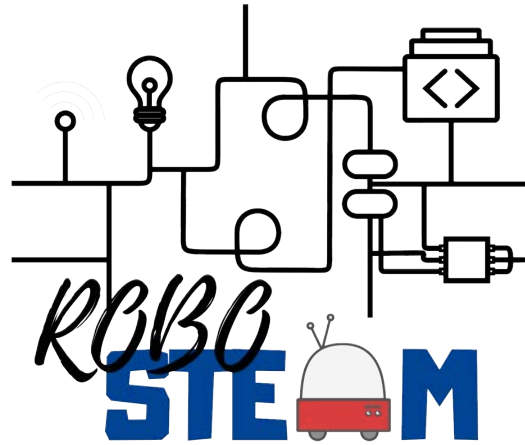




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RoboSTEAM Project

A brief review

Camino Fernández-Llamas
Miguel Ángel Conde-González
University of León

Schools



IES Eras de Renueva - LEÓN



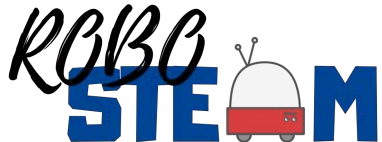
Agrupamento de Escolas
Emídio Garcia



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Universities



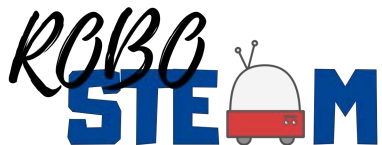
VNIVERSIDAD
D SALAMANCA



Karlsruher Institut für Technologie



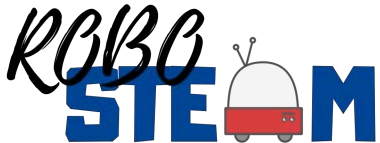
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Objectives

- Main objective
 - Definition of a knowledge base to facilitate integrating STEAM and computational thinking by using robots
- Subobjectives
 - **Analyse the different existing activities that deal with STEAM integration**
 - **Define some challenges and instruments to facilitate STEAM integration and computational thinking development**
 - Define metrics to evaluate both the integration and the competence development
 - **Establish guides for the definition of integration STEAM challenges by using PD&R**
 - **Define educational resources for in-service teachers and future teachers**
 - Establish ways of collaboration between robotic companies and educational institutions
 - **Publish the obtained results in order to involve other educational institutions of the same and different contexts**



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How to achieve this

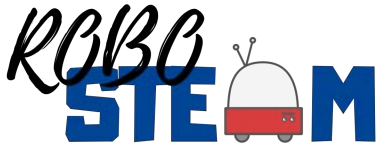
- This require
 - Experimenting with STEAM integration projects that help learners to develop computational thinking by using/programming PD&R in pre-university education environments
- To achieve this
 - Exchange in the European context of experiences related to this topic
 - Challenges and tools
 - Analyse results

Activities

- Activities
 - A1. Project Management
 - Leader: ULE – Participants: All
 - A2. Quality Assurance
 - Leader: USAL – Participants: All
 - A3. Pilot Phase1 (M9-M17; June2019 – February2020)
 - Participants: all
 - A4. Pilot Phase2 (M12-M19; October2019-April2020)
 - Participants: all
 - A5. Dissemination and Mainstreaming
 - Leader: UEF – Participants: All

Outcomes

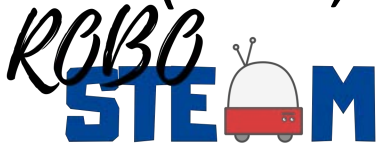
- O2. Guides for designing Open Hardware PD&R (M5-M19; February 2019 – April 2020)
 - Leader: ULE – Participants: ALL
 - Necessary for A3 and A4
- O3. RoboSTEAM Environment (M5-M24; February 2019-September 2020)
 - Leader: USAL – Participants: ALL



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Multiplier Events

- E1. Hackaton (M19 – Bragança; April 2020)
 - Multisite Event
- E2. Mainstreaming RoboSTEAM Final Conference (M24; End of September 2020 – León)
 - Only universities and IES Eras de Renueva
- E5. German Local Multiplier Event (M24; September2020)
- E6. Finnish Local Multiplier Event (M24;September2020)



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Learning/Teaching/Training Activities

- C1. Staff Exchange (M22;July2020 – Germany)
 - 2 Persons per partner
- C2. Students Exchange (M13;October2019 – Spain)
 - Portuguese school students to León school
- C3. Students Exchange (M14;November2019 – Portugal)
 - Spanish school students to Bragança school
- C4. Students Exchange (M17;February2020 – Spain)
 - Finnish school students to León school
- C5. Students Exchange (M17;February2020 – Portugal)
 - Finnish school students to Bragança school
- C6. Students Exchange (M18;March2020 – Finland)
 - Portuguese and Spanish students to Finland school

Schedule

Project activity*	MONTHS	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25
A1 Overall project management																										
A2 Quality Assurance																										
M1 (Bragança)					M1																					
O2 G. Designing Open Hardware PD&R/A1																										
O2 G. Designing Open Hardware PD&R/A2																										
O2 G. Designing Open Hardware PD&R/A3																										
M2 (Karlsruhe)									M2																	
O2 G. Designing Open Hardware PD&R/A4																										
O2 G. Designing Open Hardware PD&R/A5																										
A3 - Pilot Phase 1																										
C2 - Short-term exchanges of groups of pupils (Spain)														C2												
C3 - Short-term exchanges of groups of pupils (Portugal)														C3												
A4 - Pilot Phase 2																										
C4 - Short-term exchanges of groups of pupils (Spain)																										
C5 - Short-term exchanges of groups of pupils (Portugal)																										
C6 - Short-term exchanges of groups of pupils (Finland)																										
O2 G. Designing Open Hardware PD&R/A6																										
M3 (Joensuu)																										
E1 (Hackaton)																										
O3 RoboSTEAM Environment/A1																										
O3 RoboSTEAM Environment/A2																										
O3 RoboSTEAM Environment/A3																										
O3 RoboSTEAM Environment/A4																										
C1 - Short-term joint staff train.event																										
A5 Dissemination and mainstreaming																										
E5 German Local Multiplier Event (Karlsruhe)																										
E6 Finish Local Multiplier Event (Joensuu)																										
M4 (León)																										
E2 Final Conference																										



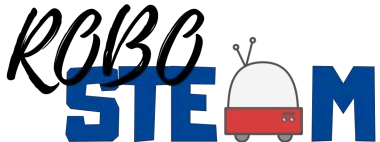
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Project Transnational Meetings

- Bragança (February 2019)
- Karlsruhe
 - October 2019
- Joensuu (March 2020)
 - At the same time than C6
- León (September 2020)
 - At the same time than E2

Expected results

- Analysis of current STEAM integration background in European schools (linked to O1 and necessary for A3 and A4)
- Set of methodological and diagnose tools that facilitate integrating STEAM through PD&R (linked to O1 but necessary in O3)
- Bank of instruments to assess STEAM related competences acquisition (linked to O1 but necessary in O3)
- Analysis of the application of PD&R in educational contexts and sample PD&R toolkits for integrating STEAM (linked to O1 and O2)
- Design and implementation of training actions. Different courses (initially in person, then online and self-learning) will train educational practitioners in the definition of challenges that integrates STEAM through PD&R (linked to O3, O4 and C1)
- Guides for defining integrating STEAM challenges that use PD&R in different contexts (O4)
- ICT tools (questionnaires, rubrics, learning analytics tools) to track how STEAM integrating is carried out and gather evidences (O3)
- Contact networks among the companies that develop PD&R for educational contexts (O3, O4 and A5)



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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
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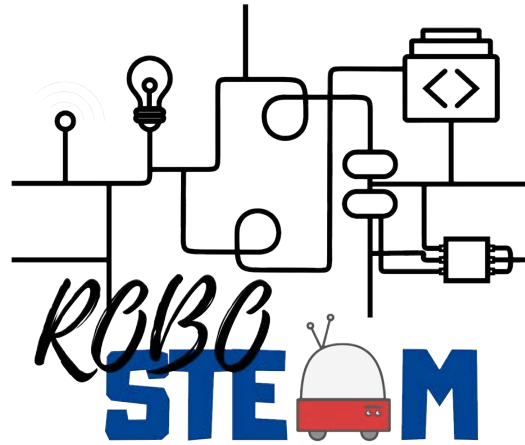
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