RecycleIOT

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RecycleIOT is an advanced semi-automatic system that has the potential to revolutionize the entire waste collection process and the management of environmental resources.
The device is designed to promote correct waste sorting, reduce environmental pollution and encourage more efficient use of resources.
The heart of the system is made up of rotating discs, which operate mechanically to sort waste based on its type. This sorting process is essential for recycling and sustainable waste management. Waste is directed to appropriate sectors, separating plastic, paper, glass, metals and other materials, ensuring accurate collection and efficient management.
But sorting waste is often annoying! For this reason the RecycleIOT is equipped with a camera with cutting-edge Computer Vision technology, which plays a fundamental role in the waste sorting process.
This camera is able to recognize the type of material that is placed in the appropriate opening of the device. Thanks to sophisticated visual recognition algorithms, RecycleIOT can accurately identify whether the material is plastic, paper, glass, metal or other.
Each device is equipped with a small local computer with memory and a cloud connection. This IT system allows you to constantly monitor the operation of the device, record data relating to waste collection and differentiation and transmit this information to dedicated control centers.
The RecycleIOT user interface is designed to be accessible and intuitive. Users can interact with the device through a touchscreen or key display. This allows them to deposit waste correctly and, if necessary, actively participate in the differentiation process.
To guarantee the success of the system, public bodies must install recycling centers throughout the territory and set up control, collection and sorting centers. Users will receive an EcoCard or smart card which allows them to access the system and take advantage of services such as waste storage and the accumulation of points, which represent a further incentive for the correct use of Recycling.
The data collected by RecycleIOT are sent to the control centers, where they are processed for various purposes. This data can be used to create targeted promotions, advertising campaigns focused on waste separation and consumption statistics.
This not only incentivizes users to actively participate in the differentiation process, but also provides valuable information for planning future interventions.

LEARNING OBJECTIVES

Understand the Concept: Develop a clear understanding of the concept and purpose of the Riciclotto, including its environmental benefits and potential impact on waste management.

Mechanical Design: Learn the mechanical components and principles behind the functioning of the prototype, including the rotating discs for waste sorting.

Computer Vision Technology: Gain knowledge about computer vision technology, its role in waste recognition, and its integration into the prototype.

Programming Skills: Acquire programming skills to develop the software for the prototype, enabling it to recognize and sort different types of waste accurately.

Data Management: Understand the data storage and transmission mechanisms within the Riciclotto prototype, including the use of cloud-based systems.

User Interface Development: Develop skills in designing a user-friendly interface for the Riciclotto, such as touchscreen or button displays.

Environmental Impact Assessment: Assess and analyze the potential environmental impact of the Riciclotto in terms of waste reduction, recycling, and resource conservation.

Collaboration and Teamwork: Work effectively in a team to design, build, and test the Riciclotto prototype, fostering collaborative skills.

Problem-Solving: Develop problem-solving skills to troubleshoot and improve the prototype as issues or challenges arise during the development process.

Presentation and Communication: Learn how to effectively present the prototype's features, benefits, and functionality to different stakeholders, such as local authorities or potential users.

Sustainability Awareness: Understand the broader context of sustainability and the role that innovative waste management solutions like Riciclotto can play in promoting a sustainable environment.

C'S OF EDUCATION

COLLABORATION | COMMUNICATION | CRITICAL THINKING | CREATIVITY

AGE GROUP
From 13 to 19

SCENARIO LANGUAGE
English

TOTAL DURATION
16 hours

SUBJECTS

ART | CITIZENSHIP - CULTURE - SOCIETY | CROSS CURRICULAR | DESIGN - TECHNOLOGY | DRAMA - ECONOMICS | INFORMATICS / ICT | LAW | MATHEMATICS | NATURAL SCIENCES | VOCATIONAL SUBJECTS - HANDICRAFT

2 HOURS 0 MINUTES — Group Ideation and Brainstorming

EXCHANGE & DISCUSS

C'S OF EDUCATION

COLLABORATION | COMMUNICATION | CRITICAL THINKING

TOOLS

Classroom: paper and post-it notes. This activity can also take place online by making use of digital canvases or shared documents.

SPACE FORMAT
Private, limited distraction

POSITION OF LEARNERS
Small groups

ROLE OF TEACHER
Teacher at the side

DESCRIPTION

The teacher puts large sheets of paper with questions or topics in different places in the classroom and divides the class into the groups equal to the number of sheets. Each groups gets 5-10 minutes to brainstorm ideas on the topic. When the time is up, they move to another poster.

2 HOURS 0 MINUTES — Teacher-Guided Prototyping Session

INTERACT & INSTRUCT

C'S OF EDUCATION

COLLABORATION | CRITICAL THINKING

TOOLS

Poll or brainstorm tool

SPACE FORMAT
Private, limited distraction

POSITION OF LEARNERS
Small groups

ROLE OF TEACHER
Teacher at the side

DESCRIPTION

Students brainstorm on open ended questions about a certain topic. They create in small groups a driving question for their project work.

2 HOURS — Data Collection and Waste Analysis

0 MINUTES

INVESTIGATE & RESEARCH

C'S OF EDUCATION

COLLABORATION | CRITICAL THINKING

TOOLS

Poll or brainstorm tool

SPACE FORMAT

Private, limited distraction

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

Students brainstorm on open ended questions about a certain topic. They create in small groups a driving question for their project work.

Riciclotto Prototype Development

4 HOURS 0 MINUTES

CREATE

C'S OF EDUCATION

CRITICAL THINKING

TOOLS

Mind mapping tool

SPACE FORMAT

Private, limited distraction

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

Students analyse and visualise the relations between concepts by creating a mind map. Mind maps or concept maps are visual representations of the relationships between concepts.The concepts are placed in nodes (often circles), and the relationships between them are indicated by labelled arrows connecting the concepts.

Prototype Testing and Evaluation

3 HOURS 0 MINUTES

ASSESSMENT & FEEDBACK

C'S OF EDUCATION

COLLABORATION | COMMUNICATION | CRITICAL THINKING

TOOLS

Three columns (3, 2, 1) on paper or on digital canvas or shared document.

SPACE FORMAT

Private, limited distraction

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

Students must create three lists, (a) 3 ideas or concepts they learned, (b) 2 ideas or concepts that surprised them and (c) 1 thing they want to do based on what they learned or question they have about the content.

3 HOURS 0 MINUTES

Community Showcase Event

PRESENT & SHARE

C'S OF EDUCATION

COMMUNICATION

CREATIVITY

TOOLS

Rubric tool

SPACE FORMAT

Private, limited distraction

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

"A fair activity is a chance for groups to present their project simultaneously. In the first part of the lesson, half of the class (formed by the sum of the halves of all the groups) present their product at their stands. The other half of the class plays the visitors' role and they listen and at the same time assess the speakers.The visitors can walk around as if they where on a real fair. After half-time the students swap roles.
"

Co-funded by the Erasmus+ Programme of the European Union

NOVIGADO

The Scenario Tool has been created within the Novigado project, which is funded with support from the European Commission's Erasmus+ Programme. The Scenario Tool and any of its content reflects the views only of the author(s), and the EC cannot be held responsible for any use which may be made of the information contained therein.