



# WP5-A4. Pilot RockChain Course implementation for VET teachers.



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of Brasov





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## Contents

1. INTRODUCTION .....	3
2. PILOT COURSE IN CEHEGIN .....	4
2.1. Agenda .....	4
2.2. Course content .....	4
2.3. Attendance .....	8
3. QUALITY ASSESSMENT .....	9
3.1. EVALUATION QUESTIONNAIRE .....	9
3.2. RESULTS OF THE QUESTIONNAIRE .....	14
4. CONCLUSIONS .....	18



## 1. INTRODUCTION

This report presents the implementation and main results of WP5-A4 “Pilot RockChain Course implementation for VET teachers”, delivered within WP5 (RockChain Open Educational Resource – OER), which foresees a set of pilot trainings to validate the project’s educational and digital outputs with different target groups.

In line with the approach already applied in the other WP5 pilot reports, the purpose of WP5-A4 was to test, in a real classroom setting, the coherence, usability and training relevance of the RockChain results produced in previous work packages—namely the curriculum structure (WP2), the training content and learning materials (WP3), and the interactive RockChain digital tool and app (WP4)—collecting feedback that can inform final refinements before wider rollout.

The pilot course was held on 31 October 2025 at the facilities of the Centro Tecnológico del Mármol (CTM) in Cehegín (Spain) and was delivered by David Caparrós Pérez and Carlos Martínez González. The session gathered 15 participants, a group composed of professionals linked to the natural-stone sector (with a strong focus on ornamental rock) and with experience in continuing training and skills development for workers. The pilot followed a 4-hour interactive agenda, combining project context, guided navigation of the RockChain OER platform, and progressively applied learning activities aligned with the RockChain curriculum units.

From a content perspective, the training covered the full learning sequence (Units 1–5), moving from sector context and challenges (Unit 1) to the fundamentals of blockchain (Unit 2), then to circular-economy principles and valorisation pathways for stone waste (Unit 3), and finally to blockchain-enabled waste-management workflows (Unit 4).

The session culminated with Unit 5, where participants engaged with the RockChain App as an educational, gamified environment that simulates market dynamics for natural stone, waste and recovery processes, helping learners internalise concepts such as traceability, recycling value, proof-of-work-like “mining”, and smart-contract logic through practice.

As in the other WP5 pilots, the report documents the training implementation and provides evidence for quality review (including participant feedback and visual documentation), supporting the overall objective of ensuring that the RockChain OER is both pedagogically robust and usable for real VET and lifelong-learning delivery contexts.



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## 2. PILOT COURSE IN CEHEGIN

### 2.1. Agenda

The pilot course followed the agenda below, covering 4 hours of interactive training:

- 09:00 – 09:15 – Registration of participants
- 09:15 – 09:30 – General introduction to the RockChain project
- 09:30 – 09:45 – RockChain OER platform.
- 09:45 – 10:15 – Module 1 Introduction to the Ornamental Stone and Mining Industry
- 10:15 – 10:45 – Module 2 Blockchain Fundamentals
- 10:45 – 11:15 – Module 3 Circular economy in the context of ornamental stone
- 11:15 – 11:45 – Coffee break.
- 11:45 – 12:15 – Module 4 Blockchain applied to waste management
- 12:15 – 13:15 – Module 5 Final practical exercise: integrative project and RockChain App.
- 13:15 – 13:30 – Open discussions and conclusions

The registration of the participants was done on the spot by the individual registration on a list previously prepared according to the attached model.

### 2.2. Course content

The pilot course delivered in Cehegín was structured around the RockChain curriculum Units 1–5, combining (i) a progressive introduction to the ornamental-stone value chain and its sustainability challenges, (ii) the core concepts of blockchain and smart contracts, and (iii) a practical, hands-on consolidation activity using the RockChain OER platform and the RockChain App as a serious-game environment for traceability and waste-management workflows.

Unit 1 – Introduction to the Ornamental Stone and Mining Industry.

Participants reviewed the fundamentals of the sector: main stone types and segments, the end-to-end industrial process “from quarry to market”, the main stakeholders involved, and current structural challenges (energy, emissions, traceability and compliance) that justify the need for digital and circular transformation.

Unit 2 – Blockchain Fundamentals.

This unit provided a clear, non-specialist pathway through blockchain concepts needed for training delivery: what blockchain is, how blocks and hashes build immutability, what distributed ledgers and decentralisation imply for multi-actor ecosystems, and how



smart contracts enable automation and trust without intermediaries. The unit also highlighted the differences versus traditional databases and included sector-relevant use cases (including waste management and mining) to connect technology with vocational realities.

Unit 3 – Circular economy in the context of natural stone.

The course then moved from “why change” to “how to change”, covering the circular-economy pillars (reduce, reuse, recycle) applied to natural stone, the shift from linear to circular models, and practical circular strategies across extraction, processing and product design. Specific attention was given to stone-waste valorisation routes (e.g., aggregates, fillers, decorative reuse) and to the role of digitalisation/traceability as an enabler of circularity under EU policy drivers.

Unit 4 – Blockchain applied to waste management.

Building on Units 2 and 3, this unit focused on the waste-management domain where RockChain is anchored: typical waste streams in ornamental stone processing (including sludge and cutting by-products), the logic of traceability and reporting obligations, and how blockchain-based approaches (material passports, decentralised ledgers, digital twins) can strengthen monitoring and compliance. The training also introduced smart-contract use cases for automated reporting/certification and incentive mechanisms, and briefly discussed integration with IoT and data-collection tools—especially relevant for technicians and trainers working close to industrial operations.

Unit 5 – Final practical exercise: integrative project and RockChain App.

The course concluded with an applied activity designed to consolidate the full learning sequence. Participants explored the RockChain platform functionalities and workflows and then used the RockChain App as a gamified simulation of a market for natural stone, industrial waste and recovery processes. Through the game mechanics (market transactions, recycling actions, proof-of-work-style “mining” challenges, and role-based participation), learners experienced how traceability events can be recorded and audited and how circular-economy decisions affect both environmental and economic outcomes.



Figure 1: Picture.



Figure 2: Picture.



Figure 3: Picture.



Figure 4: Picture.



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## 2.3. Attendance

The WP5-A4 pilot course (“Pilot RockChain Course implementation for VET teachers”) was delivered on 31 October 2025 at the facilities of the Centro Tecnológico del Mármol (CTM) in Cehegín (Spain). The session gathered a total of 15 participants.

Attendance corresponded to the intended target profile for this pilot: a group of professionals linked to the natural-stone sector, with a particular connection to ornamental rock, and with experience in continuing training and upskilling activities for workers. This ensured that the pilot feedback reflected the perspective of trainers and training-oriented staff, including their needs regarding course structure, clarity of concepts, and feasibility of using the RockChain OER platform and app as teaching tools within VET delivery contexts.



### 3. QUALITY ASSESSMENT

In line with the quality approach applied across WP5 pilot implementations, the WP5-A4 training in Cehegín incorporated a structured evaluation process to capture feedback from participants and to validate the suitability of the RockChain outputs for delivery in vocational and continuing-training contexts. This aligns with the project's broader Quality Assurance logic, where pilot courses and their questionnaires are used as a key mechanism to identify improvements and inform subsequent technical/pedagogical refinements.

The quality assessment focused on the same core dimensions used in other RockChain pilots:

- Relevance and clarity of the course content.
- Quality and usefulness of learning materials.
- Usability and pedagogical value of the RockChain tool.
- Trainer performance and overall organization.
- Suggestions for improvement.

#### 3.1. EVALUATION QUESTIONNAIRE

After completion of the pilot session, a paper-based evaluation questionnaire was distributed to participants, following the same practice applied in other WP5 pilots. Responses were collected anonymously to encourage candid feedback.

Consistently with the template used in the VET-student pilot, the questionnaire format is based on a set of 14 questions, combining rating-style items (to enable basic aggregation) with open questions to capture qualitative observations and improvement proposals.



## Feedback questionnaire of RockChain Pilot Course.

*TRANSVERSAL TECHNOLOGICAL SKILLS FOR THE ORNAMENTAL ROCK INDUSTRY  
FOCUSING ON THE APPLICABILITY OF BLOCKCHAIN IN A CIRCULAR ECONOMY*

*REFERENCE: 2023-1-DE02-KA220-ADU-000166863*

This questionnaire collects feedback about the RockChain pilot course. Your answers are anonymous and will help us improve content, delivery, and user experience across partners. It takes ~5-7 minutes.

davidcaparrospez@gmail.com [Cambiar de cuenta](#)



 No compartido





## Feedback questionnaire of RockChain Pilot Course.

davidcaparrosperez@gmail.com [Cambiar de cuenta](#)



No compartido

\* Indica que la pregunta es obligatoria

### Attendance and Profile

1. Where did you assist to the course? \*

- Spain
- Germany
- Croatia
- Romania

2. Gender: \*

- Male
- Female
- Other

3. Role/Background \*

- VET student
- VET trainer
- Industry professional (stone/construction/waste)
- Reasearcher/Academic
- Otro: \_\_\_\_\_

4. How did you attended to the course?

- In person
- Online
- Otro: \_\_\_\_\_

5. Previous familiarity with blockchain and circular economy \*

- |      |                       |                       |                       |                       |                       |      |
|------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------|
|      | 1                     | 2                     | 3                     | 4                     | 5                     |      |
| None | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | High |

### Overall Satisfaction

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

	1	2	3	4	5	
Not satisfied at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very satisfied

7. Would you recommend this pilot activity to your colleagues or classmates?

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Of course

### Learning Outcomes

8. To what extent do you agree with the following statements? \*

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
The course contents were relevant to my needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I now better understand circular economy principles applied to natural stone and construction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I now better understand the basics of blockchain and its role in traceability and waste management.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I improved my ability to use the RockChain app (navigation, actions, in-round decisions).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The course helped me connect market dynamics, mining challenges, and waste valorization in a realistic way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel more confident to apply what I learned in my studies or job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

	Fully disagree	Rather disagree	Neither agree nor disagree	Rather agree	Fully agree
Contents were clearly understandable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contents were interesting and motivating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Balance between theory and practice was adequate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trainer facilitation and guidance were effective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning materials/slides were clear and helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Platform and technical setup were reliable (access, devices, connectivity).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Timing and pacing were appropriate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The learning environment was inclusive and supportive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### RockChain APP

10. Usability of RockChain app during the course

	1	2	3	4	5	
Very hard to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very easy to use

11. How clear were the in-app round mechanics (timer, market, mining, recycling)?

	1	2	3	4	5	6	7	8	9	10	
Not clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very clear

## Feedback questionnaire of RockChain Pilot Course.

davidcaparrospez@gmail.com [Cambiar de cuenta](#)

No compartido

\* Indica que la pregunta es obligatoria

### Open Feedback

12. What aspects of the activity did you find most interesting? \*


Tu respuesta

13. Where could it be improved? \*

Tu respuesta

14. Do you have any additional comments, suggestions or opinions about the pilot activity?

Tu respuesta



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[Atrás](#) [Enviar](#) [Borrar formulario](#)

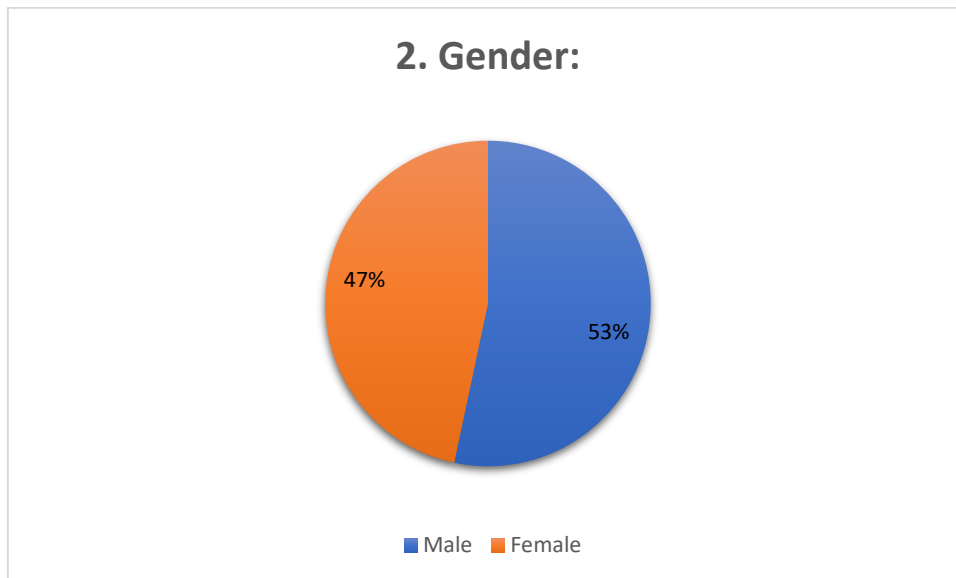
### 3.2. RESULTS OF THE QUESTIONNAIRE

All completed questionnaires were collected at the end of the course and will be used to consolidate evidence on: (i) the adequacy of the RockChain unit sequence for VET delivery, (ii) the usability of the OER and the RockChain App during an in-person training session, and (iii) the most relevant adjustments to improve future editions (including potential inputs to WP5-A7 "Environment test and technical improvements").

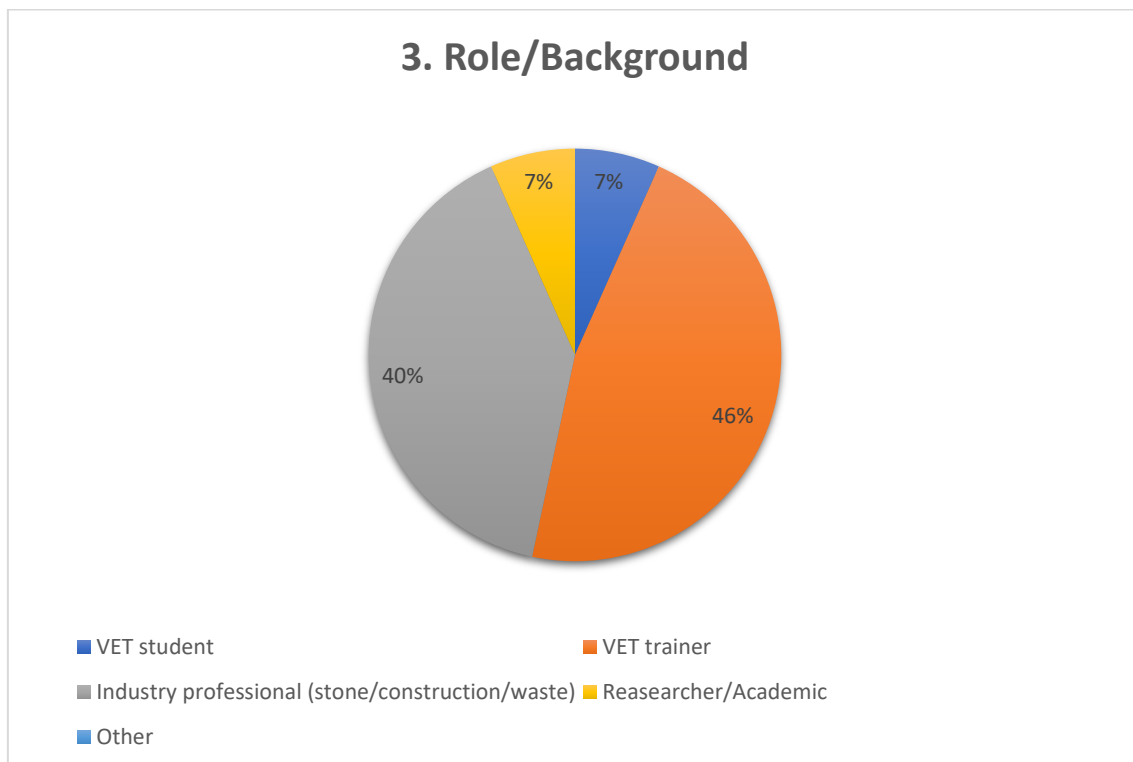
### 1. Where did you assist to the course?

100% from Spain.

### 2. Gender



### 3. Role/Background



4. How did you attend to the course?

100% in person.

5. Previous familiarity with blockchain and circular economy

Average: 2,8

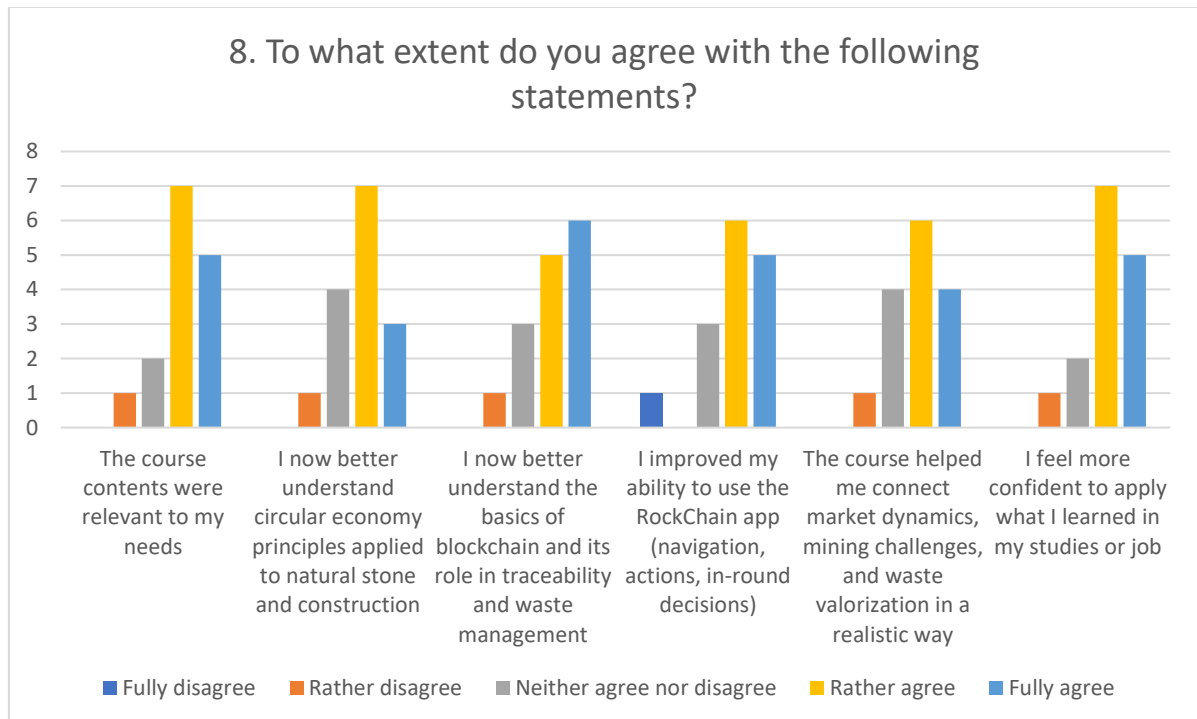
6. Overall, how satisfied were you with the training activity?

Average: 4,13/5

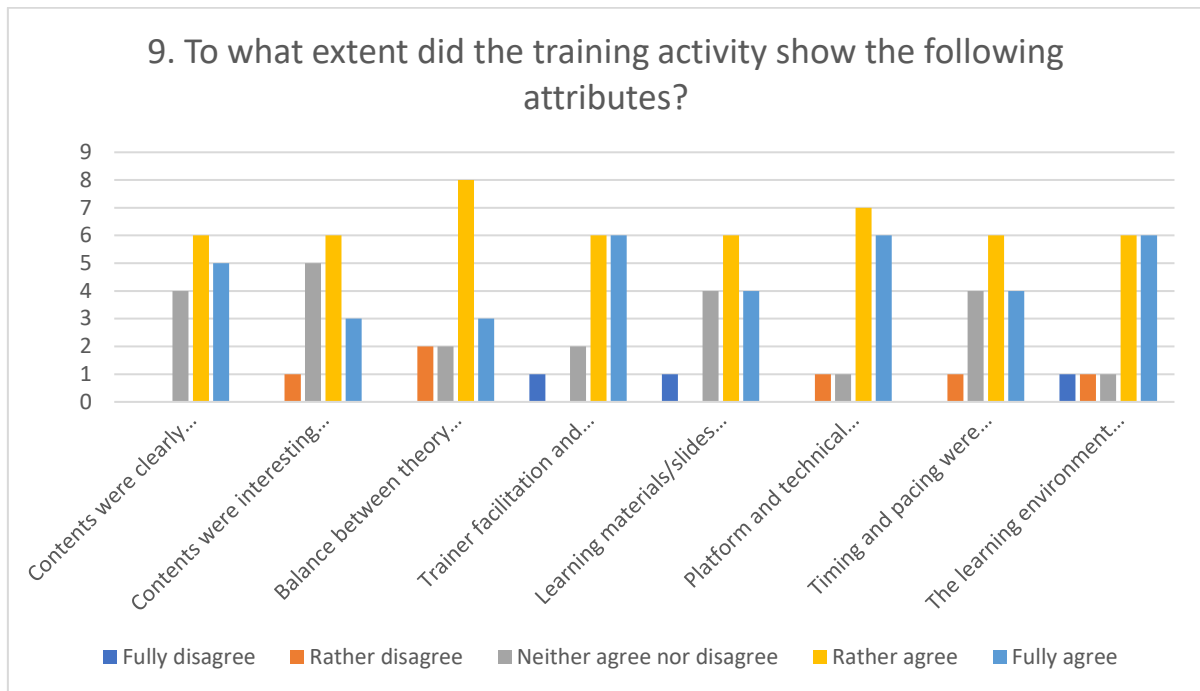
7. Would you recommend this pilot activity to your colleagues or classmates?

Average: 4,13/5

8. To what extent do you agree with the following statements?



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



#### 10. Usability of RockChain app during the course

Average: 3,93/5

#### 11. How clear were the in-app round mechanics (timer, market, mining, recycling)?

Average: 7,33/10

#### 12. What aspects of the activity did you find most interesting?

*More information in the conclusions.*

#### 13. Where could it be improved?

*More information in the conclusions.*

#### 14. Do you have any additional comments, suggestions or opinions about the pilot activity?

*More information in the conclusions.*

## 4. CONCLUSIONS

The WP5-A4 pilot course in Cehegín (Spain) successfully validated the RockChain training approach with a target group aligned to VET-teacher needs: professionals connected to the ornamental-stone sector and experienced in continuing training. The 4-hour format proved adequate to deliver the full learning pathway (Units 1–5) and to test the RockChain OER platform and the RockChain App in a guided, face-to-face setting.

Despite a moderate initial familiarity with blockchain and circular economy (2.8/5), participants reported a high level of satisfaction with the activity (4.13/5) and an equally strong willingness to recommend it to colleagues (4.13/5). This indicates that the course structure and facilitation enabled non-specialist trainers to follow the concepts and see their training value. More specifically, feedback across open questions (Q12) consistently points to three clear strengths:

- The RockChain App and its game-based approach, frequently described as the most engaging part (e.g., “the app”, “game”, “the proposed game”, “RockChain”).
- The circular-economy perspective, particularly the idea of reusing waste and “taking care of the environment”, showing that the sustainability framing resonates strongly with training-oriented participants.
- The practical dimension (examples, interactive discussions, and the “buying and selling of the stone” mechanics), which helped connect abstract blockchain concepts to sector-relevant decision-making.

These reactions confirm the pilot’s main pedagogical hypothesis: a progressive theory-to-practice sequence (industry context → blockchain fundamentals → circularity → waste-management workflows → integrative exercise with the app) is effective for VET delivery.

Regarding the usability of the digital tool Participants rated the usability of the RockChain App positively (3.93/5) and considered the round mechanics (timer, market, mining, recycling) reasonably clear (7.33/10).

This suggests that the app is already suitable as a classroom support tool, while still leaving room for usability enhancements and deeper guided practice.

About the open feedback (Q13) converges on a limited set of actionable improvements:



- Increase the duration or provide additional sessions to allow more time for discussion and hands-on work (“time should be increased”, “more meetings”, “more hands-on activities”).
- Add more practical assignments and/or extended practice with the app, as several participants asked for more “in practice” engagement.
- Provide more concrete, real-world examples of stone-waste reuse/valorisation (some participants requested clearer, more specific reuse pathways rather than only the concept).
- Strengthen content around traceability labels and, for some profiles, deepen the quarrying stage perspective.

Finally, most participants added no further remarks (Q14), but the qualitative tone is overall positive (e.g., “well structured and engaging”), with isolated scepticism (“I don’t see the point of the pilot activity”) that can be addressed by making the training-to-workplace transfer even more explicit (e.g., VET lesson plans, assessment ideas, and sector case studies).

In conclusion, the Spanish pilot confirms that RockChain’s learning design is relevant, understandable, and engaging for training professionals, with the app/game acting as the strongest motivator and conceptual “anchor”. The next iteration should primarily expand hands-on time and enrich the course with more concrete valorisation/traceability examples, to better support VET teachers in replicating the training within their own educational settings.