Manual for Trainers/ Teachers/ Tutors / Coaches - WP3

SHOEPRO

PARTNERS

HUP CROATIAN EMPLOYERS' ASSOCIATION

SVEUCILISTE U ZAGREBU University of Zagreb Faculty of Textile Technology

CENTRO TECNOLÓGICO DO CALÇADO DE PORTUGAL

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Contents

1- EXECUTIVE SUMMARY

The project SHOEPRO addresses the emergent need of a new strategy for the education and training, in Croatia but also in Portugal, towards a flexible offer and a quick and ready to use response to the Companies needs what concerns green and digital skills development. The shift to digital and green is now a must and cannot wait for robust and rigid and very complex strategies. It demands flexibility and right to the point actions.

In this line the sector in both countries will benefit of a new era of cooperation, allying experience and flexibility in a quicker and agile response to the footwear companies, which is the most innovative aspect of this project.

This manual serves as a comprehensive guide for trainers, teachers, tutors, coaches and stakeholders involved in the SHOEPRO project. It supports the design, delivery and assessment of innovative training programs tailored to the footwear industry, blending online and face-to-face learning to develop relevant professional skills. It was designed as a practical tool to guide trainers through all stages of the training process – the curricula design and participant selection to delivery, assessment and certification. It offers methodological insights, ensuring quality and effectiveness in training outcomes.

2- PRESENTATION OF THE PROJECT

The footwear industry in Croatia, comprehends 81 companies, 5.470 people, concentrated in the North and East regions. It has been steadily developing from local brands and producers to increasingly bigger players working toward international markets exporting to European markets and experiencing a continued growth along the last years.

The sector needs now to compete with other countries well positioned in the footwear worldwide markets. The potential for Footwear Croatian sector growth should be based on product differentiation, innovative design, high-quality materials, adoption of sustainable and digital manufacturing and marketing practices, together with the implementation of new organisation strategies leading to an enhancement of productivity, flexibility and high-quality products and services.

Sustainability has been gaining traction globally in footwear whose transition can be challenging involving a wide range of variables in the equation, from materials to waste management, new practices at design level among others. The adoption of digital strategies in footwear manufacturing represents a transformative shift as well in how manufacturers operate, market, and engage with consumers. There are several areas in a footwear company that should be worked out from Digital Design and Prototyping, Supply Chain Management, digital marketing strategies, among others.

With the shift toward green and digital practices, there's a need for continuous training and upskilling of employees, whether in Croatia or elsewhere, crucial for ensuring that professionals in footwear industry are equipped with the necessary skills to enable the adoption of the news practices.

Portugal is the 20th biggest player in the footwear worldwide scene, in terms of production and exportations, with its 35.000 people working in the sector, and holds the 2nd highest average price, after Italy. The adoption of sustainable practices as well as digitalization strategies are already in place and a group of companies are in the worldwide leadership of the state-of-the-art technologies. In terms of education and training, footwear is a mature sector with a robust sector skills framework and VET system. However, it’s too rigid and inflexible in some points, preventing a rapid response to the footwear companies training needs.

Project Objectives

The specific objectives of the project are:

- To develop the footwear VET offer in Croatia and Portugal, through the creation of innovative and agile "ready to use" short-term curricula, envisaging the upskilling and reskilling of workers and youngsters in footwear, complying with companies' needs, toward the green and digital transformation in footwear sector;
- To train teachers and trainers and in-companies tutors in the emerging subjects of the sectorial development and for the delivering of the new contents and promote the use of new training tools, more adequate to the new learning methodologies, seeking to increase more effectiveness and efficiency in the learning process and capture younger people to the sector;
- To increase connections in VET (Vocational Education Training) between Croatian organisations in the field and other countries in Europe namely Portugal;
- To address common needs and priorities in the fields of education training such as an agile curriculum toward the upskilling and reskilling of footwear sector for the green and digital transition, between Croatia and Portugal;
- To contribute for a more robust training education sector toward the footwear industry;
- To create strong connections between organisations active in VET and business within Croatia and Portugal and among EU countries;

Project Results

SHOEPRO project defines the following results:

- Innovative and agile short term "ready to use" curriculum on Footwear manufacturing from design to market, to support the green and digital transition of the footwear industry. The objective of the curriculum is to provide footwear companies with an immediate training solution for the development on competences on digital and sustainable manufacturing to be able to make the definitive step ahead toward the state-of-art companies worldwide.
- A portfolio of contents on digital and green skills in footwear sector (Knowledge Hub on digital and green skills in footwear sector), collected from the various past projects, adapted to the target-groups, available from the project website.
- Manual for trainers/teachers on the topics of the curriculum in English, Croatian and Portuguese

- Evidences and report on the 1-week learning event in Portugal for trainers, teachers, tutors, namely the training path for future replication.
- A set of local workshops in each country, providing opportunities to test the developed training solutions, and to collect feed-back, to improve and consolidate the final outcomes.
- Communication and Dissemination Plan
- Project corporative image, project website and social media
- Promotional material, namely newsletters and press release
- Agreement for exploitation and sustainability and possible integration in the different E&T systems Multiplier events where the results of the project will be disseminated and stakeholders from the fashion, education and green sector will be invited.

Project target-groups

The main beneficiaries of this project are people in labour market from EQF level 2 to level 6 or more, involved in the digital and green transformation of their employers/companies; managers and key-people in the footwear companies, who needs a wide vision of the digital and greens skills for the uprising of their companies; employers, operators and technicians to be able to transpose to the daily companies' activities the good practices; students from the VET (Vocation Education and Training) system willing to learn a profession in the footwear sector; footwear companies interested in evolving in terms of skills for the digital and green transformation; trainers, teachers and in-companies' tutors in order to operationalize the new strategies for training education in Croatia; VET institutions that will cooperate together with businesses to achieve more accurate training education strategies and partners organizations.

Partnership

The partnership grew from a work relationship established over some years into three fronts of the project framework: the sectorial strand involving textile, clothing, footwear and furniture/upholstery, the design and the circular economy. The partnership is well-balanced and has the necessary skills and expertise to cope with the project implementation demands.

The 3 project partners, from 2 different countries, are:

- **HUP** - The Croatian Employers' Association known in Croatian as "Hrvatska udruga poslodavaca" (HUP), is the leading employers' organization in Croatia. It serves as the collective voice of employers in various economic sectors and plays a significant role in shaping

the business landscape in Croatia by acting as a bridge between employers and the government, and by representing Croatian businesses in various international forums. HUP offers various advisory services to its members, including legal advice, labour market insights, and information on the latest changes in laws and regulations that might affect businesses. Also conducts training sessions, seminars, and workshops for its members on various topics, from law, health and Safety regulations, and human resource management and also some technical issues related to digital and green topics. https://www.hup.hr/

- **Faculty of Textile Technology of the University of Zagreb** (TTF) is Croatia's largest and oldest educational institution, comprising 31 faculties, 3 art academies, and numerous university departments and centres. UNIZG offers Education programmes in all scientific fields (arts, biomedicine, biotechnology, engineering, humanities, natural sciences and social sciences) and a broad spectrum of courses at all study levels. https://www.ttf.unizg.hr/
- **CENTRO TECNOLÓGICO DO CALÇADO DE PORTUGAL** (**CTCP**) – www.ctcp.pt – Portugal: a private, non-profit organization working for 30 years to support all Portuguese Footwear cluster companies in the field of Quality Control, Consultancy, Training, Marketing and Promotion, Research and Development, Health & Safety, Environment, Business Intelligence, Studies and comparative Research. It employs 45 trainers, consultants and specialized staff and has more than 500 associates from the Footwear cluster and other private and public entities. It's specialized in Footwear and Leather Goods technology which includes the sustainability and circular economy framework too.

2.1 Presentation of WP 3

Activity 3 – Training of Trainers, Teachers, Tutors

This activity involved the preparation of trainers, teachers and in-company tutors for the best use of the project results. This activity involves the following tasks:

T3.1 – Development of a manual for trainers / teachers / in-company tutors The creation/ production of a manual and correspondent translation into Croatian, to support trainers/ teacher organizing and providing the training

T3.2 - Train of trainers/teachers in Portugal for the better assimilation of the training topics and transference of already existing content wise training tools. The training will be provided in Portugal for 1 week, prepared by CTCP, envisaging to prepare the trainers/teacher from VET/University including tutors from companies to implement the curricula. This involves:

- The definition of an agenda for the 1 week training to trainers/teachers/tutors
- The analysis of the already existing contents/manuals, videos that can be used in the training
- The analysis, improvement and validation of the manual
- Evaluation of the training, certificates, report/evidences

T3.3 – Translation of the manual in Croatian and Portuguese

Objectives of the activity:

- Provide trainers, teachers, and in-company tutors with advanced knowledge on green and digital transformation.
- Broaden their professional horizon through physical events including workshops, presentations, visits, and peer exchange.
- Develop a methodology and guidance to enhance the use of training tools and curricula management created in Activity 2.
- Foster the development of tailor-made solutions in VET.
- Prepare trainers, teachers, and tutors for collaborative training courses using e-learning platforms and other digital tools.
- Share successful approaches on VET governance with trainers, VET organisation staff, associations, and companies.

Target groups and beneficiaries:

- Direct beneficiaries: Trainers, teachers, and in-company tutors, who will gain the capacity to operationalize new strategies for training and education in Croatia, aligned with best practices in leading countries.
- VET institutions: Will collaborate with businesses to implement agile curricula, supporting the rapid acquisition of green and digital skills for the transformation of the footwear sector in both Croatia and Portugal.

- Partners organizations (HUP, University of Zagreb Faculty of Textile Technology, and CTCP): Will jointly develop strategies, training contents, and tools that are closely aligned with company needs.

Expected impact:

All target groups will participate and benefit from the tasks and events developed in this activity, ensuring a stronger alignment between VET provision and industry needs, amplifying their knowledge, autonomizing the companies in the training process and contributing to the green and digital transformation of the footwear sector in Croatia and Portugal.

3- METHODOLOGY

The training methodology adopted in this Erasmus+ project combines innovation, sustainability and digitalization as core pedagogical principles. It has been jointly developed by the University of Zagreb and the CTCP – Portuguese Footwear Technology Centre, with the accompaniment of HUP, and is designed both for trainees of the vocational and education systems, and higher education students and adult learners seeking to acquire advanced skills in Eco-Design and Waste Management in the Footwear Sector and Digital Skills for Footwear Design and Modelling.

The methodology follows a competence-based, experiential and blended learning approach, in full alignment with the European Higher Education Area and Erasmus+ priorities on green and digital transitions.

Pedagogical Framework

The overall pedagogical model integrates:

- Active and experiential learning, encouraging participants to learn through experimentation, simulation and project work;
- Problem-Based Learning (PBL), using real industrial challenges related to eco-design, materials testing and digital production;
- Collaborative and peer learning, promoting teamwork and cross-cultural exchange between Croatian and Portuguese participants;
- Digital and blended learning, combining online modules, self-paced activities and in-person workshops.

This approach ensures that learners develop both technical competences (CAD, materials testing, additive manufacturing) and transversal skills (critical thinking, problem-solving, teamwork and environmental awareness).

Delivery Formats

The training can be implemented in three complementary formats:

- Online learning – hosted on the project's Knowledge Hub, providing access to digital content, interactive tutorials, video lectures and self-assessment tools;
- Face-to-face learning – enabling hands-on laboratory sessions, group work and mentoring by trainers;
- Blended learning – combining the flexibility of online study with the experiential value of physical workshops.

This flexibility allows the methodology to be applied by universities, vocational training centres and companies, ensuring broad accessibility and scalability.

Learning Activities

Both curricula are organised into structured modules that progressively move from conceptual understanding to practical application.

Learning activities include:

- Interactive lectures introducing key concepts such as circular economy, sustainable production, 3D/2D modelling and additive manufacturing;
- Laboratory and technical exercises involving testing of materials (chemical and mechanical and environmental testing);
- Digital design and simulation tasks using CAD tools for footwear design and virtual prototyping;
- Project-based assignments focused on developing sustainable and digitally enabled footwear solutions;
- Case studies and discussions analysing industry data and environmental impact.

All activities are supported by digital resources, templates and toolkits available through the Knowledge Hub at https://shoepro.eu/knowledgehub .

Role and Preparation of Trainers and Teachers

Training will be delivered by Croatian and Portuguese trainers and teachers, all of whom will participate in a one-week Train-the-Trainers program in Portugal.

This preparation ensures:

- A common understanding of the pedagogical and technological framework;
- Proficiency in CAD and laboratory tools;
- Consistent evaluation criteria and mentoring approaches.
- Trainers act as facilitators and mentors, supporting learners' autonomy, providing feedback and guiding them in applying theoretical knowledge to real-world challenges.

Inclusion and Accessibility

The methodology promotes inclusive and flexible learning.

All contents are available in English, Portuguese and Croatian, ensuring accessibility to all participants.

Digital materials are compatible with assistive technologies, and activities can be adapted to different learning speeds and prior knowledge levels.

Expected Learning Outcomes

By completing the training, learners will be able to:

- Apply eco-design and circular economy principles in footwear production;
- Use CAD tools for 2D and 3D footwear modelling and prepare files for additive manufacturing;
- Perform and interpret physical, chemical and environmental tests on materials;
- Evaluate environmental impacts using LCA methodologies;
- Integrate digital and sustainable practices into design, production and waste management processes.

4- THE CURRICULA

This chapter presents the two training curricula developed within the Erasmus+ project, designed to address the growing need for digital and sustainable skills in the European footwear sector.

Developed collaboratively by the University of Zagreb and the CTCP – Portuguese Footwear Technology Centre, the curricula combine theoretical knowledge, practical training, and digital tools to enhance innovation, sustainability and circularity in footwear design and production.

Both curricula are aligned with the European priorities on green and digital transitions and aim to strengthen the competences of higher education students, professionals and adult learners. The learning content supports the integration of eco-design principles, waste reduction practices, and digital manufacturing technologies in the sector.

The two complementary curricula are as follows:

4.1 Digital Skills for Footwear Design and Modelling

Focused on developing learners' technical proficiency in 2D and 3D computer-aided design (CAD), virtual prototyping, and additive manufacturing. The curriculum introduces digital tools and modelling techniques essential for innovative, efficient and sustainable footwear development.

Title of the Curriculum: **Digital skills and waste management in the footwear sector** ***MODULE: Digital skills for footwear design and modelling***
Introduction to CAD tools for 3D footwear modelling
Basics of 3D modelling
3D modelling of basic footwear components
3D design/modelling of shoe soles
3D design/modelling of shoe uppers

Visualization of 3D models
Preparation and presentation of virtual shoe sample designs
Introduction to CAD tools for 2D footwear modelling
Basics of 2D modelling
Line creation tool system
Production of cut parts
Basics of additive manufacturing
Preparation of CAD models for 3D printing
Basics of FDM desktop 3D Printer
3D Printing Parameters

4.2 Eco-Design and Waste Management in the Footwear Sector

Dedicated to building competences in sustainable design, circular economy principles, and environmental impact assessment. The curriculum explores material testing, life cycle assessment (LCA), waste management strategies, and green chemistry applications in footwear production.

Together, these curricula provide an integrated learning pathway that connects digital innovation with environmental responsibility, preparing learners and professionals to actively contribute to a more sustainable and technologically advanced European footwear industry.

Title of the Curriculum: **Digital skills and waste management in the footwear sector** ***MODULE: Eco-Design and Waste Management in the Footwear Sector***
Introduction to sustainable design
Introduction to the circular economy
Ecological and economic principles in production
Green chemistry and the REACH regulation

LCA methodology
Testing mechanical properties of finished leather
Analysis of obtained test results
Environmental impact testing
Analysis of results and environmental impact assessment
Testing leather flammability before and after finishing using a Limiting Oxygen Index (LOI) device
Testing leather heat resistance before and after finishing using thermogravimetric analysis (TGA)
Analysis of obtained LOI and TGA test results
Material classification based on physicochemical properties (FTIR-ATR)
Preparation and analysis of obtained spectral curves
Waste management in footwear production

5. NEW LEARNING STRATEGIES

In today's fast-changing world, learning processes and environments are evolving rapidly. The digital and green transitions are redefining the skills needed in the labour market and transforming the way training is designed, delivered, and experienced. This chapter explores new learning strategies and focuses on understanding the new learner profile, the main training formats, and the changing roles of trainers and trainees.

5.1 The New Learner Profile

Today's learners are more connected, autonomous, and selective. They value flexibility, interactivity, and practical relevance. Digital natives expect to have access to information anytime and anywhere, and they tend to prefer active learning experiences rather than traditional lectures.

The new learner is:

- Digitally literate, comfortable with online tools, and used to integrating technology into daily activities.
- Goal-oriented, looking for training that is relevant and applicable to real work situations.
- Collaborative, open to peer learning, teamwork, and knowledge exchange.
- Independent, but still values guidance and mentorship from experienced trainers.
- Socially and environmentally aware, motivated by sustainability and ethical practices.
- Recognizing this learner profile helps trainers design more engaging and adaptive learning experiences, where the learner becomes an active participant in their own development.

5.2 E-learning / Face-to-Face / Blended Learning

Training today can take several forms, each with specific advantages and challenges:

E-learning

Digital learning platforms allow trainees to access content at their own pace, from anywhere. This flexibility supports lifelong learning and inclusion. However, maintaining motivation and ensuring active engagement can be challenging. Effective e-learning requires interactivity, multimedia tools, and continuous feedback.

Face-to-Face Learning

Presential training remains essential for developing practical skills, teamwork, and interpersonal competencies. It provides immediate feedback and a stronger emotional connection between trainer and trainee. However, it can be less flexible and more resource-intensive.

Blended Learning (B-learning)

A combination of online and in-person training offers the best of both worlds. Blended learning enables flexibility while preserving human interaction. Trainers can use digital tools for theory and individual work, and face-to-face sessions for practice, discussion, and assessment. This model is increasingly popular in VET, as it aligns well with the realities of the workplace and the learning styles of modern trainees.

5.3 The Role of the Trainer / Teacher

The trainer's role is evolving from knowledge provider to facilitator of learning. Modern trainers guide learners in building their own understanding, using critical thinking, creativity, and collaboration.

Key functions of the modern trainer include:

- Designing learning experiences, not just lessons.
- Integrating digital tools effectively (e.g., learning management systems, simulations, collaborative platforms).
- Adapting to learner needs, using flexible and inclusive teaching methods.
- Encouraging problem-solving and project-based learning.

- Providing continuous feedback and mentoring.

Trainers must also continuously update their own skills – especially digital competencies and pedagogical innovation – to remain relevant and effective in a rapidly changing environment.

5.4 The Role of the Trainee / Student

In new learning models, trainees are not passive recipients of knowledge but active co-creators of their learning process. They take responsibility for their progress, manage their own time, and engage actively with content and peers.

Effective learners in this new context are:

- Self-motivated and proactive.
- Collaborative, contributing to group learning dynamics.
- Reflective, able to evaluate their own learning outcomes.
- adaptable, ready to use new tools and methods.

Trainers should encourage autonomy while offering clear guidance and structured feedback. Empowering learners to take ownership of their education is essential to ensure engagement, long-term retention, and skill transfer to real-life professional contexts.

New learning strategies require a shift in mindset for both trainers and trainees. Training environments must combine digital innovation, human connection, and adaptability. The most effective learning happens when technology supports—not replaces—interaction, creativity, and collaboration. By embracing these strategies, VET institutions and companies can ensure that their workforce remains agile, competent, and prepared for the challenges of the green and digital transformation.6 - SHOEPRO learning materials

6- SHOEPRO LEARNING MATERIALS

SHOEPRO's Knowledge Hub portfolio is strategically built on a foundation of previous high-impact footwear projects (e.g., Step2Sustainability, Digital FABLAB, GreenShoes 4.0, LIFE GreenShoes4All, SHOEDES, High-end Shoe, Feet In 4.0, Fit2Comfort, ICSAS, SCILED, LEIA), which represent more than a decade of educational innovation in areas such as green transformation, digitalization, advanced materials, ergonomics, eco-design, and Industry 4.0 methodologies within the footwear and leather sector. By selecting, adapting, and translating the most relevant content, SHOEPRO is assembling a training resource base that is both industry-grounded and pedagogically sound.

Through this structured uptake process, SHOEPRO transforms the accumulated knowledge from recent landmark projects into an integrated, future-proof portfolio of training resources. This portfolio is not simply a collection of existing materials; it is a carefully adapted, translated, validated, and pedagogically optimized body of content that directly supports the footwear sector in advancing its digital and green transformation.

SHOEPRO began by conducting a comprehensive mapping exercise of existing educational resources, training modules, digital tools, and methodological frameworks created across past EU-funded research, innovation, and VET projects. This mapping ensures that the Knowledge Hub capitalizes on:

- Cutting-edge technical developments
- Proven pedagogical approaches
- Tools validated by industrial partners
- Industry-relevant competencies already aligned with EU green and digital agendas
- The projects selected represent the most up-to-date and practically applicable resources available for the sector.

The SHOEPRO Knowledge Hub acts as a digital aggregation platform, where all curated, adapted, and translated content becomes:

- Easily accessible for trainers, companies, and VET learners
- Searchable by topic, digital skill, green skill, or job profile
- Usable as standalone micro-learning modules or as part of structured curricula

- Continuously updated as the sector evolves and new project outputs become available

By repositioning earlier materials within a unified digital environment, SHOEPRO significantly amplifies the impact of these past investments.

6.1 Where to find the contents

All the training materials and resources developed within the project are made available online to ensure easy and open access for trainers, teachers, in-company tutors, students, and other stakeholders.

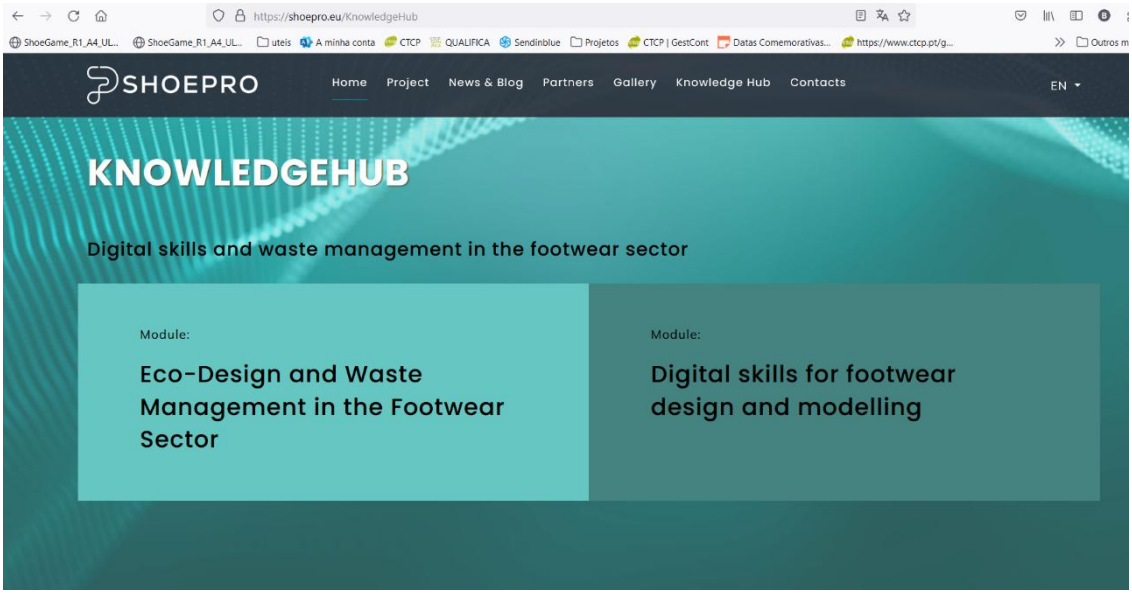
The contents are hosted on the project website – http://shoepro.eu/within the menu KNOWLEDGE HUB https://shoepro.eu/KnowledgeHub, a dedicated digital space designed to support learning, collaboration, and continuous professional development in the footwear sector.

The Knowledge Hub include:

- Training manuals and pedagogical guides for trainers and teachers;
- Presentations, case studies, and good practice examples;
- Videos, e-learning materials, and interactive tools;
- Links to additional references and useful resources.

The pedagogic materials are available in English, and some of them in Portuguese and Croatian, ensuring that users from all partner countries can benefit from the shared contents in the spirit of a shared European knowledge base.

By centralizing all resources in one online platform, the SHOEPRO project aims to promote accessibility, transparency, and collaboration among VET institutions, companies, and trainers, reinforcing the connection between education and industry in the green and digital transformation of the footwear sector.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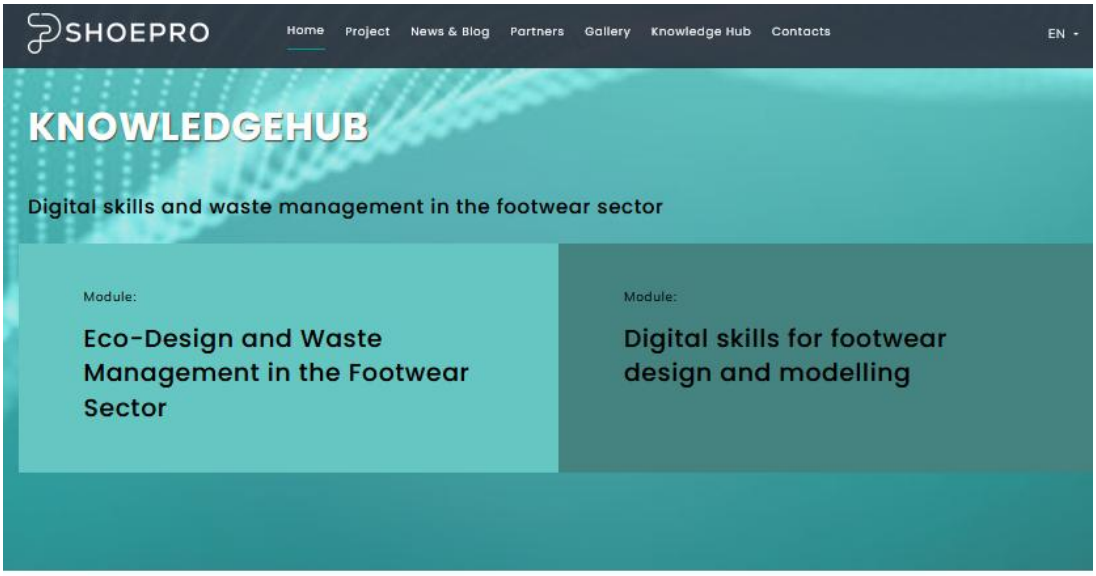
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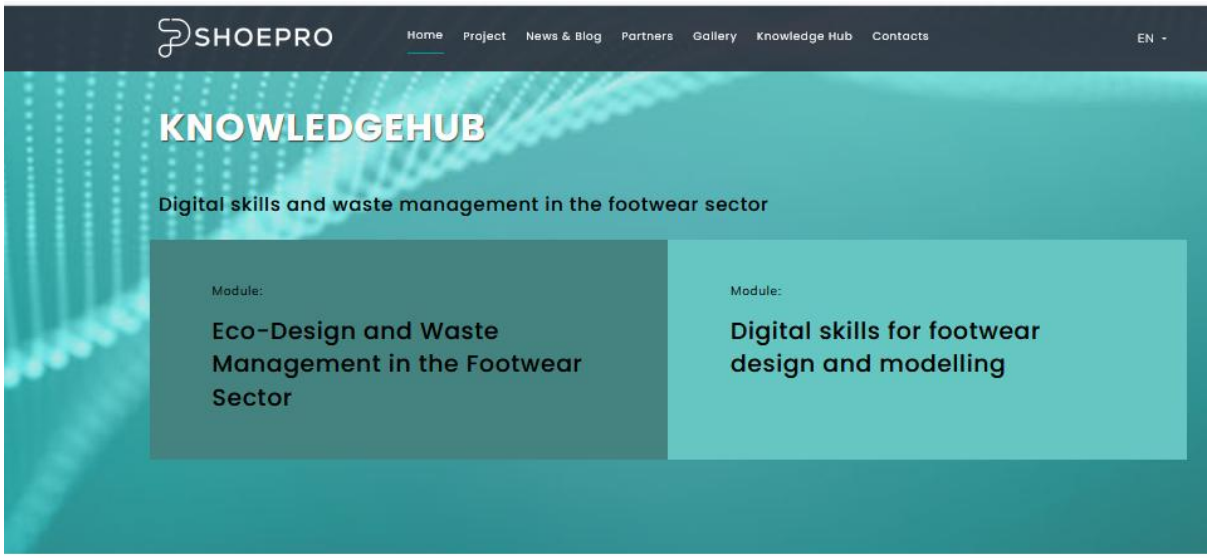

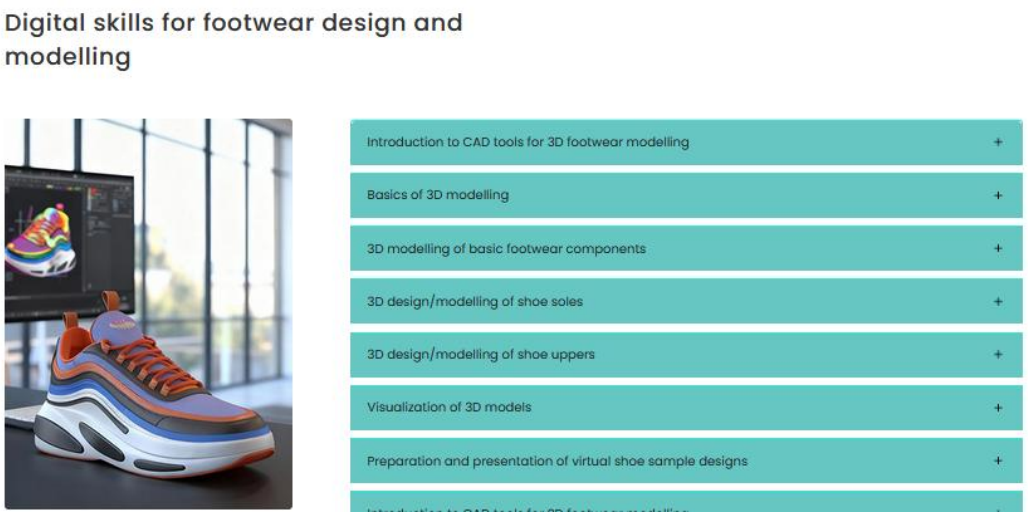

6.2 How can the contents be used in classroom

The SHOEPRO Knowledge Hub is a comprehensive digital learning environment designed to support the acquisition of technical skills and sustainability competencies across the footwear sector. It provides a structured set of manuals, guides, training videos and reference materials that can be used flexibly in different training contexts—university programmes, VET schools and workplace-based learning in companies.

Because the materials are available online and accessible at any time, trainers can integrate them into courses, workshops, apprenticeships or on-the-job training according to their own schedules and pedagogical strategies. The platform offers a dual learning pathway: Digital Skills for Footwear Design and Modelling (Module 1) and Eco-Design and Waste Management in the Footwear Sector (Module 2). Together, these modules support an integrated approach to training, where innovation in digital modelling is combined with environmental responsibility.

This chapter provides a detailed roadmap explaining how tutors and trainers can effectively incorporate the Knowledge Hub into their teaching, regardless of learning mode (face-to-face, online or hybrid). The roadmap is intentionally general and adaptable, allowing educators to decide the depth, sequence and method of use according to the needs of their learners and organisational context..

Roadmap for using the SHOEPRO Knowledge Hub in training

1. Initial familiarisation with the Knowledge Hub

Before introducing learners to the platform, trainers should explore the Knowledge Hub thoroughly. Understanding the structure is essential to selecting the most relevant materials for each training context.

Key actions:

Navigate through all sections of Modules 4.1 and 4.2.

- Identify the types of resources available: manuals (for structured learning), video demonstrations (for visual explanations), downloadable guides (for practical exercises) and case studies (for contextualisation).
- Consider how each resource fits into your teaching approach—whether used for demonstrations, learner preparation, self-study, assessment or reinforcement.

Training benefit:

This familiarisation enables trainers to confidently guide learners and integrate the tools as part of a coherent learning experience rather than as isolated digital resources.

A. USING MODULE 4.1 – DIGITAL SKILLS FOR FOOTWEAR DESIGN & MODELLING

Module 4.1 provides the technical foundation needed for digital footwear development. The materials range from introductory content to more advanced modelling and additive manufacturing principles. Trainers can adapt this module to beginners or more advanced learners by selecting appropriate combinations of manuals and videos.

2. Introducing CAD Tools and Digital Modelling

This phase helps learners understand the role of digital tools in footwear design and prepares them to navigate the modelling process independently.

How to use the Hub:

- The introductory materials offer an accessible starting point, showing the software interface, essential tools and typical workflows.
- Manuals provide structured explanations and can serve as reference material during practice.
- Guides support the execution of practical tasks in a step-by-step manner.

For different trainer profiles:

- University professors may integrate theoretical components—such as digital design principles or ergonomics—before using the videos for technical demonstration.
- VET trainers benefit from using videos to introduce concepts and then immediately guiding learners through hands-on tasks.
- Company tutors can selectively use only the parts of the module directly relevant to the company's digital processes.

Value:

- Learners become autonomous more quickly because they can revisit the videos and guides at their own pace.

3. Developing 3D Footwear Components

The Knowledge Hub provides demonstrations on modelling basic footwear components, including soles and uppers.

Suggestions for trainers:

- Encourage learners to follow the video demonstrations step-by-step, pausing as needed to reproduce the actions.
- Use the manuals to highlight important modelling conventions (naming, file structure, scale, symmetry).
- For more advanced learners or workplace settings, trainers can incorporate real design files from the company to reinforce practical relevance.

Outcome:

- Learners gain confidence in manipulating 3D shapes, applying textures, refining geometry and preparing models for visualisation.

4. Working with 2D modelling and cut process

The transition from 3D to 2D is crucial in footwear production, and the Hub includes resources to guide learners through this step.

Practical applications:

- Use the 2D modelling guides to demonstrate the logic of flattening 3D surfaces into workable patterns.
- Trainers can assign tasks where learners convert their own 3D upper models into 2D patterns.
- VET trainers can reinforce practical relevance by comparing digital cut parts with physical pattern templates used in workshops.

Key benefit:

- Learners understand how digital design connects directly to production, reinforcing vocational

relevance.

5. Introducing Additive Manufacturing

The Knowledge Hub includes foundational content on 3D printing processes relevant to footwear prototyping.

How trainers can use the resources:

- Use the videos to demonstrate slicing software, parameter settings and preparation of models for printing.
- Learners can prepare files independently and then print them during in-person sessions or supervised practice in companies.
- Trainers lacking physical printers can rely entirely on the detailed video explanations and examples provided.

Why it matters:

- Additive manufacturing skills are increasingly required in footwear prototyping and innovation, and the Hub provides an accessible introduction regardless of equipment availability.

B. USING MODULE 4.2 – ECO-DESIGN & WASTE MANAGEMENT

Module 4.2 complements digital skills by introducing sustainability considerations throughout the footwear lifecycle.

6. Introducing sustainable design and the circular economy

This module begins with the conceptual foundations of sustainability, which are essential for all learners regardless of technical background.

Teaching approach:

- Trainers can use the introductory manuals to give clear, visual explanations of circular design

principles.

- Manuals offer concise definitions and examples that can be used to initiate group discussion or comparative analysis.
- Company tutors can illustrate concepts by sharing examples from their own sustainability practices.

Impact:

- Learners build an environmental mindset and understand why sustainable design is becoming a competitive requirement.

7. Teaching Environmental Impact and Life Cycle Assessment (LCA)

The Hub provides accessible materials that simplify LCA methodology for education and training.

How trainers can use the resources:

- Use the LCA guides to walk learners through each stage of the assessment.
- Provide sample datasets from the Hub for practice if real company data is not available.
- Ask learners to conduct a mini-LCA on a shoe they designed in Module 4.1, making the learning highly integrated.

Outcome:

- Learners develop the ability to evaluate the environmental impact of design and material choices and justify improvements.

8. Material testing and analysis

The Hub covers videos about several key laboratory tests

Integration strategies:

- Trainers in universities or VET institutions with laboratories can replicate the tests using the Hub's protocols.
- Institutions without laboratories can rely on the detailed video demonstrations and datasets

included on the platform.

- Tutors can assign learners to interpret spectral curves or compare flammability results before and after finishing processes.

Training benefit:

- Learners acquire practical analytical skills even when physical equipment is unavailable.

9. Teaching waste management in footwear production

This part of the Hub provides an operational perspective on resource efficiency and waste reduction.

Applications:

- Trainers can use case studies to illustrate common waste sources in footwear production.
- Learners can map waste flows and identify improvement opportunities.
- Company tutors can tailor the exercise to their specific production environment.

Result:

- Learners understand waste streams and can identify realistic circular strategies.

C. INTEGRATED USE OF BOTH MODULES – PROJECT-BASED LEARNING

10. Developing an Integrated Project Using Hub Resources

The Knowledge Hub supports a full project-based approach where learners combine digital design skills with sustainability analysis.

Typical project deliverables include:

- A complete digital footwear model (sole + upper)
- Corresponding 2D patterns
- Optional: STL file ready for 3D printing
- A simplified LCA

- Sustainability recommendations
- A final presentation (digital or physical)

How the Hub supports this:

- Videos provide detailed demonstrations for each modelling step.
- Manuals help structure the workflow.
- Guides include checklists and templates for evaluation.
- Tutors can encourage learners to use real cases or materials to reinforce industry relevance.

Value:

This project simulates real footwear development, preparing learners for professional roles in design, engineering or production.

11. Assessment and Reflection

The final step is ensuring learners consolidate their knowledge.

Suggestions for trainers:

- Use checklists from the Hub to evaluate the quality of modelling, pattern creation and sustainability analysis.
- Encourage learners to reflect on what worked, what was challenging and how they would improve the model or workflow.
- In workplace training, supervisors can link project output to actual production needs.

6.3 Trainer TIPS

Effective training in footwear design and sustainable production requires more than sharing content—it demands practical guidance, structured support, and engagement strategies tailored to learners' contexts. This chapter provides tips and recommendations for trainers and tutors using the SHOE-PRO Knowledge Hub.

It focuses on helping educators in universities, VET schools, and companies facilitate meaningful learning experiences in digital design (Module 4.1) and eco-design & waste management (Module 4.2). The strategies are designed to maximize learner engagement, build technical competence, and foster sustainability awareness, while being flexible enough for face-to-face, online, or hybrid environments.

1. Link content to real-world contexts

Why it matters: Learners retain knowledge better when they understand its practical application.

How to apply:

- Show examples of how CAD models, 3D printing, or eco-design principles are used in real footwear companies.
- Use workplace or lab scenarios to demonstrate relevance.
- Encourage learners to reflect on how each skill or concept could improve efficiency, innovation, or sustainability in their future work.

Example: A VET learner models a shoe sole using CAD, then compares the design with production constraints from a local footwear company.

2. Keep instructions clear and Step-by-Step

Use short, concrete instructions for each task.
Combine demonstration → learner practice → immediate feedback.
Avoid overloading learners with theory before they try practical applications.

Tip: Break complex exercises into micro-tasks (e.g., first model a sole, then add the upper, then assemble the components).

3. Focus on essential skills

Prioritize what learners need to do professionally, not every software feature.

In digital design: focus on core CAD functions, pattern creation, STL preparation, and visualization.
In sustainability: emphasize basic LCA, waste mapping, and material assessment.

Example: A company tutor teaches only the CAD functions used in production, leaving advanced rendering or animation for later, optional training.

4. Integrate real production processes

- Whenever possible, use actual materials, tools, and workflows.
- Encourage learners to compare their digital models with real prototypes or production parts.
- Discuss constraints and trade-offs that occur in real manufacturing.

Example: University students test their CAD models against a factory's cutting pattern to see how theoretical designs translate to physical production.

5. Use the Knowledge Hub as a practical reference

- Treat the Hub as a tool for guidance, not just theory.
- Assign videos for pre-class preparation (flipped learning) and manuals for step-by-step exercises.
- Encourage learners to revisit the Hub when they need clarification or guidance.

Tip: Create a "Hub usage routine" for learners: watch → attempt task → submit → receive feedback.

6. Reinforce Cross-Functional skills

Emphasize skills beyond CAD and sustainability:

- Organization and workflow management
- Accuracy and attention to detail
- Digital communication (sharing files, presenting models)

- Safety when handling tools or printers

Example: During 3D printing exercises, highlight best practices for file naming, print monitoring, and workspace safety.

7. Demonstrate slowly and comment extensively

- Learners benefit from step-by-step demonstrations, explaining not just "how" but also "why" each step is taken.
- Repeat critical steps and highlight common errors.

Example: When creating a 3D upper, explain why surface continuity matters, then show how to correct mistakes in real time.

8. Assess performance through practical outputs

- Focus on observable competences rather than written theory alone.

Examples of assessments:

- Completed 3D models
- Correct 2D patterns
- STL files ready for 3D printing
- Mini-LCA reports
- Environmental improvement proposals

Tip: Use checklists for each stage to standardize evaluation.

9. Use checklists to standardize learning

Provide learners with step-by-step checklists to track their progress.

Examples include:

- CAD modelling checklist
- STL export and printing checklist
- LCA calculation checklist
- Waste reduction strategies checklist

Benefit: Reduces errors, increases consistency, and gives learners a sense of accomplishment.

10. Support learners at their own pace

- Learner proficiency may vary in digital skills and sustainability knowledge.
- Define minimum requirements for each task and provide optional challenges for advanced learners.

Example: A learner struggling with 3D printing may complete a simpler prototype, while another experiments with support structures and print orientation.

11. Give direct, constructive feedback

- Feedback should be specific, actionable, and focused on improvement.
- Avoid general praise or criticism; point out exact areas to correct and how.

Example:

Instead of: “Your model is not correct.”

Say: “The upper geometry does not align with the sole; adjust the connection at points X, Y, Z using the Hub tutorial on alignment.”

12. Close each session with a Micro-Objective

- End each lesson with a clear, tangible outcome.

Examples:

- "Today, all learners exported a correctly scaled STL file."
- "All learners completed a 2D pattern for their upper."

- "All learners have interpreted LOI or TGA results for one material."

Benefit: Reinforces progress, motivates learners, and provides a measurable achievement for each session.

13. Encourage reflection and continuous learning

- Have learners reflect on what they learned and how it applies to real-world scenarios.
- Use the Knowledge Hub to revisit content, refine skills, and explore advanced topics independently.

Example: Ask learners to submit a short reflection: "Which design choice improved sustainability, and how would I apply it in a real company?"

Conclusion

By following these tips, trainers and tutors can create a structured, practical, and learner-centered environment that effectively integrates the SHOEPRO Knowledge Hub. The combination of digital design skills and sustainability principles prepares learners for the modern European footwear industry, whether in academic, vocational, or workplace contexts.

7 – LEARNING OUTCOMES ASSESSMENT

SHOEPRO's assessment methodology should reflect the project's objectives: developing practical, industry-relevant digital and green skills in the footwear sector through the reuse of knowledge from past projects, active learning, and real-world challenges. To ensure coherence and measurable learning outcomes, the assessment strategy integrates three pillars:

- Research and Review of Available Materials
- Case Study Research and Analysis
- Project-Based Assessment Using Real Industry Challenges

Together, these elements create an assessment ecosystem that is competency-based, practice-oriented, and aligned with sector needs.

7.1 Assessment through research and review of available material

On the purpose of developing learners' ability to:

- Investigate digital and green concepts
- Compare different solutions, technologies, and sustainability methods
- Extract knowledge from the SHOEPRO Knowledge Hub
- Build autonomy in upskilling

Assessment Activities suggested:

1.1 Structured Research Tasks

Learners are given a topic connected to SHOEPRO content (e.g., eco-design tools from SHOEDES, digital fabrication from Digital FABLAB, sustainability indicators from GreenShoes4.0).

They must produce:

- A short research review (written or oral)

- A summary of “Key Lessons for the Footwear Sector”
- Identification of advantages, limitations, and future trends

1.2 Annotated Bibliography / Content Map

Learners are to prepare a mapping of selected modules from different past projects, explaining how each resource contributes to digital or green skills.

1.3 Concept Comparison Matrix

Students are to create a matrix comparing 2–3 digital or green approaches (e.g., LCA vs. PEF; manual vs. digital patterning).

Trainers should evaluate:

- Depth of understanding
- Ability to connect content to real production contexts
- Evaluation Criteria
- Accuracy and relevance of information
- Correct use of terminology
- Ability to synthesize content from multiple sources
- Practical applicability of findings to footwear companies

7.2 Case study research ad critical analysis

On the purpose of strengthen industry awareness and critical thinking, students and trainees are to examine real scenarios, technologies, and sustainability challenges.

Case Study Sources

Case studies should be drawn from:

- Past projects

- Real company data (when available)
- Trainer/industry partner contributions

Assessment Activities

2.1 Guided Case Study Analysis

Learners are to answer structured questions:

- What problem was addressed?
- What digital/green methods were used?
- What were the results and limitations?
- How could the solution be improved?

2.2 Comparative Case Study Review

Learners are to compare two case studies from different projects (e.g., one digital, one green). This highlights cross-cutting competencies.

2.3 "What Would You Do?" Scenarios

Learners are to propose alternative solutions, simulating decision-making roles:

- Sustainability manager
- Product developer
- Footwear technician
- Production supervisor

Evaluation Criteria

- Depth of analysis
- Ability to identify cause–effect relationships
- Quality of proposed improvements

- Evidence of understanding sector constraints (materials, costs, processes)

7.3 Project-based assessment using real-world challenges

On the purpose of assessing the application of digital and green skills in realistic industrial contexts, learners are to design solutions based on trainer-provided challenges, ideally co-created with partner companies.

Each project challenge is designed around footwear-centred problem-solving, such as:

- Examples of Challenge Themes
- Redesign a model using circular design principles
- Develop a plan to digitalize a manual process
- Apply environmental footprint indicators to evaluate a shoe concept
- Propose ergonomic improvements to a product or workstation
- Design a sustainability roadmap for a small footwear SME

Assessment Activities

3.1 Project Proposal

Learners are to develop a proposal outlining:

- Problem statement
- Objectives
- Relevant knowledge from past projects
- Materials and tools required

3.2 Prototype or Digital Simulation

Depending on the course level, students are to produce:

- Sketches, digital models, or prototypes
- Process flow diagrams
- Circularity or sustainability calculations

- Digital tool demonstrations (e.g., AR/VR application)

3.3 Final Presentation

Learners are to present to a panel of trainers, industry mentors, or peers:

- Their solution
- Rationale
- Technical feasibility
- Sustainability/digital impact

Evaluation Criteria

- Innovation and creativity: novel use of digital or green methods
- Technical feasibility: realistic application to footwear production
- Sustainability or digital impact: clear improvements vs. baseline
- Quality of execution: clarity of models, prototypes, or simulations
- Communication skills: clear explanation and strong justification

8 – REFERENCES

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9 – ANNEXES

Curricula

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