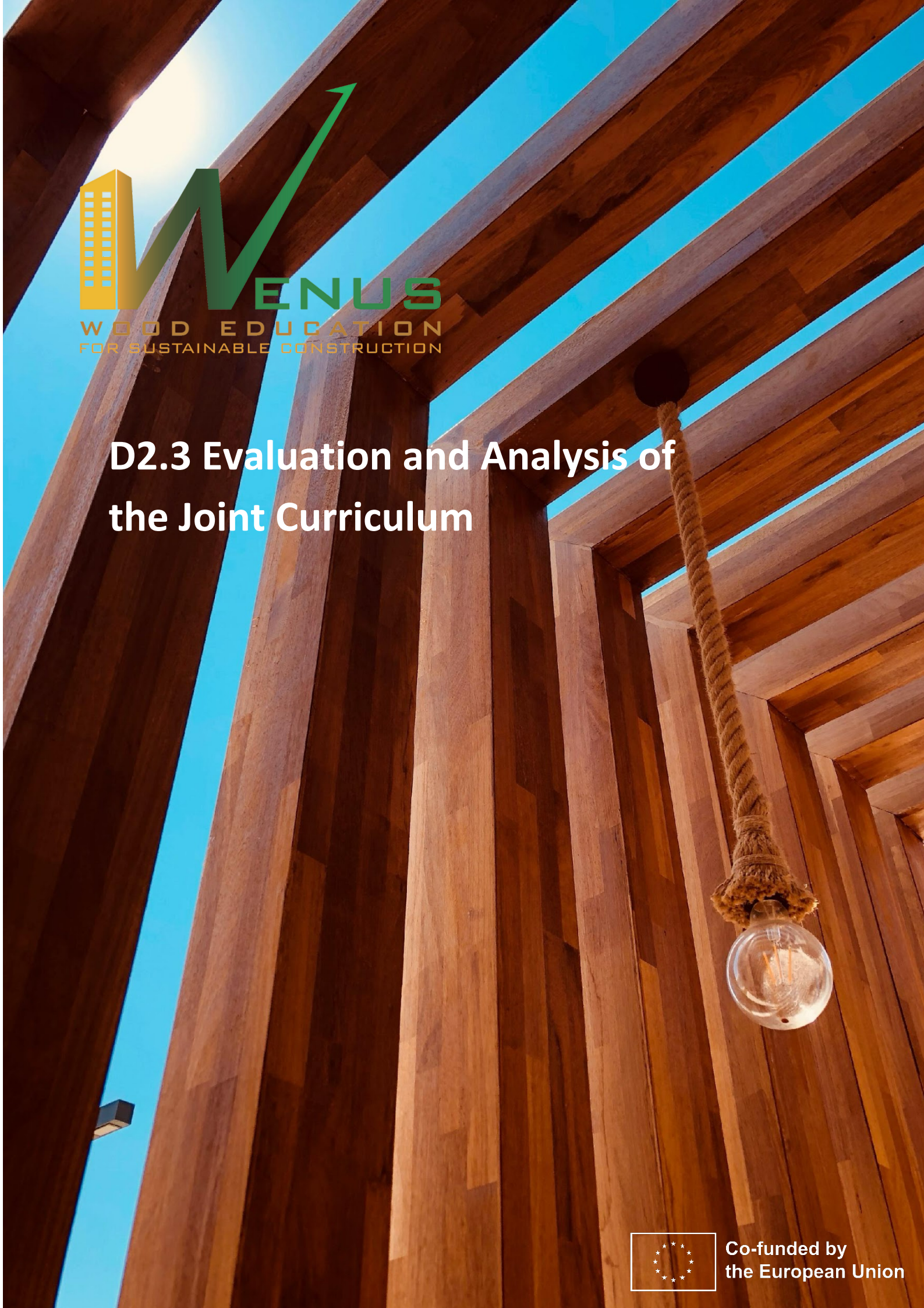

D2.3 Evaluation and Analysis of the Joint Curriculum

Co-funded by
the European Union

Evaluation and Analysis of the Joint Curriculum

April 2025

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WENUS Project

The WENUS project aims to enhance Vocational Education and Training (VET) in sustainable wood and Timber construction by integrating circular economy principles and 3D Printing technologies into the curriculum, addressing the industry's evolving needs for green and digital skills, and promoting innovation, sustainability, and efficiency.

WENUS aims to create a student-centered curriculum that integrates Circular Economy principles into timber construction, coupled with tailored training content featuring 3D printing exercises. It plans to launch an e-learning platform to broaden access and enrich vocational training with essential green and digital skills.

WENUS is directly aligned with the twin green and digital transition, focusing on how sustainable digital technologies, such as 3D printing, could enable a carbon-neutral EU by 2050. The use of 3D printing for practical training is highly effective as it enables learners to engage in hands-on training experiences in a safe and controlled environment.

The purpose of this document is to analyze the opinions regarding the final Joint Curriculum, assessing whether it adequately addresses the needs of the sector. In addition, the perspectives and recommendations offered by external experts from the wood and timber construction sector, which were gathered through the survey, have been taken into account. Their responses are systematically analysed in the following sections.

1. Methodology

Surveys are among the most commonly used tools for gathering insights on the opinions, experiences, or knowledge of specific target groups. This approach is particularly relevant in applied research, as it allows for the direct collection of valuable information from professionals and subject-matter experts.

For the WENUS Project, partners designed a structured 12-question online questionnaire to validate the Joint Curriculum developed by the consortium (see Annex I). The survey was distributed via Google Form[1] and addressed to professionals in the fields of education, sustainable timber construction, and the Circular Economy, including educators, sector stakeholders, and technical experts.

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1 https://docs.google.com/forms/d/e/1FAIpQLSfjJe0mmngALyS10YOL_VoqzWxAhiCgTK5GdsPNngiwB8oV-A/viewform?usp=preview

The survey was accompanied by a summary of the Joint Curriculum to ensure that all respondents had access to the context and content they were being asked to evaluate. This summary was available online[2] and is also included in this report (see Annex II), enabling participants to provide informed and constructive feedback.

The questionnaire included a variety of question types to allow for both quantitative and qualitative analysis:

- 5 demographic questions to collect information on participants' professional and educational backgrounds.
- 8 Likert-scale questions, including:
    - 2 statements rated on a verbal Likert scale (*Strongly agree* to *Strongly disagree*), to evaluate perceptions of the curriculum's benefits and relevance.
    - 6 rating-scale questions using a numeric Likert-type scale (1 to 5, with 5 being the highest), to assess the perceived necessity and interest in each proposed module and learning unit.
- 1 binary (Yes/No) question to confirm whether the curriculum addresses the sector's needs.
- 2 open-ended questions designed to capture qualitative feedback and specific recommendations for improvement.

A total of 41 responses were collected. The quality and depth of the feedback are supported by the respondents' expertise, as they represent a cross-section of active professionals directly involved in the fields addressed by the WENUS Project.

2. Results of the survey

This survey has been organized into three different sections. The first presents data about the participants; the second provides a summary of the Joint Curriculum developed by the WENUS consortium; and the third focuses on the training materials that the project will offer in the future. All the data will be analyzed following this structure.

[2] https://view.genially.com/679a1341807e2af4872d99eb/interactive-content-wenus-joint-curriculum

Data of participants

Partners of the WENUS Project selected professionals from various countries, involving both organizations and individual experts, to engage a broad spectrum of stakeholders. As a result, the consortium collected 41 responses — exceeding the initial Key Performance Indicator (KPI) of 30 — making the survey a successful tool for the project and a valuable resource for future research.

Most responses came from the WENUS consortium countries — Spain (10), Germany (8), Slovenia (8), and Poland (4). Experts from nine additional countries also took part, including Italy, Belgium, Serbia, Hungary, Finland, Sweden, Bulgaria, the United Kingdom, and Ukraine, contributing to a broader European perspective.

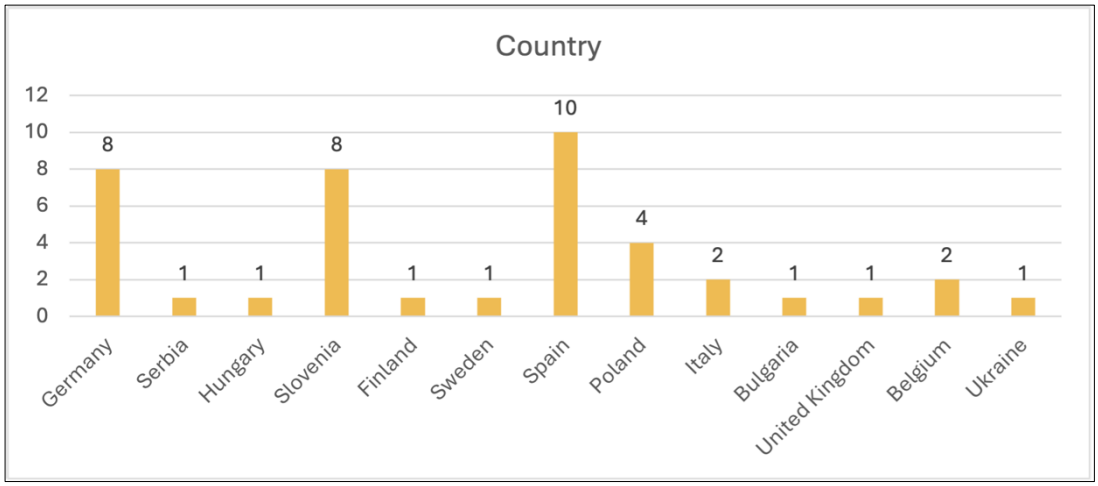
The respondents' backgrounds reflect a wide range of expertise. The most represented areas were Education (18), Wood and Timber (16), and Architecture (12), followed by Circular Economy (9) and Construction (6). Less frequent backgrounds included Project Management, New Technologies Applied to Timber and Furniture, Wood and Furniture Business Associations, Public Authorities, and Environment.

In terms of educational level, participants also brought strong academic and technical foundations. A total of 7 respondents had completed Vocational Education and Training (VET), 13 had Higher Education qualifications, 14 held Master's degrees, and 11 had earned a PhD. This diversity in educational background strengthens the quality of the feedback, as it combines theoretical knowledge with practical experience across different levels of expertise.

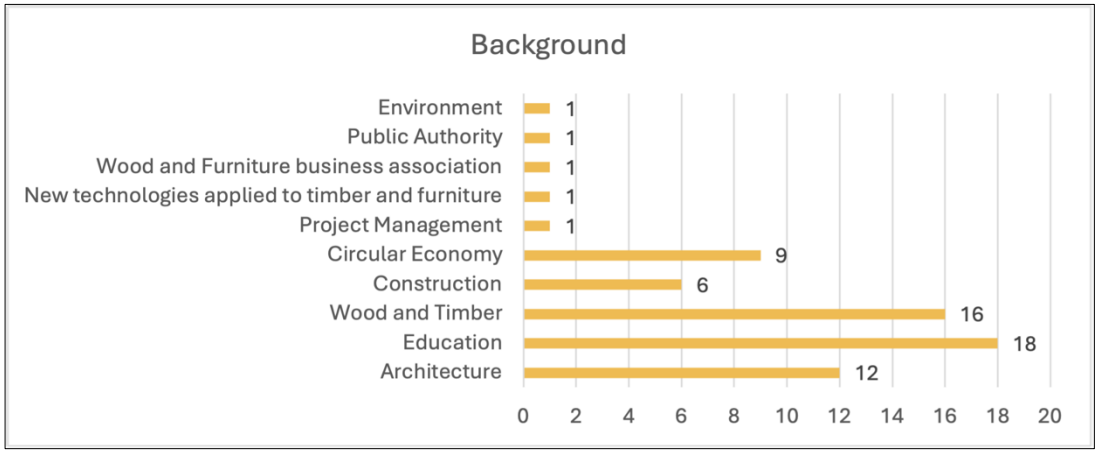
In addition to the diversity in academic and professional backgrounds, the respondents represent a wide range of institutions and organizations. These include universities, vocational education centers, research institutes, architectural and engineering firms, industry associations, and sustainability-focused consultancies. This institutional diversity ensures that the feedback collected is not only academically informed but also grounded in real-world application and current industry practices.

This variety of professional and academic profiles adds strong value to the evaluation of the WENUS Joint Curriculum, ensuring feedback that reflects perspectives from

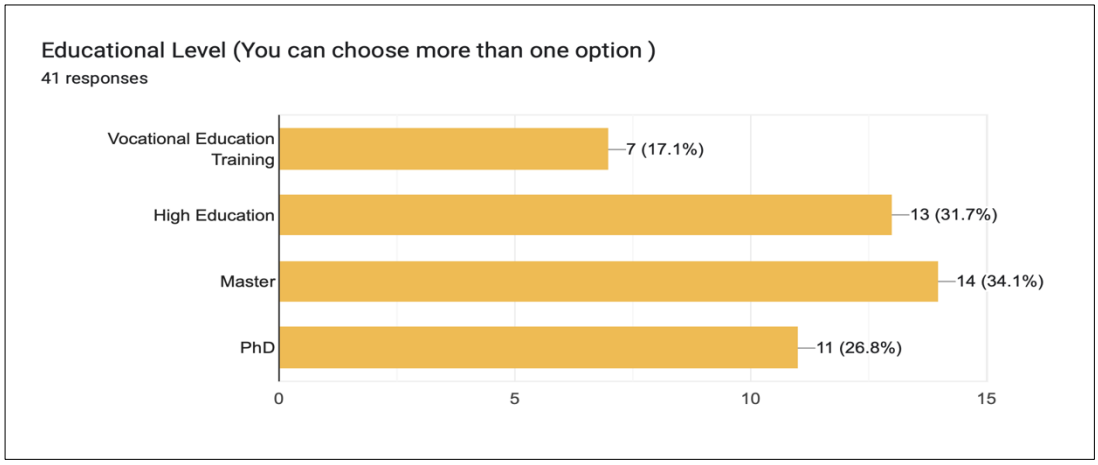
education, industry, policy, and innovation. Such input enhances the curriculum's relevance and potential impact across sectors linked to sustainable timber construction and the Circular Economy.



Graphic 1: Count of countries.



Graphic 2: Count of backgrounds.



Graphic 3: Educational Level.

WENUS Joint Curriculum

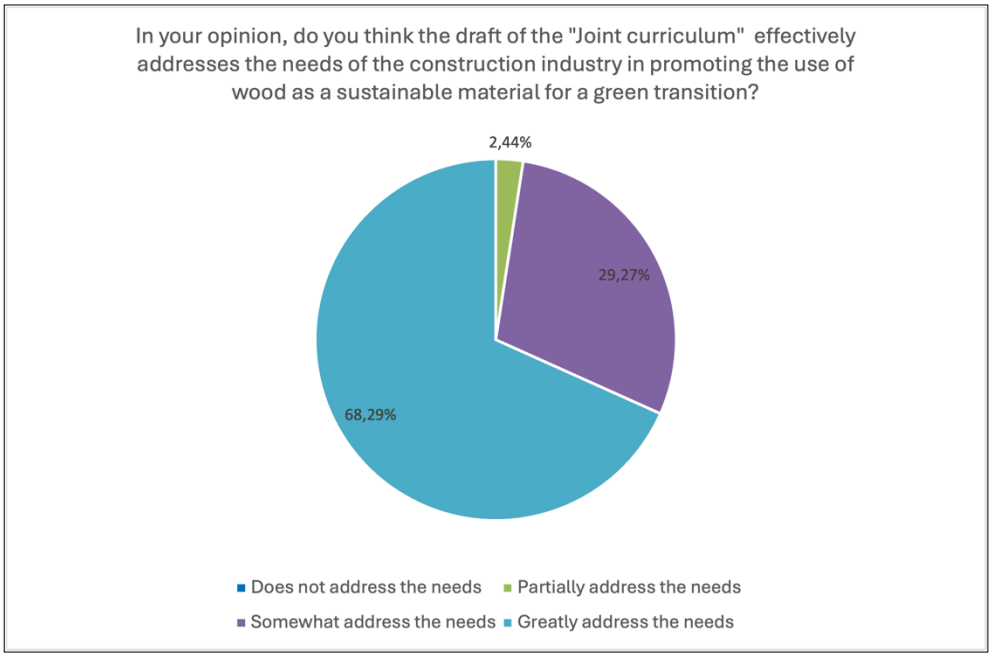
In this section of the survey, participants were asked to evaluate the Joint Curriculum after reviewing and analyzing its content (refer to Annex II). The objective was to gather their perceptions regarding the structure and content of the curriculum, including the proposed modules and units, and to collect valuable feedback to identify potential areas for improvement.

Needs addressed by the Joint Curriculum

The first question asked whether respondents believed that the proposed Joint Curriculum adequately addresses the needs of the construction industry in promoting the use of wood as a sustainable material for a green transition.

The results show that 28 participants stated that it greatly addresses these needs, 12 respondents said it somewhat addresses them, and 1 participant indicated it partially addresses the needs. Notably, no one considered that it does not address the needs at all.

In total, nearly 100% of respondents provided positive feedback, confirming that the Joint Curriculum is well aligned with the current priorities and expectations of the construction sector regarding sustainability and innovation.

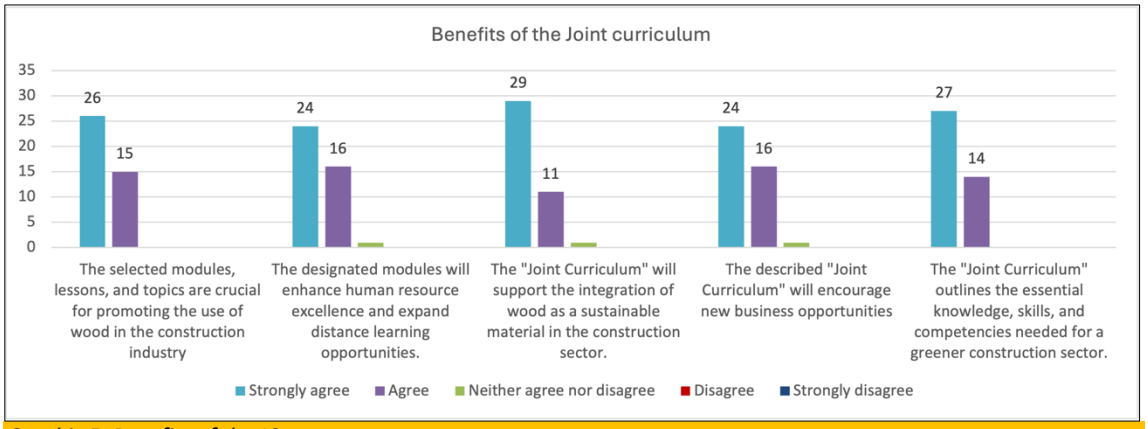


Graphic 4: Needs addressed in the JC.

Benefits of the Joint Curriculum

The second question focused on the perceived benefits of the curriculum. Participants were asked whether they agreed that the selected modules, lessons, and topics are relevant and contribute to promoting the use of wood in construction.

The vast majority of respondents either strongly agreed or agreed, indicating a very high level of endorsement. Only one participant selected a neutral option, and no negative responses were recorded. This positive feedback confirms that the curriculum is seen as useful and relevant for promoting sustainable practices in the construction sector.



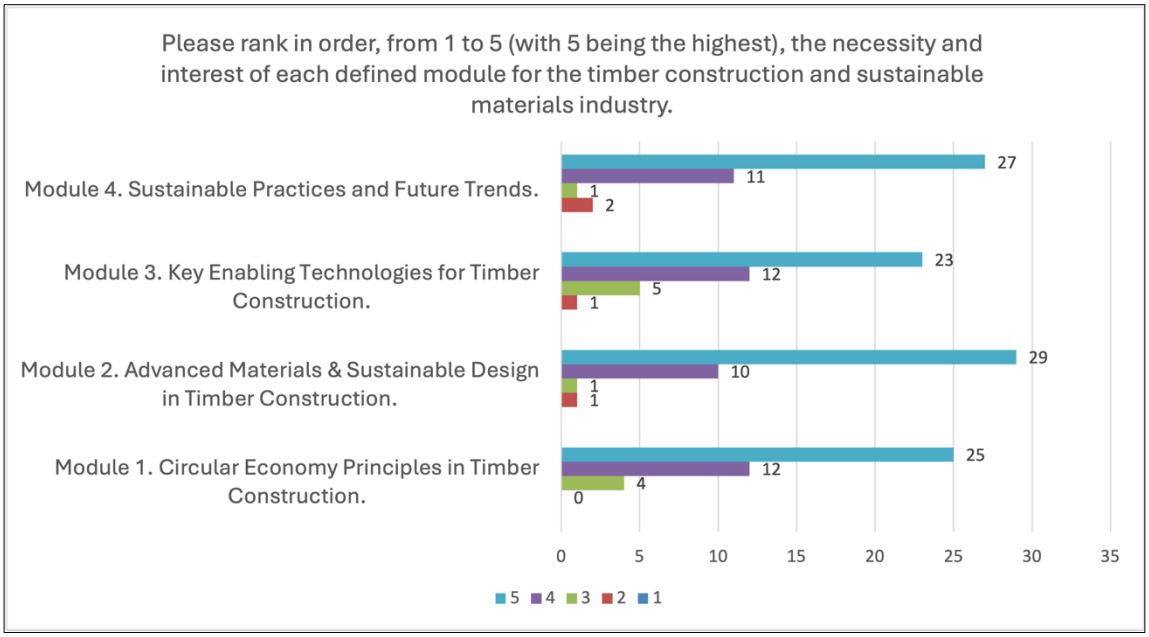
Graphic 5: Benefits of the JC.

Training modules

The training modules included in the WENUS Joint Curriculum focus on key areas such as circular economy, sustainable materials, and digital innovation in timber construction. These modules represent the core structure of the proposed training offer and are designed to equip learners with the green and digital skills required by the sector.

Participants were asked to rate each module based on its necessity and relevance for the timber construction industry, using a scale from 1 (lowest) to 5 (highest). The results reflect a strong level of approval: most ratings were 4 or 5, and more than half of the respondents gave the maximum score to each module. Only a small number of responses were below 4.

This clear positive trend confirms that the selected modules respond well to current sector priorities and challenges. It also supports the project's objective of integrating circular economy principles and technologies like 3D printing into vocational training for a greener, more innovative construction industry.



Graphic 6: Participant ratings of the proposed modules' relevance.

Learning units

This section presents the evaluation of the learning units that make up each training module. These units provide detailed content on key topics and are fundamental to structuring the WENUS Joint Curriculum.

Participants assessed the relevance and level of interest of each learning unit for the timber construction sector using a scale from 1 (lowest) to 5 (highest), with each module evaluated individually.

Module 1: Circular Economy Principles in Timber Construction

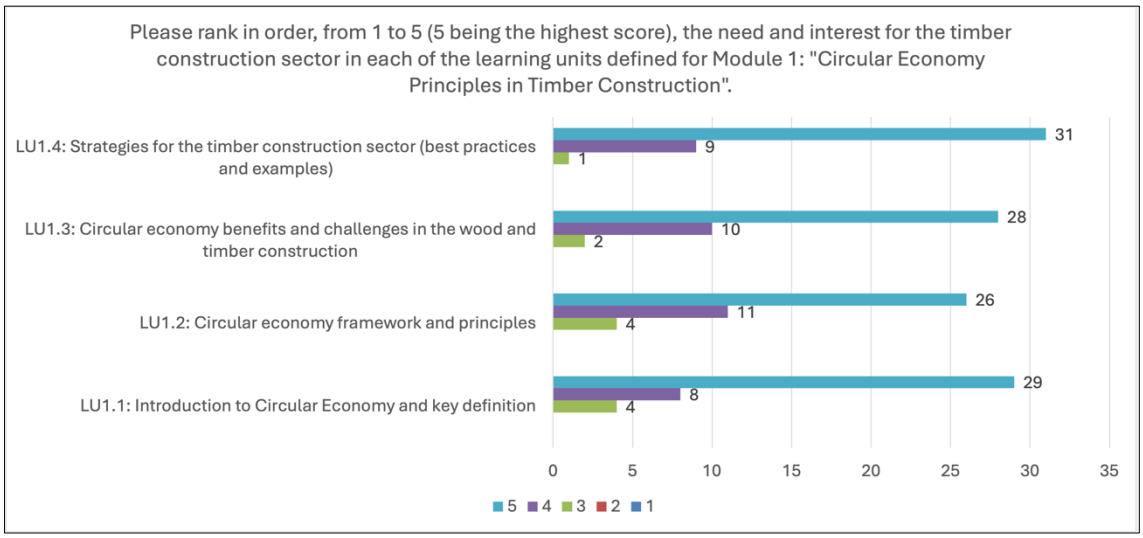
This module introduces the fundamental concepts of the circular economy within the context of timber construction. It sets the foundation for the rest of the training by providing the theoretical and strategic framework needed to understand sustainability in this sector.

The learning units in this module received highly positive ratings, with approximately 90% of participants assigning scores of 4 or 5. This indicates a clear recognition of their

relevance and usefulness. Only a small number of respondents gave a score of 3, and none rated the units lower.

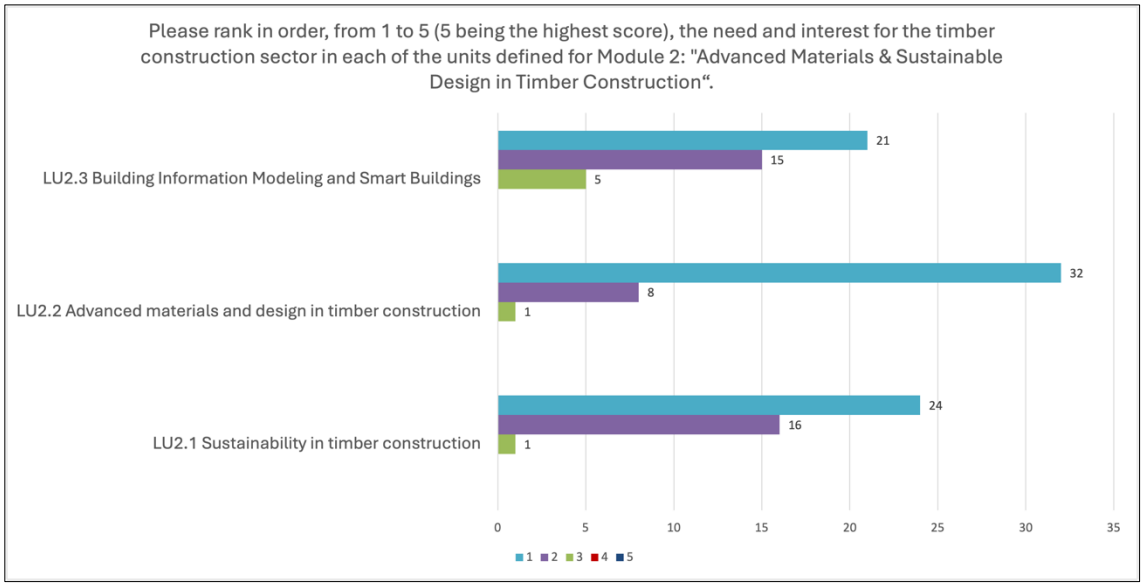
Graphic 7: Ranking of learning units' module one.

Module 2: Advanced Materials & Sustainable Design in Timber Construction.



This module explores the use of innovative materials and sustainable design strategies within the timber construction sector. It aims to strengthen technical knowledge and promote environmentally responsible construction practices.

The learning units in this module were very well received. Most participants rated them with the highest score of 5, reflecting strong interest in the topics covered. A significant number also assigned a score of 4, reinforcing the perception that these contents are both necessary and highly relevant for advancing sustainability in timber construction

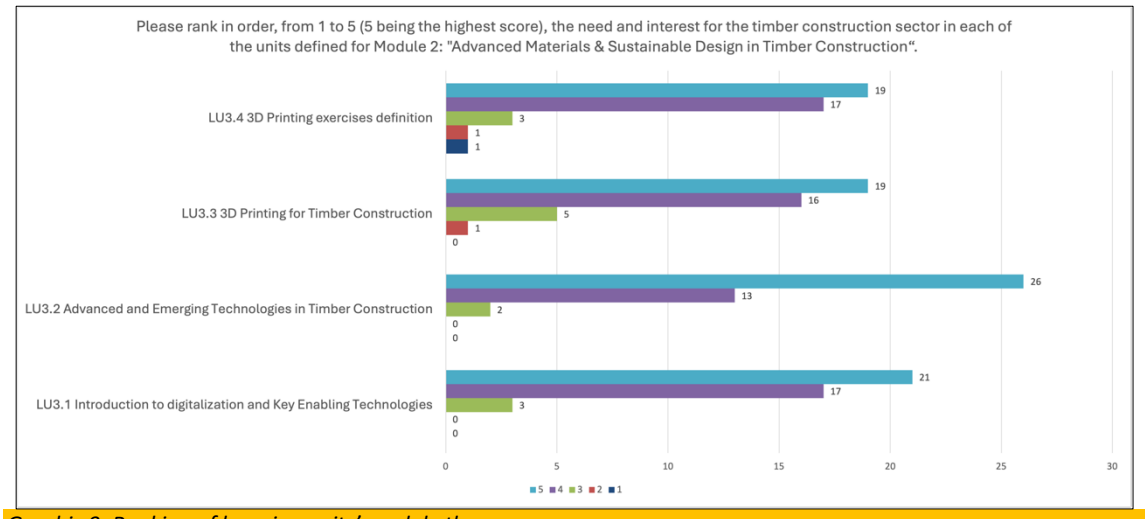


Graphic 8: Ranking of learning units' module two.

Module 3: Key Enabling Technologies for Timber Construction.

This module focuses on emerging technologies that can support innovation and improve efficiency in timber construction processes. It introduces learners to tools and methods that are transforming the sector, such as digital fabrication and automation.

The evaluation of this module shows a generally high level of interest. Most participants rated the learning units with scores of 4 or 5, particularly the unit addressing emerging technologies, which received the highest number of top scores. While a few respondents gave lower ratings (3, 2, or 1), the overall trend confirms the relevance of these technological topics for the future of the industry.

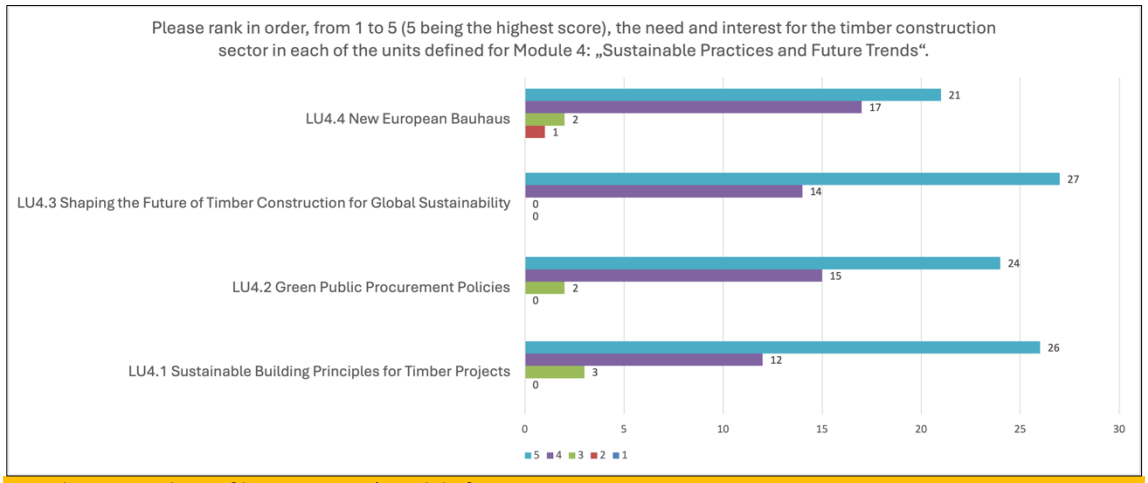


Graphic 9: Ranking of learning units' module three.

Module 4: Sustainable Practices and Future Trends.

This module addresses current best practices and explores future directions in sustainable timber construction. It encourages forward-thinking approaches and aims to prepare learners for upcoming challenges and innovations in the sector.

The learning units were positively received, with most participants assigning scores of 4 or 5, indicating consistent interest in the topics covered. Units 1 and 3 received the highest ratings, while Unit 4 scored slightly lower, though still within a generally favorable range. These results suggest that the content resonates with the sector's priorities and supports long-term strategic thinking.

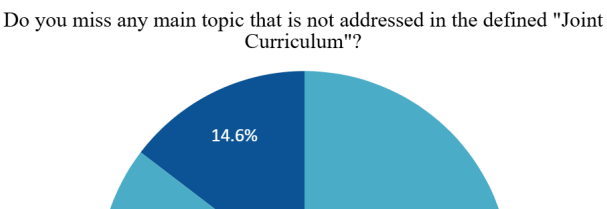


Graphic 10: Ranking of learning units' module four.

After the questions related to the evaluation of the modules and learning units, the survey included an additional item to identify whether any key topics were perceived as missing from the WENUS Joint Curriculum.

The majority of respondents (85%) indicated that the curriculum covers all the necessary areas, while 15% suggested that there are still topics that could be addressed.

Those who responded affirmatively were invited to specify what content they felt was lacking. Their suggestions are presented in the table below.



Graphic 11: Missing topic.

The suggestions provided by participants (see table 1) who felt certain topics were missing point to advanced and highly technical aspects of timber construction, such as structural safety, material performance, and sustainability assessment tools. While some of these areas go beyond the scope of EQF level 4, which focuses on foundational and applied vocational skills, they show relevant directions for deepening the curriculum in future iterations. Several of the topics - such as circular economy indicators, basic safety considerations, and material properties - can be partially integrated or referenced through introductory content, case studies, or optional advanced materials, ensuring alignment with the intended training level while addressing sector expectations.

Table 1: Missing topics.

In case of "YES", what topic do you consider is not addressed?
Fire safety and durability of timber structures in sustainable construction.
Design thinking / future thinking, supply chain - reverse logistics, stakeholder involvement, strategy, leadership, LCA...
Circular economy indicators and impact measurement in timber construction.
Sustainable forestry, wood processing, wood as a material, real estate financing.
Technical properties and details in wood construction, monitoring wood mois-ture, fire safety, earthquake safety.
How to measure the sustainability of buildings.

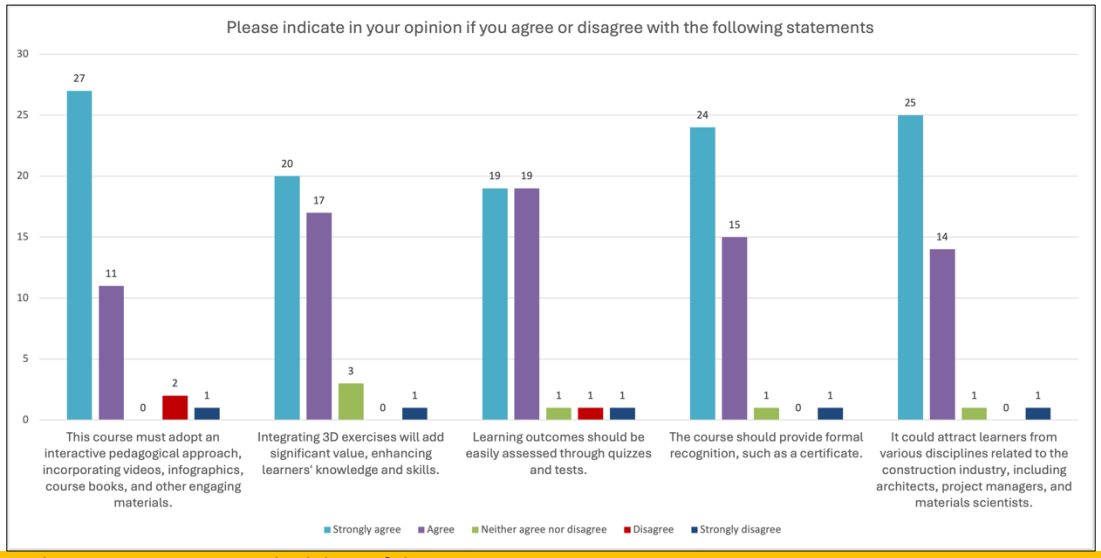
WENUS training course

Methodological aspects

Participants were asked to evaluate several methodological aspects of the proposed training course. They were presented with a series of statements and asked to indicate their level of agreement using a standard Likert scale.

The statements focused on key pedagogical features, including the use of interactive materials (videos, infographics, course books), the integration of 3D exercises, the inclusion of quizzes and tests to assess learning outcomes, the importance of formal certification, and the course's potential to attract learners from various construction-related disciplines.

The results show a strong consensus in favor of these features. The majority of participants either strongly agreed or agreed with all five statements. Only a few selected neutral responses, and very few expressed disagreement. This positive feedback confirms broad support for an engaging, interactive, and multidisciplinary approach - aligned with the project's aim to provide accessible, practice-oriented training that meets the expectations of both learners and the construction sector.



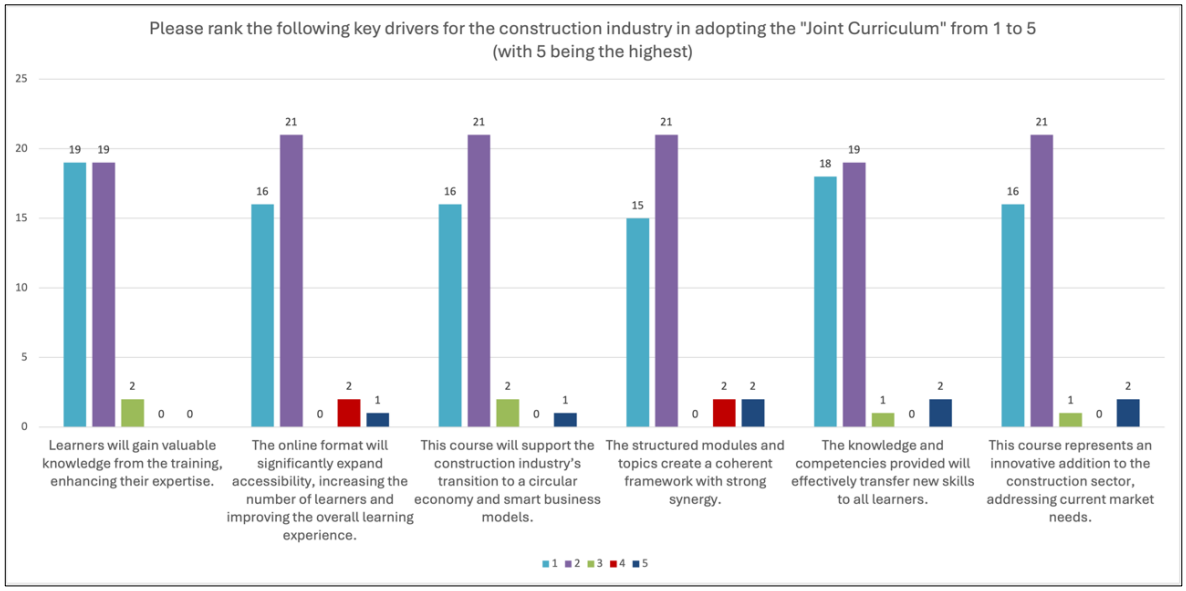
Graphic 12: Statements. Methodology of the course.

Key drivers

Participants were also asked to rank six statements related to the potential of the Joint Curriculum to meet the current and future needs of the construction industry. These statements addressed factors such as knowledge transfer, digital accessibility, innovation, and alignment with sustainability goals.

The results were largely positive: the majority of respondents rated the statements with scores of 4 or 5, indicating strong agreement with the proposed value of the curriculum.

Among the most highly rated drivers were the course's contribution to enhancing learners' expertise, its potential to support the sector's transition to circular economy models, and its role in providing accessible, structured, and future-oriented training



content.

Graphic 13: Key drivers ranking.

Final participants observations and suggestions

To conclude the survey, participants were invited to share any additional thoughts or suggestions regarding the WENUS Project through an open-ended question. A wide range of comments was received, most of which were highly positive.

Many participants praised the initiative for its relevance, structure, and potential to bridge the gap between sustainable timber construction and emerging technologies. The curriculum was often described as well-designed, informative, and aligned with current sector needs. Several respondents highlighted its value for both students and professionals, particularly in promoting sustainability and green skills development.

Suggestions included the addition of real case studies, practical tools for measuring impact, and clearer links to key professional groups such as architects and public procurement prescribers. Other recommendations emphasized the importance of experienced educators and the need to ensure the content remains accessible and up to date.

Overall, the feedback confirms that the WENUS Joint Curriculum is regarded as a strong and timely contribution to vocational education in the timber construction sector.

Table 2: Additional comments.

Please add any comment on the "WENUS Joint Curriculum" that you consider
This curriculum is a great initiative to bridge the gap between sustainable timber construction and emerging technologies.
The WENUS Joint Curriculum is well-structured and comprehensive. It aligns well with current needs and provides valuable insights. Good Project!
The course covers content that is highly relevant to working in the timber sector.
The first 'groups' that need to be educated are the architects and engineers, but also the prescribers, e.g. for public procurement. I don't see the link with these groups (at first sight).
WENUS seems to me to be an interesting proposal that will surely help to increase knowledge in the sector.
It can be a good stimulus for students in developing their work with materials such as wood.
The curriculum is very well designed and a great step towards promoting sustainability in timber construction. Adding more real case studies and practical tools for measuring impact would make it even more valuable for learners.
Great initiative!
Show practical examples and examples of good practice
Great topics, make it accessible for audience with clear goals of learning outcomes and up-to-date information.
It is ssential that professors have experience in education as well as in professional practice.

3. Summary of survey implications

This section provides an integrated analysis of the feedback received through the validation survey, highlighting how the results reinforce the structure, content, and objectives of the WENUS Joint Curriculum. Rather than repeating response statistics, the goal is to reflect on how the insights gathered validate the curriculum's direction, reveal sectoral expectations, and identify areas for potential enhancement.

The feedback confirms that the curriculum is strongly aligned with both current and future needs of the timber construction sector. Participants emphasized the relevance of the modules and learning units, the effectiveness of the methodological approach, and the importance of integrating both green and digital skills. The high level of agreement observed across most survey items demonstrates a broad consensus among stakeholders - from educators to industry professionals - regarding the value and timeliness of this training offer.

The project also surpassed its initial Key Performance Indicator (KPI) of 30 responses, gathering a total of 41. Among those, 97.5% of respondents stated that the curriculum adequately or greatly addresses sector needs, indicating a high level of satisfaction and endorsement.

In addition to this overall positive assessment, the survey responses offered several constructive proposals aimed at enhancing the curriculum's practical applicability and technical depth. These suggestions have been synthesized and are considered essential for refining the final training offer and for guiding the development of complementary learning materials in the next phases of the WENUS project.

4. Conclusions

The results of the WENUS Joint Curriculum validation survey demonstrate that the proposed training program meets the expectations of a diverse group of professionals involved in timber construction, sustainability, and education across Europe. With 97.5% of participants rating the curriculum as relevant to the needs of the sector, the training offer is positioned as a meaningful contribution to vocational education and the green and digital transitions in construction.

The curriculum's structure, which integrates circular economy principles, sustainable design, and emerging technologies such as 3D printing, is seen as a timely and strategic response to the evolving challenges of the industry. The training is not only suitable for students, but also valuable for upskilling current professionals.

At the same time, survey feedback identified two key areas for enhancement:

Improvements in the Joint Curriculum

Respondents recommended several modifications to strengthen the training experience. These included the addition of real-world case studies and good practice examples to provide a practical dimension to theoretical content. They also suggested incorporating tools to assess the environmental and technical impact of timber construction activities. Furthermore, it was emphasized that trainers delivering the course should have both teaching experience and professional practice, ensuring content delivery that is pedagogically sound and grounded in real industry contexts.

It was also noted that greater engagement with professional profiles such as architects, engineers, or public procurement professionals could enhance the impact of the curriculum. While not the primary target group, these roles play a key part in shaping sustainable construction practices, and their consideration could help broaden the curriculum's reach and relevance.

Points for developing training materials

Respondents also suggested enriching the content of the training materials with complementary topics. While some of these go beyond the EQF Level 4 framework, they can still be addressed through introductory lessons, optional resources, or case-based learning. These include:

- Fire safety and structural durability of timber buildings.
- Circular economy indicators and sustainability measurement tools.
- Sustainable forestry, wood processing, and timber performance characteristics.
- Technical topics like moisture control, seismic safety, and reverse logistics.
- Design thinking, stakeholder engagement, and leadership in sustainability.

These ideas will be carefully considered during the next development phase of the WENUS course, ensuring that the training offer remains relevant, forward-looking, and responsive to the challenges and priorities of the timber construction sector.

Together, the feedback gathered through the survey and the suggestions received provide a solid basis for finalizing the curriculum and designing impactful training materials. The WENUS Project is now well positioned to deliver a high-quality learning experience that supports sustainable development and skills acquisition in the construction industry.

Based on the feedback received through the validation survey, several suggestions will be made to enhance the WENUS Joint Curriculum and increase its relevance for the target audience.

5. ANNEX 1- Questionnaire

Validation of the Joint Curriculum: Questionnaire

We kindly invite you to complete this survey regarding the Joint Curriculum for Sustainable Wood and Timber Construction, developed within the framework of the WENUS Erasmus+ Project.

Your responses are strictly confidential and will only be shared among project partners. All data collected will be analyzed collectively, ensuring anonymity and privacy.

For more details about the project, feel free to visit our website: **https://wenusproject.eu**.

Thank you for your valuable contribution!

DATA OF PARTICIPANT

Name of your organization:

Background (You can choose more than one option):

Education Level (You can choose more than one option):

Country:

Email (by providing your email, you agree to receive information on the WENUS Project):

QUESTIONNAIRE

1. In your opinion, do you think the draft of the "Joint curriculum" effectively addresses the needs of the construction industry in promoting the use of wood as a sustainable material for a green transition?

a)	Greatly address the needs	
b)	Somewhat address the needs	
c)	Partially address the needs	
d)	Does not address the needs	

2. Please indicate in your opinion on the following perceived benefits of the "Joint curriculum".

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The selected modules, lessons and topics are crucial for promoting the use of wood in the construction industry.					
The designated modules will enhance human resource excellence and expand distance learning opportunities.					
The “Joint Curriculum” will support the integration of wood as a sustainable material in the construction sector.					
The described “Joint Curriculum” will encourage new business opportunities.					
The “Joint Curriculum” outlines the essential knowledge, skills and competencies needed for a greener construction sector					

3. Please rank in order, from 1 to 5 (with 5 being the highest), the necessity and interest of each defined module for the timber construction and sustainable materials industry.

	1	2	3	4	5
Module 1. Circular Economy Principles in Timber Construction					
Module 2. Advanced materials & Sustainable design in Timber Construction					
Module 3. Key Enabling Technologies for Timber Construction					
Module 4. Sustainable Practices and Future Trends					

4. Please rank in order, from 1 to 5 (5 being the highest score), the need and interest for the timber construction sector in each of the learning units defined for Module 1: "Circular Economy Principles in Timber Construction".

	1	2	3	4	5
LU 1.1: Introduction to Circular Economy and key definitions					
LU 1.2: Circular economy framework and principles					
LU 1.3: Circular economy benefits and challenge in the wood and timber construction					
LU 1.4: Strategies for the timber construction sector (best practices and examples)					

5. Please rank in order, from 1 to 5 (5 being the highest score), the need and interest for the timber construction sector in each of the units defined for Module 2: "Advanced Materials & Sustainable Design in Timber Construction ".

	1	2	3	4	5
LU 2.1: Sustainability in timber construction					
LU 2.2: Advanced materials and design in timber construction					
LU 2.3: Building Information Modeling and Smart Buildings					

6. Please rank in order, from 1 to 5 (5 being the highest score), the need and interest for the timber construction sector in each of the units defined for Module 3: "Key Enabling Technologies for Timber Construction ".

	1	2	3	4	5
LU 3.1: Introduction to digitalization and Key Enabling Technologies					
LU 3.2: Advanced and Emerging Technologies in Timber Construction					
LU 3.3: 3D Printing for Timber Construction					
LU 3.4: 3D Printing exercises definition					

7. Please rank in order, from 1 to 5 (5 being the highest score), the need and interest for the timber construction sector in each of the units defined for Module 4: “Sustainable Practices and Future Trends “.

	1	2	3	4	5
LU 4.1: Sustainable Building Principles for Timber Projects					
LU 4.2: Green Public Procurement Policies					
LU 4.3: Shaping the Future of Timbe Construction for Global Sustainability: Environmental, Economic and Leadership Perspectives					
LU 4.4: New European Bauhaus					

8. Do you miss any main topic that is not addressed in the defined "Joint Curriculum"?

Yes	
No	

In case of “YES”, what topic do you consider is not addressed?

9. Please indicate in your opinion if you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

This course must adopt and interactive pedagogical approach, incorporating videos, infographics, course books and other engaging materials					
Integrating 3D exercises will add significant value, enhancing learners´ knowledge and skills					
Learning outcomes should be easily assessed through quizzes and tests					
The course should provide formal recognition such as a certificate					
It could attract learners from various disciplines related to the construction industry, including architects, project managers and materials scientists					

10. Please rank the following key drivers for the construction industry in adopting the "Joint Curriculum" from 1 to 5 (with 5 being the highest):

	1	2	3	4	5
Learners will gain valuable knowledge from the training, enhancing their expertise.					

The online format will significantly expand accessibility, increasing the number of learners and improving the overall learning experience.					
This course will support the construction industry´s transition to a circular economy and smart business models.					
The structured modules and topics create a coherent framework with strong synergy.					
The knowledge and competencies provided will effectively transfer new skills to all learners.					
This course represents an innovative addition to the construction sector, addressing current market needs.					

11. Please add any comments on the "WENUS Joint Curriculum" that you consider.

6. ANNEX 2: Joint Curriculum Structure.

Figure 1: Modules of the course.

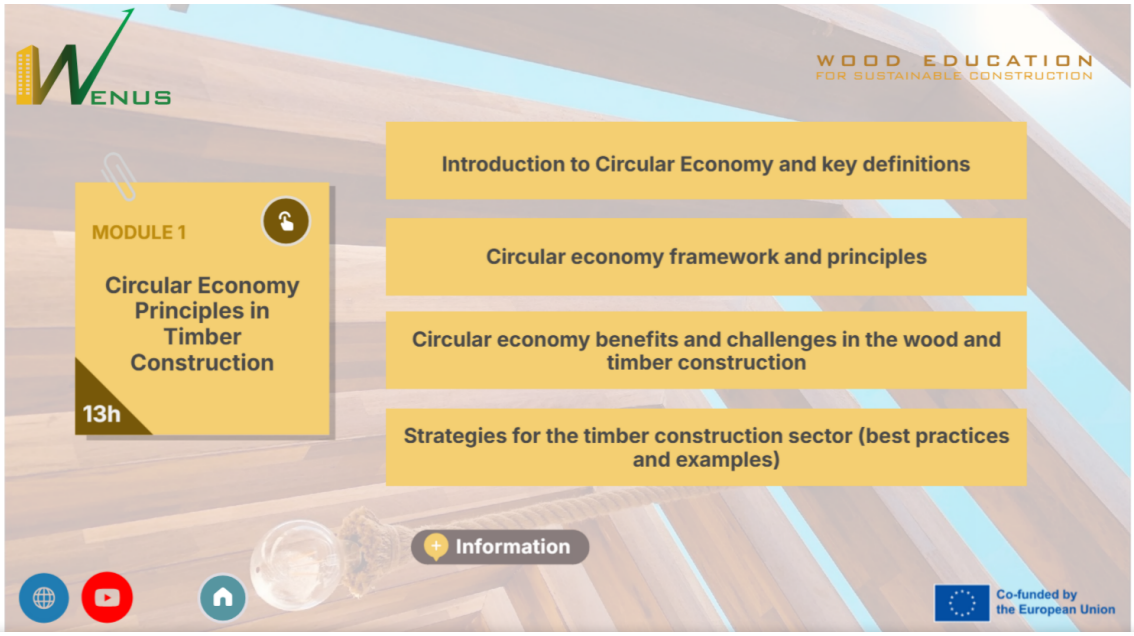


Figure 2: Module 1: Circular Economy Principles in Timber Construction.

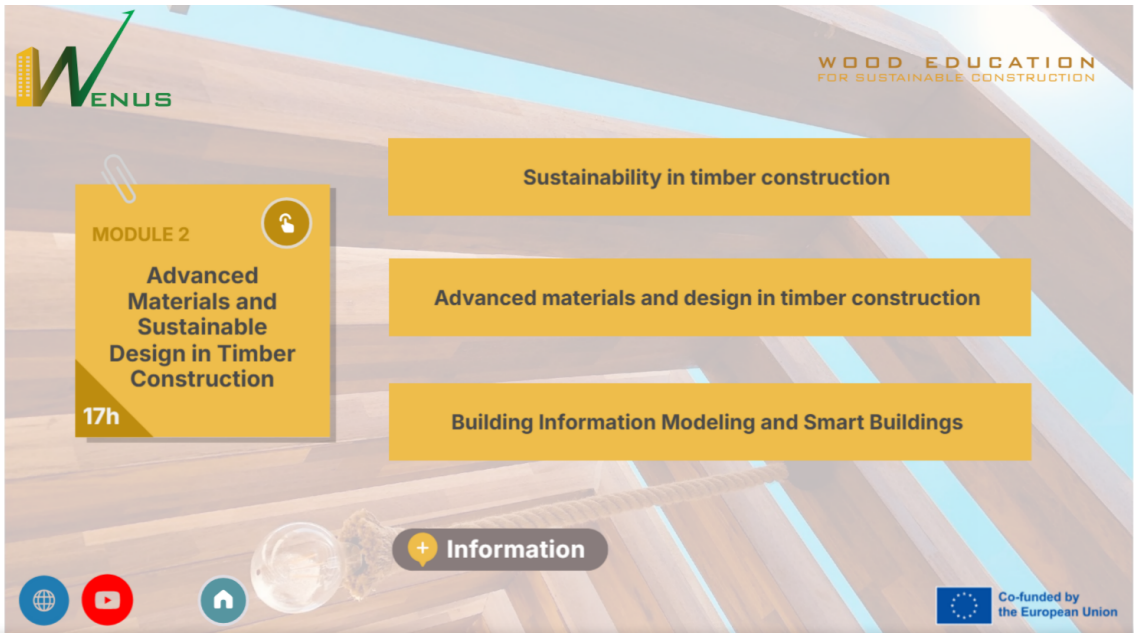


Figure 3: Module 2: Advanced materials and sustainable Design in timber construction.

Figure 4: Module 3: Key Enabling Technologies for Timber Construction.

Figure 5: Module 4: Sustainable Practices and Future trends.

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