




CIRC VET

CIRCULAR ECONOMY PRACTICAL TRAINING MATERIALS
FOR PLASTIC MANUFACTURING INDUSTRIES

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D6.3 - Pilot Analysis and Recommendations



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CIRC VET – Circular Economy Practical Training
Materials for Plastics Manufacturing Industries

TABLE OF CONTENTS

Contents

D6.3 - Pilot Analysis and Recommendations (I-VET-VET)	3
1. Introduction	6
2. Overview	7
Module 1: General Circular Economy Understanding – Systemic Strategies	7
Module 2: Eco-Design and LCA	8
Module 3: Digital Skills	9
Module 4: Recycling, Downcycling, and Upcycling	10
Module 5: Manufacturing Processes	10
Module 6: Users and Usage	13
Module 7: Recovery	15
D6.3 - Pilot Analysis and Recommendations (I-VET-HE)	2
1. Introduction	4
2. Overview	5
Module 1: General Circular Economy Understanding – Systemic Strategies	5
Module 2: Eco-Design and LCA	6
Module 3: Digital Skills	7
Module 4: Recycling, Downcycling, and Upcycling	8
Module 5: Manufacturing Processes	9
Module 6: Users and Usage	10
Module 7: Recovery	12

D6.3 - Pilot Analysis and Recommendations (I-VET-VET)

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1. Introduction

This report summarizes the piloting feedback for various modules from all partners involved. Each module's performance, feedback, and areas for improvement are outlined based on the data collected from trainers, coordinators, and students.

2. Overview

Module 1: General Circular Economy Understanding – Systemic Strategies

Partner Piloting: APRC

Number of students: 13

Target: 15

- **Data Relating to Piloting:** Start Date: 15/04/2024 End Date: 17/05/2024
- **Location:** APRC, Alytus, Lithuania
- **Trainer:** Edita Šidlauskaitė (APRC)
- **Center Coordinators:** Živilė Šatienė
- **Students from:** I-VET course

Feedback:

The course included theoretical content and internships. Feedback was collected from APRC trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

- **Time Constraints:** Limited time affected the comprehensiveness of the material.
- **Online Platform:** Students faced difficulties with the e-learning platform regarding access, navigation, and enrollment.
- **Content:** Students: Test Questions: Some test questions are misleading. Tests could benefit from revision to ensure clarity and accuracy. Information Presentation: Information can be repetitive. Desire for more detailed and specific information. Content should be more focused and less redundant. Practical Application: Need for more hands-on activities to aid in memorizing material. Preference for more internships and individual practical tasks. More practical work and exercises to check knowledge. Desire for more practical examples to illustrate concepts. Teacher: Assessment Tasks: Inconsistencies in assessment tasks, with answers being too similar and close in meaning. Practical Tasks: More practical tasks are needed to enhance learning and application of material.

Suggestions to reduce theoretical content and focus on basic concepts and practical activities.

Conclusion: To improve the course and address the feedback provided by students and teachers, the following adjustments should be considered:

Revise Test Questions: Review and refine test questions to eliminate any misleading or confusing items. Ensure tests are clearly structured and accurately assess knowledge.

Enhance Information Presentation: Reduce repetitive content to maintain engagement and focus. Provide more detailed and specific information to deepen understanding. Focus on presenting concrete information to avoid ambiguity.

Increase Practical Application: Incorporate more hands-on activities to help students memorize and apply material. Introduce more internships and individual practical tasks to provide real-world experience. Increase the number of practical exercises to regularly check and reinforce knowledge. Include a greater variety of practical examples to illustrate theoretical concepts.

Align Assessment Tasks: Ensure assessment tasks have clear, distinct answers to avoid confusion. Regularly review assessment tasks for consistency and clarity. By addressing these points, the course

can provide a more effective and engaging learning experience, combining detailed theoretical knowledge with practical application and ensuring accurate and fair assessment of students' understanding. Increased time allocation, improved platform usability, and a focus on fundamental concepts are necessary.

Module 2: Eco-Design and LCA

Partner Piloting: APRC

Number of students: 13

Target: 8

- **Data Relating to Piloting:** Start Date: 15/04/2024 End Date: 17/05/2024
- **Location:** APRC, Alytus, Lithuania
- **Trainer:** Edita Šidlauskaitė (APRC)
- **Center Coordinators:** Živilė Šatienė
- **Students from:** I-VET course

Feedback:

The course included theoretical content and internships. Feedback was collected from APRC trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

- **Time Constraints:** Limited time affected the comprehensiveness of the material.
- **Online Platform:** Students faced difficulties with the e-learning platform regarding access, navigation, and enrollment.
- **Content:** Students: Information Presentation: Request for more concrete and detailed information to improve clarity and depth. Practical Application: Desire for more practical work to apply the learned material effectively. Teacher: Content Quality: The material is very interesting and introduces a lot of novel concepts. Student Preparedness: Suggests providing more basic knowledge for I-VET and VET students, as the field is relatively new and might be challenging for them. Summary Materials: Would have appreciated summary materials after each topic to reinforce key concepts. Opportunities for Reflection: Would like more opportunities for students to reflect on the material, potentially through discussions or reflective exercises.

Suggestions to review the theoretical content and focus on basic concepts and practical activities.

Conclusion:

To enhance the course and address both student and teacher feedback, consider the following improvements: **Detail and Clarity:** Present information in a more concrete and detailed manner to ensure students fully grasp the material. **Increase Practical Work:** Incorporate more practical activities that allow students to apply what they have learned in a hands-on manner. **Support for I-VET students:** Provide additional basic knowledge and foundational concepts to help I-VET students better understand the newer material. **Summary Materials:** Develop summary materials after each topic to help reinforce the key points and facilitate better retention. **Encourage Reflection:** Create more opportunities for student reflection, such as through guided discussions or reflective exercises, to deepen their understanding and engagement with the material. By implementing these changes, the course can become more accessible, engaging, and effective, catering to the needs of both novice and more experienced students while ensuring that all participants can reflect and apply the knowledge gained.

Module 3: Digital Skills

Partner Piloting: KIMWQ

Number of students: 15

Target: 15

Data Relating to Piloting:

- **Location:** KIMWQ, Berlyn, Germany
- **Trainer:** Torsten Urban (KIMWQ)
- **Center Coordinators:** Torsten Urban (KIMWQ)
- **Students from:** I-VET course
- **Date and Duration:** from 06/03/2024 to 28/06/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from KIMWQ trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

- **Time Constraints:** Limited time affected the comprehensiveness of the material.
- **Online Platform:** No comments.
- **Content:** Students: Practical Application: Desire for more practical applications to enhance the learning experience. Materials: The use of PPT and PDF formats is considered outdated; students suggest incorporating modern online applications. Bibliography: The current bibliography could be improved and made more comprehensive. Global Perspective: Students appreciated the international perspective provided in the course. Teacher: Content Level: Suggests that the content level can be raised, particularly in areas like traceability and data security. Focus on Applications: Recommends shifting the focus more towards practical applications rather than teaching basic concepts like blockchain in detail. Gradual Implementation: Indicates that these adjustments are not urgent and can be introduced gradually as the course progresses.

Conclusion:

To enhance the course based on the feedback from both students and the teacher, the following steps should be considered:

- **Increase Practical Application:** Integrate more practical exercises and real-world applications to make the learning experience more engaging and relevant.
- **Modernize Materials:** Transition from traditional PPT and PDF formats to more interactive online tools and applications to keep the content fresh and engaging.
- **Enhance Bibliography:** Expand and improve the bibliography to ensure it is more comprehensive and provides students with a broader range of resources.
- **Focus on Advanced Content:** Gradually shift the course content to focus more on advanced topics like traceability and data security, while reducing time spent on foundational topics like blockchain basics.

- **Global Perspective:** Continue to emphasize the international perspective, which has been well-received by students, ensuring that the course content remains globally relevant. By implementing these changes, the course can better meet the needs of its students, providing a more modern, practical, and globally-oriented learning experience while gradually increasing the complexity and relevance of the content.
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Module 4: Recycling, Downcycling, and Upcycling

Partner Piloting: AIJU

Number of students: 26

Target: 7

Data Relating to Piloting:

21/05/2024 and 28/05/2024

Location: AIJU, Ibi Alicante, Spain

Trainer: Ana Ibáñez (AIJU)

Center Coordinators: Elena Dionisio

Students from: I-VET courses (machining course and plastic course)

Training divided in two days + number of students: 21/05/2024: 14 students and 28/05/2024: 12 students

Feedback:

Collected through questionnaires focusing on the training's effectiveness and impact:

- **Usefulness and Applicability:** The content has been a little dense, it could be complemented through the visualization on the creation by tours. There is specific content from other countries. The content should be more generic and summarized.
- **Platform Feedback:** no comments.

Conclusion: Online platform: students have difficulties understanding the platform: Access button to the e-learning platform; Locate the target module; Enroll in the module and the corresponding level

Content: Reduce theoretical content and focus on basic concepts.

Module 5: Manufacturing Processes

Partner Piloting: VPM

Number of students: 8

Target: 7

Data Relating to Piloting:

- **Location:** VPM, Visaginas, Lithuania
- **Trainers:** Denis Udovičenko and Aleksandr Nechaicik (VPM)
- **Center Coordinators:** Jurgita Mikutavičienė
- **Students from:** I-VET course
- **Date and Duration:** from 18/03/2024 to 17/06/2024

Feedback:

Similar to Module 4, the course consisted of theoretical content and internships. Feedback was received from students, VPM trainers and coordinator:

- **Time Constraints:** Limited time for comprehensive teaching.
- **Online Platform:** The platform effectively presents information in a clear and illustrative way, particularly through slides and real-life examples, contributing to a better understanding of the content.
- **Content:** Students: More concretize information. It will be more interesting if we have more practical work. More exercises to check knowledge. Will be better if teacher show to us more information in video format. More time for questions, for finalizing knowledge of course. More visualization of information. More practical examples.

The quality of the training material was as expected. It provided a concise overview of the main and ancillary production methods for plastic products, information on the prospects for reducing plastic waste and recycling products, and the use of alternative materials. It also provided information on the negative environmental impacts of plastic production and ways to reduce them. The CircVet training platform presents the information in a relatively clear and illustrative way in the form of slides and real-life examples. In addition, the practical part of the training allows participants to simulate decision-making, which in turn encourages independent thinking and awareness of the need for a circular plastic economy. In conclusion, the training material and especially the practical exercises allow to see the plastic production processes from a wider perspective than that of a production worker and create perspectives for the project participants to involve the plastic production companies they work in internally in the improvement of their production processes in line with the principles of the circular economy of plastics.

Conclusion:

The training program effectively provided a comprehensive overview of plastic production methods, waste reduction strategies, and the environmental impact of plastics. However, based on participant feedback, several areas for improvement have been identified to enhance the learning experience:

Increased Practical Application:

- **More Practical Work:** There is a clear demand for more hands-on exercises to solidify understanding and application of the concepts.
- **Simulation of Decision-Making:** The practical exercises that allow participants to simulate decision-making are particularly valuable and should be expanded to further encourage independent thinking and awareness.

Enhanced Content Delivery:

- **More Concrete Information:** Participants desire more specific and detailed information to deepen their understanding.
- **Visualization and Video Format:** Incorporating more visual elements and videos could make the material more engaging and easier to understand.
- **More Practical Examples:** Including additional real-life examples would help bridge the gap between theory and practice, making the content more relatable.

Interactive Learning:

- **More Time for Questions:** Allocating more time for Q&A sessions would help participants clarify doubts and solidify their knowledge.
- **More Exercises to Check Knowledge:** Frequent knowledge checks through exercises would help reinforce learning and ensure participants are grasping key concepts.

Platform and Material Quality:

- **Training Material:** The quality of the training material met expectations, providing a clear and concise overview of the plastic production processes and the circular economy.
- **CircVet Training Platform:** The platform effectively presents information in a clear and illustrative way, particularly through slides and real-life examples, contributing to a better understanding of the content.

Broader Perspective:

- **Circular Economy Awareness:** The course successfully broadened participants' perspectives, allowing them to see beyond the role of a production worker and understand the importance of integrating circular economy principles into plastic production.

In summary, while the training material and practical exercises are strong, incorporating more practical work, visual content, and interactive opportunities will further enhance the learning experience, making it more engaging, informative, and applicable to real-world scenarios.

Module 6: Users and Usage

Partner Piloting: AIJU

Number of students: 12

Target: 7

Data Related to Piloting:

- **Location:** AIJU, Ibi, Alicante
- **Trainer:** several
- **Center Coordinators:** several
- **Students from:** I-VET course
- **Date and Duration:** 28/06/2024

Feedback

The "Users and Usage" module received positive feedback for its relevance, especially in addressing contemporary issues like greenwashing. However, several areas for improvement were noted:

1. **External Speakers:** Students suggested inviting professionals from private companies, especially those involved in eco-labeling, to share practical insights.
2. **Visual Content:** There was a desire for more dynamic and visual content, such as real-life case studies and product examples, to keep students engaged.
3. **Content Alignment:** Some presentations were not aligned with the manual, leading to confusion between topics. Clearer organization is needed.
4. **Practical Exercises:** The eco-label design exercise was appreciated, but a lengthy 25-minute video was considered irrelevant. Students preferred more focused practical tasks.
5. **Updated Materials:** Students recommended modernizing and expanding the bibliography, using online tools for better engagement.

Conclusions

To enhance the module's effectiveness, the following improvements are recommended:

1. **Invite Experts:** Incorporate brief sessions with professionals in eco-labeling to provide real-world insights.
2. **Align Content:** Ensure presentations are properly aligned with the manual to avoid confusion and continue improving visual aids for clarity.
3. **Add Dynamic Content:** Use more real-life examples and case studies to make the material more engaging and relevant.
4. **Focus on Relevant Exercises:** Prioritize exercises directly related to the content, removing irrelevant tasks like long video watching.
5. **Modernize Materials:** Expand the bibliography and integrate online applications for a more current and interactive learning experience.

Module 7: Recovery

Partner Piloting: KIMWQ

Number of students: 15

Target: 15

Data Relating to Piloting:

- **Location:** KIMWQ, Berlyn, Germany
- **Trainer:** Torsten Urban (KIMWQ)
- **Center Coordinators:** Torsten Urban (KIMWQ)
- **Students from:** I-VET course
- **Date and Duration:** from 06/03/2024 to 28/06/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from KIMWQ trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

- **Time Constraints:** Limited time affected the comprehensiveness of the material.
- **Online Platform:** No comments.
- **Content:** Students: Interactive Learning: Students requested the inclusion of more interactive apps to enhance engagement beyond just reading and watching. Practical Application: While the lessons were well-received, students emphasized the need for more practical application, specifically through exercises involving real manufacturing plants. Teacher: Content Relevance: The topic was highly appreciated by participants, particularly the European perspective, which was found to be very interesting and relevant. Document Quality: The provided documents were rated as very good, effectively answering key questions and providing essential information. Practical Relevance: Despite the high quality of the content, participants expressed a desire for more practical relevance. They suggested incorporating company visits, internships, or excursions to bridge the gap between theoretical learning and real-world application.

Conclusion: The feedback indicates that while the course content and documentation are strong and well-regarded, there is a significant demand for increased practical and interactive elements. To address these needs, the following actions are recommended:

Enhance Interactivity:

- **Incorporate More Interactive Apps:** Introduce apps and tools that allow for interactive learning experiences, moving beyond traditional reading and watching methods to engage students more deeply.

Increase Practical Application:

- **Real-World Exercises:** Develop exercises that involve real manufacturing plants, enabling students to apply theoretical knowledge in practical settings.
- **Company Visits and Internships:** Arrange for company visits, internships, or excursions to provide hands-on experiences and a direct understanding of industry practices.

- **Partnerships with Companies:** Establish partnerships with companies willing to host study groups, offering students the opportunity to observe and participate in real-world operations.

Maintain High-Quality Content: Continue providing well-prepared documents and materials that effectively address key topics and questions, ensuring that the theoretical foundation remains strong while expanding the program's practical aspects.

By integrating these elements, the course can offer a more balanced and immersive learning experience, combining solid theoretical grounding with valuable practical exposure. This approach will not only engage students more effectively but also prepare them better for real-world applications in their field.

Module 8: Entrepreneurship

Partner Piloting: AIJU

Number of students: 14

Target: 7

Data Relating to Piloting:

27/06/2024: 7 students

05/07/2024: 7 students

Location: AIJU, Ibi Alicante, Spain

Trainer: David Monllor (AIJU)

Center Coordinators: Guillermo Abad

Students from: I-VET courses

Training divided in two days + number of students: 27/06/2024: 7 students and 05/07/2024: 7 students

Feedback:

Collected through questionnaires focusing on the training's effectiveness and impact:

- **Usefulness and Applicability:** Try to reduce the theoretical content in the entrepreneurship part and make the concepts simpler in the business plans part.
- **Platform Feedback:** no comments.

Conclusion:

Online platform: students have difficulties understanding the platform:

- Access button to the e-learning platform
- Locate the target module
- Enroll in the module and the corresponding level

Content:

- Reduce theoretical content and focus on basic concepts.
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PROJECT INFO

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PROJECT CONSORTIUM



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1. Introduction

This report summarizes the piloting feedback for various modules from all partners involved. Each module's performance, feedback, and areas for improvement are outlined based on the data collected from trainers, coordinators, and students.

2. Overview

Module 1: General Circular Economy Understanding – Systemic Strategies

Partner Piloting: HIT

Number of students: 23

Target: 15

- **Location:** HIT (UNITRENT), HUB INNOVAZIONE TRENINO - FONDAZIONE, Italy
- **Trainer:** Gloria Cannone (HIT)
- **Center Coordinators:** Milena Bigatto (HIT)
- **Students from:** I-VET course
- **Date and Duration:** from 28/02/2024 to 08/05/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from HIT trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

- **Time Constraints:** Limited time affected the comprehensiveness of the material.
- **Online Platform:** No comments
- **Content:** The feedback on the module highlights several key points: Content Quality - High Quality but Generic: The content is of high quality but is perceived as somewhat generic, potentially lacking in specificity or depth in certain areas. Duration - Excessive Length: The 6-hour duration of the module is considered too long given the ease of understanding the material. The content is straightforward, allowing the trainer to move quickly through the material. Practical Examples - Appreciation for Practical Examples: Participants highly valued the practical examples provided, which helped to contextualize the theoretical concepts discussed. Reflective Questions - Value of Reflective Questions: The reflective questions related to the circular economy and its impact were particularly appreciated, encouraging deeper thought and engagement with the material.

Conclusion:

While the module is well-constructed and delivers high-quality content, there are areas for optimization to enhance its effectiveness: Adjust Module Duration: Shorten the Module: Given that the content is easy to understand and the trainer can cover it quickly, reducing the duration from 6 hours could make the module more efficient and keep participants more engaged. Increase Specificity: Deepen Content Focus: To address the perception of the content being generic, consider including more detailed or advanced topics, particularly for participants who may already be familiar with the basics. Expand Practical Examples: Continue and Expand Practical Examples: The practical examples are a strength of the module and should be maintained. If possible, more examples could be added to further enrich the learning experience. Maintain Reflective Components: Keep Reflective Questions: The reflective questions are highly valued and should remain an integral part of the module, as they promote critical thinking and deeper engagement with the circular economy concepts.

By making these adjustments, the module can become more efficient, targeted, and impactful, better aligning with the needs and expectations of the participants while maintaining its strengths.

Module 2: Eco-Design and LCA

Partner Piloting: HIT

Number of students: 23

Target: 15

- **Location:** HIT (UNITRENT), HUB INNOVAZIONE TRENINO - FONDAZIONE, Italy
- **Trainer:** Edoardo Zonta (HIT)
- **Center Coordinators:** Milena Bigatto (HIT)
- **Students from:** I-VET course
- **Date and Duration:** from 28/02/2024 to 08/05/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from HIT trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

Time Constraints: Limited time affected the comprehensiveness of the material.

Online Platform: No comments.

Content: Content Quality: Overall Good Content: The content of the module is generally well-received and considered good by participants. Repetition: Content Repetition: There is some repetition between chapters 1, 2, and 5, which could lead to redundancy and reduce the effectiveness of the learning experience. Content Organization: Suggested Reordering: Chapters 6 and 7 should be placed earlier in the module, specifically before the parts related to Life Cycle Assessment (LCA) and the training with the software, to improve the logical flow of the content.

Training Materials: Database Issue: The suggested database, Agribalyse, is no longer free, necessitating a switch to another database from the Open LCA website, which could have caused some inconvenience during the training. Slide Presentation: Slide Improvement: Significant changes were made to the slides to improve their graphical quality, making the communication more effective and the content more engaging. Some slides were initially difficult to comprehend, which has now been addressed.

Conclusion:

The module is well-structured and delivers valuable content, but some adjustments could further enhance its effectiveness: **Eliminate Redundancy:** Reduce Repetition: Review and streamline the content to eliminate unnecessary repetition between chapters 1, 2, and 5, ensuring a more concise and focused presentation. **Reorder Content for Better Flow:** Reorganize Chapters: Move chapters 6 and 7 to an earlier position in the module, preceding the LCA-related content and software training. This reordering will provide a better foundation for students before they engage with the more complex topics. **Update Training Resources:** Address Database Availability: Ensure that all training resources, such as databases, are up-to-date and accessible. Communicate any necessary changes to the students in advance to avoid confusion. **Improve Slide Design:** Enhance Visual Communication: Continue to refine the slides' graphical aspects to improve clarity and engagement. Ensure that all visual aids are clear, effective, and contribute positively to the students' understanding of the material.

By addressing these areas, the module can become more streamlined, logically structured, and visually engaging, thereby enhancing the overall learning experience for students.

Module 3: Digital Skills

Partner Piloting: ULPGC

Number of students: 22

Target: 15

Data Relating to Piloting:

- **Location:** ULPGC, Universidad de Las Palmas de Gran Canaria, Spain
- **Trainers:** Aday Romero Pérez (ULPGC), Yamilet Rivero López (ULPGC)
- **Center Coordinators:** Raquel Ortega (ULPGC)
- **Students from:** I-HE course
- **Date and Duration:** From 15/04/2024 to 10/05/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from ULPGC trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

Time Constraints: Limited time affected the comprehensiveness of the material.

Online Platform: No comments.

Content: Students: Final Test: Insufficient number of questions in the final test, leading to frequent repetition over 3 attempts. Suggested adding 10-20 more questions to avoid repetition. Syllabus and Classes: More focus needed on the circular economy from the start. Current examples are too general and not directly related to the circular economy. Preference for tools and techniques that encourage involvement and practical exercises. Interdisciplinary Approach: Value seen in diverse disciplinary perspectives, enriching the learning experience. Level Assessment: Suggested initial assessment to gauge participants' knowledge levels to better adapt the course content. Tools like "Kahoot!" could be used to encourage engagement and assess levels. Teachers: Presentations: Presentations do not summarize the manual contents effectively. Relationship between module content and circular economy is unclear. Manual: Topics lack a clear connection to the circular economy. Excessive content for the course duration, making it difficult to cover all material. Exercises: Many exercises and quizzes do not align with the topics or cannot be covered in the sessions. Specific exercises (e.g., exercises 2 and 3 of topic 2, and exercises 5 and 6 of topic 3) are not directly related to the topics. Questionnaires: Initial question bank had 116 questions, but only 11 met the required format. Modifications made to fit the format, resulting in a final bank of 69 questions. Subject Matter: Content is dense and difficult to teach in the given time. Concepts are not directly related to the circular economy. Practical aspects are complicated to execute. Extra material was needed to supplement the manual. Enjoyable Topics: Cybersecurity and augmented reality (topics 9 and 10) were engaging and led to active class participation. More everyday life examples needed for augmented reality.

Conclusion: To improve the course and enhance its effectiveness, consider the following adjustments: Expand Final Test Questions: Increase the number of questions in the final test to avoid repetition and ensure a comprehensive assessment. Circular Economy Focus: Emphasize circular economy-related examples and applications from the beginning. Ensure the syllabus and examples are directly relevant to the circular economy. Interactive Tools and Techniques: Use modern tools like "Kahoot!" for engagement and level assessment. Incorporate practical exercises and techniques that encourage active participation. Interdisciplinary Learning: Continue leveraging the diverse backgrounds of participants to enrich the learning experience. Presentation Alignment: Ensure presentations align closely

with the manual and clearly relate to the circular economy. Simplify and focus presentations to avoid mixing concepts. Manual and Content Scope: Revise the manual to ensure a clear connection to the circular economy. Streamline content to fit the course duration and focus on key concepts. Practical Exercises: Ensure exercises are relevant and feasible within the course sessions. Align quizzes and practical tasks with the main topics of the syllabus. Supplementary Material: Continue using supplementary material to fill gaps in the manual. Incorporate more real-life examples, especially for topics like augmented reality, to make sessions more engaging. By implementing these improvements, the course can better meet students' needs and provide a more focused, engaging, and practical learning experience.

Module 4: Recycling, Downcycling, and Upcycling

Partner Piloting: HIT

Number of students: 23

Target:15

- **Location:** HIT (UNITRENT), HUB INNOVAZIONE TRENINO - FONDAZIONE, Italy
- **Trainer:** Edoardo Zonta (HIT)
- **Center Coordinators:** Milena Bigatto (HIT)
- **Students from:** I-VET course
- **Date and Duration:** from 28/02/2024 to 08/05/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from HIT trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

- **Time Constraints:** Limited time affected the comprehensiveness of the material.
- **Online Platform:** No comments.
- **Content:** Content Overlap:
- **Repetition in Subchapter 1.2:** Subchapter 1.2 contains material that repeats content from Module 2, specifically related to Eco-design and Life Cycle Assessment (LCA). This repetition suggests a need for better coordination between the two modules to ensure they complement rather than duplicate each other. **Depth of Coverage:** Need for Deeper Treatment in Chapter 2: Some topics within Chapter 2 require deeper exploration to provide students with a more comprehensive understanding of the subject matter. **Slide Presentation:** Graphical Improvements: Significant changes were made to the slides to enhance their graphical quality, making the communication more effective and engaging. Initially, some slides were difficult to understand, prompting these improvements.

Conclusion:

To improve the effectiveness and coherence of the module, the following steps are recommended:
Avoid Content Overlap: Coordinate with Module 2: Ensure that Subchapter 1.2 and Module 2 are developed in a complementary manner. Collaborate with the developers of Module 2 to align content and avoid unnecessary repetition, ensuring each module adds unique value to the learning experience.
Deepen Content Coverage: Expand on Key Topics in Chapter 2: Provide a more in-depth treatment of

certain topics within Chapter 2. This could involve adding more detailed explanations, case studies, or practical examples to help students gain a deeper understanding of complex concepts. **Enhance Visual Communication:** Continue Improving Slide Design: Maintain and further develop the improvements made to the slides' graphical aspects. Ensure that all visual aids are clear, comprehensible, and engaging, thereby enhancing the overall learning experience and student curiosity. By implementing these changes, the module can become more integrated with other course content, provide a more in-depth exploration of key topics, and offer a visually engaging and effective learning experience for students.

Module 5: Manufacturing Processes

Partner Piloting: HIT (UNITRENT)

Number of students: 23

Target: 15

Data Relating to Piloting:

- **Location:** HIT (UNITRENT), HUB INNOVAZIONE TRENINO - FONDAZIONE, Italy
- **Trainers:** Edoardo Zonta (HIT)
- **Center Coordinators:** Milena Bigatto
- **Students from:** I-VET course
- **Date and Duration:** from 28/02/2024 to 08/05/2024

Feedback:

Similar to Module 5, the course consisted of theoretical content and internships. Feedback was received from students, HIT (UNITRENT) trainers and coordinator:

- **Time Constraints:** Limited time for comprehensive teaching.
- **Online Platform:** No comments.
- **Content:** Content Relevance: Repetitive for Materials Engineering Students: The module appears to be redundant for students with a background in materials engineering, particularly in terms of processing techniques. These students may find the content too basic or repetitive, which could reduce its effectiveness for this audience. Confusing Content in Chapter 2: Lack of Coherence: The topic of Chapter 2, which covers composite materials and recycled materials, is presented in a confusing manner. The two subjects are not closely related, making their combined treatment in this chapter difficult to justify and understand. Conceptual Errors: Some conceptual errors are present in the content, which could lead to misunderstandings or misinformation. Omission in Subtopic 3.2: Lack of Specificity in Biomaterials Characterization: Subtopic 3.2, which is supposed to cover the characterization of biomaterials, does not offer new information. Instead, it repeats previous content about characterization techniques. This section should instead focus on specific techniques unique to biomaterials, such as biodegradability tests. Slide Presentation: Graphical Enhancements: Significant modifications were made to the slides to improve their graphical quality. These changes were necessary to make the content more comprehensible and engaging, as some slides were initially difficult to understand.

Conclusion:

To enhance the relevance, clarity, and effectiveness of the module, the following improvements are recommended: **Tailor Content for Diverse Backgrounds:** Differentiate for Materials Engineers: Consider offering alternative content or advanced modules for students with a materials engineering background. This will help avoid redundancy and ensure that all students, regardless of their background, find the material challenging and informative. **Clarify and Refine Chapter 2:** Reevaluate Chapter 2 Structure: Separate the topics of composite materials and recycled materials into distinct sections or chapters, as their current combination is confusing and lacks coherence. Correct Conceptual Errors: Review the content to identify and correct any conceptual errors, ensuring accuracy and clarity. **Focus on Unique Aspects of Biomaterials in Subtopic 3.2:** Incorporate Specialized Techniques: Revise Subtopic 3.2 to focus on specific characterization techniques unique to biomaterials, such as biodegradability tests, rather than repeating general characterization content. **Continue Enhancing Visual Communication:** Maintain Improved Slide Design: Continue refining the slides to ensure they are visually appealing and effective in conveying complex information. Clear, well-designed slides can greatly enhance student engagement and comprehension. By addressing these areas, the module can better meet the needs of a diverse student audience, improve the clarity and relevance of its content, and provide a more engaging and informative learning experience.

Module 6: Users and Usage

Partner Piloting: ULPGC

Number of students: 22

Target: 15

Data Relating to Piloting:

- **Location:** ULPGC, Universidad de Las Palmas de Gran Canaria, Spain
- **Trainer:** Yamilet Rivero López (ULPGC)
- **Center Coordinators:** Raquel Ortega (ULPGC)
- **Students from:** I-HE course
- **Date and Duration:** From 15/04/2024 to 10/05/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from ULPGC trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

- **Time Constraints:** Limited time affected the comprehensiveness of the material.
- **Online Platform:** No comments.
- **Content:** Students: **Guest Speaker:** Suggested inviting a professional from a private company involved in eco-labeling to share their experience briefly. **Usefulness and Relevance:** Considered one of the most useful modules in the circular economy course, dealing with current issues like greenwashing. **Teacher's Efforts:** Acknowledged and appreciated the teacher's visible efforts during the sessions. **Syllabus and Methodology:** Very satisfied with the syllabus and the teaching methodology. Teachers: **Presentations:** **Alignment Issues:** Some presentations did not align with the manual topics, mixing concepts from different topics (e.g., topic 5 included material from topic 4 and vice versa). **Need for Dynamic Content:** More dynamic and visual examples, such as real cases and product examples, are needed to keep classes engaging. **Practical Cases:** The JTBD syllabus

presentation could benefit from practical cases to illustrate its successful use and application in different contexts. **Questionnaires: Consistency:** Final questionnaire adhered to the proposed format, though one question needed correction before the test was administered. **Practical Exercises: Eco-label Exercise:** The exercise of creating and designing an eco-label was found to be very interesting. **Video Exercise:** A 25-minute video exercise was deemed irrelevant. **Summary. Engagement and Entertainment:** Overall, the syllabus has been engaging and entertaining, especially for students with prior knowledge of the subject.

Conclusion:

To further enhance the course, consider the following improvements:

1. Guest Speakers: Introduce brief sessions with professionals from private companies involved in eco-labeling to provide practical insights.
2. Presentation Alignment: Ensure presentations align with the manual topics to avoid mixing concepts and ensure clarity.
3. Dynamic Content: Incorporate more dynamic and visual content, using real-life examples and case studies to maintain student engagement.
4. Practical Cases: Integrate practical cases into presentations, especially for complex concepts like the JTBD syllabus.
5. Relevant Exercises: Focus on practical exercises that are directly relevant and engaging, avoiding irrelevant tasks such as long video watching.
6. Bibliography and Modernization: Improve and expand the bibliography and modernize materials using online applications to keep up with current educational trends.

By addressing these points, the course can maintain its strengths while becoming more practical, engaging, and relevant for students.

Module 7: Recovery

Partner Piloting: ULPGC

Number of students: 22

Target: 15

Data Relating to Piloting:

- **Location:** ULPGC, Universidad de Las Palmas de Gran Canaria, Spain
- **Trainer:** Aday Romero Pérez (ULPGC)
- **Center Coordinators:** Raquel Ortega (ULPGC)
- **Students from:** I-HE course
- **Date and Duration:** From 15/04/2024 to 10/05/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from ULPGC trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

Time Constraints: Limited time affected the comprehensiveness of the material.

Online Platform: Improvement of the platform, something more intuitive and direct, based also on the obtaining of 'achievements' when finishing the course.

Content: Students: Students appreciate practical in-class exercises that encourage participation and sharing of ideas. They suggest improving platform access to classes, as well as ensuring progress in one language counts towards others. Some slides need legends for clarity. Course tasks should start with simpler examples, and it's important to clarify whether tasks should be completed in forums or as mandatory course components. Lastly, the platform could be more intuitive and offer achievement badges upon course completion. Teacher: Presentations effectively summarize the module's manual content and are appropriately timed to cover topics and solve questions during sessions. The manual is well-structured, enhancing the information from presentations. Exercises for 3-4 topics successfully meet training goals and are discussed in the module's forum, with some detailed responses despite limited participation. The questionnaires, with four possible answers and one correct solution, were suitable in scope and difficulty for the initial pilot phase.

Conclusion: Enhance In-Class Exercises: Incorporate more practical tasks that promote participation and idea-sharing among students. Improve Platform Access: Ensure classes are easily accessible from the platform and allow progress in one language to count across all languages. Revise Slide Content: Add legends to slides with graphs to improve clarity. Simplify Initial Course Tasks: Start with simpler examples for course tasks and clarify whether these should be completed in forums or as mandatory components. Upgrade Platform Usability: Make the platform more intuitive and consider introducing achievement badges upon course completion. Maintain Effective Presentations: Continue summarizing module content effectively in presentations, ensuring they are well-timed to cover topics and solve questions during sessions. Utilize Structured Manuals: Use well-structured manuals to enhance the information presented in sessions. Optimize Exercises: Keep proposing exercises that cover key knowledge areas and facilitate discussion in forums, while aiming to increase participation. Refine Questionnaires: Continue using appropriately scoped and difficult questionnaires with clear solutions for evaluation during pilot phases.

Module 8: Entrepreneurship

Partner Piloting: ULPGC

Number of students: 22

Target: 15

- **Location:** ULPGC, Universidad de Las Palmas de Gran Canaria, Spain
- **Trainer:** Rosa Batista Canino (ULPGC)
- **Center Coordinators:** Raquel Ortega (ULPGC)
- **Students from:** I-HE course
- **Date and Duration:** From 15/04/2024 to 10/05/2024

Feedback:

The course included theoretical content and internships. Feedback was collected from ULPGC trainer and coordinator through questionnaires completed by students. Key issues highlighted include:

Time Constraints: Limited time affected the comprehensiveness of the material.

Online Platform: No comments.

Content: Students: Interest and Completeness: Found the course very interesting and comprehensive. Additional Material: Suggested adding more content on grants and ways to join projects for both startups and established companies. Geographical Focus: Recommended distinguishing the importance of the circular economy between Europe/Western economies and other regions where profitability is a primary concern. Resource Complexity: Resources are difficult to read; simplifying or adapting them could enhance understanding. Teaching Quality: Praised teachers for effectively synthesizing material and simplifying the syllabus. Content Volume: Noted the course covers a lot of material in limited time, preventing deep dives into topics. Teacher: Time-Material Ratio: Highlighted that the extensive and sometimes repetitive material made it challenging to cover within the given time. Content Adjustment: Suggested removing the entrepreneurship section in favor of focusing on corporate growth strategies. Preparation Requirement: Emphasized the need for prior student preparation for smooth module execution.

Conclusion:

The course is well-regarded for its interesting and comprehensive content, with high praise for the teaching quality and the ability of instructors to simplify complex material. However, several areas for improvement have been identified:

- **Additional Material:** Including more content on grants and project participation for both startups and established companies could enhance the course's practical value.
- **Geographical Focus:** There is a need to address the varying importance of the circular economy across different regions, emphasizing the profitability aspect in non-Western economies.
- **Resource Accessibility:** Simplifying or better adapting reading resources could help students understand the material more easily.
- **Content Volume and Time Management:** The course currently covers too much material in a short time, limiting the ability to delve deeply into topics. A reduction in content or an extension of the teaching period could help mitigate this issue.
- **Curriculum Adjustment:** The section on entrepreneurship could be revised or removed to allow more focus on strategies for the growth of existing companies.
- **Student Preparation:** Encouraging or requiring students to do preparatory work could facilitate smoother module progression and better comprehension of the material.

- By addressing these points, the course can enhance its effectiveness and better meet the needs and expectations of students and instructors alike.

PROJECT INFO

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Action Type	ERASMUS Lump Sum Grants
Project Title	CIRCJET – Circular Economy Practical Training Materials for Plastics Manufacturing Industries
Project starting date	01-09-2022
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Project duration	3 years

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PROJECT CONSORTIUM

