SUSTAINABLE URBAN RACE (SUR), A PROJECT TO EDUCATE IN SCIENTIFIC AND TECHNICAL VOCATIONS OF THE UNIVERSITY OF HUELVA

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Abstract:

The authors have devised a project that consists of the construction of a solar vehicle with the objective of promoting technical studies among pre-university students, to later carry out a public competition in which to reward the best projects.

This paper describes the project carried out at the University of Huelva together with 15 institutes in 2018, as well as some of the results obtained in it.

Keywords: Environmental education, Electrical vehicle, Solar energy, Student motivation, Sustainable mobility.

1. INTRODUCCTION:

The aim of the Sustainable Urban Race (SUR) is to increase the interest in science and technology among pre-university students.

SUR was devised within the "Control and Robotics" research group (TEP-192) of the University of Huelva, and has the collaboration of the Technological Scientific Center Huelva (CCTH by its initials in Spanish). This project has been funded by the Spanish Foundation for Science and Technology (FECYT), of the Ministry of Science, Innovation and Universities. The principal idea of SUR is to encourage the students from institutes in the southwest of the peninsula to study scientific and technical education. Also bring science, technology and innovation to non-university students and to society.

In this project, the students must create an electrical vehicle that uses solar energy, capable of transporting at least one person in the urban environment. The organization provides the participating centers with a development kit, in order to standardize the capabilities of the vehicles. The kit is composed of an electric motor, the electronics needed for the control, two solar panels and an energy meter. The meter allows the evaluation of the energy efficiency of the vehicle.

The organization proposes to the participants the application of Project Based Learning (PBL) to include the SUR project in their daily classes. PBL is included in active methodologies, that is, student-centered methodologies. PBL has proven to be effective for learning, especially in scientific-technical subjects. This methodology achieves a great motivation of the students and a high degree of assimilation of contents.

The organizers maintain a fluid contact with the teachers involved in the project, in order to provide technical and pedagogical support if needed. Periodic visits are also carried out to offer help and ensure compliance with deadlines.

The SUR19 edition of the project took place in May 2019, like the previous editions, at the El Carmen Campus of the University of Huelva. The competition, open to the public, became a remarkable event in the city. On http://surbanrace.com you can access to the information of all editions, images, videos and technical documentation of this project.

In order to study the impact of the project on the students, some surveys were carried out. The results of the surveys have shown that students from all the pre-university levels have participated, from the first to the last institute courses, including the intermediate and higher level of vocational and training cycles. Most of the centers chose to make participation in the project optional for the students, and they gave it a transversal character, involving several subjects.

On a global level, it can be concluded that the participants consider that the project has been challenging but realistic, and very related to their subjects. They have learned a lot about tools, connecting batteries, charge regulators, installing safety switches, and a bit of programming. They also consider that the project has helped them to take initiative, to learn for themselves and to be able to organize themselves, as well as to become aware of the conservation of the environment, to work as a team and to improve their skills in mathematics, science and technology.

One of the objectives of this edition was the increase in female. With a female participation of something more than 1/3, we consider that the initiatives taken have been fruitful, and we will continue with the intention of increasing this percentage in future editions.

The Sustainable Urban Race project was created to increase the interest in science and technology among pre-university students. The high impact obtained, especially in its latest edition, and the fulfillment of the planned objectives, checked objectively through surveys made to participants, invites the organizers to keep this idea alive, and to continue improving as much as possible. The CCTH is proud of its participation in this wonderful initiative, and we hope it will last for many more years.

2. CONCLUSIONS:

The overall result of the project has been very satisfactory. The chosen format is very innovative and interesting, and represents a challenge for the participants, both students and teachers. The study evidently covers a not very large number of centers, about 20, since it is not possible economically for the organizers to greatly expand the number of participants. However, each year the number of participating centers is increased depending on the economic availability of the project.

In conclusion, we think that the project has met the objectives set in a very satisfactory way, has had a great acceptance among the pre-university centers in the region, and has had a great media impact, both in the press, radio and television. The organizers hope to continue improving in future editions and to increase the number of participants.