NEW DIMENSION OF EDUCATION

Mobility in Portugal

Erasmus+

To delight, the teacher needs to be delighted.

If the teacher teaches, it does not mean that the student learns.

In today's day, more than teaching, you need to get students to learn. And they learn: if they are enthusiastic about innovative materials.

Will your next activities delight your students?

Nothing like experiencing it!
“Capable of performing a specific range of pre-programmed tasks, tangible programmable objects come to life and perform instructions given by the student. Miniature versions of Drones (unmanned aerial vehicles or UAV’s) and Robots (mechanical devices) are programmed leading to recognizable movements in the three-dimensional space. The language used to programme these objects is similar to the widely used common programming languages. The fundamental difference is the way the program execution results can be observed. Combined with other electronic devices, tablets and smartphones (seen as tangible objects) are tools that positively contribute to the learning process of most subjects, especially in programming. The small dimensions are adequate to any classroom or academic setting. Identifying the nature of students’ difficulties in learning Programming, the challenge is to find the appropriate strategies to overcome them. This study aims to understand how the use of programmable tangible objects can contribute to students learning Programming with focus and contentment, stimulating a critical stance, as well as the effort and persistence, during the completion of projects within specific learning scenarios (Matos, 2014). The specific objective is to find connections between the use of tangible programmable objects and the way students learn Programming. The advantage of learning to Program using tangible objects is, first and foremost, the novelty of using these tools itself. Programming deals with abstract concepts and processes (with sophisticated programming languages and environments); solving problems within physical objects allows building knowledge linked to real situations. Mistakes in design or programming can be detected immediately, fostering a critical viewpoint and motivating for problem solving (Berland, 2008). Skills, effort and persistence can be developed, as students tend to pursue the anticipated goal until it is achieved. Programming tangible objects creates conditions to participation in collaborative work (Park, 2015) and positive perceptions when methods of assessment are applied. Accordingly, it is crafted the right environments for reflection, and the students’ interest in the practice of Programming is highly stimulated leading to new learning processes (Barata, 2017a)” (Barata, 2017b, p44).

Beginning with being used in a more basic teaching, they can give teachers the opportunity to teach and basic tasks can be implemented, such as concepts of direction, angle, height, weight, and speed.

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In mathematics, where lack of application in practice renders discipline too abstract, the use of drones can serve to aid understanding of concepts and retention of information because students see their application in the real world. In the arts, we can design scenarios where robots can move. In English because the programs are almost always in English. From simple laterality to ... where the imagination of a teacher arrives ...

References (APA)
General objective:
At the end of the elaboration of Scenario:
- The student should feel that this goal was achieved through activities that stimulated his:
  • Interest and satisfaction
  • Critical and creative spirit
  • Effort and persistence

Important links: [https://www.arduino.cc/](https://www.arduino.cc/)

[http://s4a.cat/](http://s4a.cat/)

1º Organize the workspace and identify the materials to carry out the activities:
- Pc
- Arduíno Uno
- Cable USB
- Breadboard
- Led’s
- Resistors
- Ultrasound Sensor
- Light Sensor
- Cables M/M
- Buzz
- Button

**Note:** With these objects you can do various activities and program all objects through various software very easy to program for children of all ages.
Arduino
Examples of some connections: Control the alarm system, bell and lights of a house.
Interface - Scratch for Arduino (S4A)

Example of activity in class: Develop a prototype to control the alarm system, bell and lights of a home.

1. Choose and build a 1-room house model, drawing up a list of needed materials.

2. Make a list of the necessary electronic material and put that available material on your desk.

3. Assembly of the components in the model of the house.

4. Develop the programming.

5. Test and solve problems (search the internet for problem solving).

6. Elaborate the full binding Fritzing required.

7. Complete the presentation with all the photos and videos necessary to demonstrate the evidence of this activity.

8. Send the elaborate presentation to Meocloud
General objectives:

- Control a mini drone with programming.
- Learn to program with interest and satisfaction.
- Stimulate critical and creative spirit.
- Stimulate effort and persistence

Important links: [https://www.tynker.com/](https://www.tynker.com/)


[https://edu.parrot.com/](https://edu.parrot.com/)
Some Videos:

Drone Jumper: https://www.youtube.com/watch?v=-_8MtJ6WujI

Drone Mambo: https://www.youtube.com/watch?v=pS7g_c6DbAM
https://www.youtube.com/watch?v=wOz1iRyyWL4
https://www.youtube.com/watch?v=Fb8viIuPTBM

Example of use: https://www.tynker.com/support/drone

Examples: Control a mini drone, with programming, using the Tynker online platform.

**Objective 1:** Take off and land a drone.

1.1. Programming

1.2. Save

1.3. Open activity on Tablet

1.4. Connect the drone:

**Objective 2:** Draw a straight line in the air, forward and backward, when the space key is pressed.
Example of activity in class: Develop a scheme for the drone to travel between 3 airports, overcoming at least 2 obstacles, above, below and/or inside.

1. Build the physical scenery with airports and obstacles.

2. Build in Tynker the scene with the actors of the 3 airports.

3. Elaborate the programming so that when you press the actor of an airport the drone will fly until the next one going through the obstacles.

4. Test and solve problems (search the internet for problem solving).

7. Complete the presentation with all the photos and videos necessary to demonstrate the evidence of this activity.

8. Send the prepared presentation to Meocloud.
Activitie with others Robots

1. WeDo 2.0

WeDo robot as a tool for use in teaching.


How to Connect to the WeDo 2.0 Smarthub

1. Start WeDo 2.0
2. Create a new project or choose one of your data templates


2. Doc

Doc robot as a tool for use in teaching. Works with programming on the robot itself.

3. Mind

Mind robot as a tool for use in teaching.

It works by voice commands, with programming in the robot itself or with tablet with bluetooth connection and APP Mind Designer.

APP Mind Designer allows you to use the robot in 3 different modes.

4. Cyber Robot

Cyber Robot as a tool for use in teaching.
Works with programming on the robot itself or with tablet with bluetooth connection and the APP Cyber Robot.

5. Evolution Robot

Evolution Robot as a tool for use in teaching.
Works with programming on the robot itself or with tablet with bluetooth connection and the APP Evolution Robot

6. Mio Robot

Mio Robot as a tool for Works with programming on the robot itself.

7. Robot WeeeBot

WeeeBot Robot as a tool for use in teaching.


8. Robot WeeeBot Evolution

WeeeBot Robot Evolution as a tool for use in teaching.


Portuguese Team: Cláudia Barata; Paula Alcobia e Luís Roque

Support: João Roubaud; Ana Silva; Pedro Castro; Vítor Moelas

Good Job