOGIC 5- ETHICS
Title of the experience: One Probot and three Beebots wandering around paths School: Mohandas Karamchand Gandhi
Class/Age11-12years Number of students20(males10 females10)
Teachers involved: 1. NameErika D'Ambrosio_ SubjectMath & Science

- 2. Name ___Matthias Stohrer_ Subject ____Special Teacher____
- 3. Name _____ Franceso Mori _____ Subject _____ Italian Literature ____

Start date _October 17th 2016_End date February 28th 2017____ Aims and objectives:

- a) Helping each other in so many ways, from talking in English to interpreting instructions;
- b) Using computational and programmable machines for a specific goal and having fun too;
- c) Applying measurement criteria in different contests, using a versatile instrument such as a Probot or Beebot tool;
- d) Switching between different representations and applications of length and angle measurements.

Tools / Kit used:

Paper and pen, four (only) computers available, one (only) Probot and three Beebot and... much creativity.

In connection with science activities and in order to promote continuity in children experiments, we recovered some cardboards they had prepared the previous year (when they were asked to check the rotation angle of the sun in the school yard) so that they could draw on them again, using the pen (insted of their hand) controlled by the Probot. In fact this was the first step, in tight relation to what had been observed and studied in the past, of many lessons dedicated to angles and direction changes.

I found angles are a subject in geometry, fundamental indeed, rather difficult for kids to manage, maybe because angles and directions are quite abstract.

Assessment procedures

In order to introduce the relevance of what we were up to, a few tutorials have been shown to the involved class at the LIM (Lavagna Interattiva Multimediale that is an interactive big screen connected to a PC). The nice part was watching kids from all over the world explaining and describing their activities, which spurred our children and challenged them a little. Our kids have been forced to think more actively in terms of logic, since a programmable language is rigorous even when it's simple. Mistakes have always been the sparkle to start discussion and also to conceive corrections in a sort of test and trial esperimental method.

Cross-curricular connections (explain how the experience connects more subjects) Mathematics: we used Beebots to evaluate lenghts, introducing the concept of measurement by means of the steps that are to be incremented by children in their simple code. Science: since cardboards had been previously prepared to quantify both the apparent sun motion

during one day and among different days, the machines have been used to draw lines at 30 degrees from each other, exploring angles.

Logic: pieces of imformation have been considered in a two'way communication back and forth between kids and the Probot, which does what it is intended to and, if something is wrong or missed, problems must be found out along the lines. This helped the critical thinking of our very young children.

Visibility within the Institute (explain how the experience has been enhanced within the institution)

The work that has been done shall be illustrated to all families and children within our school in June, when a Creativity Festival is arranged every year. Were some Probots (we got only one and loaned) bought by the whole Institute more teachers could use them and create other activities in every field (such as a puppet show in English as it was done, for example, a few years ago within a multidisciplinary project named Acariss).

Explain if/how traditional curriculum elements have been changed The core is not affected.

The most important outcome is getting together many disciplines (geometry, programming and computational skills, robotics, English language, logic) and educational tools. The ethic part was all over since, for example, any action the probot has ever taken, was a result of an instruction sequence, which has taught our children their responsibility because errors are not due to the robot.

Datas

Class that makes the experience: seven grade

	Maths	Science	Language	Foreign language
October	В	D		
December	С	С		

Similar class which doesn't achieve the experience

	Maths	Science	Language	Foreign
				language
October	C	C		
December	C	В		
A = Excellent	C = Good		E = poor	
B = Very Good	D = Average			

Teacher's reflections on the experience achieved

(underline the strengths and weaknesses):

One only probot is a problem since group working is an asset only when the number of components is optimal, otherwise the better ones (which means more motivated but also less shy) are naturally in charge of most of the activities and the remaining part just watches. For sure any small number is better than zero and we are both grateful to the Center of Educational and Didactical Resources for having provided our school the opportunity of experimenting a bite of innovative learning techniques along with new tools. With a view to choose (next year) the high school to go to (which is a tough decision) the STEM Project helped both those who are mathematically talented and the ones who are not really gifted neither for informatics nor for "engineering" approach to life to ponder that with a view to a long-term carrier which is starting early next year.

Students' reflections on the experience achieved (underline the strengths and weaknesses):

First of all let me mention the class that was used as the control set for letting measurable improvements with no robotic activity emerge was not pleased by the role they had to play, as they had thought they would be involved in the project too. This is quite a positive result.

The other outstanding comment is that the students opnion concerning how nice is the way something is learnt is never taken seriously into account, as only percentages of success, coming out in test results, are data that statistical analysis focus generally on (nationwide when examinations are to be passed and locally in each school as well).