

## 1.1 ACTIVITY PLAN TEMPLATE

Provide the title of the activity as it is mediated to students

### Exploring with Dash, and, programming Dash

---

#### AUTHOR:

Joanna Pullicino, Annalise Duca, Angele Giuliano

### Short description of the activity (Summary)

These were workshops run with students whose average age was 10 years, and, at primary level. The robots used were Dash and Dot although the practical aspects were explored with Dash. Dash is a ready made robot and our activities focused mostly around discovering the functionalities of Dash, using its sensors, and programming Dash to move in a maze, race or move between two fixed posts.

During these sessions, run between October and December 2016, the tutors reflected with the students about teamwork and collaboration (Annex 1 to this document), creativity (held a spontaneous draw a postcard session - Annex 2) and sustaining attitudes to STEM by expanding on career prospects and brushing on gender in Science.

Furthermore, a set of questions were handed out to Learning Support Assistants (Annex 3 to this document) to hear their views about how their students could/could not engage with robots.

PS during these months, AcrossLimits was holding sessions still with Primary students - same age/school level as had been done during Spring 2016. Nonetheless, certain aspects from the ten commandments were included to upgrade the workshops accordingly.

### Focus, Set up and Requirements of the activity

---

#### CURRICULUM

Select NO if the scenario is not aligned with the curriculum of your country and YES if it is. Please mention the relevant subject matter.

NO  YES  Subject: .....

---

#### CONTENT

Choose categories and give a rating of the level of emphasis on concepts from each of the following domains

<input checked="" type="checkbox"/> Science	<input checked="" type="checkbox"/> Technology	<input type="checkbox"/> Business	<input type="checkbox"/> Engineering	<input type="checkbox"/> Arts	<input checked="" type="checkbox"/> Mathematics
(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)
6	8	0	0	0	3

## OBJECTIVES

<i>Subject related</i>	e.g. Basic programming and loops (If then, repeat until)
<i>Technology use related</i>	e.g. Using remote control and Drag and Drop visuals
<i>Social and action related</i>	e.g. Develop collaborative skills, learn how to take turns and listen to each other, reach a compromise and decision etc.
<i>Argumentation and fostering of maker culture:</i>	e.g. Groups were encouraged to make the robot intelligent and to work at any point in time and not only once. They were encouraged to test before they tell the tutors that their work was ready.

## TIME

**Duration:** e.g. 8 hours split across two mornings

**Schedule:** e.g. 2 sessions of 4 hours each.

## MATERIALS AND ARTIFACTS

<i>Digital artifact</i>	e.g. Drag and Drop visual
<i>Robotic artifact</i>	i.e. Not applicable
<i>Student's workbook and manual</i>	e.g. worksheets with a set of graded exercises
<i>Teacher's instruction book and manual:</i>	e.g. Powerpoint presentations

Students and space

## STUDENTS (TARGET AUDIENCE)

<i>Sex and Age:</i>	boys& girls, average 10 years of age. Classes were at times single gender; other times they were a mixed group.
<i>Prior knowledge:</i>	None of the students had prior knowledge on Dash. Around 5% of students attended short summer courses outside their school on Lego Mindstorm
<i>Nationality and cultural background</i>	around 96% Maltese. Remainder from Europe or outside European countries.
<i>Social status and social environment</i>	Mainstream public school, Private and Church schools.
<i>Special needs and abilities</i>	Autism, Down's syndrome, ADD, dyslexia, Soc. Em. Behavior Disorders. Less than 4% had problems understanding English.

## SPACE INFO

**Organizational and cultural context:** School gymnasium or hall.

**Physical characteristics:** indoors

## Social Orchestration

### POPULATION

**Students:** Groups of 24 to 27

**Tutors:** 2 occasionally 3

### GROUPING:

<b>Grouping criteria</b>	Mixed abilities. Single or mixed gender. Each class had students with special needs.
<b>Setting:</b>	Students seated on paper mats on the floor facing projector during talk time by tutors. When exploring with Dash, students were again on the floor and Dash on the mat.

### INTERACTION DURING THE ACTIVITY (EMPHASIS)

<b>Actions</b>	e.g. Exchange ideas and dialogue
<b>Relationships</b>	e.g. Collaborative and competitive (during races)
<b>Roles in the group</b>	e.g. role exchange in the group
<b>Support by the tutor(s)</b>	e.g. Intervene, monitor, facilitate

## Learning Procedures

### EXPECTED STUDENT ACTIVITY

Students during the activity are expected to engage in the following actions: construct, observe, communicate, create, present their work in a blog, exchange ideas, etc.

### STUDENT LEARNING PROCESSES

<b>Designed Conflicts and misconceptions</b>	Not applicable
<b>Learning processes emphasized:</b>	1. observe the robot's behavior once programmed 2. communicate and discuss tasks set and decide on the way forward 3. create your experience on a 2 differently designed postcards (one postcard was not printed on both sides; the other, was printed on only one side).
<b>Expected relevance of alternative knowledge</b>	None

## "How to" in the classroom

In this section of the activity plan we describe how we expect the teaching and the learning process to evolve. We might use phases or activities for this description. The phases or activities should support the objectives stated and make use of the materials, tools and teaching and learning processes mentioned earlier in the activity plan. Next we provide an example of phase description

---

#### PHASE 1: INTRODUCTION AND EXPERIMENTATION

**Duration:** 2 hours

**Orchestration:** group work

**Description:** The pre-questionnaire was first carried out. This was followed by an introduction to what are robots and what isn't a robot. Advantages and disadvantages of robots in everyday life, and, how or why humans use them.

Collaboration, communication and teamwork are discussed and students are asked to reflect on what are the requisites for good teamwork (Part A, Annex 1). Examples of science careers and employments are presented to them to sustain the applicability of STEM subjects and nurture STEM in their thinking and possibly future choice of subjects. Gender is brushed upon to explain that any STEM career can be equally followed by males or females and hence to break down any stereotype images that the students might have had.

A demonstration of Dash and its functions, sensors and actions was explained to the children. The robot was then handed out and they were allowed firstly to experiment and explore freely.

Indicate which of the stated objectives are supported by this phase: Subject related, Technology use related and Social and action related

Expected student constructions: Not applicable

Expected forms of student dialogue: communication and taking turns

Teaching method: Instruction, demonstration by example, discussion with the students and experimentation by the students themselves.

---

#### PHASE 2: SEQUENTIAL PROGRAMMING, GROUP REFLECTION AND INDIVIDUAL CREATION OF A POSTCARD

**Duration:** 2 hours

**Orchestration:** Group work (groups of 2 or 3) and individual

**Description:** Students implement their first programs as per the puzzle sheet. No loops. The first programs moved the robot on a predefined path on the floor, made sounds, turned on/off its lights etc. They were then asked to reflect and think about the outcome of this first workshop, their impression of teamwork and collaboration and the advantages and disadvantages of working together (Annex 1, Part B and C).

Finally, students were given a postcard - printed on one side with Dash and Dot, and empty on the other side. This was a 'free to think' and 'do as you wish' exercise where students were asked to

draw and/or colour and/or describe their experience of during the workshop (Annex 2). This was done individually by each student.

Indicate which of the stated objectives are supported by this phase: Subject related, Technology use related and Social and action related

Expected student constructions: Not applicable

Expected forms of student dialogue: discussion, communication, taking turns, taking decisions

Teaching method: Instruction, demonstration by example, discussion, experimentation

---

### PHASE 3: REFLECTION AND USING LOOPS

**Duration:** 3 hours 30 minutes

**Orchestration:** group work (groups of 2 or 3)

**Description:** Follow on from the previous session and further reflection on teamwork/collaboration.

Students try to find a way to simplify their programs by avoiding using the same sequence of blocks many times in the same program. They use loops with their programming blocks. With teacher assistance, they recognize the usage, the conditions and the characteristics of the new programming structure and also the role of the sensors in executing a loop block.

Indicate which of the stated objectives are supported by this phase

Expected student constructions: not applicable

Expected forms of student dialogue: discussion, communication, taking turns, taking decisions

Teaching method: Instruction, demonstration by example, discussion, experimentation

---

### PHASE 4: CREATIVITY AND EVALUATION

**Duration:** 30 minutes

**Orchestration:** Individual and class work

**Description:** The students are handed out a postcard, same size and shape as the one from the first session. It is different that it is empty at the back and at the front.

In addition with the activity sheets that students complete during activity phases, they also fill in an evaluation questionnaire. The teacher gets short informal open interviews from a group of students (2 - 3) who had been informed previously (during the first workshop) to share their experience.

Indicate which of the stated objectives are supported by this phase: Subject related, Technology use related and Social and action related

Expected student constructions: Not applicable

Expected forms of student dialogue: discussion, communication, creativity and thinking

Teaching method: Discussion

## Assessment Procedures

Suggestions for procedures, methods and tools that can facilitate the achievement of the teaching objectives stated at the beginning of the activity plan. (e.g. post activity tests, reflective videos etc)

### Annex 1

#### **Reflective Questions:**

Before Starting Workshop No 1: (Part A)

1. What do you think is the Golden Rule to work together? {Write all the comments on a blank paper}
2. How do you feel about group work?

Before Postcard Activity No 1: (Part B)

1. Apart from working together as a group, what have you learnt today (prompt regarding programming/technology)?
2. Do you have any previous experience working together/collaborating from other projects (prompt: this could be together at school or in other circumstances outside the school where they engage together e.g. sports, dancing sessions, scouts/guides etc.)
3. How does it feel, or, what are your impressions about teamwork?

End of Workshop No 1: (Part C)

1. Now that you have worked as a group, reflect on one thing that you would like to change to work better in a group/team. Write a sentence on this and bring it with you to the next workshop.

Before Starting Workshop No 2: (Part D)

1. Discuss on points from previous activity: What would you change to work better in a team?
2. Remind them of the Golden Rules set from Workshop 1

**Annex 2**

**Annex 3**

**Questions to Learning Support Assistant**

1. Age of student/s you assist:

---

1. What are the student/s conditions/learning difficulty etc.?

---

---

---

1. Does your student/s prefer to work alone? Why?

---

---

---

1. Could working in a group (teamwork) of 2 - 3, benefit your student/s. How?

---

---

---

1. In your opinion, do you think that the use of robots would be beneficial for your student/s in particular subjects? Yes/ No? Which subjects? Why?

---

---

---