

Memorandum of Understanding

ECVET Validation and Recognition



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TwinRevolution Project Info

<i>Project Reference</i>	2021-2-DE02-KA220-VET-000050453
<i>Programme</i>	Erasmus+ Partnerships for cooperation and exchanges of practices
<i>Action type</i>	Cooperation partnerships in vocational education and training
<i>Project title</i>	Supporting the twin digital and green transition on the manufacturing and traditional industry sectors through innovative VET resources.
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Memorandum of Understanding

1. Objectives of the Memorandum of Understanding

The Memorandum of Understanding¹ (MoU) forms the framework for cooperation between the competent institutions. It aims to establish mutual trust between the partners. In this Memorandum of Understanding partner organisations mutually accept their respective criteria and procedures for quality assurance, assessment, validation and recognition of knowledge, skills, and competence for the purpose of transferring credit.

2. Organisations signing the Memorandum of Understanding

<i>Organisation 1 – Karlsruhe Institute of Technology</i>	
Country	Germany
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	Position: Academic Councillor
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¹ For more information and guidance on the establishment of a MoU please refer to the ECVET User's Guide: 'Using ECVET for geographical mobility (2012) - Part II of the ECVET Users' Guide - Revised version – including key points for quality assurance' – available at: https://www.cedefop.europa.eu/files/ECVET_USERS_GUIDE_PART-2-EN_update_2012.pdf

Organisation 2 – Vaasan Yliopisto

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Name of the organisation	Vaasan Yliopisto - UVA
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Telephone	+358 29 449 8000
Website	www.uva.fi
Contac Person	Name: Arto Rajala
	Position: DEAN, School of Marketing and Communication, University of Vaasa
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Organisation 3 – Centro tecnológico del mueble y la madera de la Región de Murcia

Country	Spain
Name of the organisation	Centro tecnológico del mueble y la madera de la Región de Murcia - CETEM
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Contac Person	Name: Josefina Garrido Lova
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Organisation 4 – Textilni zkusebni ustav

Country	Czech Republic
Name of the organisation	Textilni zkusebni ustav - TZU
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Contac Person	Name: Vitezslav Gaja

	Position: Deputy director
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Organisation 5 – IES José Luis Castillo-Puche	
Country	Spain
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Address	C. Játiva, 2, 30510 Yecla. Spain
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	Position: Head of studies VET
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3. Qualification covered by this MoU

Qualification

Training modality	Online non formal training
Title of qualification	TwinRevolution Training Course
EQF level	4
Units of learning outcomes	4 modules 17 Learning Units
ECVET	2
Enclosures in annex	Joint Curriculum

4. Assessment, documentation, validation, and recognition

By signing this Memorandum of Understanding we confirm that we have discussed the procedures for assessment, documentation, validation, and recognition and agree on how it is done.

5. Validity of this Memorandum of Understanding

6. Signatures

Karlsruhe Institute of Technology

Name, role

Volker Koch

Academic Councillor

Place, date

Karlsruhe, 15.05.2023

Signature



Stamp



Karlsruher Institut für Technologie
Institut Entwerfen und Bautechnik
Professur Building Lifecycle Management

Vaasan Yliopisto

Name, role

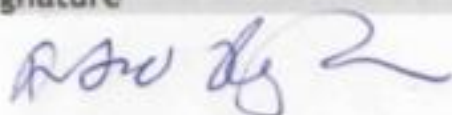
Arto Rajala

*DEAN, School of Marketing and
Communication, University of Vaasa*

Place, date

Vaasa, 15.05.2023

Signature



Stamp



Centro tecnológico del mueble y la madera de la Región de Murcia

Name, role

Josefina Garrido Lova

R&D director

Place, date

Yecla, 15.05.2023

Signature



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Textilní zkusební ústav**Name, role**

Vitezslav Gaja

*Deputy director***Signature****Place, date**

Brno, 15.05.2023

**Stamp****Textilní zkusební
ústav**
Cejl 480/12 602 60 Brno

IES José Luis Castillo-Puche

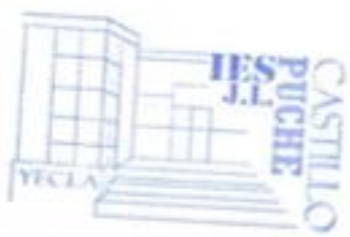
Name, role

Rafael Ruz Muñoz
Head of studies VET

Place, date

Yecla, 15.05.2023

Signature



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7. Annexes

Joint Curriculum & Definition of the Learning Units

Structure of the Joint Curriculum		Pathways			EQF/NQF	ToTal Hours
		General	Furniture	Textile		
MODULE 1 TWIN TRANSITION INTRODUCTION: TOWARDS A GREEN AND SMART MANUFACTURING INDUSTRY						2,50
LU1	Manufacturing Industry in transition.	x	x	x	4	
LU2	Introduction to Industry 4.0.	x	x	x	4	
LU3	Introduction to Circular Economy	x	x	x	4	
LU4	Introduction to twin green & digital Transition	x	x	x	4	
MODULE 2 CIRCULAR ECONOMY APPLIED IN THE MANUFACTURING INDUSTRY						17
LU5	Circular economy definitions	x	x	x	4	
LU6	Circular economy framework and principles	x	x	x	4	
LU7	Circular economy benefits and challenges	x	x	x	4	
LU8	Strategies for the furniture sector (best practices and examples)	x	x		4	
LU9	Strategies for the textile sector	x		x	4	
LU10	Tools and processes (for the implementation of CE in the manufacturing Industry) – Practical.	x	x	x	4	
MODULE 3 INDUSTRY 4.0 TECHNOLOGIES IN THE MANUFACTURING INDUSTRY						17
LU11	Overview of I4.0 technologies	x	x	x	4	
LU12	Benefits and challenges of I4.0 technologies	x	x	x	4	
LU13	Relevant I4.0 technologies in the Furniture sector	x	x		4	
LU14	Relevant I4.0 technologies in the textile sector	x		x	4	
MODULE 4 TWIN GREEN AND DIGITAL TRANSITION						13,5
LU15	Twin green and digital transition in the life cycle chain. (Both sectors)	x	x	x	4	
LU16	Applications of twin and digital transition in the furniture sector	x	x		4	
LU17	Applications of twin and digital transition in the textile sector	x		x	4	
						50,00

MODULE 1:**TWIN TRANSITION INTRODUCTION: TOWARDS A GREEN AND SMART MANUFACTURING INDUSTRY****Leader:** TZU**Learning Unit 1: Manufacturing Industry in transition****Contents**

1. What is the current state of play of manufacturing in the textile and furniture sector?
2. Where should we be heading in the furniture and textiles sector?
3. What steps should we take for the green and digital translation?

Objectives

1. Explain the current state of the manufacturing industry in the furniture and textile sector.
2. Explain the basic idea of a green and smart industry in the furniture and textile sector.

Knowledges

1. Understand the principles of the manufacturing hierarchy in the furniture and textile industries.
2. Understand which supporting principles can support the manufacturing industry in the transition.

Skills

1. Understand the limits of the manufacturing industry in the furniture and textile sector.
2. Recognize what dimensions need to be changed.

Competences

1. Explain the basic rationale of the transformation.

Learning Unit 2: Introduction to Industry 4.0.**Contents**

1. Where are we now in Industry 4.0.
2. What technologies and tools are used in Industry 4.0.
3. Where Should We Go?

Objectives

1. Explain the basic concepts and technologies of Industry 4.0.

Knowledges

1. Understand the basic definitions of Industry 4.0.
2. Basic knowledge of technology and tools

Skills

1. Explain the benefits of Industry 4.0.

Competences

1. Understand what kind of tools are in Industry 4.0.

Learning Unit 3: Introduction to Circular Economy

Contents

1. The concept of circular economy and its current status.
2. What are the main points of the circular economy?
3. What are the barriers to the implementation of the circular economy?

Objectives

1. Explain the principle of the circular economy.
2. Explain the main pillars of the circular economy.
3. Explain some of the obstacles to the circular economy.

Knowledges

1. Understand the current situation of the circular economy.
2. Recognize what to focus on when introducing circular economy.
3. Understand and recognize key circulation strategies, tools and processes.

Skills

1. Know the appropriate circular strategies relevant to the textile and furniture industry.

Competences

1. Explain the basic principles of circular economy as an engine of transformation.

Learning Unit 4: Introduction to Twin Green & Digital Transition

Contents

1. Introduction to the basic principles and definitions of the Twin transition
2. Describe the link between the green and digital transition for the manufacturing industry.
3. Policy environment in the area of Twin -transition, policy framework, directives

Objectives

4. Explain the basic principle and definition of a twin transition.
5. Introduction of the framework policy and guidelines on twin transitions.

Knowledges

6. Understand how the basic principles twin transition for praxis.
7. Understand the link between the green and digital transition for the manufacturing industry.

Skills

1. Being able to select proper documents for company twin transition.

Competences

1. Understand how to use the relevant documents.

MODULE 2:

CIRCULAR ECONOMY APPLIED IN THE MANUFACTURING INDUSTRY

Leader: UVA

Learning Unit 5: Circular Economy Rationale and Definitions

Contents

1. Where We are Now: Limits to the Linear Economy
2. Where Should We Go: Doughnut Economics & The Sustainable Development Goals
3. How Do We Get There? Introducing the Circular Economy definition

Objectives

1. Explain our current economic model and how it has resulted in humanity living an unsustainable lifestyle.
2. Explain the core idea behind Doughnut Economics and the big picture it gives us for the future.
3. Explain the role the Sustainable Development Goals play in shaping a better future for all.
4. Explain the basic idea behind the Circular Economy.

Knowledges

1. Understand the limits to linear economy.
2. Recognize which dimensions need to change to develop a thriving society within planetary boundaries.
3. Comprehend how a circular economy can support this transformation.

Skills

1. Being able to form a system map of societal transformation needed to thrive within planetary boundaries.

Competences

1. Explain the basic rationale of circular economy as an engine of transformation.

Learning Unit 6: Circular Economy Framework and Principles

Contents

1. The Road to the CE: Three Principles
2. Operationalising the CE: R Frameworks

Objectives

1. Explain the core concepts behind the definition of the Circular Economy including the R-Framework/waste hierarchy, and systems perspective.
2. Understand the three principles on which the Circular Economy is based; design out waste and pollution, keep products and materials in use, and regenerate natural systems.

Knowledges

1. Name the underlying principles and frameworks defining a circular economy.
2. Understand the principles of the waste hierarchy.
3. Comprehend which enabling principles can support a circular economy.

Skills

1. Position your organization/sector within the butterfly diagram

Competences

1. Choose the right strategy on the gR framework that fits best your organization/sector

Learning Unit 7: Circular Economy Benefits and Challenges

Contents

1. What Do We Gain? Benefits of a Circular Economy
2. What is Stopping Us? Challenges to a Circular Economy
3. Breaking the Barriers - Everyone has a Role.

Objectives

1. Highlight the key benefits of the Circular Economy for the environment, the economy, and society.
2. Explain what the biggest barriers to implementing a Circular Economy are and how to cross them.
3. Share how anyone can contribute to a Circular Economy transition, no matter what their industry or role.

Knowledges

1. Name the key benefits of implementing a Circular Economy
2. Understand the cultural, technological, and economical challenges hindering the development of a circular economy.

Skills

1. Explain to colleagues the advantages of transitioning to a circular economy.

Competences

1. Systems thinking

Learning Unit 8: Circular Strategies for the Furniture Sector

Contents

- 1.1. Strategies for implementing circularity in the furniture sector
 - 1.2. Materials innovation
 - 1.3. Ecodesign
 - 1.4. New business models
 - 1.5. End of life
- 1.2. Best practices from the industry

Objectives

1. Translate the key principles and strategies of circular economy in the furniture sector.

Knowledges

1. Understand which strategies can support Circular Economy in the furniture sector.
2. Connect with existing best practices from the industry.

Skills

1. Prioritize which strategies can be relevant for my organisation.

Competences

1. Select and understand how to implement the right strategy.

Learning Unit 9: Circular Strategies for the Textile Sector

Contents

1. Strategies for implementing circularity in the furniture sector.
 - 1.1. Materials innovation
 - 1.2. Ecodesign
 - 1.3. New business models
 - 1.4. End of life

2. Best practices from the industry

Objectives

1. Translate the key principles and strategies of circular economy in the furniture sector.

Knowledges

1. Understand which strategies can support Circular Economy in the textile sector.
2. Connect with existing best practices from the industry.

Skills

1. Prioritize which strategies can be relevant for my organisation.

Competences

1. Select and understand how to implement the right strategy.

Learning Unit 10: Tools and Processes for the Implementation of CE in the Manufacturing Industry

Contents

1. Overview of key tools and process to implement circularity.

Objectives

1. Get a better understanding of practical tools and processes supporting the implementation of circular economy in the manufacturing sector.

Knowledges

1. Name and understand the key steps to implement circularity.

Skills

1. Choose the right tools and methods to implement circularity.

Competences

1. Apply the right tools and methods.

MODULE 3:**INDUSTRY 4.0 TECHNOLOGIES IN THE MANUFACTURING INDUSTRY****Leader: KIT****Learning Unit 11: Overview of Industry 4.0 technologies****Contents**

1. Industry 4.0 overview.
2. Industry 4.0 technologies.
 - 2.1. Internet of Things
 - 2.2. Big Data & Analytics
 - 2.3. Simulation
 - 2.4. Robotic
 - 2.5. Additive Manufacturing
 - 2.6. Augmented and Virtual Reality
 - 2.7. System Integration
 - 2.8. Artificial Intelligence
3. Implementation of Industry 4.0: Technologies trends of Industry 4.0.

Objectives

1. Introducing Industry 4.0 and digital transformation.
2. Explain the main concepts and characteristics of Industry 4.0 technologies.
3. Explain Industry 4.0 technology trends.

Knowledges

1. Know general concepts about Industry 4.0 and digitalisation.
2. Obtain generic knowledge of Industry 4.0 technologies.
3. Know the technological trends of Industry 4.0.

Skills

1. Identify relevant Industry 4.0 technologies and their application in industry.

Competences

1. Analyse, compare and select relevant industry 4.0 technologies.

Learning Unit 12: Benefits and Challenges of Industry 4.0 Technologies**Contents**

1. Introduction.
2. Benefits and challenges of Industry 4.0 technologies in manufacturing.
3. Use of Industry 4.0 technologies in sustainable manufacturing.

Objectives

1. Explain the benefits and challenges presented by Industry 4.0 technologies.
2. Explain the advantages of the application of Industry 4.0 technologies in manufacturing.
3. Introduce the use of Industry 4.0 technologies in sustainable manufacturing.

Knowledges

1. Understand the main benefits and challenges presented by Industry 4.0 technologies.
2. Recognise the advantages of Industry 4.0 technologies in manufacturing.
3. Basic knowledge of the use of Industry 4.0 technologies in sustainable manufacturing.

Skills

1. Be able to identify the uses of Industry 4.0 technologies in manufacturing.

Competences

1. Analyse, compare and select relevant Industry 4.0 technologies in manufacturing.

Learning Unit 13: Relevant Industry 4.0 Technologies in the Furniture Sector

Contents

1. Industry 4.0 in the furniture sector.
2. Main Industry 4.0 technologies in the furniture Industry.
3. Advantages and challenges of implementing Industry 4.0 technologies in the sustainable furniture industry.

Objectives

1. Explain the uses, benefits, and challenges of Industry 4.0 technologies for the sustainable furniture industry.

Knowledges

1. Understand the main benefits and challenges presented by Industry 4.0 technologies in the furniture industry.

Skills

1. Identify the uses of key enabling technologies in the furniture sector and in which areas could be applied.

Competences

1. Be able to select the most appropriate industry4.0 technologies to be implemented in a furniture organisation.

Learning Unit 14: Relevant I4.0 Technologies in the Textile Sector

Contents

1. Industry 4.0 in the textile sector.
2. Main I4.0 technologies in the textile Industry.
3. Advantages and challenges of implementing I4.0 technologies in the sustainable textile industry.

Objectives

1. Explain the uses, benefits, and challenges of Industry 4.0 technologies for the sustainable textile industry.

Knowledges

1. Understand the main benefits and challenges presented by Industry 4.0 technologies in the textile industry.

Skills

1. Identify the uses of key enabling technologies in the textile sector and in which areas could be applied.

Competences

1. Be able to select the most appropriate industry4.0 technologies to be implemented in a textile organisation.

MODULE 4:

TWIN GREEN AND DIGITAL TRANSITION

Leader: CETEM

Learning Unit 15: Twin Green and Digital Transition in the Life Cycle Chain

Contents

1. Industry 4.0 technologies that could be applied with sustainable purposes.
 - 1.1. Internet of things
 - 1.2. Big data & analytics
 - 1.3. Simulation
 - 1.4. Robotics

- 1.5. Additive manufacturing
- 1.6. Augmented and virtual reality
- 1.7. System integration
- 1.8. Artificial intelligence
2. Industry 4.0 technologies use in each life cycle step with sustainable purposes.
 - 2.1. Design
 - 2.2. Production
 - 2.3. Distribution
 - 2.4. Consumption, use, reuse, repair
 - 2.5. Waste collection
 - 2.6. Recycling

Objectives

1. Explain how industry 4.0 technologies could foster the circular economy transition and its sustainable benefits.
2. Highlight the technologies that could be used with circular economy purposes in each step of the manufacturing process/life cycle chain.

Knowledges

1. Describe the interconnections between green and digital transition for the manufacturing industry.
2. Name the most applied industry4.0 technologies that could foster the circular transition and their benefits.
3. Know the industry4.0 technologies that could be applied in the different manufacturing processes or life cycle steps with sustainable purposes.

Skills

1. Identify the suitable industry4.0 technologies to be applied in a particular manufacturing process to support a twin transition.
2. Be able to explain the benefits for a circular transition based upon the implementation of different industry4.0 technologies.

Competences

1. Choosing the industry4.0 technology that fits best in a particular life cycle step to boost a twin digital and green transition.

Learning Unit 16: Applications of Twin and Digital Transition in the Furniture Sector

Contents

1. Industry 4.0 technologies that could be applied with sustainable purposes in the furniture sector.
2. Best practices of furniture companies that applied industry 4.0 technologies to foster the twin digital and green transition.

Objectives

1. Offer examples of furniture companies that have applied industry 4.0 technologies to boost their twin digital and green transition.
2. Understand the benefits for a circular transition based on industry 4.0 technologies.

Knowledges

1. Understand which strategies can support Twin Digital and Green transition in the furniture sector.
2. Understand which industry 4.0 technologies can be applied, and in which processes, to boost the circular transition in a furniture organisation.
3. Connect with existing best practices from the furniture industry.

Skills

1. Prioritize which strategies can be relevant for a furniture organisation to boost a twin digital and green transition.

Competences

1. Select and understand how to implement the right industry 4.0 technology for a twin digital and green transition in a furniture organisation.

Learning Unit 17: Applications of Twin and Digital Transition in the Textile Sector

Contents

1. Industry 4.0 technologies that could be applied with sustainable purposes in the textile sector.
2. Best practices of textile companies that have applied industry 4.0 technologies to foster the twin digital and green transition.

Objectives

1. Offer examples of textile companies that have applied industry 4.0 technologies to boost their twin digital and green transition.
2. Understand the benefits for a circular transition based on industry 4.0 technologies.

Knowledges

1. Understand which strategies can support Twin Digital and Green transition in the textile sector.
2. Understand which industry 4.0 technologies can be applied, and in which processes, to boost the circular transition in a textile organisation.
3. Connect with existing best practices from the textile industry.

Skills

1. Prioritize which strategies can be relevant for a textile organisation to boost a twin digital and green transition.

Competences

1. Select and understand how to implement the right industry 4.0 technology for a twin digital and green transition in a textile organisation.

twin revolution

Twin digital and green
transition for furniture
and textile industries



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