INTELLECTUAL OUTPUT 3

Task O3-A2. Pilot CircularBIM Course implementation: environment test and technical improvements

This project has been funded with support from the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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CONTENT

1. DESCRIPTION OF THE TASK

This report is included in the IO3 CircularBIM OPEN EDUCATIONAL RESOURCE (OER) which is based on the implementation in technical courses and trainings on specialisation focused on the CircularBIM project. Partners of the Project have implemented pilot courses and used current courses based on the products of the project, which was also served as evaluating products for possible improvement before the end of the project.

The feedback obtained from experts during these courses and events was very useful to the improvement of the products of the project, mainly the Production of the OER, MOOC and pilot courses, and the quality assessment of technical content and pedagogical approach and IT quality assessment of ICT Based.

The beta versions of those products were shown to experts and teachers, to be checked and used in during or after the courses. It was necessary because beta versions to correct them, as well as sometimes the trainings are carrying out in facilities where there is not online connection.

Finally, the consortium has also scheduled courses, trainings, and other events (workshops, meetings, seminars, etc.) beyond the end of the project to guarantee the sustainability of the project.

All the information about the project and more technical documentation is available in the following url:

- CircularBIM project web: www.circularbim.eu

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2. MOOC PILOT COURSE EXPERIENCE

2.1. STARTING POINT

The MOOC created for the CircularBIM project is based on previous reports, considering the main aspects to contribute to overcome the barriers related to the topic of this project. These basic contents were sent to all partners who commented on any additions or changes to be made. The content of the MOOC is mainly based on manuals accompanied by supporting material such as videos, articles, legislation and lectures.

The MOOC is available at: https://class.circularbim.eu/

The course was attended by a total of 70 students related to the construction sector. The people enrolled in these courses were from Spain, Portugal and Romania. The MOOC can be used in all languages of the project partners and in English.

Below you can see the different courses created in the MOOC, one in each language of the consortium partners, and one in English.

Figure 1: Different courses available at the MOOC

You can see the "REGISTER" button at the top. By clicking on this button, the user is redirected to the registration form available at the following link: https://docs.google.com/forms/d/e/1FAIpQLSduJZXotUAChRMRnmDifGIICQ3UWvmcVgaJhwsPo_mgixAF3A/viewform

Below are the screenshots of the registration form:

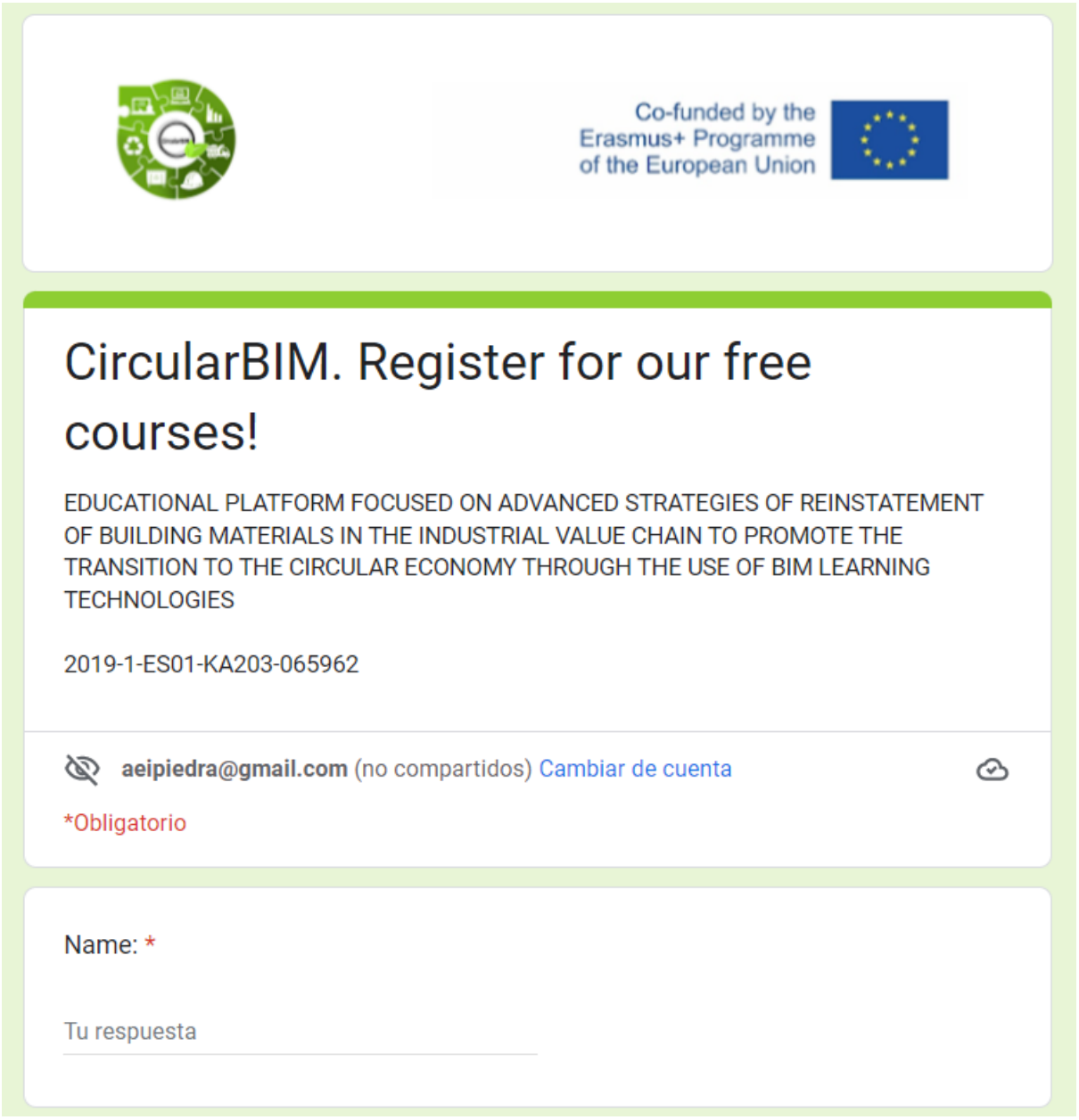

Figure 2: Register form

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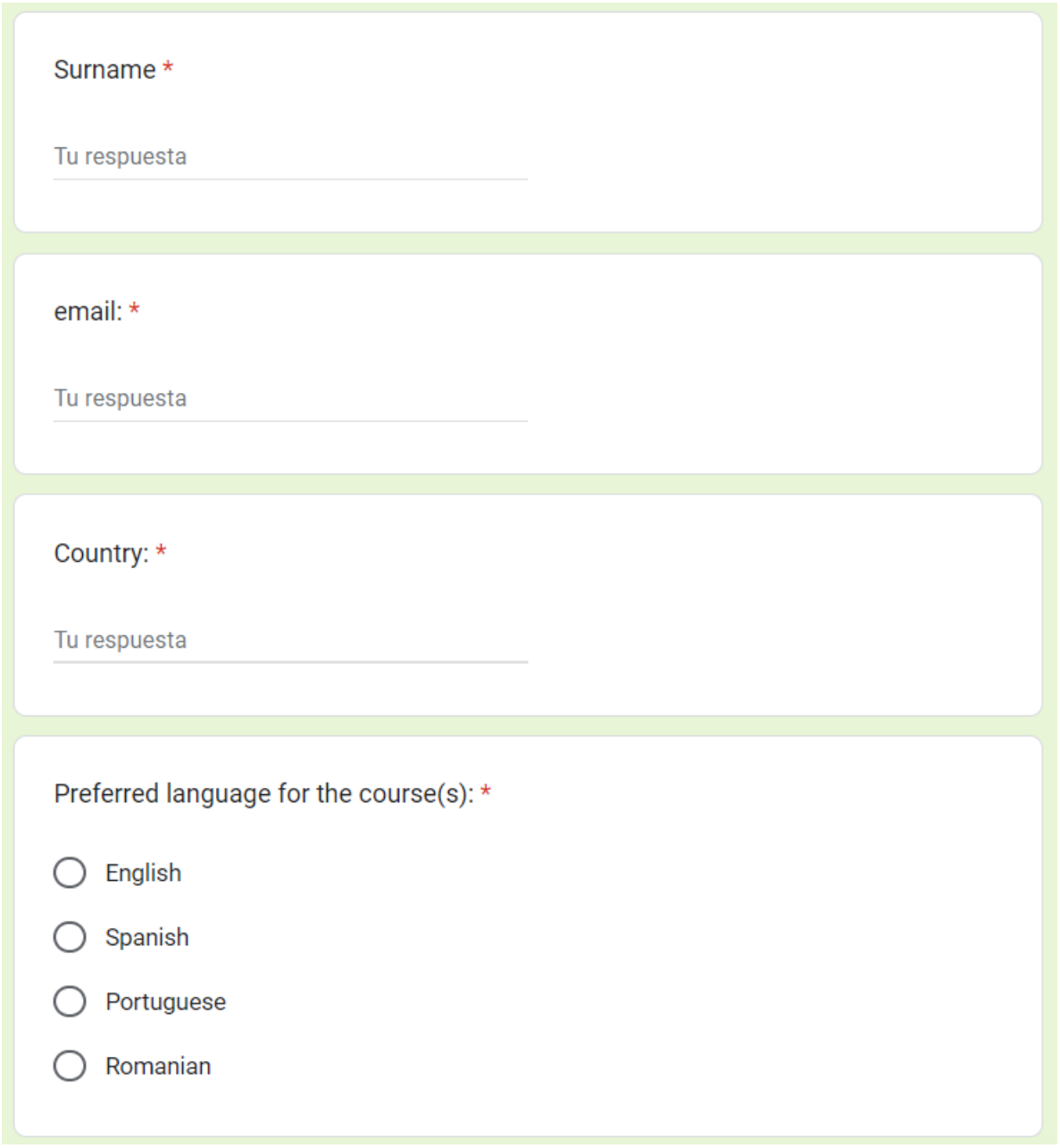

Figure 3: Register form

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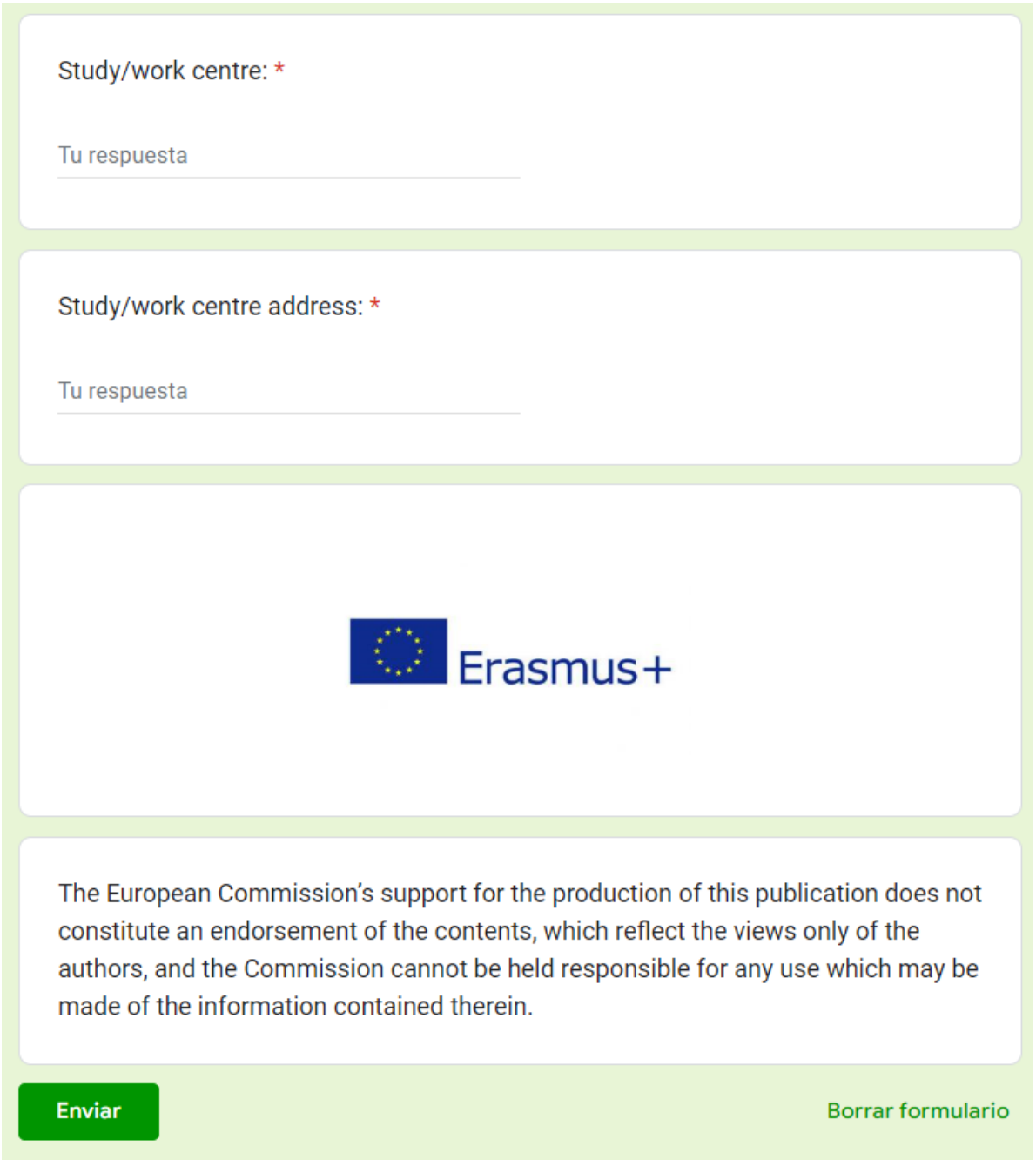

Figure 4: Register form

2.2. CONTENT OF THE PILOT COURSES: MOOC and OER

As mentioned above, a MOOC has been created for the CircularBIM project. This MOOC is hosted within the OER: https://circularbim.eu/es/oer/

In the MOOC, learners can find the content they need for their training: the topics, related documents, videos related to the topics, etc. Below are some screenshots of the MOOC. We have selected the English language for the report. But in each of the courses, the topics can be found in the corresponding language.

Figure 5: Screen shot of the MOOC.

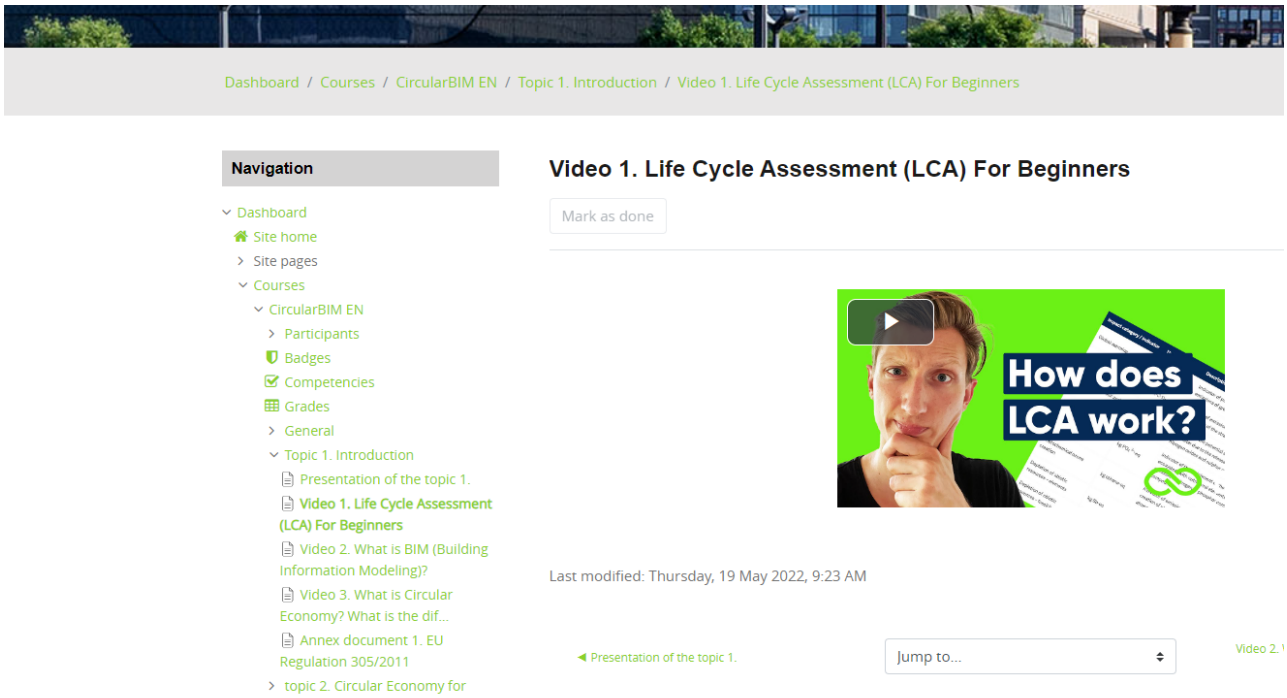

Figure 6: Screen shot of the MOOC.

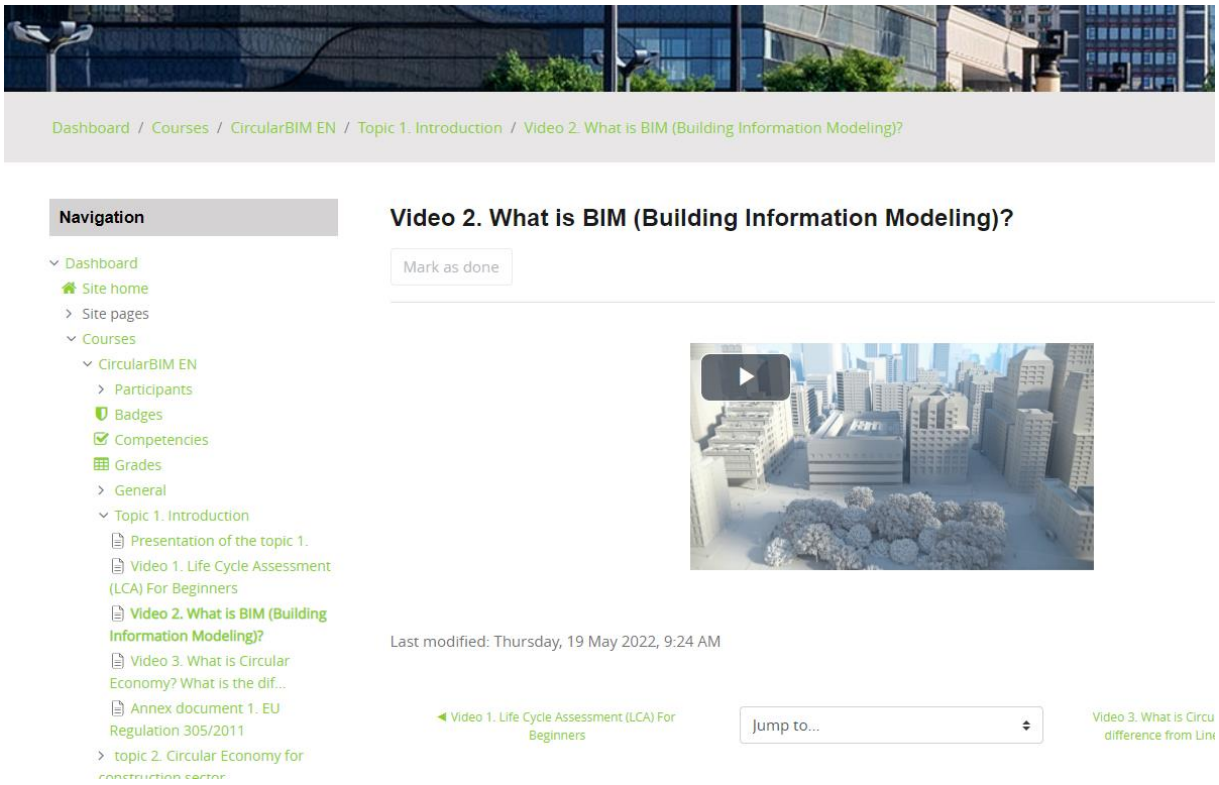

Figure 7: Screen shot of the MOOC.

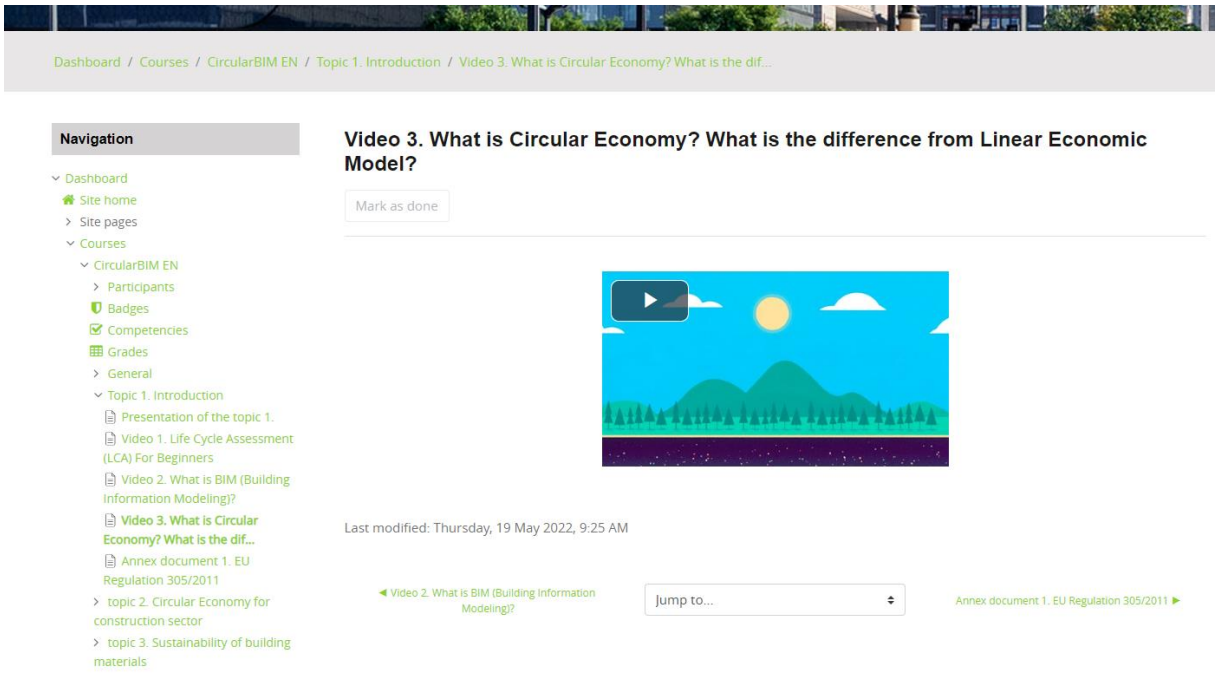

Figure 8: Screen shot of the MOOC.

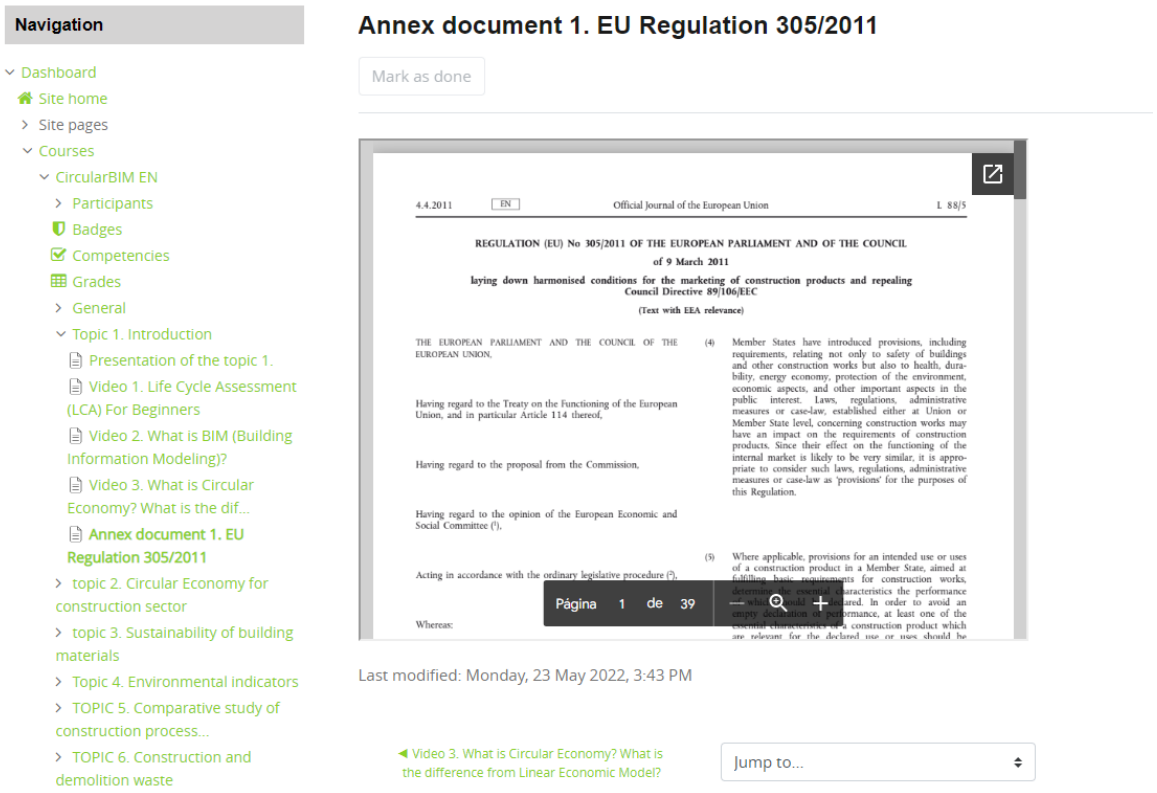

Figure 9: Screen shot of the MOOC.

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The contents of the different units of the course can be found below:

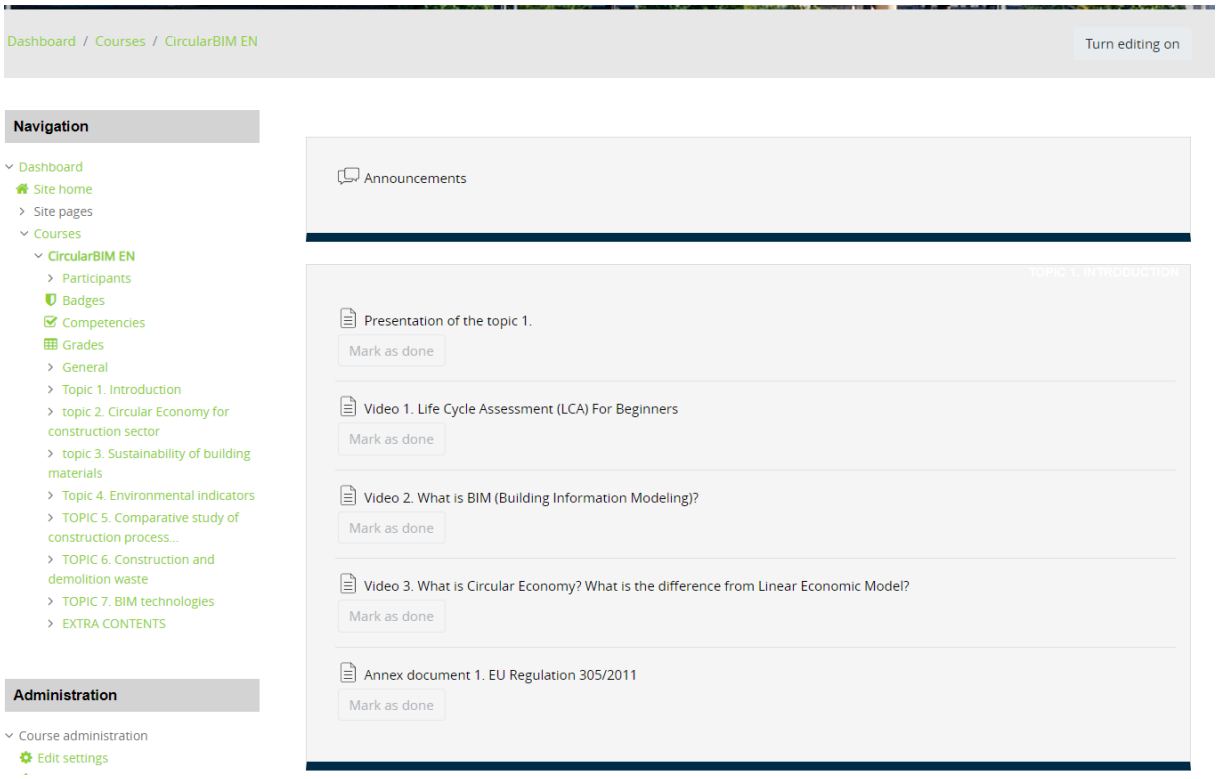

Figure 10: Contents of the MOOC.

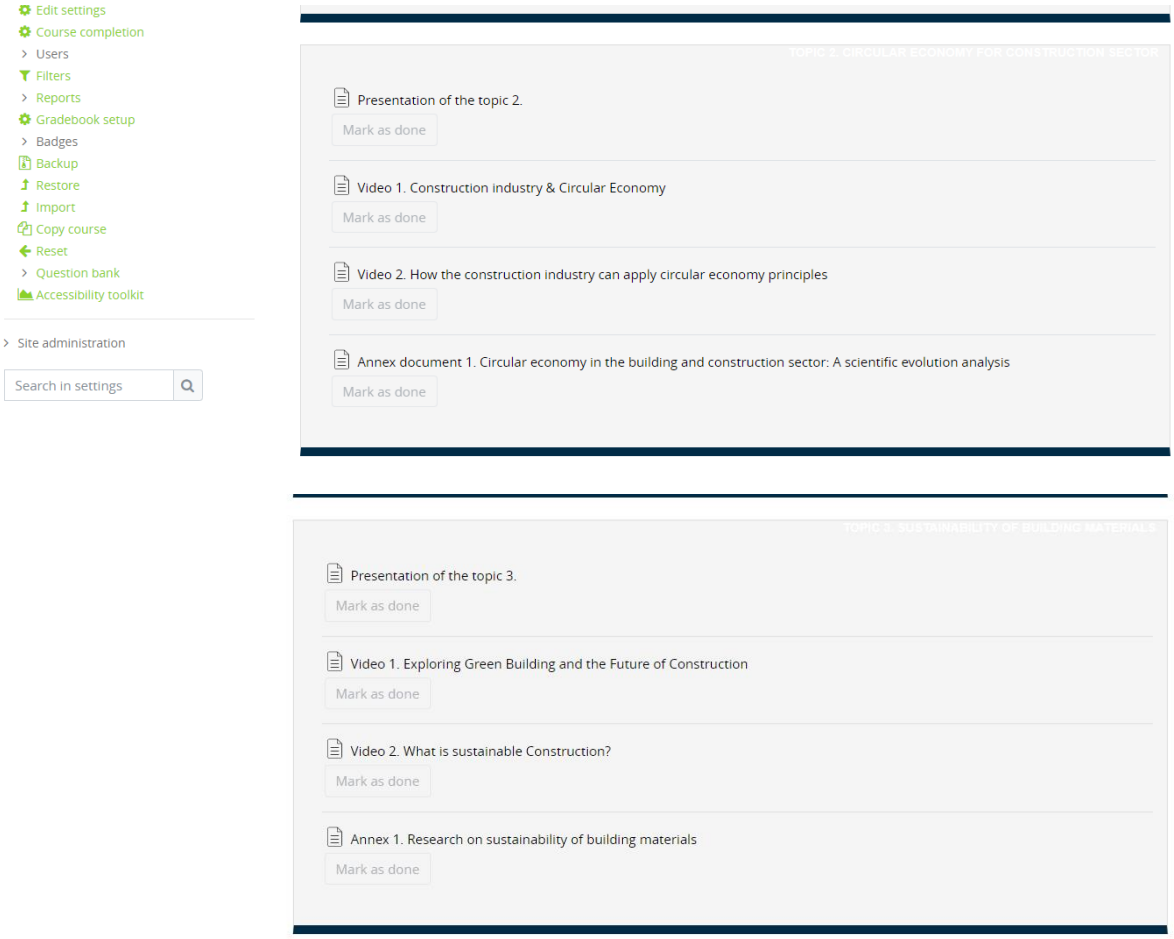

Figure 11: Contents of the MOOC.

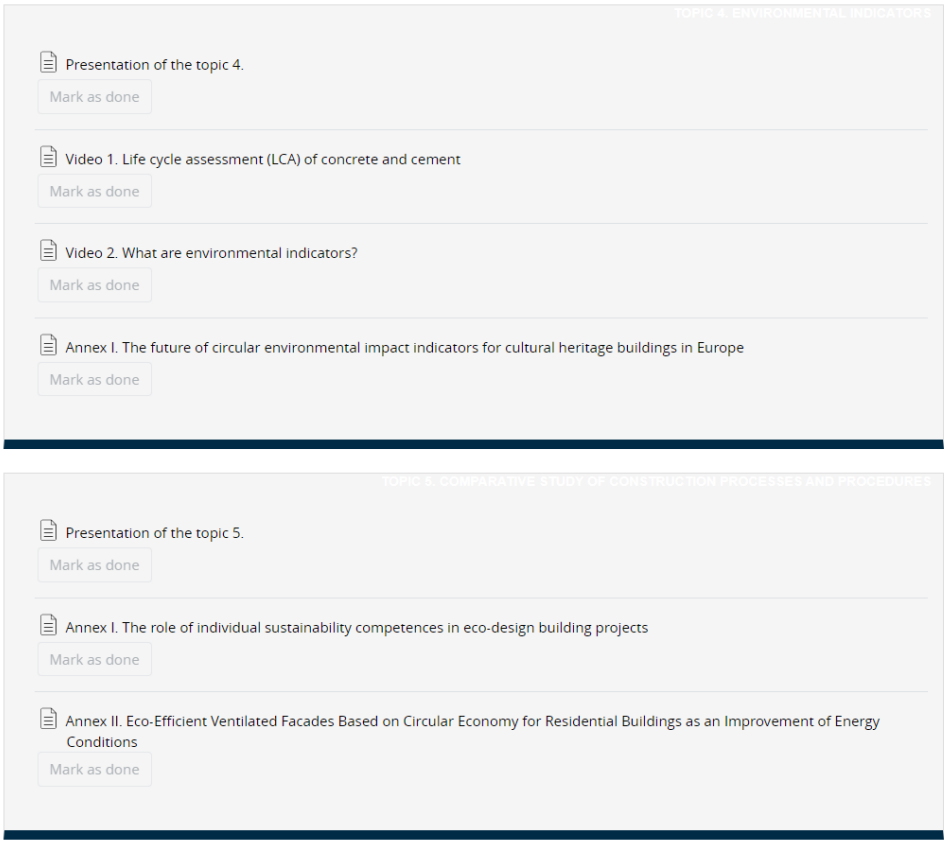

Figure 12: Contents of the MOOC.

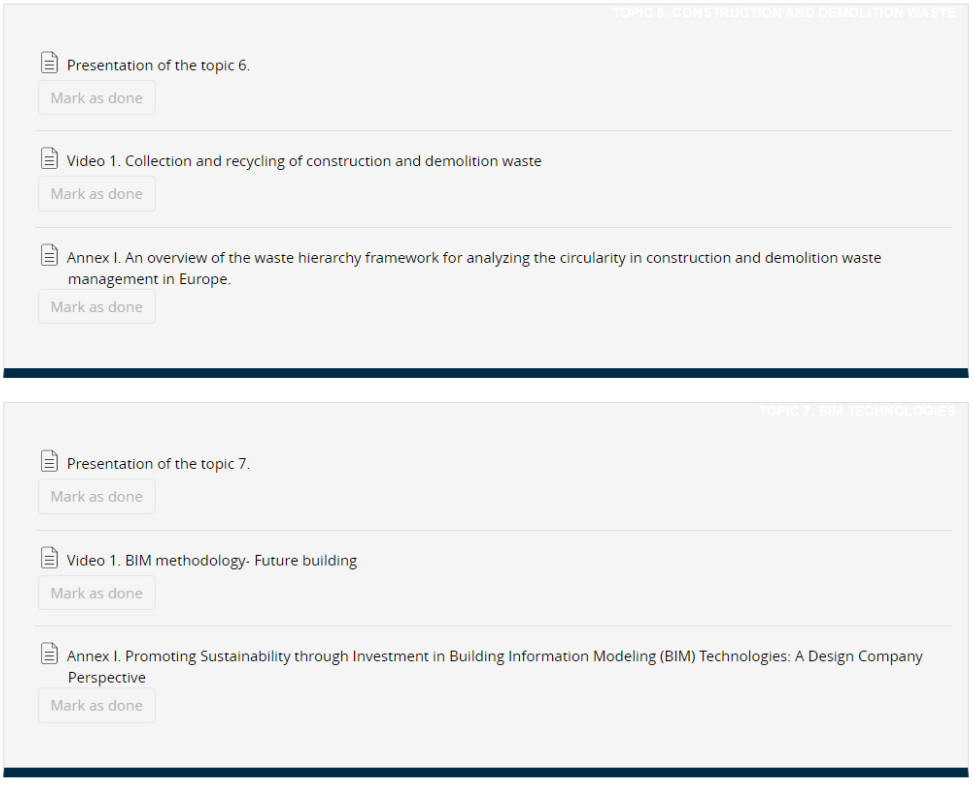

Figure 13: Contents of the MOOC.

In addition, in the OER the trainees have been provided with the project tasks to complete their training.

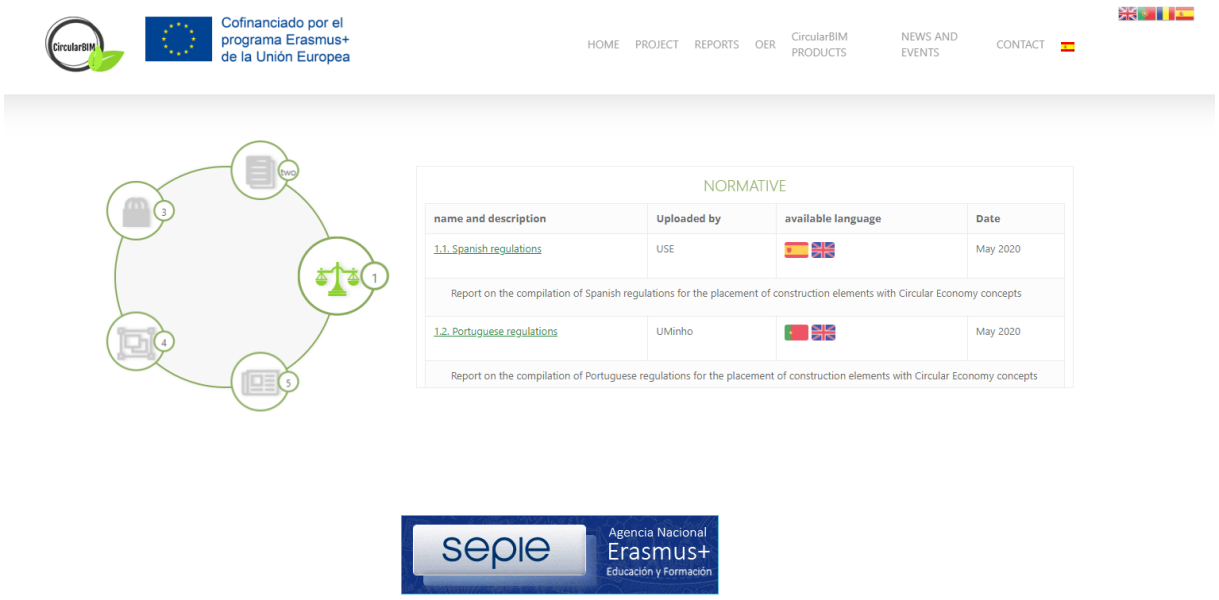

Figure 14: Screen shot of the OER.

3. PILOT COURSES

3.1. PILOT COURSE IN SPAIN (USE)

Two courses were held, both at the facilities of the University of Seville.

The first one, held at the ETSIE and given by Alejandro Rocamora, was attended by 6 people. Below are some pictures of the course:

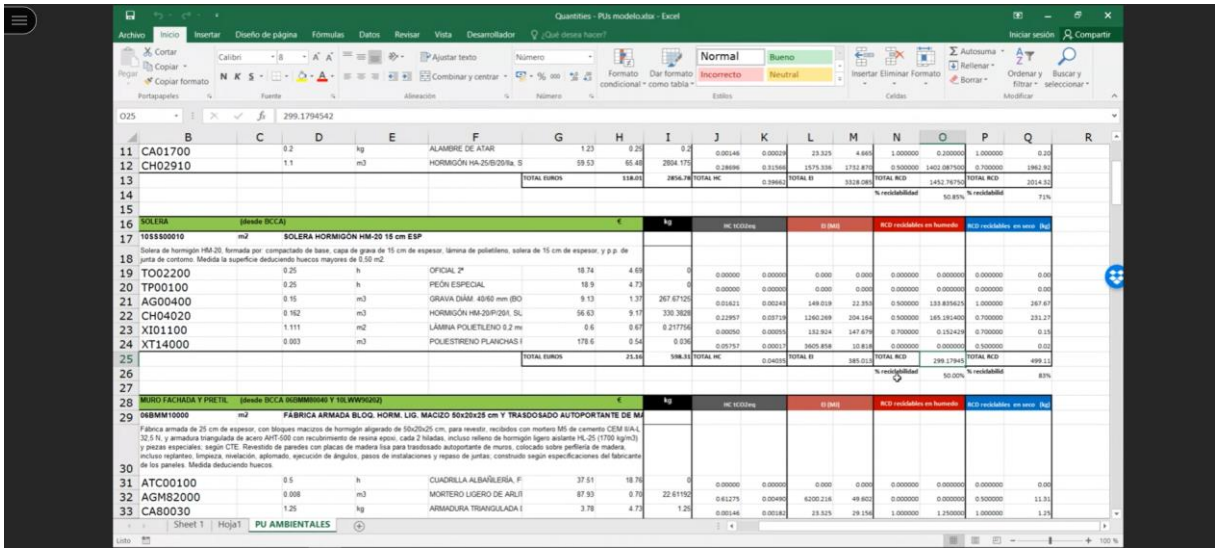

Figure 15: Pilot course in Spain.

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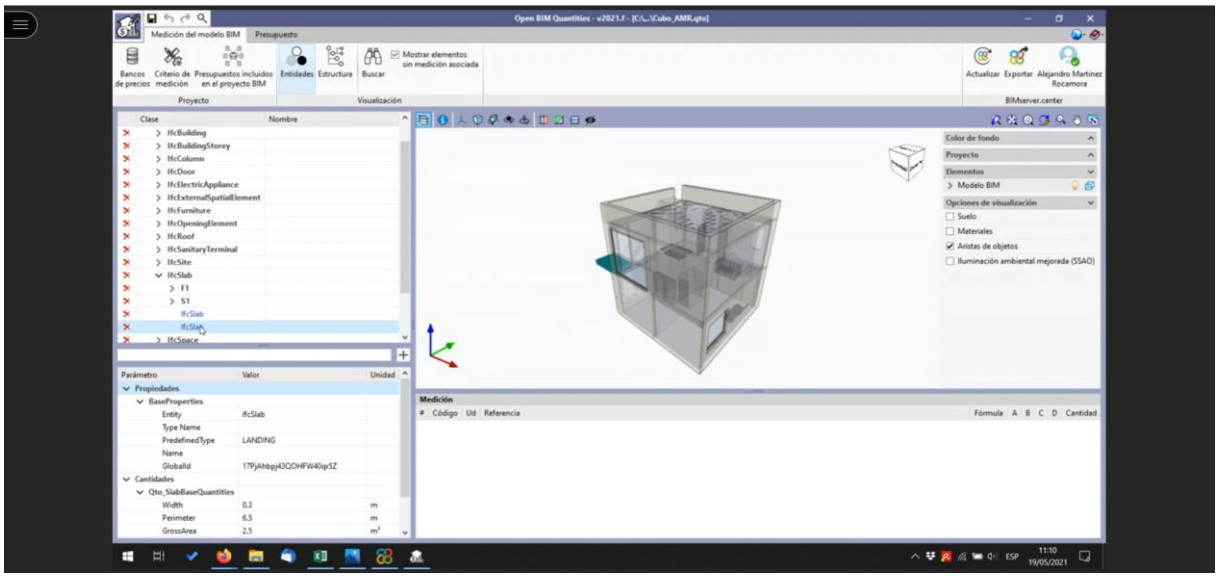

Figure 16: Pilot course in Spain.

The second one was attended by a total of 25 students. This course was held at the ETSA and was given by Pilar Mercader(USE) and Pablo Gylabert (CYPE). Below are some pictures of the course:

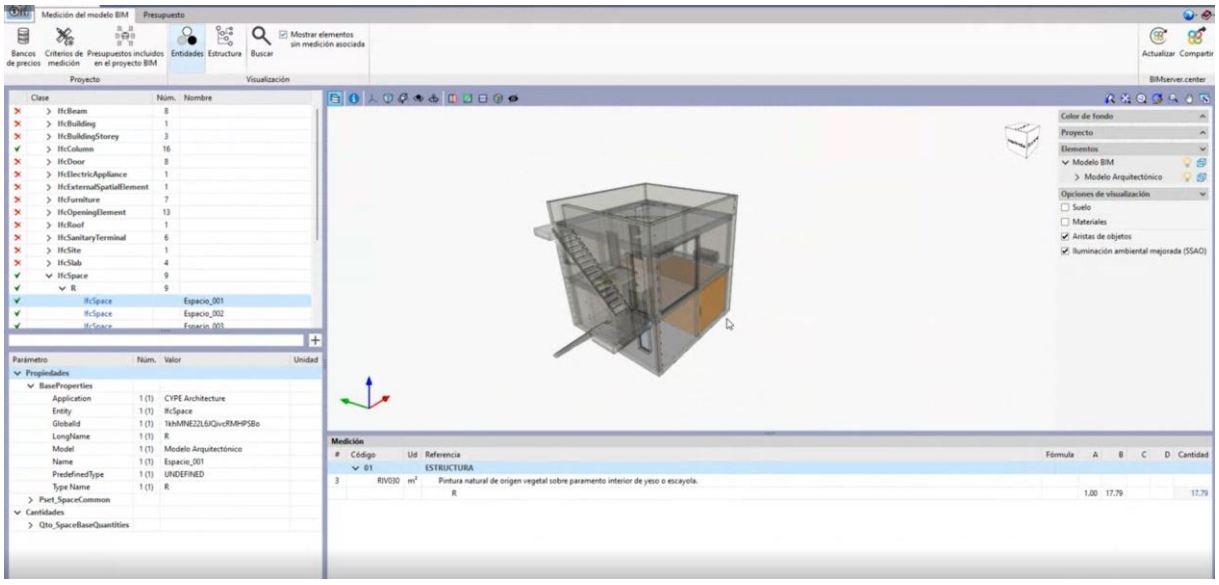

Figure 17: Pilot course in Spain.

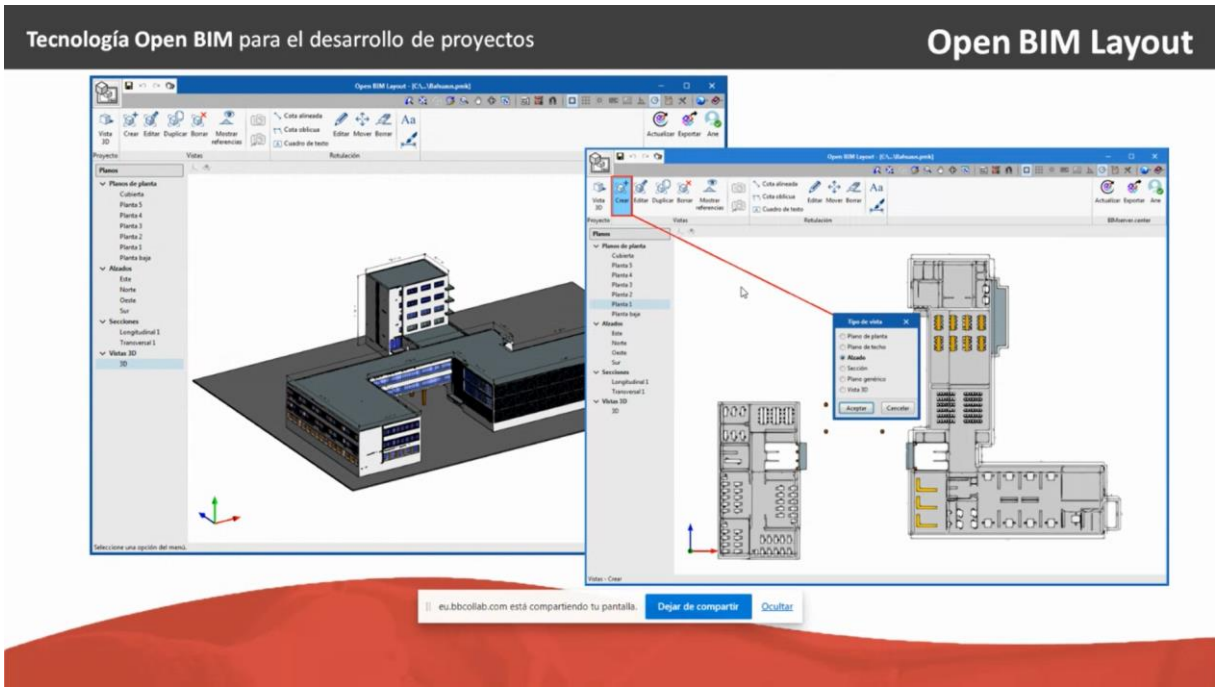

Figure 18: Pilot course in Spain.

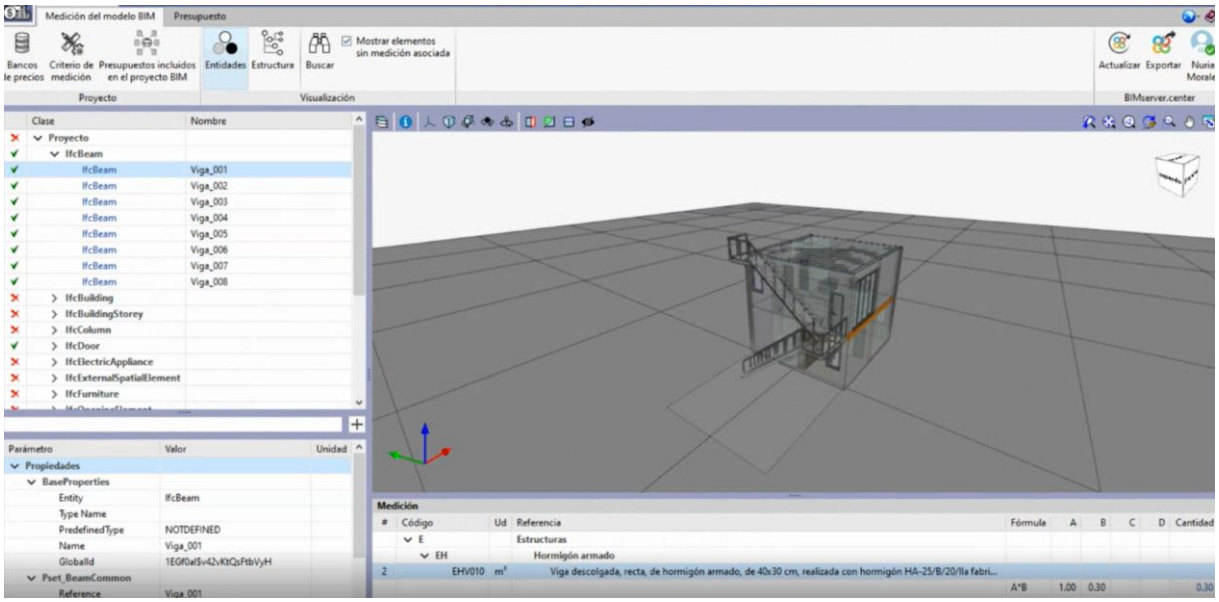

Figure 19: Pilot course in Spain.

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3.2. PILOT COURSE IN PORTUGAL (UMINHO)

Along the months of June and July of 2022, weekly meetings on Thursdays at 5 p.m. were held in which the subjects of the course CircularBIM were presented and discussed in group. During these discussions, a group of eight people gathered, under the coordination of prof. Miguel Azenha, which led the presentation of concepts.

The training material of the course was also made available to the participants through an online platform, so they could visualize the presentation slides in English, Portuguese or Spanish and a recorded video class in an asynchronous format.

On the 21st of July, the link of the course evaluation form was shared with the participants, which were asked to complete it in order to contribute with the evaluation and improvement of the training program.

Below is a picture of the course:

Figure 20: Pilot course in Portugal (includes some invited members that showed in one of the sessions but were not transversal to all sessions).

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3.3. PILOT COURSE IN RUMANIA (UNITBV)

UNITBv organized the pilot course between 6 – 8 of June 2022, in this way, all the projects' results being finished and useful for students.

The course content, developed during the project's implementation, divided into six modules, was translated into Romanian language for a better understanding for all participants.

The pilot course was conducted with physical presence for all modules.

UNITBv uses an on-line platform for teaching and learning activities based on Moodle platform. In this platform, a CircularBIM pilot course was created and all the content (in both language, English and Romanian) was uploaded, so that the students could have access to it.

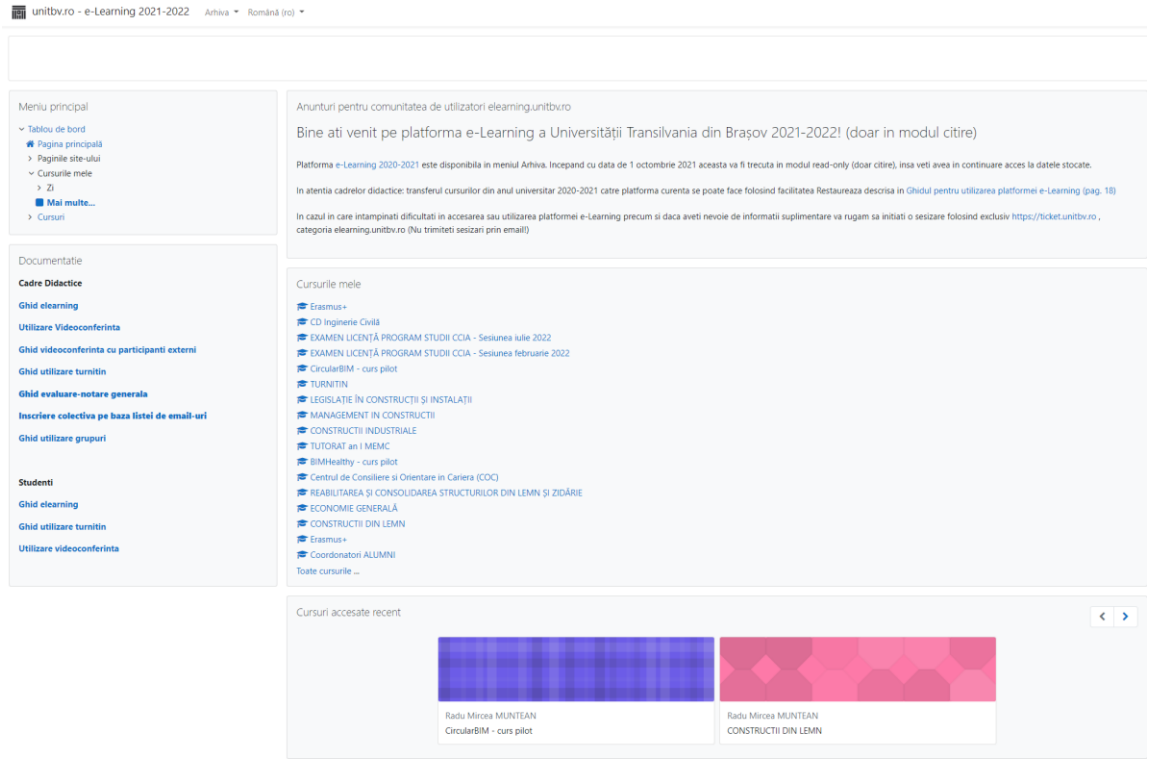

Figure 21: MOOC of the pilot course in Romania.

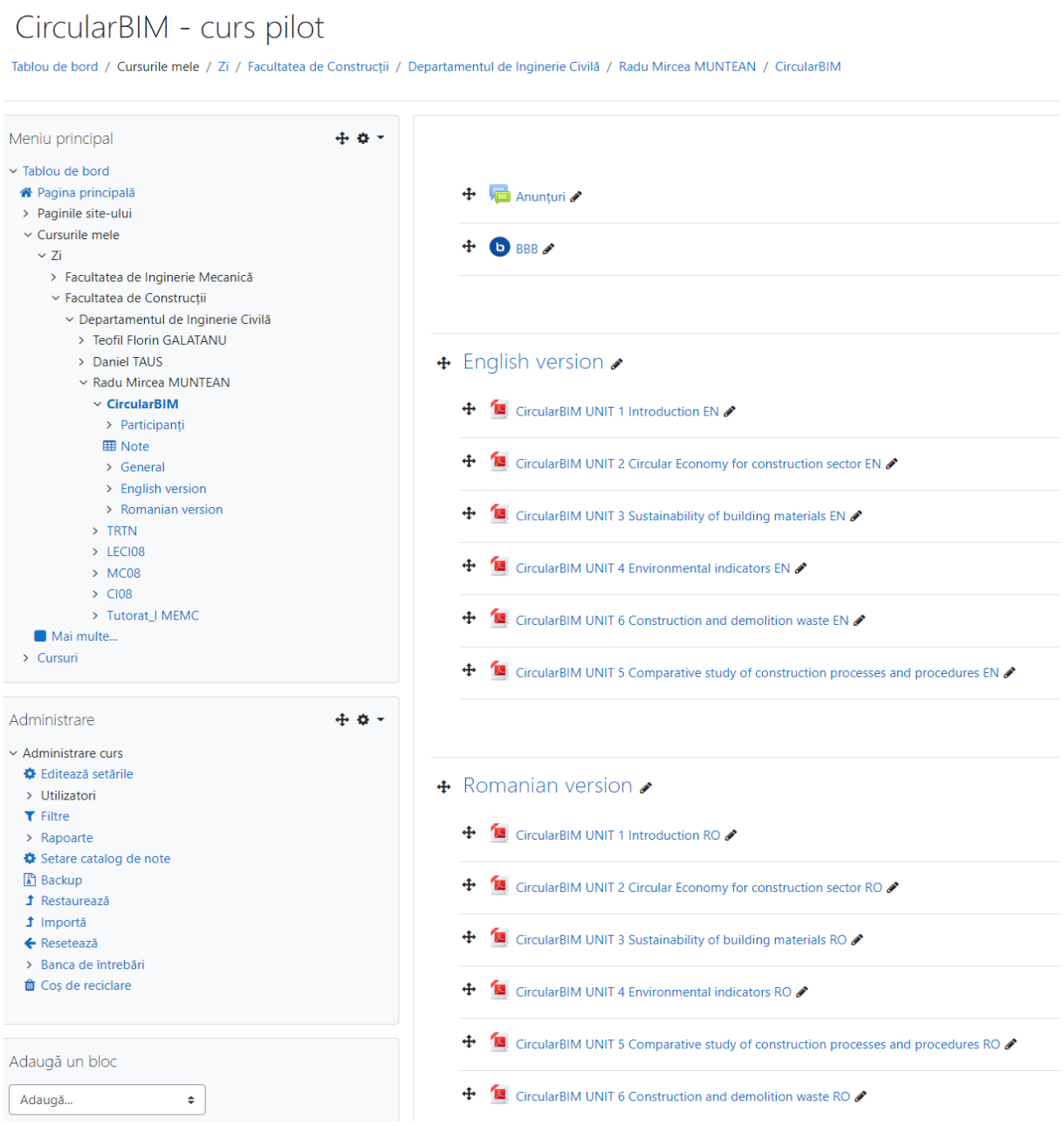

Figure 22: MOOC of the pilot course in Romania.

Participants to the pilot course were selected from undergraduate students from the Faculty of Civil Engineering. They were volunteers, being enrolled due to their interest to the proposed content and themes, since no ECTS credits were offered. They found out about the project and its topics in different presentations made by the project team during the implementation and developing period.

A number of 30 participants were selected and enrolled into the platform, based on their interest, similarity to their present and future study program and on their availability for the specific period of time for the implementation of the pilot course.

The selected participants were enrolled into the on-line platform, having access to download and study the course content and to respond to a questionnaire after completing the course.

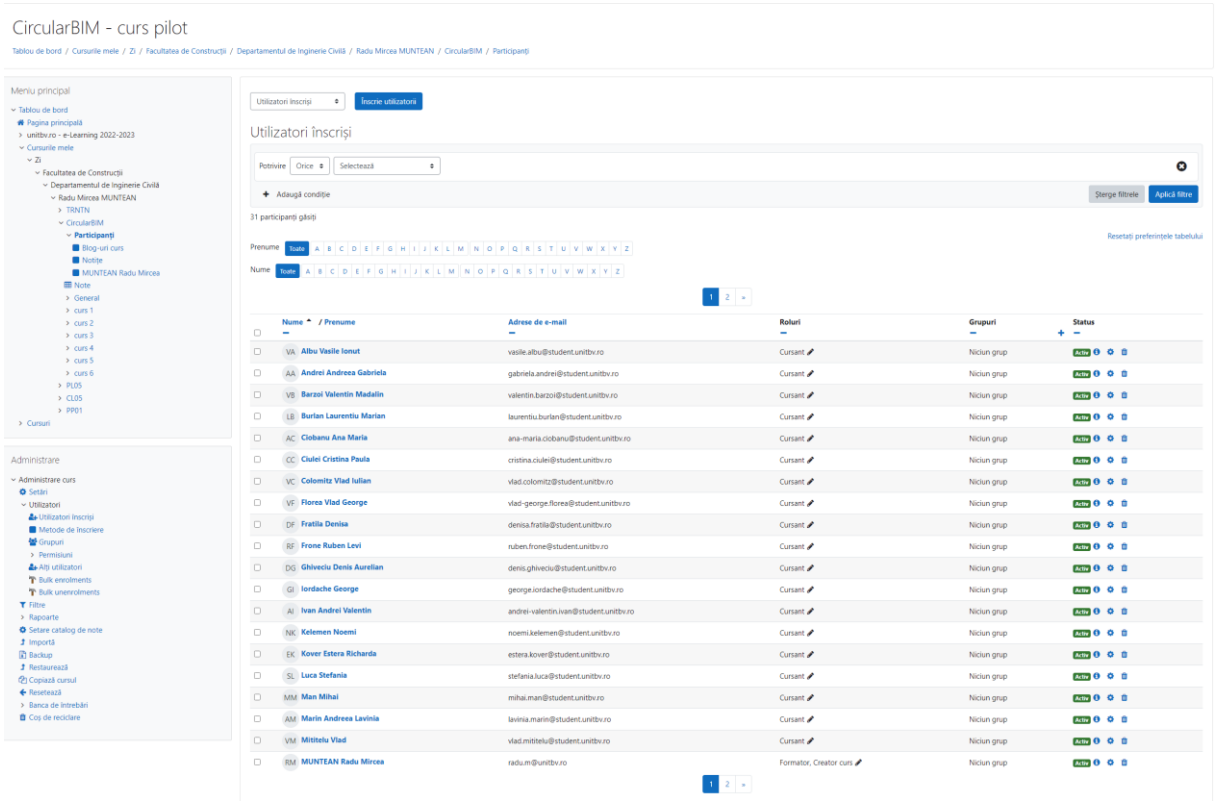

Figure 23: Participants of the pilot course in Romania.

Figure 24: Pilot course in Romania.

Figure 25: Pilot course in Romania.

To finalize the pilot course, students were asked to do a homework - a written paper on a chosen theme from those discussed during the pilot course. All the answers were uploaded on the university e-learning platform and graded by the professors.

After the end of the pilot course, an on-line questionnaire was submitted to the participants asking for their opinion regarding the content and the quality of presentations.

Certificates of attendance were given to all the students who successfully completed the pilot course. Some promotional materials like a notebook and a pen with project's logo were offered to all participants to be used during the pilot course.

CircularBIM – Economia circulară și tehnologiile BIM aplicate în construcții
2019-1-ES01-KA203-065962

Cofinanțat prin programul Erasmus+ al Uniunii Europene

Se acordă dlui/drei Ana Maria CIOBANU

CERTIFICAT DE PARTICIPARE

La cursul pilot **„CircularBIM – Economia circulară și tehnologiile BIM aplicate în construcții"**, desfășurat în perioada 6 - 8 iunie 2022, în cadrul proiectului cu nr. 2019-1-ES01-KA203-065962, la Facultatea de Construcții din cadrul Universității Transilvania din Brașov.

Radu Muntean
Coordonator proiect CircularBIM, Universitatea Transilvania din Barșov

Figure 26: Certificates of attendance of the pilot course in Romania.

4. QUESTIONNAIRE

A specific questionnaire was developed to check and improve the course programmes and training activities.

These training activities were carried out for the educational staff to evaluate the content of the curricula and training material developed during the project.

The questionnaires given to the participants included a generic question to propose any comments they considered necessary to improve the quality of all the products of the CircularBIM project.

The questionnaire for the evaluation of the training activities carried out was the following: https://docs.google.com/forms/d/e/1FAIpQLSce6QlUDqKkNhmIhFW9LlOYN4u4BxqgDEOhaYZ7RGFxsBdLGg/viewform?usp=sf_link

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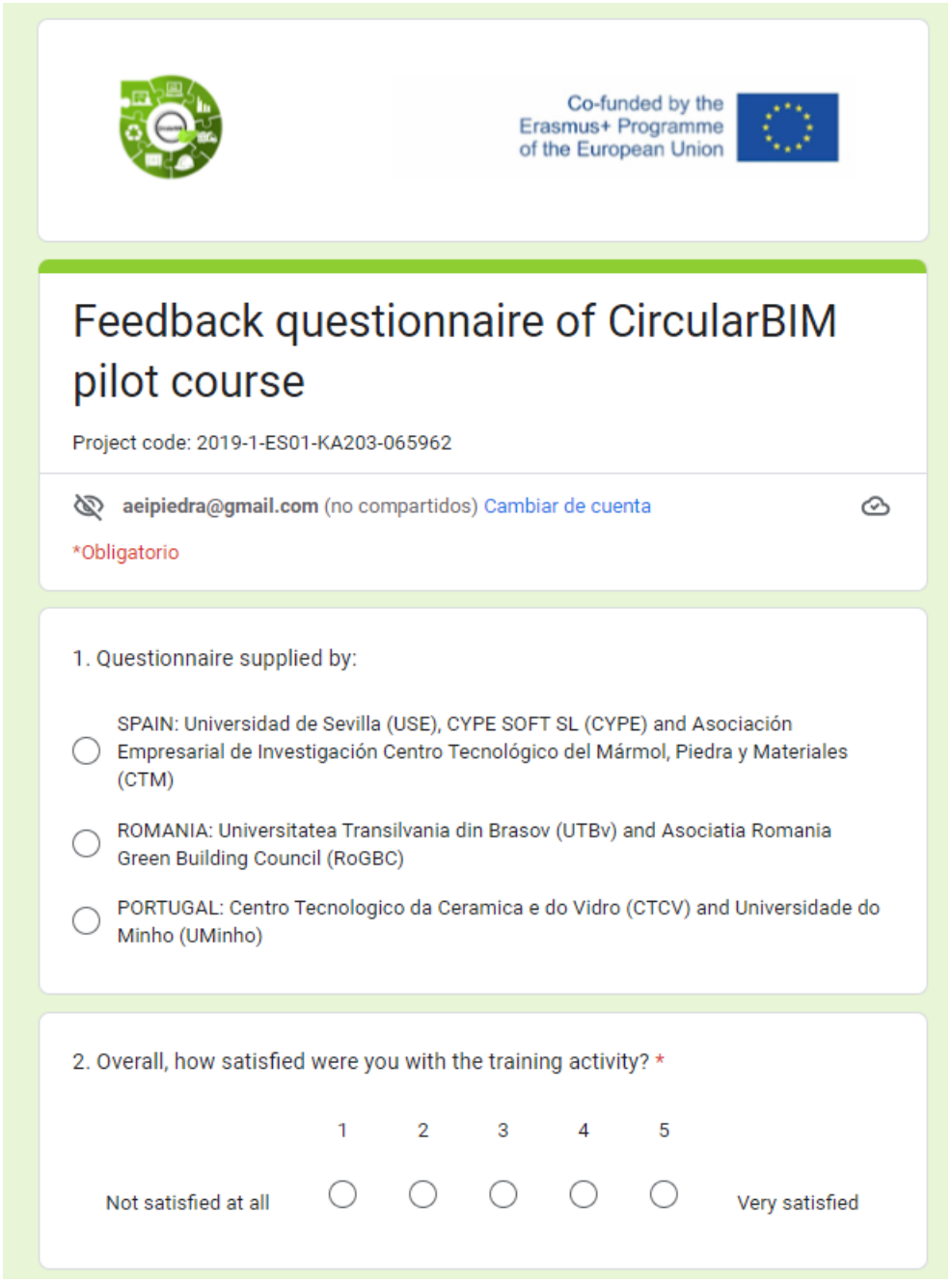

Co-funded by the Erasmus+ Programme of the European Union

Feedback questionnaire of CircularBIM pilot course

Project code: 2019-1-ES01-KA203-065962

aeipiedra@gmail.com (no compartidos) Cambiar de cuenta

*Obligatorio

1. Questionnaire supplied by:

- SPAIN: Universidad de Sevilla (USE), CYPE SOFT SL (CYPE) and Asociación Empresarial de Investigación Centro Tecnológico del Mármol, Piedra y Materiales (CTM)
- ROMANIA: Universitatea Transilvania din Brasov (UTBv) and Asociatia Romania Green Building Council (RoGBC)
- PORTUGAL: Centro Tecnologico da Ceramica e do Vidro (CTCV) and Universidade do Minho (UMinho)

2. Overall, how satisfied were you with the training activity? *

	1	2	3	4	5	
Not satisfied at all	○	○	○	○	○	Very satisfied

Figure 27: Pilot course questionnaire

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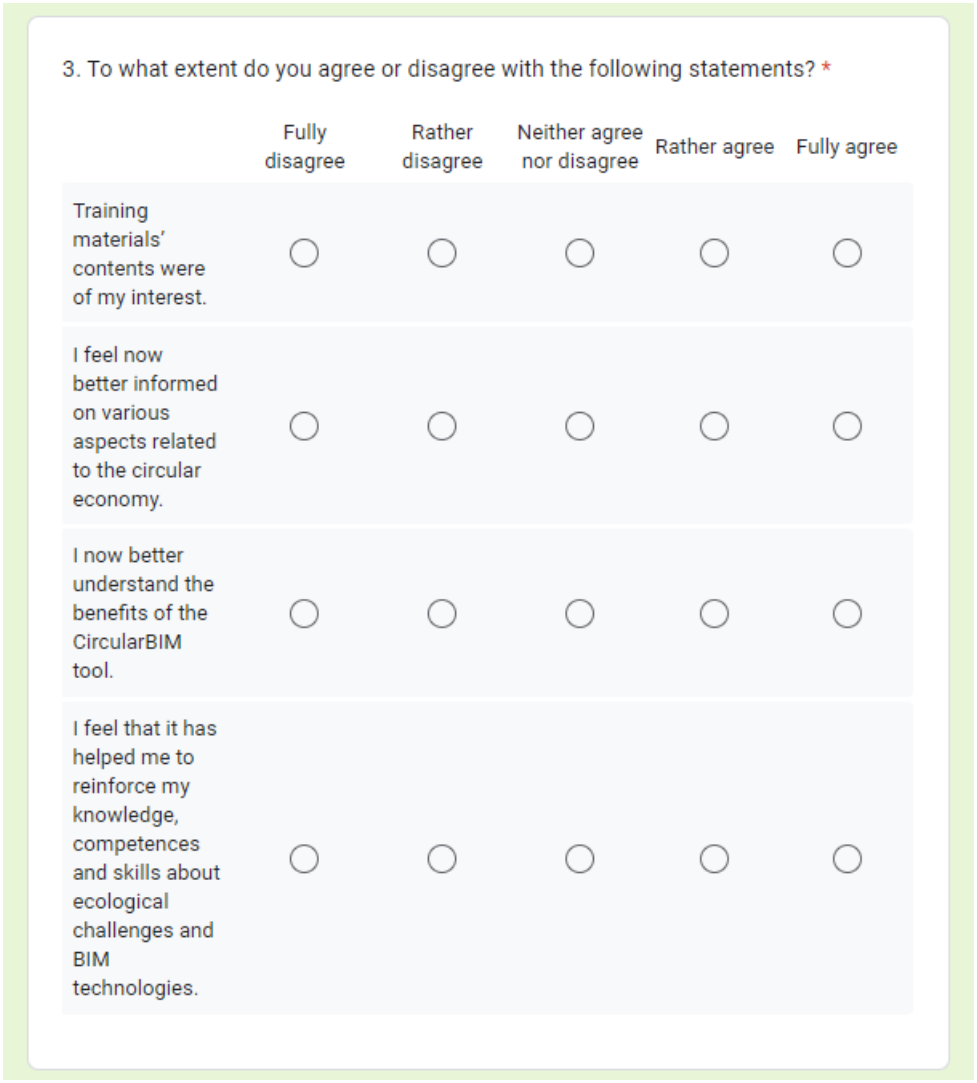
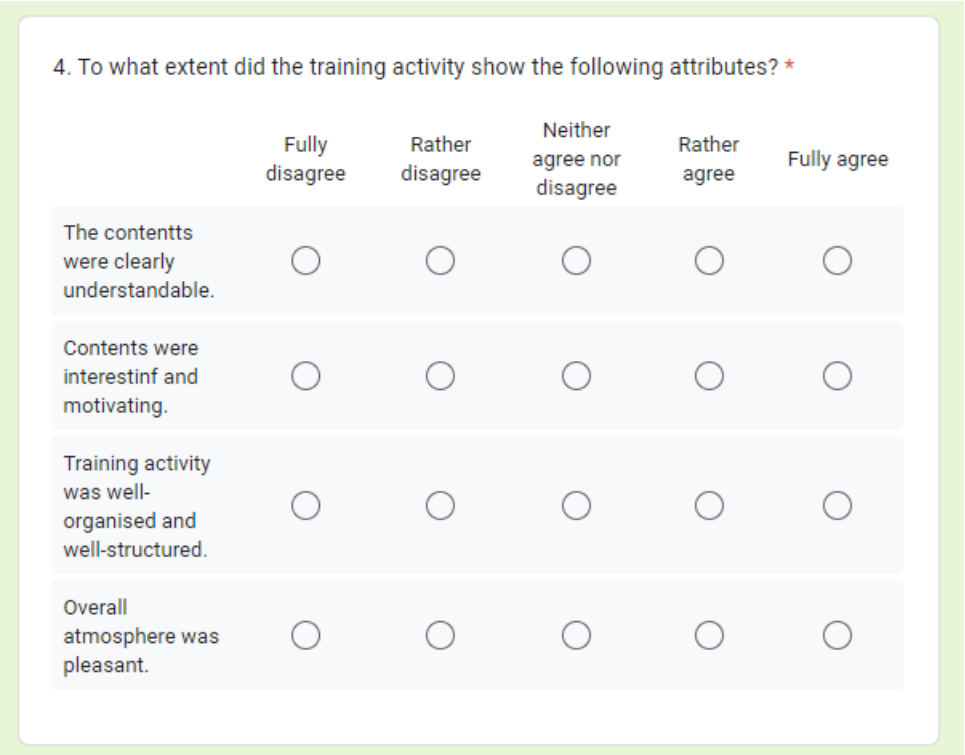


3. To what extent do you agree or disagree with the following statements? *

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
Training materials' contents were of my interest.	○	○	○	○	○
I feel now better informed on various aspects related to the circular economy.	○	○	○	○	○
I now better understand the benefits of the CircularBIM tool.	○	○	○	○	○
I feel that it has helped me to reinforce my knowledge, competences and skills about ecological challenges and BIM technologies.	○	○	○	○	○

Figure 28: Pilot course questionnaire

Consortium members: Universidad de Sevilla (USE), Asociación Empresarial de Investigación Centro Tecnológico del Mármol, Piedra y Materiales (CTM), CYPE SOFT SL (CYPE), Universitatea Transilvania din Brasov (UNITBv), Asociatia Romania Green Building Council (RoGBC), Centro Tecnologico da Ceramica e do Vidro (CTCV) and Universidade do Minho (UMinho)



4. To what extent did the training activity show the following attributes? *

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
The contentts were clearly understandable.	○	○	○	○	○
Contents were interestinf and motivating.	○	○	○	○	○
Training activity was well-organised and well-structured.	○	○	○	○	○
Overall atmosphere was pleasant.	○	○	○	○	○

Figure 29: Pilot course questionnaire

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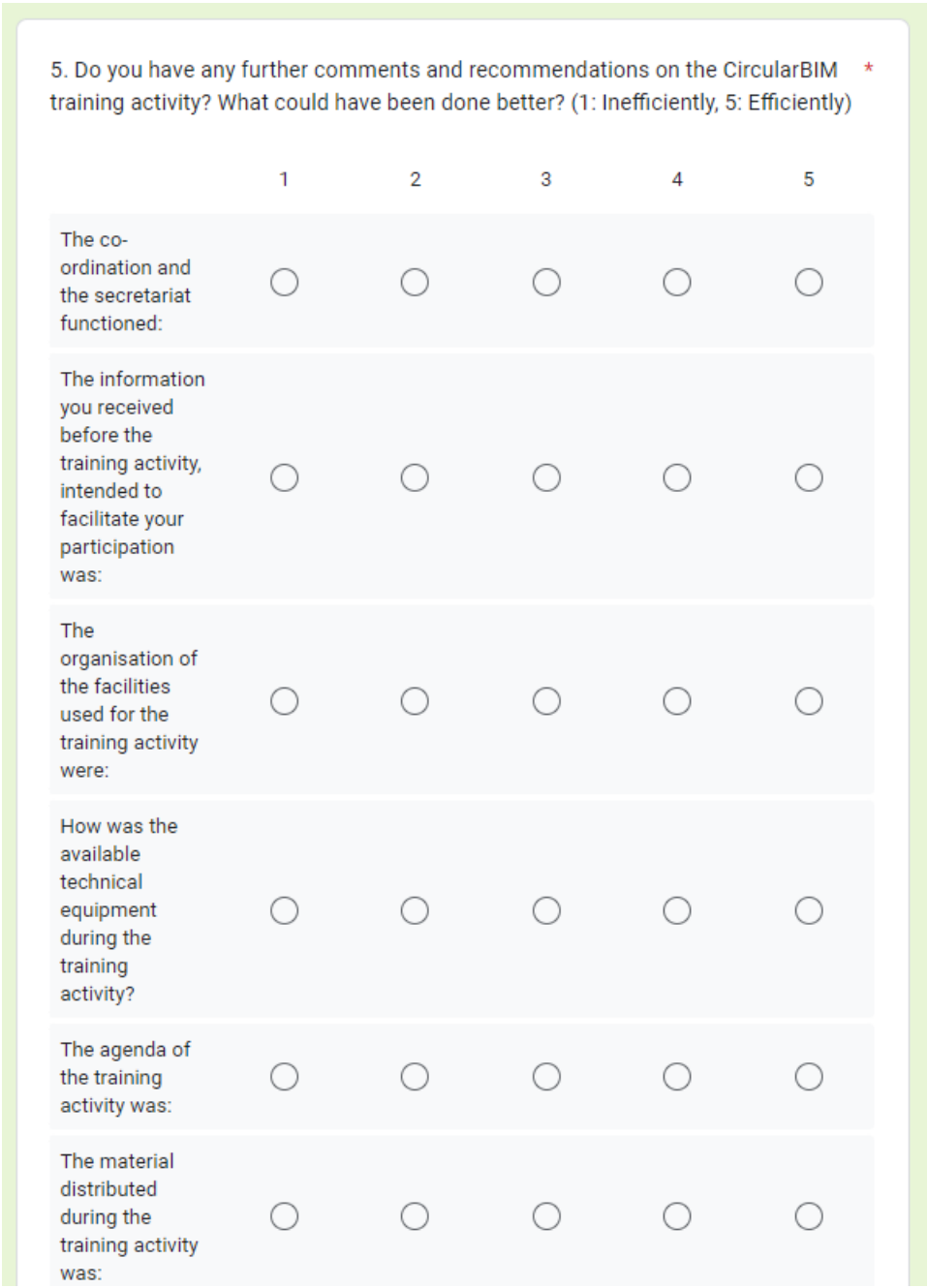

5. Do you have any further comments and recommendations on the CircularBIM training activity? What could have been done better? (1: Inefficiently, 5: Efficiently) *

	1	2	3	4	5
The co-ordination and the secretariat functioned:	◯	◯	◯	◯	◯
The information you received before the training activity, intended to facilitate your participation was:	◯	◯	◯	◯	◯
The organisation of the facilities used for the training activity were:	◯	◯	◯	◯	◯
How was the available technical equipment during the training activity?	◯	◯	◯	◯	◯
The agenda of the training activity was:	◯	◯	◯	◯	◯
The material distributed during the training activity was:	◯	◯	◯	◯	◯

Figure 30: Pilot course questionnaire

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The way you were received at the training activity was	○	○	○	○	○
At the start of the training activity, the themes, the time available and the procedures were:	○	○	○	○	○
The time management of the training activity was:	○	○	○	○	○
The working conditions for the training activity were:	○	○	○	○	○
The working atmosphere for the training activity were:	○	○	○	○	○
The general management of the training activity was:	○	○	○	○	○
The management of the development of the work in the training activity was:	○	○	○	○	○
The course relates to the circular economy and BIM technologies:	○	○	○	○	○

Figure 31: Pilot course questionnaire

Consortium members: Universidad de Sevilla (USE), Asociación Empresarial de Investigación Centro Tecnológico del Mármol, Piedra y Materiales (CTM), CYPE SOFT SL (CYPE), Universitatea Transilvania din Brasov (UNITBv), Asociatia Romania Green Building Council (RoGBC), Centro Tecnologico da Ceramica e do Vidro (CTCV) and Universidade do Minho (UMinho)

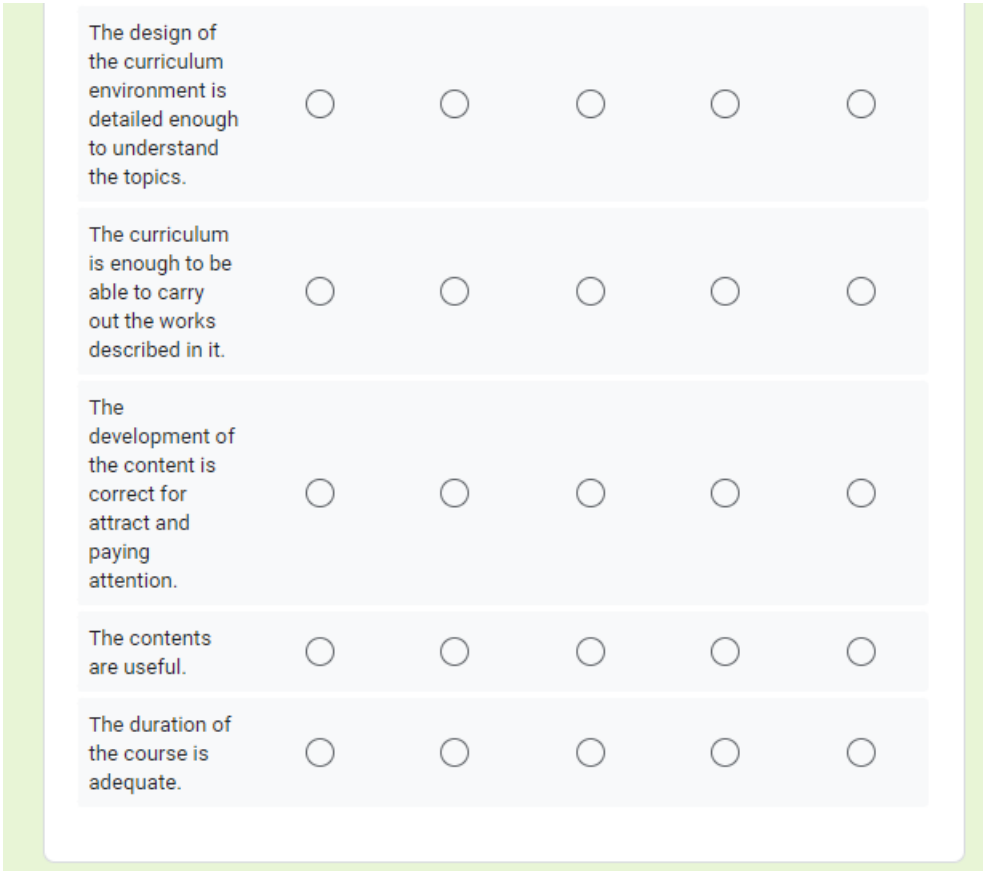

Figure 32: Pilot course questionnaire

Consortium members: Universidad de Sevilla (USE), Asociación Empresarial de Investigación Centro Tecnológico del Mármol, Piedra y Materiales (CTM), CYPE SOFT SL (CYPE), Universitatea Transilvania din Brasov (UNITBv), Asociatia Romania Green Building Council (RoGBC), Centro Tecnologico da Ceramica e do Vidro (CTCV) and Universidade do Minho (UMinho)

6. Do you have any further comments and recommendations on the CircularBIM training activity? What could have been done better? *

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
The course relates to the circular economy and BIM technologies:	○	○	○	○	○
The design of the curriculum environment is detailed enough to understand the topics.	○	○	○	○	○
The curriculum is enough to be able to carry out the works described in it.	○	○	○	○	○
The development of the content is correct for attract and paying attention.	○	○	○	○	○
The contents are useful.	○	○	○	○	○
The duration of the course is adequate.	○	○	○	○	○

Figure 33: Pilot course questionnaire

Consortium members: Universidad de Sevilla (USE), Asociación Empresarial de Investigación Centro Tecnológico del Mármol, Piedra y Materiales (CTM), CYPE SOFT SL (CYPE), Universitatea Transilvania din Brasov (UNITBv), Asociatia Romania Green Building Council (RoGBC), Centro Tecnologico da Ceramica e do Vidro (CTCV) and Universidade do Minho (UMinho)

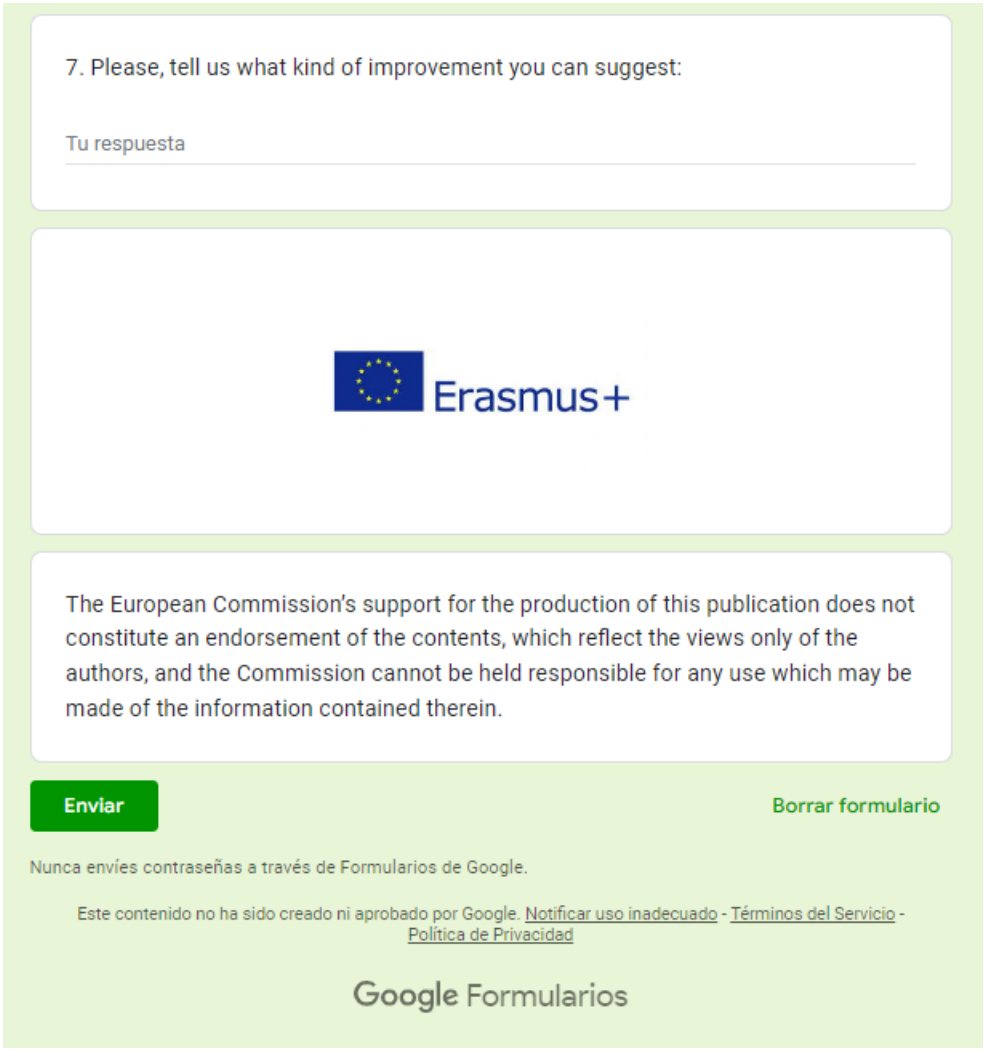

Figure 34: Pilot course questionnaire

Consortium members: Universidad de Sevilla (USE), Asociación Empresarial de Investigación Centro Tecnológico del Mármol, Piedra y Materiales (CTM), CYPE SOFT SL (CYPE), Universitatea Transilvania din Brasov (UNITBv), Asociatia Romania Green Building Council (RoGBC), Centro Tecnologico da Ceramica e do Vidro (CTCV) and Universidade do Minho (UMinho)

4.1. QUESTIONNAIRE RESULTS

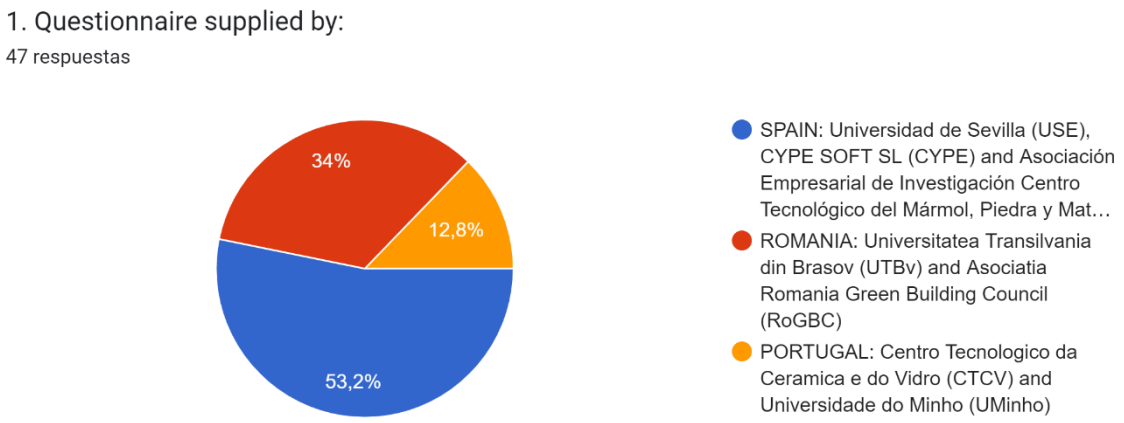

Figure 35: Questionnaire results

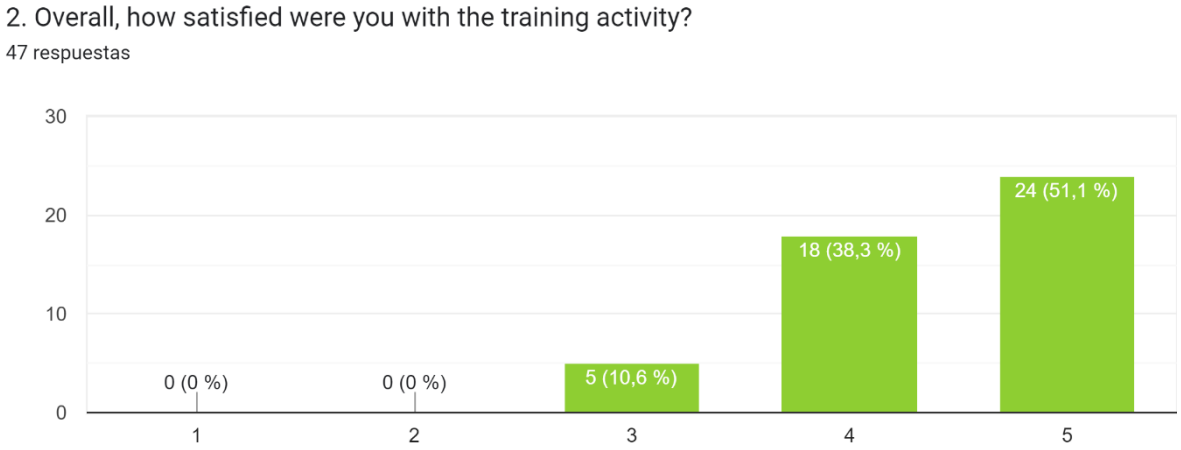

Figure 36: Questionnaire results

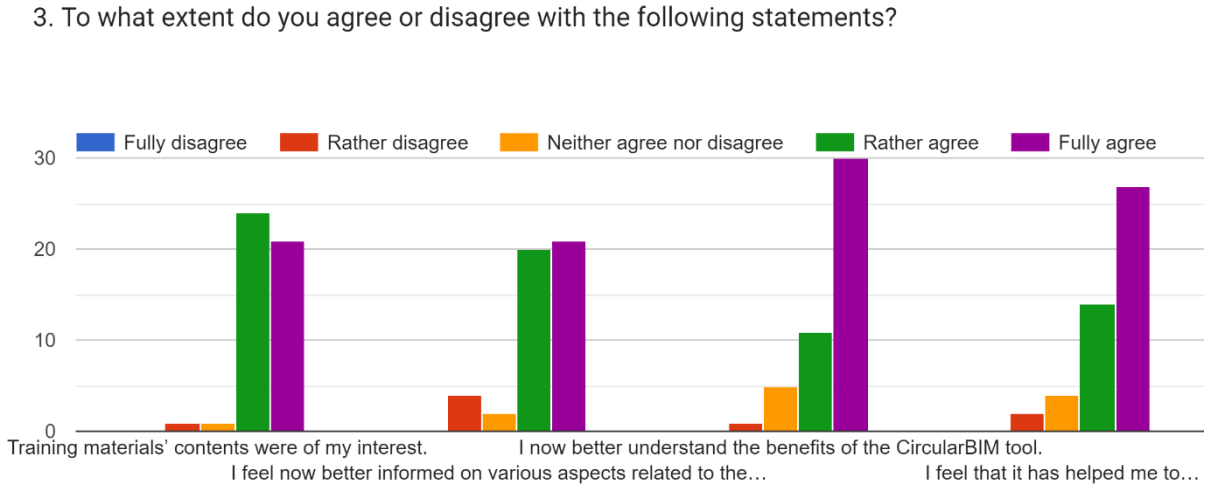

Figure 37: Questionnaire results

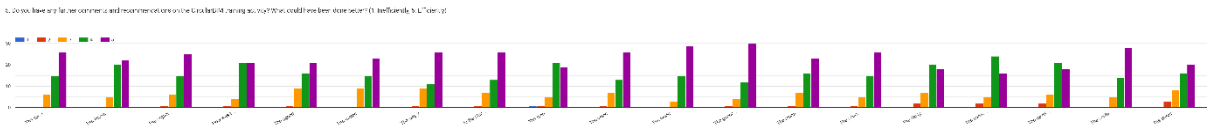

Figure 38: Questionnaire results

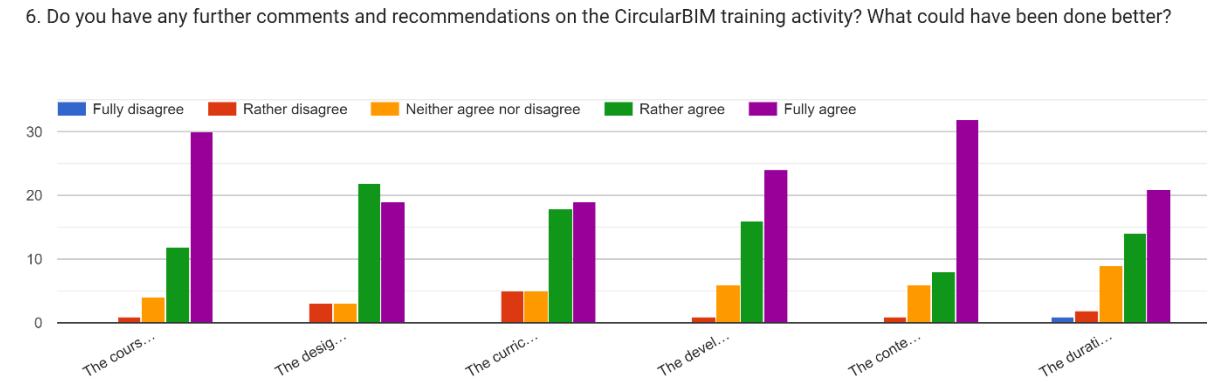

Figure 39: Questionnaire results

Consortium members: Universidad de Sevilla (USE), Asociación Empresarial de Investigación Centro Tecnológico del Mármol, Piedra y Materiales (CTM), CYPE SOFT SL (CYPE), Universitatea Transilvania din Brasov (UNITBv), Asociatia Romania Green Building Council (RoGBC), Centro Tecnologico da Ceramica e do Vidro (CTCV) and Universidade do Minho (UMinho)

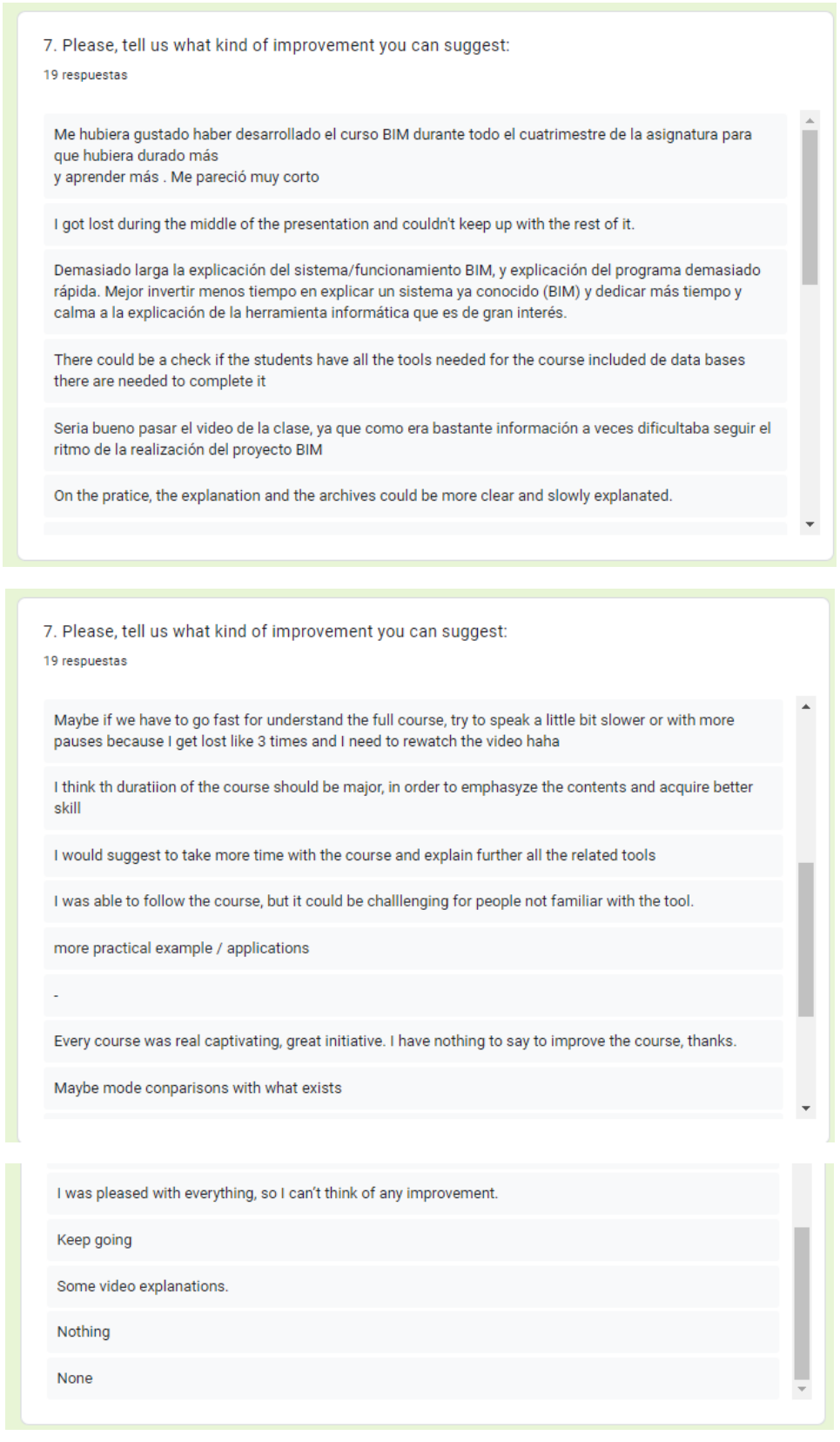

Figure 40: Questionnaire results

5. CONCLUSIONS

CONCLUSIONS OF SURVEYS:

Feedback on the pilot courses was obtained from 47 people. More than 67% of students completed the survey.

According to the data obtained from the questionnaires carried out in the training activities, it can be concluded that the results have been quite positive. From the surveys collected, we can conclude that all participants rated the training activity well (from 3 to 5).

As for the rest of the questions, it shows that some of the participants have not improved their knowledge in certain areas, but they have improved their knowledge in other complementary areas. It is also noteworthy to add that some participants did not find the contents clearly understandable and that they required a greater amount of time to assimilate this new knowledge.

There were also shortcomings in the curriculum, so it was decided to complete the topics and make them more extensive.

In short, we can conclude that the students of these pilot courses find the contents interesting, but the training time is scarce, with some of them suggesting that the course should last longer, in some cases even suggesting that it should be taught over a four-month period.

CONCLUSIONS OF PILOT COURSES:

Despite being pilot courses, the students have been happy with them. This may be due to the personalised attention they have received with the tutorials, as they have always tried to get quick answers to their questions, either through video calls or email conversations.

In addition, some of the students expressed their satisfaction with the supplementary material, as it strengthened their learning process.

Until now, only the basic terms and results of the project have been presented to teachers and students. Implementation in the teaching process based on an elaborate curriculum has not yet started.

6. IMPACT

To develop and test parts of the project, especially the pilot course units, students from the different entities involved in the project participated as volunteers. They put into practice and presented themes and topics related to circular economy, building materials, LCA, etc. The whole project and the pilot course were very well received by the students, demonstrating their interest as well as in the use of the knowledge acquired in their studies.

Moreover, during the development and implementation of the pilot course, the need to update and correlate the Romanian curricula with other European curricula emerged. In this sense, new courses based on the curricula developed in the CircularBIM project were proposed for the future: Composite Building Materials and Elements, Performing Technologies in Construction (for undergraduate studies) and Sustainable Construction and Circular Economy (for Master studies).

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