Co-funded by the
Erasmus+ Programme
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CIRO PROJECT

COMMUNICATION PLAN

INTRODUCING THE IMPORTANCE OF THE COMING EUROPEAN "GREEN" ENERGY MODEL IN SCHOOL EDUCATION

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1. INTRODUCTION

Ciro project aims to promote knowledge, skills, and capabilities on climate change, sustainability, renewable energies, energy storage systems (with emphasis on hydrogen technologies) and the final applications of these technologies. Promotes the training of teachers and awareness of students between 14 and 17 years in these concepts. Its aim is to generate restlessness and proactivity (in students) for the improvement of air quality and the reduction of climate change either to pursue higher education in these subjects (university / professional training) or to apply it to their daily life, through practices that benefit sustainability. Ciro project is co-funded by the Erasmus + programme of the European Commission. The project is coordinated by ARIEMA Energía y Mediambiente S.L with the support of the following project partners: CRES, a company specializing in learning and knowledge technologies (CCS) and 3 educational centres (IES Diego de Guzmán, Jesús Nazareno School and Städtisches Heriburg-Gymnasium).

As a general summary, the consortium can assert that, after these more than two years involved in CIRO, it feels thankful and satisfied with the experience of actively participating in the Erasmus + k2 “CIRO – Introducing the importance of the coming European “green” energy model in School Education”.

This extra report, not considered in the initial planification of the work to be developed within Ciro Project, arises from the need to reflect, and critically analyse our CIRO's experiences and describe what factors may have positively or negatively affected the development of the project.

2. Lesson Learned

The whole consortium understands that this main objective has been fulfilled. This is mainly due to the fact that both students and teachers have been trained, thanks to the participating experts, on theoretical and practical usage of hydrogen in a much greener society. Therefore, CIRO project's main aim, which is "promoting the training of teachers and awareness of students, between 14 and 17 years, in the development of knowledge, skills and capabilities on climate change, sustainability, renewable energies, energy storage systems (emphasizing on hydrogen technologies) and the final applications of these technologies", has been achieved. In fact, this is something we have clearly witnessed in students' involvement in the final competition and in the results of it, with projects that show an unquestionable learning on the importance of renewable energies to create better cities.

From the evaluators point of view, the student participants have acquired adequate level of knowledge, skills and capabilities on climate change, sustainability, renewable energies, energy storage systems. In the final competition, students highly engaged themselves in various activities such as the soft-skill training, commercialisation plan activity, their presentations and oral defence. This reflects that the CIRO project could effectively arouse their interests in and draw their attention to environmental issues.

We are really proud of the team we have created, both companies and schools. In fact, it seems quite sad that this experience of us working together is coming to an end because there has always been support, enthusiasm and interest to work properly and to help one another.

All of our transnational meetings have been very productive, and the environment has been that of hard work and teamwork. Notwithstanding, COVID 19 came into our lives and made that, from then on, all our gatherings had to be online, which has caused some technological difficulties and has obviously depleted some key aspects that were important to maintain this easy-going environment. Of course, this has specially affected, to a great extent, the CIRO competition that was going to be held in Huelva and that had to be finally performed online.

Thanks to the development of virtual meeting technology and the massive organisation work done by ARIEMA, the final competition was successfully held online. However, if the final competition could be carried out face to face, the activities could be taken place more smoothly and this could facilitate more interaction between participants from different countries.

3. Lessons learned about training materials

Teachers consider that the material collected in the Moodle Platform are the most important part of the project. This material allows individual teachers to pick and choose what to teach and how much one wants to go into detail. The order of the modules makes sense. The availability in a Moodle platform makes it easy to tell other teachers about it.

One of the aspects pointed out by the teachers is that the materials proposed by the companies would have needed to be analysed from the perspective of teachers' experience, because, in most cases, the modules were extremely theoretical, and they were not adapted to the real level of students' ages. This part could have been much more useful if teachers had set the basis of the necessities they had for these modules and they themselves had created the templates for the activities in order to consider methodological aspects. So, in this module creation, there should have been more cooperative work, even though the modules have been useful when teachers have adapted them for their lessons by adding some teaching digital tools, teaching strategies, challenging activities, interdisciplinary aspects, gaming for learning, etc.

A possible improvement in future, is that teachers who have used these materials could share their findings in terms of difficult points in moodle. This helps other teachers plan for their lessons when using these materials. In addition, we could include an introduction in the beginning of the O1 training explaining why those five modules are important and how they can utilise these materials in their lessons.

Depending on the level and the background of the students who are engaged in CIRO activities, it is possible that the training material could be enhanced as far as the practical part is concerned, with the inclusion of more and/or more complex and demanding practical activities that would trigger the skills of the students having to do with their abilities to investigate, create, implement, and experiment.

Moreover, the modules should be further enhanced in the future with more materials, newer texts, more links etc. As especially the market for hydrogen seems to be very active nowadays, therefore it would be easy to add more applications and local projects about hydrogen.

Regarding the CIRO City game, it meets all expectations and teaches us the importance of taking care of our planet. This game could be improved by increasing its difficulty level to make it more attractive to young audiences.

On the other hand, the kits have allowed students to see first-hand how a fuel cell works and how the energy produced can be used in real applications on a small scale. However, teachers consider that they could be improved to make them more interesting from the educational point of view. One suggestion on this sense is the inclusion of metal hydrides as storage for hydrogen (especially the house).

Furthermore, it would have been more interesting if some experiments had been defined by experts, not only for demonstrative use of the kits, but also to learn how to integrate different parts of a small-scale hydrogen production application.

3.1. Lessons learned about C2: Training activity for students

This competition has been a magnificent ending for the CIRO project as, therein, we have been able to check that our objectives were fulfilled. Nevertheless, the fact of having to do it online, limited a lot the interaction among students, which is clearly one of the main goals of any ERASMUS project.

As it has been mentioned above, for the whole consortium, the CIRO project has been extremely beneficial, despite minor aspects that could be easily improved and, specially, COVID-19, which has been the real inconvenience for the perfect development of this project.

Due to the COVID pandemic, the final competition could not be held face to face. Thanks to the development of virtual meeting technology and the massive organisation work done by ARIEMA, the final competition was successfully held online. However, if the final competition could have been held in person, the activities could have run more smoothly and this would have facilitated greater interaction between participants from different countries.

In terms of the contents in the final competition (C2), training activities, such as the soft-skill and the commercialisation plan trainings, have provided a satisfactory level of knowledge and skills to the students. However, if the soft-skill and the commercialisation plan trainings had been given in the early stage of the project composition, we believe that the students could have realized a more practically achievable project, and this could have enhanced the effectiveness of the CIRO project. The reason is that they would be able to incorporate the soft-skills while working on their projects. This would allow them to see not only the scientific feasibility, but also the practical feasibility of their ideas. Furthermore, soft-skills like leadership and entrepreneurship are what needed while collaborating with people. In this regard, one to two short online workshops could have been organised prior to their project development phase.

The methodology applied in the evaluation of the final competition was effective. However, it could be improved in the following aspects:

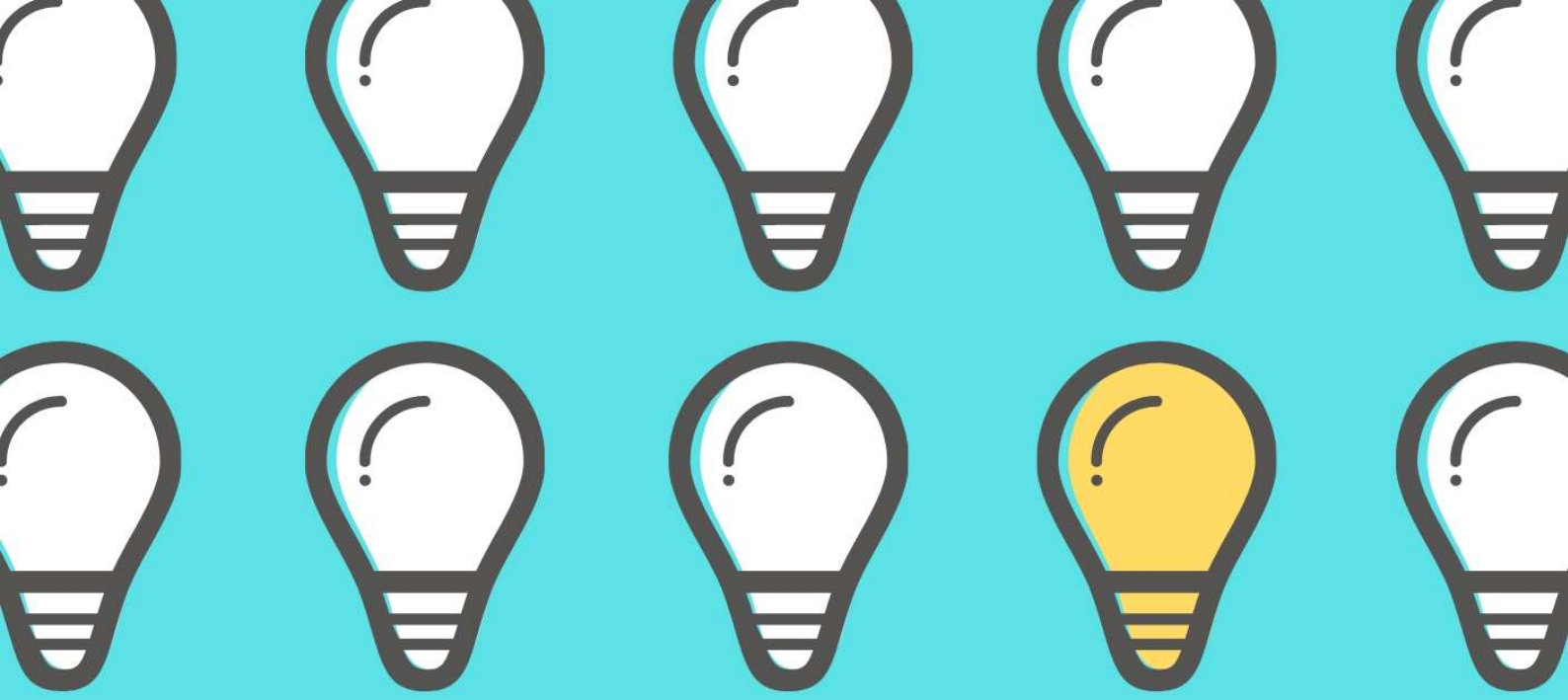
First, a project proposal could have been graded and the score could have been counted towards the grade in the final competition. In this way, a balance between "preparation" and "presentation" could also have been maintained. In the current setting, projects are graded based on oral presentation and defense, which may have benefited those who are more skilful in public presentation and have a higher English proficiency. However, students must have put a lot of effort and time into the project proposal and writing, therefore, a small percentage

representing the structure and content of the projects could also have been included. The quality of their project reflected how well they have learnt the knowledge, how creative and innovative they are as well as how well they collaborated throughout the process. Grading their project proposals and counting the grades towards their final grades give credit to these works. It could also maintain a balance between 'preparation' and 'presentation'.

Second, the oral defense section should have taken place immediately after each presentation. In the current situation, all teams presented their projects in one section and had their oral defense in another section held on a different day. In addition, the questions asked in the oral defense section were the same for all teams. In this way, the oral defense eventually became a part of their presentation, as all teams were able to integrate their answers to these questions into their presentation. Although this was intended to maintain "fairness" for all teams, since they had approximately the same amount of time to prepare their answers, fairness would also be achieved if these questions were made known to them after they had presented their project proposals. Under the evaluators' point of view, the oral defence aims at finding out two points. First, how much they understand their project, including what it does, how it was developed, the strengths and weaknesses. Second, how organised and persuasive they can present their ideas. Having the oral defence immediately after each presentation can help the teams present their ideas more consistently and thus can facilitate evaluators to understand the whole stories more easily.

Third, one to two catch-up questions could have been asked in the oral defence section. It may sound a bit difficult to the participants as English is not their month tongue and at CIRO we are looking for learners to feel comfortable and enjoy learning. However, doing such might have brought us even closer to the aim of the oral defence section. One proposal, for future editions, would be to reduce the difficulty by doing the following. First, the number of catch-up questions could be limited to one or two. Second, the evaluators could agree on a specific area in which the questions would be asked. Teams would be informed of this area but not the questions prior to the oral defense. Third, each team could be given two minutes to discuss and organize their response.

We would like just to add that we do hope to continue with CIRO competition for future generations and to be able to keep on working somehow with this team. Besides, CIRO competition has lots of possibilities to be expanded to other schools and that is a clear success of its power.



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