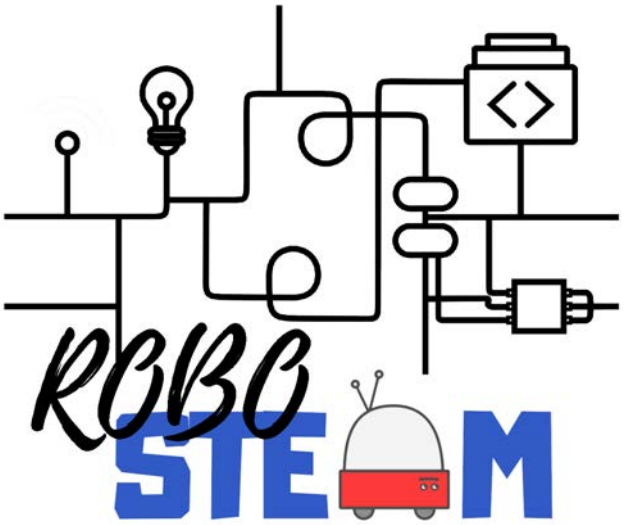
E2. RoboSTEAM Mainstreaming Event



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Project Number: 2018-1-ES01-KA201-050939

Version History

Version	Date	Comments
1.0	31/03/2021	First Draft after finishing the event
1.1	30/04/2021	Compiled photos and unifying signatures
1.2	29/05/2021	Format and data corrections

Table of Contents

1. E2. RoboSTEAM Final Mainstreaming Event

This document describes RoboSTEAM Mainstreaming Final Event carried out by the University of León in the context of RoboSTEAM project [1-8], at the three of November of 2020. The document includes the event description.

2. Event Description

2.1. Description and aim of the activity

The RoboSTEAM Mainstreaming Final Event is a dissemination event that takes place in León between the 15th and the 23rd of March of 2021. Initially it was defined as a single event in which we aim to reach 60 local participants and 10 foreigners. They should be staff from educational institutions different from the University of León. The dissemination event was carried out properly, reaching the objective, in fact we achieved 42 local participants and 28 foreigners which increases the transnational value of the project. However, to complete the event we carried out 6 events (more reduced in number of participants) instead of 1. More information about them:

- The first was carried out in the Fundación de Supercomputación de Castilla y León, a regional entity with interest in the project topics, it was a 4-hour event with additional 2 work hours for the presenters at home when they answer participants doubts.
- The following two were carried out in Engineering School at the same time of a hybrid conference (in this way it was possible to achieve foreigner participants); they were 5-hour events with additional 2 work hours for the presenters at home when they answer participants doubts.
- The three next took place in different days on Secondary Schools with the staff of such entities; they were 4-hour events with additional 2 work hours for the presenters at home where they answer participants doubts. One of them in addition to a face-to-face presentation includes a virtual

presentation to which the students attend. In one of the cases as the event was in the afternoon the time for working at home was reduced.

2.2. Agenda of the activities

Multiplier Event

Agenda

Monday, 15th March 2021

Location: Supercomputación Castilla y León (SCAYLE)

09:30 – 10:00 Presentation
10:00 – 10:30 Project overview
10:30 – 11:30 Description of the results
11:30 – 11:45 Coffee break
11:45 – 12:30 Possible applications and collaborations within the participants' environment
12:30 – 13:15 Working with participants
13:15 – 13:30 Questions
15:30 – 17:30 Working at home

Tuesday, 16th March 2021

Location: University of León – Escuela de Ingenierías Industrial, Informática y Aeroespacial

09:00 – 09:30 Presentation
09:30 – 10:00 Project overview
10:00 – 10:30 Description of the results
10:30 – 11:30
11:30 – 11:45 Coffee break
11:45 – 12:30 Presentation of various challenges carried out in the pilot tests
12:30 – 13:15 Possible applications and collaborations within the participants' environment
13:15 – 13:45 Working with participants
13:45 – 14:00 Questions
15:30 – 17:30 Working at home

Thursday, 18th March 2021

Location: University of León – Escuela de Ingenierías Industrial, Informática y Aeroespacial

09:00 – 09:30 Presentation

09:30 – 10:00 Project overview

10:00 – 10:30 Description of the results

10:30 – 11:30

11:30 – 11:45 Coffee break

11:45 – 12:30 Presentation of various challenges carried out in the pilot tests

12:30 – 13:15 Possible applications and collaborations within the participants' environment

13:15 – 13:45 Working with participants

13:45 – 14:00 Questions

15:30 – 17:30 Working at home

Friday, 19th March 2021

Location: IES San Andrés del Rabanedo

09:30 – 10:00 Presentation

10:00 – 10:30 Project overview

10:30 – 11:30 Description of the results

11:30 – 11:45 Coffee break

11:45 – 12:30 Possible applications and collaborations within the participants' environment

12:30 – 13:15 Working with participants

13:15 – 13:30 Questions

15:00 – 17:00 Working at home

Friday, 19th March 2021

Location: Salesianos León - Colegio Don Bosco (also steamed)

09:30 – 10:00 Presentation

10:00 – 10:30 Project overview

10:30 – 11:30 Description of the results

11:30 – 11:45 Coffee break

11:45 – 12:30 Possible applications and collaborations within the participants' environment

12:30 – 13:15 Working with participants

13:15 – 13:30 Questions

15:00 – 17:00 Working at home

Tuesday, 23th March 2021

Location: Colegio San Juan de la Cruz - León

16:30 – 17:00 Presentation

17:00 – 17:30 Project overview

17:30 – 18:30 Description of the results

18:30 – 18:45 Coffee break

18:45 – 19:30 Possible applications and collaborations within the participants' environment

19:30 – 20:15 Working with participants

20:15 – 20:30 Questions

20:30 – 21:30 Working at home

2.3. Tools used during the activity

The activity in this case was more a dissemination than in the case of the hackathon so the tools used and discussed were the challenges templates, Zenodo collection, our web page and videos of the results obtained during the project.

3. Signatures

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RoboSTEAM - Evento multiplicador

15 de marzo de 2021

Centro TIC de Recursos para el Aprendizaje y la Investigación (CRAI-TIC), Aula 104, Universidad de León, León, España

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2018-1-ES01-KA201-050939

Multiplier Event

16 y 18 de Marzo de 2021

Escuela de Ingenierías Industrial, Informática y Aeroespacial, León, Spain

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43					
44					
45					

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ROBO STEAM ROBOTICS GROUP

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RoboSTEAM - Evento multiplicador

19 de marzo de 2021

Salesianas – Colegio Don Bosco, León, España

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RoboSTEAM - Evento multiplicador

19 de marzo de 2021

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RoboSTEAM - Evento multiplicador

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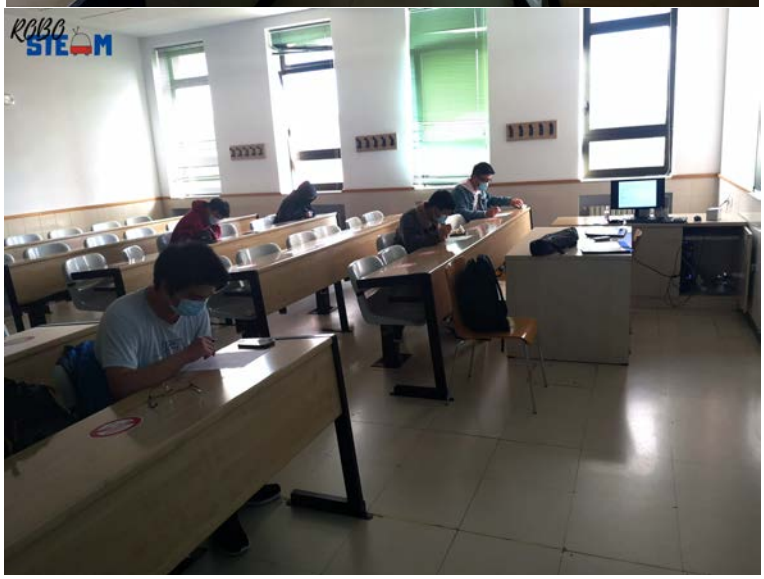
4. Photos

SCAYLE

Engineering School 1

Engineering School 2



SAN ANDRÉS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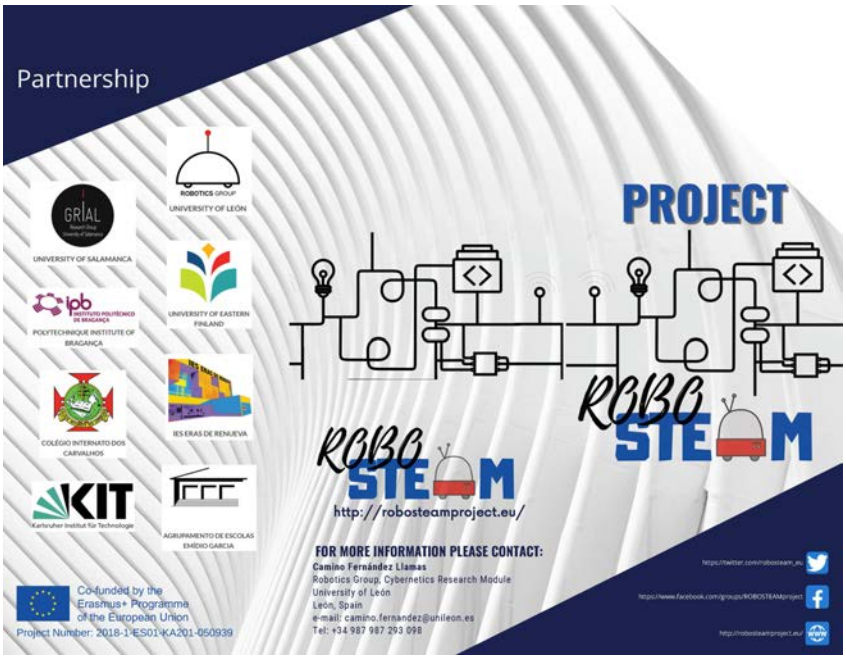
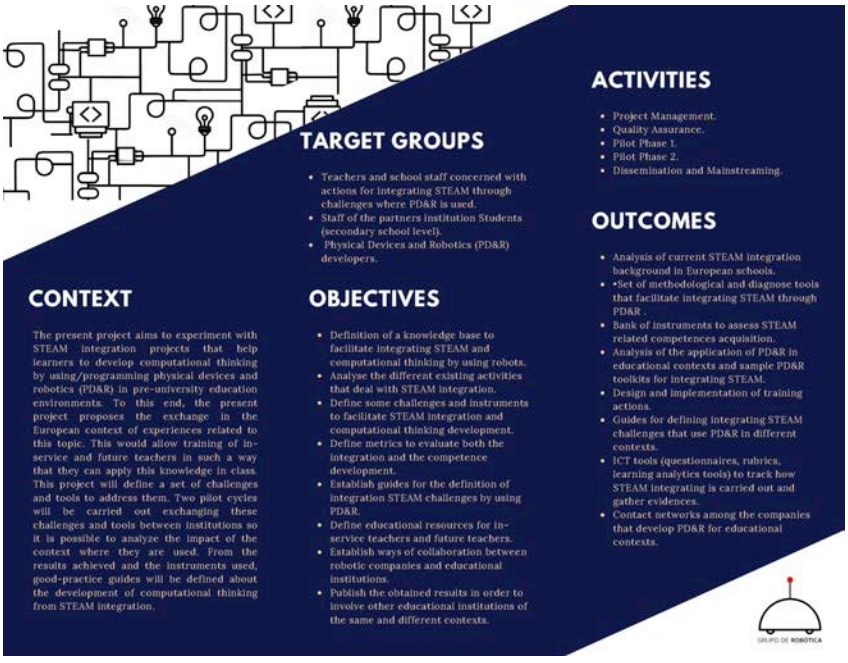
Proyecto RoboSTEAM

SAN JUAN DE LA CRUZ

5. Documentation

5.1. Leaflet





5.2. Presentation Sample

Universidades

Objetivos

- Objetivo principal
  - Definición de una base de conocimiento que facilite la integración de STEAM y el desarrollo de pensamiento computacional mediante el uso de robots
- Sub-ojetivos
  - Analizar las diferencias existentes entre actividades que abordan el problema de la integración de STEM
  - Definir retos e instrumentos para facilitar la integración STEAM y el Desarrollo del pensamiento computacional
  - Definir métricas para la evaluación de ambos factores
  - Establecer guías para la definición de como mediante retos y el uso de robots y componentes físicos es posible facilitar la integración STEAM
  - Definir recursos educativos para los docentes y otros potenciales profesionales del sector educativo
  - Establecer mecanismos de colaboración entre compañías robóticas e instituciones educativas
  - Publicar los resultados obtenidos de cara a involucrar otras instituciones de los mismos contextos y de otros diferentes

¿Cómo se consigue esto?

- Esto supone
  - Experimentar en la realización de actividades de integración STEAM mediante la aplicación de aprendizaje basado en retos empleando robots y dispositivos físicos en contextos de aprendizaje pre-universitario
- Para conseguirlo
  - Intercambios de experiencias en el contexto europeo de los socios en lo relativo a este tema
  - Retos y herramientas
  - Analizar resultados

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Actividades

- Actividades
  - A1. Gestión de proyectos
  - A2. Gestión de la calidad
  - A3. Fase de pilotos (M9-M17; Junio 2019 – Febrero 2020)
  - A4. Fase de pilotos (M12-M19; Octubre 2019-Abril 2020)
  - A5. Diseminación y consolidación

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Resultados

- R2. Guías para el diseño de Hardware Abierto para robots y dispositivos físicos (M5-M19; Febrero 2019 – Abril 2020)
- R3. Entorno RoboSTEAM (M5-M24; Febrero 2019 – Septiembre 2020)

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Eventos Multiplicadores

- E1. Hackaton (M19 – Bragança; Abril 2020)
- **E2. Conferencia Final en León** (M24; Final de Septiembre 2020 – León)
- E5. Evento Multiplicador Local en Alemania (M24; Septiembre 2020)
- E6. Evento Multiplicador Local en Finlandia (M24; Septiembre 2020)

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Intercambios

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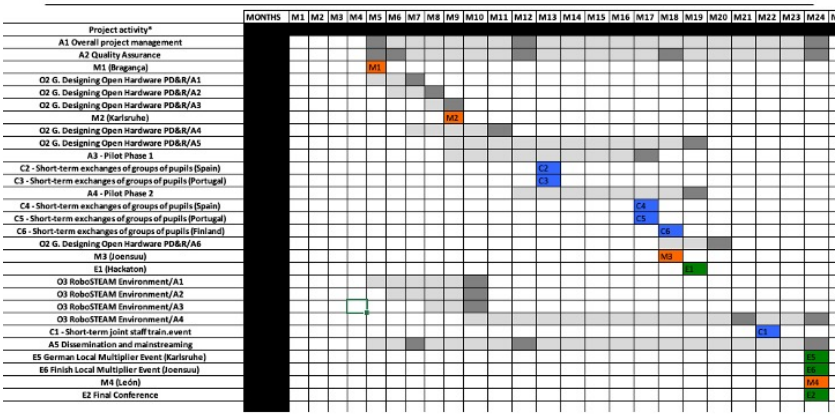
Calendarios



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Reuniones Transnacionales

- Bragança (Febrero 2019)
- Karlsruhe
  - Octubre 2019
- Joensuu (Marzo 2020)
- León (Septiembre 2020)

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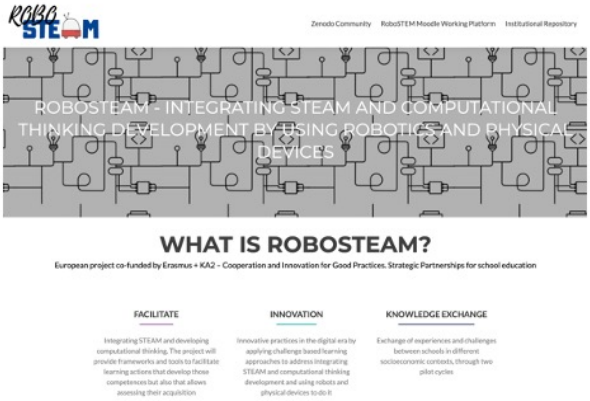
Resultados (I)



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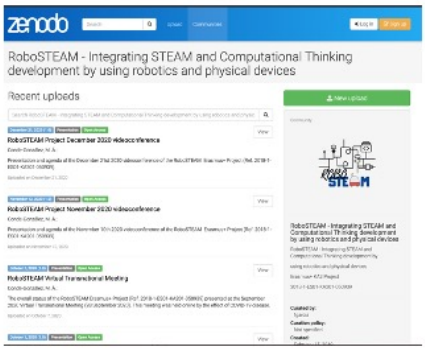
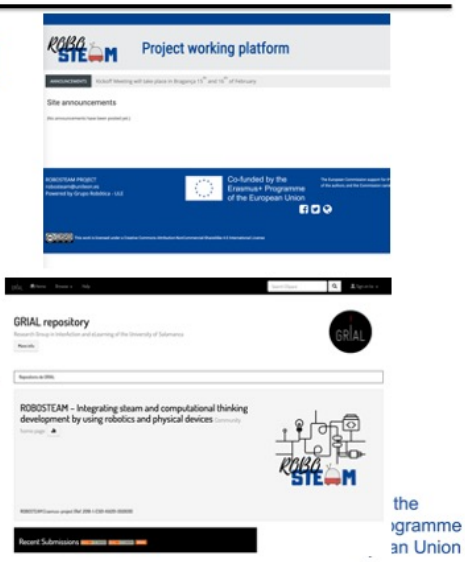
Resultados (II)





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Resultados (III)

Title	Make an LED turn on and off
What is an LED?	
What type of component is an LED? How is it connected? What resistor is required?	
Description	
• Research into the necessary components for the circuit to work correctly. • Calculate the resistor needed to prevent LED from blowing. • Create a program to turn on an LED. • Simulate the circuit using, for example, Tinkercad and send different values to an Arduino digital pin. • Connect the components to the breadboard. • Power on the Arduino board by connecting it to a computer using an USB cable. • Check that the real circuit works.	
Goal/s	
Know how to connect an LED to turn it on and off	
Kits to use	
Simulator program, Arduino Uno or similar Arduino board, a breadboard (preferably with a positive and negative rail), an LED, a resistor, jumper wires, USB cable, a computer, IDE Arduino	
Evaluation	
The students should connect correctly all the components and calculate the value for the resistor	

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Resultados (IV)

TITLE	Use mobile robots to detect and avoid the cause(s) of wildfires and reduce the impact of global warming on this issue

DESCRIPTION

Can mobile robots prevent fire(s)? (acts of arson, lack of cleanliness, global warming – drought and severe heat- etc.)

Human activities such as lighting campfires, discarding lit cigarettes, acts of arson, bushfires etc. are mainly responsible for starting a fire. However, hotter weather makes forests drier and more prone to burn. Rising temperatures, a key indicator of climate change, evaporate more moisture from the ground, drying out the soil and making vegetation more flammable. Think about how to employ mobile robots to reduce the impact of global warming on environment and avoid other causes of wildfires.

GOALS

- Study mobile robots
- Develop computational thinking
- Study possible ways to apply mobile robots to improve environment
- Develop soft skills
- Implement collaborative solution/strategy that involves students, parents, teachers and experts in this field
- Design and explore the scenarios where mobile robots can be applied;
- Develop creativity.

EVALUATION

- Time employed to solve the challenge (stds will fill in a grid)
- Degree of success producing a solution (stds will fill in a self and hetero evaluation report)
- Number of people involved in the challenge (information sheet including age, role/status and Education level)
- Perception about STEAM (stds will be asked to talk about their experience throughout the whole process of this challenge – they can make a video, around two minutes)
- Assessment of STEM skills and CT skills before and after the challenge (online questionnaires).

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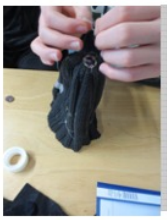
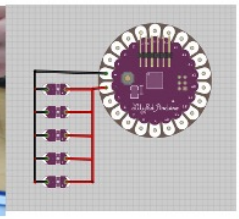
Resultados (IV)





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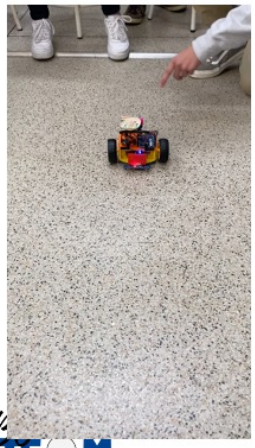
Resultados (V)



Title	Entertainment of senior citizens
Description	
Use of mobile robotics is not always easy and they don't have enough support or activity in their everyday life. Make suggestions how senior citizens standard of living could be improved.	
Goal/s	
- learn about senior citizens life *- consideration of different approaches* *- creating of research and working plan* *- know about implements, tools, communication possibilities, and environment* *- using of robotics and computational thinking* *- collaboration*	

Title	*Dancing Robot*
Research question or problem addressed by this minichallenge	
Dancing to the music	
Description	
In this minichallenge, the robot must be able to perform a dance according to the music.	
Goal/s	
The main objective is for the robot to perform a dance according to the music, that is, perform a choreography synchronized with the music in a limited space.	
Evaluation	
Due to the poor mobility and health conditions of senior citizens, the robot dance has a limited space and time and should please them with its choreography and synchronism with the music.	

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Resultados (VI)

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Disclaimer

RoboSTEAM (Integrating STEAM and computational thinking development by using robotics and physical devices) is a project funded under European Union ERASMUS+ KA2 – Cooperation and Innovation for Good Practices. Strategic Partnerships for school education Programme (2018-1-ES01-KA201-050939)

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