Terrestrial vehicle propelled by helix

Final report

The scenario “Design and building of a terrestrial vehicle propelled by helix” was proposed in the context of the technology subject. It was carried out by learners of 2º ESO, with ages comprised between 13 and 14 years. The proposal was made following the parameters of iTEC---Abalar-iTEC in Galicia---that has as its leiv-motiv “designing the classroom of the future”.

Two classrooms with learners were involved in the scenario. Since the scenario was performed in an identical way in both groups and their characteristics were very similar, the conclusions of this report are valid for all 42 learners. In order to carry out the different activities, learners were divided on different groups of 2 or 3 members. There were 17 small groups in total.

The performance of the scenario had too well differentiated stages: design, which took 4 sessions; and building, which was completed in 9 sessions.

The spaces used were: the ABALAR classroom, a computerised classroom for the design stage, and the classroom-workshop of Technology. The final testing of the prototypes was performed in the gymnasium.

The scenario involved contents from the entire curriculum of 2º ESO: the technological process; graphical design; materials, wood and metal; electricity; and the use of text processors.

The complete realisation of this proposal had a certain difficulty for the level of 2º ESO, because learners from those ages find very exigent the design in a high level of detail of complex objects that afterwards they have to build. Usually, when they build objects in the classroom, they are not requested to build proposals as concrete as the one in this scenario. The 3D design was in itself a big challenge for them. In the light of the final results, and the fidelity between the vehicles designed and the prototypes they built, the scenario can be considered a success.

All groups were able to finish their prototypes, and the huge majority of prototypes worked well. Some of them even exceeded expectations---both teacher's expectations and their own ones--- because they were fast, or they had an aesthetic value, or they moved straight, or even because they worked (when the students did not think they would).

The level of motivation was high during the entire process, and it increased with every little achievement. The activities that they liked the most were the most formal ones such as: elaborating the list of materials every time they completed the design of the vehicle, or planning the work process. Motivation was increased by the preparation of the prototypes for the final test. There were a good atmosphere and fellowship, even when there were competitiveness too.

As it was said above, this activity was made following the parameters of the iTEC project. This represented as the main initial advantage a detailed reflexion and planning of the scenario as well as of all the activities proposed. We tried---and I think we succeed—to put into practice the work philosophy of iTEC. We designed a radical scenario and a set of activities that was in accordance with the current educational trends. We got an improvement of the technological level of the students, even though we had to work hard to that end. All the above required a great effort in the preparation and tracking of the activities and in the production of documentation. This effort would only pay off if we are able to replicate this scenario in other schools. In my opinion, this should be one of the priority objectives of the people that work in the iTEC project.

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