Report of educational activity

Title of activity	Solar Car
School level	Primary school
Date	January 2019
Country	Italy
Teaching subject	Sciences
Number and age-range of students	22 students, 10 years old
Working language	Italian
Type of activity	In-school classroom activity
Level of difficulty	The level of difficult was high because this workshop normaly is done in middle school
Learning objectives	Design and buil a simply vehicle Design and build a simply solar vehicle How solar energy works Lern the basics of electronics and mechanics How we can protect our world from smog and other pollution

General description of activity	The activity was done in 2 phases. 1. Prepare groups of students and brain storming in each group about what they wanted create. Explore the materials available. Design the project of vehicle. 2. Buil and create the vehicles design. Choice of necessary materials to realize. Test drive. Plenty time with students is needed to get project's goal understood because they was to much excited for workshop. The girls were very involved and they put on this work creativity and spirit of beauty
Learning outcomes	They learned how a solar car works and which are the phases of create a prototype of a future car in this case. They achieved futuristic vehicles that could protect our world and its inhabitants
Materials or equipment that are required	Motorholder, motor, cords, solar panel, small pulley, big pulley, popsicle sticks, flower sticks, rubber bands, straws, balsa wood or cardboard, cutting mat, knife blade, pens and paper, 400W halogen lamp Optional: paint, paint brushes
Photos or other relevant material	

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Interview with teachers

What workshop was your application based on?
Solar Car

Number of pupils and their level?
22

Where did you execute the workshop and what was the timing?
In classroom, 4h 30' divided in two lessons (2h + 2h30')

How did it go?
Very well

What went well, what was difficult?
Students did very well the tasks, they have been able to collaborate and solve problems, so they were able to use the solar machine. They worked with enthusiasm including students that used to have more difficulties during school lessons.
Each member of the group collaborate and all tasks have been divided equally, so everyone participated actively both in the design and in the creation of the final machine. There was few difficulties, related to personality of each participants. So, problems were not related to cognitive abilities.
For teachers is difficult to contain enthusiasm and desire to work on the project. Creativity is everywhere and in every kind of spaces. Students not only made some creative machines but also realistic machines that were able to work in any way.

Did you make changes to the material used in the workshop?
It was not necessary to make changes to the materials because the kit provided was sufficient to meet every creative requirement for kids.

Were there any challenges in making certain material available?
At our school we have many kind of materials suitable for completing the task.

If you look back to the goals of your workshops/lesson, what was the most important part? The knowledge, the attitudes or the competences?

I was impressed about that some problematic children express many skills. The most interesting things were life skills, cooperative work, problem solving, creativity, use of

hands to acquire knowledge. I believe that my children will not easily forget how a solar car works.

Questions about student/pupil skills

What is your expectation of the students after the class
According to you: What were the learning goals?

I think that the main goals are "save our world", respect for the environment, and then basic principles of electronics and mechanics.

Specific STEM-skills (subject-related)
Understand the functioning of a solar energy machine, principles of mechanics, environmental sciences

Transversal skills
- Willingness to learn
- Problem solving skills
- Creativity
- Ability to communicate on different levels
- Being pro-active
- Being able to work in group
- Flexibility
- Life Skills

Which level (STEM-ladder) would you say your students have? And how have you tried to improve their level.

Unfortunately students were not confident with STEM issues. So, to improve their skills it would be important to do other similar laboratories that they had just experimented.

Questions about teacher's own skills

What was the biggest challenge /difficulty when you look back at the class you gave?

It was difficult to contain enthusiasm. Students are not used to participate in this kind of activities so, they did not understand very well the importance of respecting deadlines as well as giving feedback to other members. Thanks to the "circle time" they were able to get started the workshop. Thanks to brainstorming, the activities were easier and clearer for students.

If you were allowed to choose a seminar to further develop your professional competences for these kind of applications, which course would you choose?
e.g. technically oriented (how to use equipment, tools etc)
or theoretically oriented (pedagogical methodologies)
or assessment focused (how to assess progress and skills acquired by students)

I will probably choose a seminar about assessment to have a better on how to assess the children's progress.

Questions about the past workshop

Which two talents or skills do you pre-possess that were useful in these workshops?

Non-intrusive participate observation, active listening and creativity.

If you were allowed to choose a teaching assistant for this workshop, what qualities would he or she ideally have?

An assistant without a traditional teaching background and with the ability to open innovate without fear for difficulties.

According to you, what things should students definitely acquire from this workshop? Describe also, how did you try to reach this goal?

The ability to work in a group respecting others opinions. Guaranteeing different moments of sharing thoughts, so it is important to share opinions and feedback at the end of each activity.

Optional: In which way differs teaching in a Fablab from teaching in a traditional classroom?

Definitely, a FabLab has a series of instruments and materials that are not available in a traditional school. Otherwise the class can be a FabLab including some materials and with specific instrumentation. For example, in my school we have a creative atelier. Finally, I think that the most important thing is teacher's vision, approach and mission.

Overall, if you could change, add or improve one thing in the workshop you attended what would it be?

I will not change anything but I probably add some moments as described above such as the circle time or brainstorming techniques that can be used during and after the different stages of the workshop.