Developing Innovative and Attractive CVET programmes in industrial shoe production

Transfer Handbook

IO 8

This project is funded with support from the European Commission.
The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the Erasmus+ Programme of the European Union

Project data:
Programme: Erasmus+
Project title: Developing Innovative and Attractive CVET programmes in industrial shoe production
Acronym: DIA-CVET
Project 2020-1-DE02-KA202-007600
Duration: 01.09.2020- 31.08.2023
Website: www.dia-cvet.eu

Editor: Andreas Saniter

Authors: DE: Sabina Krebs, Tatjana Hubel (PFI Pirmasens);
Klaus Ruth, Andreas Saniter, Vivian Harberts (ITB);
PT: Rita Souto, Cristina Marques (CTCP), Fátima Martins,
Ricardo Sousa (CFPIC), Carla Matos (CARITÉ);
RO: Aura Mihai, Bogdan Sarghie, Arina Seul (TU Iasi).

Main parts of this transfer handbook are editorially revised versions of the single products produced and published by the DIA-CVET-partners and thus not marked as quotations.

Content

Introduction

This transfer handbook presents the research and development methods applied in the Erasmus+ project DIA-CVET (Developing Innovative and Attractive Continuous Vocational Education and Training programmes in industrial shoe production, 2020-1-DE02-KA202-007600) and chosen results of the project. Due to size limitations, not all products can be included in this handbook; all products are available via https://dia-cvet.eu/results/.

In many countries like Romania (RO) and Portugal (PT) Vocational Education and Training (VET) is considered as second choice; as an educational pathway for those who failed in reaching Higher Education (HE). One of the main reasons of this rather poor image of VET is that it often must be considered as a "dead-end" educational pathway; once you started a "blue collar" job; no or only few options of career opportunities in terms of Continuous Vocational Education and Training (CVET) exist. Thus, more challenging occupations like working for the Quality Assurance (QA), Design or Production Planning departments are reserved for colleagues with an educational background from HE.

But even in countries with established CVET-programmes like Germany (DE), where the qualifications of an industrial or handicraft foreman or technician are country-wide acknowledged and have a very good image, the academic drift is obvious. For our sector (industrial shoe production) a worrying indicator is: In the last two years (before the pandemic), when the only (for the whole country!) industrial foreman course for this occupation was offered, not enough participants (countrywide only six needed) applied – and the courses had to be withdrawn.

Thus, strengthening CVET is a crucial element of increasing attractiveness of VET and assuring its high quality. Target groups are colleagues, having been qualified via Initial Vocational Education and Training (IVET) in the sector of industrial shoe production.

For this purpose, partners of project "Developing Innovative and Attractive CVET programmes in industrial shoe production" (DIA-CVET) have chosen 13 Spheres of Activity (SoA) of industrial shoe production like "maintenance management" or "new materials", in which autonomous work is beyond competences of skilled workers (considering skilled work on European Qualification Framework (EQF) level 3 or 4). We aimed at developing, piloting and implementing comprehensive courses for chosen spheres on European level; available in English (EN) as well as in DE, RO and PT. We did not aim at developing a unified European CVET (like an "EU industrial foreman") profile, as we respect the principle of subsidiarity in educational subjects and are aware of the different preconditions and needs regarding qualifications in our three countries.

Piloting of our courses was a "feasibility study", direct beneficiaries were skilled workers from shoe industry. Via accompanying measures like an "Advisory Board" (AB), workshops and others we reached and involved delegates from all relevant stakeholders (companies, trade unions, chambers, competent bodies, training centres, networks) from the sector in our three countries.

But project had additionally a broader scope; it aims at transparency at CVET levels within shoe sector for all stakeholders, especially social partners, companies, and authorities. To accept Learning Outcomes (LO) from another learning venue, to hire a skilled foreman from another country, or to trust national qualifications from another country is an ongoing challenge. Project consortium developed successfully a Sector Qualification Framework (SQF) for footwear sector for level 2-4 in the previous project ICSAS (cp. http://icsas-project.eu/wpcontent/uploads/2020/04/06_SQF-

Table_EN.pdf). Consequently, the development of (and the referencing of existing or developed national CVET qualifications in DE, RO, and PT to) a sector qualification framework on levels 5-7 was another important objective of project DIA-CVET and the SQF will be available for future levelling of new CVET-profiles or profiles of other countries after the project's lifetime.

Against this background, this transfer handbook documents in chapter ***one*** the 13 Spheres of Activity (SoA) being relevant for CVET-qualified staff in our three countries. Methodologically we interviewed experts from the sector and drafted national lists of SoA; not this surprisingly these lists were very similar and after short negotiations we agreed on the titles and compiled the transnational list of 13 SoA.

SoA describe skilled work on an abstract level, so they can claim trans-national and trans-company relevance; but work-organisation, legal regulations and work processes might differ from country to country or company to company. Thus, a detailed analysis is necessary; in previous projects, focussing on skilled work in industry at EQF-levels 3 and 4, the method "Learning Station Analysis" (LSA) has proven it's appropriateness. As the work-processes of CVET-qualified are less "hands-on" and more abstract, we could not apply LSA; we had to develop a new method, the "Task Analysis" (TA). The manual for this method is documented in chapter ***two***.

In chapter ***three*** the outcome of one TA is document; the findings of the other TA are available via https://dia-cvet.eu/wp-content/uploads/2022/03/IO_01_TA_DE_EN.pdf.

Not all participating companies and training providers offer work respective training in all SoA; chapter ***four*** drafts briefly the similarities and (few) differences between the countries.

As sketched above, the beneficiaries of our pilots (see below) are colleagues qualified via IVET – partly with vast work experience. Thus, Recognition of Prior Learning (RPL) might play a major role. Colleagues researched the legal preconditions in our three countries and the potential applicability for the pilot – chapter ***five*** consists of a comparative report about the findings and conclusions.

The previous chapters drafted the potential content and the potential procedures of recognising prior learning – but not how to teach. Thus, we developed didactic design options for the pilot; those are documented in chapter ***six*** and easily transferable to other sectors.

These design options have been applied to our 13 SoA to develop content-specific manuals for trainers. Chapter ***seven*** consists of one of these 13 manuals; the others can be consulted via https://dia-cvet.eu/11-manuals-for-tutors-to-support-work-based-learning/.

Due to time and budget limitations of Erasmus+ projects, we could not pilot all 13 SoA. Each country opted for five SoA, being most relevant in the concrete context, and drafted curricula for those – exemplarily documented in chapter ***eight***.

Teaching or training activities can be successful or not – depending on the performance. To assure the best learning outcomes, they should be guided by measure regarding the quality. In our project, we developed quality assurance (QA) guidelines (see chapter ***nine***) and a questionnaire for formative QA, documented in chapter ***ten***.

The level of successfulness just mentioned was measured via the questionnaires and short interviews; results including a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis can be found in chapter ***eleven***.

The ***twelfths*** chapter presents a sector qualification framework of levels 5-7 for industrial shoe production. The qualifications of these levels in Germany, Portugal, and Romania were referenced in this framework - thus contributing to the transnational transparency of these qualifications.

Chapter ***thirteen*** is devoted to the sustainability of DIA-CVET project. They document two rather basic papers, a Memorandum of Understanding (MoU) and a position paper of the project partners and supporters.

1 Spheres of Activity

1.1 DESIGN / How to develop a shoe collection

In order to create a shoe design, guided, among other things, by international Fashion & Style and Fashion institutes forecasts and various Trade fairs (materials, components, accessories) for the coming summer or winter season, trend analyses for the respective product are determined and a concept is created: A reason - a story - an inspiration based on a theme that may be a date, an event, a city..., etc.

Ladies, men, children's shoes, and various types of shoes are to be shown in the collection by drawing a collection plan, which includes the following:

1. a complete number of shoe groups/floor variants
2. various fashion types/styles
3. price groups, factory price and recommended retail prices (entry prices for basic groups and further price ranges); one possibility is to define the target segment of the collection by gender or social class, age and choose the materials and complexity of the collection according to these points
4. timeline for sample collection - production run
5. date for handing over the collections to the sales department
6. dates for collection templates at customers

Shoe lasts, upper materials, outsoles and various accessories are selected, and the designer(s) start to draw the first ideas on paper or on so-called deep-drawn copies. As soon as a shoe group of approx. 5 -10 types/styles has been drawn, a decision is made on the further realization of a physical shoe or, more recently, a 3D printed shoe model.

This new 3D printing process allows a very good reproduction of last shapes, outsoles, accessories, and materials - without the need to produce a physical shoe.

Of course, this means that all these components such as last scans, material textures or decorative parts, have to be incorporated into a 3D program in advance. This also requires a lead time for processing.

AND: “old school skills” are still necessary to work out i.e. make a copy of the last, create a basic pattern and determine all important measurements of foot anatomy.

In the further collection process, it will be also decided which 3D models will be produced as physical samples in order to visit various customers and get first feedback on the collections.

At the same time, the purchasing department order all materials types and colours, and all other components for the sample collection.

Time schedules for sample production and sample flow charts for the individual models are determined for the collections, in a team of the design department and plant management.

Different colour- and material variants are additionally determined for the sales department/customer as an aid to decision-making, and are worked out e.g. as Photoshop/3D renderings or produced as physical shoes and added to the final collection.

At the collection handover date, a framework plan for the production capacities of all shoe/bottom (soles or heels) groups over a period of the next 8-12 months is agreed with the production and sales team, in which the newly developed collections / shoes are produced and delivered to the customers.

1.2 Shoe Technology - Production Planning

After the collection handover is completed, the technical department /CAD department works out the model according to priorities.

The priorities are generally based on the availability of various materials and components.

For a smooth production flow and production transition, so-called basic groups with existing models, lasts, soles etc. in e.g. new material combinations are added to the collection or sold, thus ensuring a smooth production transition - until the NEW lasts, outsoles, heels etc. are available.

These basic groups are accordingly also delivered with the earliest delivery dates.

For the NEW shoe lasts, and components, so-called group sizes are graded, i.e. pre fitting samples are produced for the later series production and “bottom” groups. (new soles, heels etc.)

The bottom components such as insoles, outsoles, heels and other parts, such as toe caps, heel reinforcements, are also graded - more or less simultaneously - in group sizes (small, medium, large) and manufactured in other supplier companies.

Once the group sizes/fitting samples have passed through production without any complaints and all departmental foremen agree to series production, all necessary measures and approvals are issued.

The production planning starts with the planning of the basic groups which can be produced with existing lasts and/or basics materials and sufficient materials for the production are available. These basic groups usually fill a large part of the total collection and production.

In the meantime, all other materials, components and accessories such as sewing threads, eyelets, shoeboxes, various small parts and materials arrive at the warehouse are scheduled and prepared for the respective production plans.

Considerable effort is required even if production is carried out in several plants in Europe or worldwide. For this purpose, the production groups must first be divided into production sites.

All materials and components must be assigned separately to the respective production sites. Either the materials are separated or split up again in the main plant immediately after receipt of goods. Or the materials are already delivered by the suppliers directly to the production sites.

The organizational, and logistical effort is considerably high!

1.3 Technical Development

Shoe technicians work with all styles or models in the sample collections right from the start. Once the sales figures are more or less fixed, the technical department works in two lines to prepare the shoe production:

- First line is pattern making and grading of the „shoe uppers“, including reinforces for different parts, toecaps and heel counters as well.
- Second line is the development and grading of insoles, soles, heels – called: „bottom components“

The *bottom components* usually have to be developed and graded, at an earlier stage, as moulds and different tools have to be produced in advance. CAD-Systems and new 3D-printing processes also support these technical developments.

Those component suppliers have to produce these *bottom components* in advance that the articles can be pre-ordered from the Purchasing department and kept in stock to be sent “right in time” to each department in the shoe production.

The development and grading of *shoe uppers* are worked out with CAD programs and this is usually much faster done - because the results of the sample collections are included - than the all the *bottom parts.*

CAD-data are transferred to the cutting table and all upper parts were cut in a fast and efficient way.

After the so-called group sizes (small, medium, large) have passed all production departments "faultlessly", the production lines are “*fed”* with orders successively and according to priorities.

Never forget the shoe lasts! According to the sales of each style- or last group the sizes are mostly ordered in a separate last factory. The design and fit have matured over the sample collections, the design and fit has matured through the sample collections, so the data can be transferred relatively quickly to series production. The gradations of lasts, soles and patterns must match the respective size systems- UK-size or French-size, etc.

A shoe technician follows the processes in the shoe production closely and is the contact person for foremen and plant managers.

1.4 Training management

The fields of action or Spheres of activity-(SOA) in shoe production are basically the same for all product groups.

One Shoe Company is specialized for example, in outdoor shoes, which then work with different leathers, cow hides are thicker and in a heavy quality, than children's shoes or exclusive lady shoes produced in fine goatskin.

Experienced and long-standing employees of a company are best able to pass on valuable processes. They know exactly how to process different materials or machine settings to produce good quality. Long-standing employees and workers are the most valuable asset of a company. No good product can be achieved without good expertise

Most of these employees are also already in management positions such as foreman/woman, head of design, plant manager or team leader.

Usually, in each department, a foreman/woman is responsible for introducing new employees to the specific working methods and characteristics of the company product, often he is supported by highly qualified staff, called trainers or tutors.

New trainees are taught or trained in all areas/departments of a shoe production: Cutting, Pre-stitching, Stitching, Pre-lasting, Lasting, Assembling, Finishing, Design, Technical Development, Production Planning, Quality Assurance, Warehouse and Shipping.

Technical skills in the field of footwear are not sufficient because lack of soft skills can limit the employees' potential. Soft skills are personal attributes that complement how well a person can work or interact with others. Soft skills can influence the success of a company.

Main categories of Soft Skills:

- Communication (Listening, Persuasion, Verbal communication, Writing reports/proposals)
- Critical Thinking (Adaptability, Creativity, Flexibility, Logical thinking, Problem solving, Research, Thinking outside the box)
- Leadership (Conflict management, Conflict resolution, Decision making, Delegation, Facilitation, Inspiring people, Managing difficult conversations, Mentoring, Motivating, Resolving issues, Supervising, Talent management)
- Teamwork (Accepting feedback, Collaboration, Dealing with difficult situations, Disability awareness, Emotional intelligence, Empathy, Dealing with difficult personalities, Interpersonal skills, Self-awareness)
- Work Ethic (Attentiveness, Business ethics, Competitiveness, Dedication, Dependability, Following direction, Independence, Meeting deadlines, Motivation, Multitasking, Organization, Perseverance, Planning, Punctuality, Results-oriented, Scheduling, Self-monitoring, Time management)

Tasks to reduce soft skills gap:

- Survey workforce to identify the current climate and the required soft skills;
- Change company culture by making soft skills a priority;
- Organize training to improve employees' satisfaction, performance and reliability.

1.5 Maintenance Management

The Maintenance Management of assets, installations and equipment, is an essential component in the management and operational activity of the footwear company.

Currently, it is essential to create a structural system that allows: ensuring the company's operational activity, ensuring the effective maintenance of facilities and equipment, enhancing efficiency, productivity and quality gains, diagnosing risks and preventing problems, assessing costs and contributing to a circular economy.

The main advantages of Maintenance Management are:

- Efficiency: Using maintenance management software is essential to ensure an organized management and efficiency in processes, to be able of correcting errors / deviations and preventing production stoppage.
- Cost control: Maintenance management costs are defined during the company's strategic planning, but the maintenance manager permanently decides which investments to make and which aspects to improve.
- Planning: It is essential to know the equipment and costs related to preventive maintenance, avoiding unnecessary costs and ensuring an efficient execution of tasks. Planning in time: the intervention, necessary human and technical resources and procedures.
- Quality: Ensuring the quality of the infrastructures and the functioning of the equipment, considering the legislation and regulations.

Maintenance Management tasks:

- Select and organize the maintenance model in accordance with the company's general management;
- Define a General Maintenance Plan and guidelines for intervention;
- Define / select management resources: software, legislation, regulations, documentation, ...;
- Define a costing system to determine the maintenance cost of each equipment;
- Organize preventive maintenance plans;
- Define indicators, intervention and evaluation criteria;
- Define essential documents in the process, such as Service Orders, various records;
- Guarantee the execution of maintenance works;
- Organize a Technical Library;
- Organize and define the general lines of a Maintenance Warehouse.
- Ensure safety at work;
- Ensure the follow-up and monitoring of the execution of tasks;
- Ensure the continuous training of human resources in this area;
- Control the quality of maintenance - Maintenance Performance Indicators
- Organize and archive the department's documentation: technical documentation, guarantees, materials, ...

The maintenance manager considers and selects the maintenance system and processes, with a view on an integrated maintenance in the general management of the company, shared, globalizing and attributing responsibility to all employees. It is intended to develop a management philosophy focused on total quality management - TPM / Total Productive Maintenance. The maintenance of quality depends on several variables such as the best technologies, innovation and methodologies, considered that they can contribute to generate greater value in each task.

1.6 Quality Management

Quality Management is often confused with Quality Assurance, however is much broader and encompasses all business processes that in all its activities contribute to customer satisfaction. Quality Assurance of footwear relates mainly to three aspects: visual appearance, fit and functional characteristics (e.g. durability, performance, absence of harmful substances). Sensibly, these controls should not only be performed on the finished footwear, but at all manufacturing stages.

The Quality Management System (QMS) can be defined as the set of methods (operational and management) implemented in a systematic way, which allow comply with the policy and objectives of the quality. The QMS focuses on obtaining customer satisfaction and improving internal processes, aiming at greater effectiveness and efficiency.

The development and implementation of a QMS should be focused on organization culture and its needs. To this end, the following steps should be considered:

- Determination of the needs of the customers and other interested parties;
- Establishment of policy and objectives of the organization;

- Definition of the necessary processes to comply with policy and objectives of the organization;
- Establishment of operational control methods for processes, including those means of preventing non-conformities. The greater the degree of risk associated to non-conformities, larger ones should be the associated means of prevention.
- Establishment of methods for measuring the efficiency and effectiveness of each process.
- Continuous improvement of the QMS.

The Quality Management System is structured in terms of compliance with ISO 9001: 2015 requirements and customer requirements of the company's processes (Strategic, Business, Design and Development, Planning, Purchasing, Production, Maintenance, Human Resources and Administrative, Quality).

Quality Management main tasks:

- Ensure that each responsible of the different processes, complies with the updated, whenever necessary, established procedures and in particular the monitoring of the performance of their process
- Follow closely the quality controllers of the productive sections
- Statistically treat data collected at quality control stations
- Ensure the company's response to customer complaints by directing corrective action
- Provide regular meetings with management and process managers to follow the established objectives, analysis of deviations and definition of measures to implement
- Prepare and monitor external audits and client audits.

As support for these activities, it is very important to integrate all the information in the company's information management system, allowing its sharing, processing and analysis in a timely manner and as a basis for decision making.

The implementation of management systems often implies a change in working methods and attitudes, including greater rigor and systematization in compliance with established rules. Such usually generates some resistance by employees. To break this resistance, and ensure active collaboration by all, it is necessary to convey that this is an option strategy of top management and that this will bring benefits to the entire company, namely an increase in competitiveness. Even if one or more persons responsible for the implementation of the management systems are defined, monitoring by the Top Management is essential, which should assume a leading role, encouraging the implementation and improvement of the system.

1.7 New Materials

The trends on digitalisation and sustainable technologies requires a new approach for producing/selecting materials for footwear industry. The 3D printed soles, for example, ask for materials and soling technologies that are different comparing to the traditional ones. The environmental impact of the footwear manufacturing could be substantially reduced by selecting sustainable materials and processes and assessing the potential re-use of products and materials to valorise the wastes resulting from the manufacturing process.

The company must promote the development of new skills related to the selection of materials for the production of footwear.

Furthermore, it´s important to know about environmentally-friendly materials that may replace other materials that have an impact on the environment, environmentally-friendly packaging techniques and materials, as well as distribution and commercialisation techniques that minimise environmental impacts.

Therefore, in the selection process of materials, there are several aspects that must be within the domain of the company's knowledge, highlighting:

Use of environmentally-friendly materials

- Extensive knowledge of the types of materials used in footwear;
- Knowledge of suppliers of raw materials with ecological characteristics:
    - water based adhesives
    - metal free leathers
    - biodegradable materials
- To be able to decide on the substitution of certain materials by eco-friendly ones, maintaining the same level of functionality and other characteristics of the model.
- Supplier selection.

To make decisions at the design stage in order to define the eco-efficient production characteristics

- To manage environmental information relating to the footwear sector, including raw materials;
- To know how to use raw materials with eco-friendly characteristics;
- To be able to optimise consumptions and production time – suggest changes to the models in order to achieve a better material and production time optimisation;
- To minimise the variety of materials in one single product.

Eco-processes and technologies

- To minimise the variety and quantity of materials;
- To minimise the number of components;
- To promote the use of local materials and prevent their transportation;
- To use materials that do not require additional treatments (eg. surface treatments for soles);
- To have knowledge of legislation applicable to materials and products, national and European legislation;
- To have knowledge about restricted substances and their restriction limits;
- To know raw material suppliers that certify compliance with the legislation about hazardous substances.

Knowledge on new materials will be framed in several departments that contribute to the selection of materials, from design and development, to commercial, purchasing and quality.

1.8 Supply Chain Management

The main activities of Supply Chain Management are related to acquisition of materials and components to supply the various production sections, through production orders, weekly planning and stock consultation and to selection and evaluation of suppliers.

The necessary information comes from other internal departments such as Development and Technical sheets and Planning of the production.

The supply chain management is a very dynamic activity in terms of orders received, delivery times, requests of materials, performance of suppliers.

These actions have to be continuously monitored given the various variables involved that change rapidly and imply adjustments to the information internally made available, namely to planning.

Supply chanin Management main tasks:

- According to production planning (delivery dates and expected dates of production start-up), analyze the material requirements for the production orders and after checking the materials in stock, define the purchase orders and their deadlines to selected suppliers, including suppliers of subcontracted operations
- Provide permanent follow-up of the planned deliveries of each supplier in order to ensure timely availability of materials
- Communicate to the planning responsible the expected delays that may interfere with the planning for the production
- Distribute, guide and control the execution of the work of the sector's employees, ensuring the supply of all productive sections and compliance with quality, environment, safety and health standards, taking into account production planning and proposing alternative measures in function of the detected deviations
- Supervise the receipt and control of materials, intervening where necessary, and coordinating the communication with those responsible for production, and in particular that of the Cutting, for validation of materials, especially leather, by conducting production tests.
- Ensure the identification of the materials, their arrangement according to the predefined criteria and the recording of all movements, carrying out periodic inventories for stock control
- Collaborate in the company's response to customer complaints related to material compliance and in taking corrective actions
- Collaborate in the preparation and follow-up of external audits and client audits.

As support for these activities, it is very important to integrate all the information in the company's information management system, allowing its sharing, faster processing and analysis in a timely manner and as a basis for decision making.

Efficient supply chain management maximizes competitiveness and customer appreciation. The goal is to control the product throughout the process from the source of the raw material to the final consumer. In this register, information flows and physical flows generated by the supply chain must be well managed. Information flows make it possible to coordinate the entire supply chain. Physical flows represent the visible part of the supply chain.

1.9 Social Responsibility Management

Social Responsibility Management refers on how to lead through communication, motivation, team working, delegation the tasks, conflict and problem solving. Additionally, it refers to the Corporate Social Responsibility (CSR) concepts, key actions, advantages and disadvantages. A footwear company should act for social responsibility on various levels: community, environment, market, relation with employees, suppliers and clients in three main areas: developing critical success actions, best practices for social responsibility/ethics and implementing a CSR plan.

The commitment for applying CSR practices drives footwear companies towards sustainability, competitiveness, and innovation. Also, modern consumers are more aware regarding products and services they use and seek organizations that have adopted CSR practices.

Corporate Social Responsibility generates internal benefits, at organizational level (Organizational commitment of employees, Learning, Operational effectiveness, Cost savings, Innovation, Improved quality, Increased productivity), but also external benefits (Reputation and publicity, Improved stakeholder relationships, Capital access, Market access, Risk reduction, Customer satisfaction and price premium and, Synergetic value creation).

The development and implementation of an CSR plan aims to align the company to the dynamic requirements of the economic and social environment by identifying and managing the expectations of stakeholders.

Social Responsibility Management focuses on the following categories:

- Environment (legislation, resources, energy efficiency, waste management, recycling and reusing);
- Community/philanthropic (charities, sponsorships, local economic growth, educational programs, health initiatives);
- Human rights (fair labour practices, employees' rights and interests, work conditions)
- Economic (ethical and moral regulations standards).

Social Responsibility (SR) Management tasks:

- Raise SR awareness inside the organization;
- Assess corporate purpose in its societal context;
- Establish a vision and a working definition of SR;
- Asses current SR status;
- Develop a SR integrated strategic plan;
- Implement SR integrated strategic plan;
- Communicate about SR commitments and performance;
- Evaluate SR integrated strategies and communication.

1.10 Sustainability Management

For the Footwear Industry, Sustainability brings significant opportunities and advantages through processes (design, development, manufacturing, distribution, and selling) that minimize negative environmental impacts, conserve energy and natural resources, are safe for employees, communities and consumers, and are economically.

Sustainability is a broad subject but it mainly focuses on environment, quality and social.

A sustainability management system (SMS) represents a systematic approach that provides guidelines for an organization to evaluate, manage, and improve sustainability and handles sustainability components as a package.

Relevant elements of a Sustainability Management System:

- Policies and rules (policy, code of conduct);
- Organisational structure (Managements Responsibilities, Sustainability officer);
- Processes (Integration in business processes, Systems to ensure compliance);
- Continuous improvement (Goals and measures (progress tracking), Monitoring / performance evaluation with sustainability indicators, Training);
- Communication (Sustainability reporting, Leadership, Internal communication, Stakeholders);
- Preparatory tasks (Determining relevant aspect and the scope of the management system).

Sustainability Management tasks:

- Plan (sustainability aspects, legal requirements, strategic objectives, customer needs etc.);
- Implement and Operate (structure and responsibility, training, awareness and competence, documentation, control etc.);
- Review and take corrective actions (monitoring and measurement, non-conformance and corrective actions, records, audits).

1.11 Environmental Management

Environmental Management relates to the use of ISO 14001 (International Standard for Environmental Management) and EMAS (Eco-Management and Audit Scheme).

ISO 14001 management system is a voluntary instrument aimed at companies or organisations who want to achieve a high level of environmental protection in their activities and provides assurance to company management and employees as well as external stakeholders that environmental impact is being measured and improved.

ISO 14001 benefits:

- Measure environment impact;
- Improve resource efficiency;
- Meet legal obligations;
- Manage environmental obligations

ISO 14001 advantages:

- Gain competitive advantage;
- Increase new business opportunities;
- Drive down costs;
- Increase stakeholder and customer trust;
- Improve overall environmental impact

Adopting ISO 14001 Management System has the following advantages: enhancement of environmental performance, fulfilment of compliance obligations and achievement of environmental objectives.

EMAS is a voluntary environmental management tool that can be used by companies to evaluate, report, and improve their environmental performance. EMAS Regulation integrates ISO 14001 management system and by taking into account additional elements, supports organisations to upgrade their environmental management system and to improve their environmental performance continuously.

EMAS benefits:

- credibility, transparency and reputation
- environmental risks and opportunities management
- environmental and financial performance
- employee empowerment and motivation

Tasks for implementing EMAS:

- Determine the organisational context of the existing Environmental Management System (EMS)
- Identify interested parties and their relevant needs and expectations,
- Consider a life-cycle perspective when assessing the significance of the organisation environmental aspects
- Determine the risks and opportunities related to the organisation EMS.

1.12 STEM in the Footwear Industry – New Technologies

Science, Technology, Engineering and Mathematics (STEM) is linked to footwear industry to demonstrate how the scientific methods can be applied to product design and manufacturing process by focusing on computational thinking and problem solving.

For the Footwear Industry, STEM relates to Industry 4.0 (Internet of things, Artificial Intelligence), Emerging technologies (Smart sensors, Nanotechnology, Knitting) and Digitalisation (Augmented and Virtual Reality, Additive Manufacturing).

Another STEM topic of great importance to product design is knowledge of the anatomy and functioning of the foot, including the forces, pressures and moments acting on its structures during the gait cycle. This includes methods of gait analysis, experimental design, and statistical analysis of results.

STEM requires continuously acquisition of knowledge and skills on the following areas:

- Product design
    - nanomaterial
    - virtual prototyping
    - 3D printing
    - computational testing
    - smart sensors
    - customization
    - anatomy
    - biomechanics
- Manufacturing
    - monitor and control (identify risks and take measures to increase workers well-being)
    - automate (Production flow, Inventory, Safety and Security, Quality Control, Packaging optimization, Logistics and Supply Chain)

1.13 Health and Safety at Work Management

Health and safety at work (HSW) is defined by regulations and procedures intended to prevent accident or injury in workplaces.

Companies have to assure to their workers a high level of protection of their health and safety at work, as well as the right to a working environment adapted to their professional needs and which enables them to prolong their participation in the labour market.

A Health and Safety Management System enable organizations to provide safe and healthy workplaces, prevent work-related injury and ill health, and continually improve its performance.

Health and Safety at Work Management focuses on the following main areas:

- risk prevention;
- technical prevention;
- training and education;
- preventive health care;
- personal and protective equipment;
- control activities.

Health and Safety at Work Management tasks:

- assure compliance with laws and regulations;
- prevent workplace injuries and illnesses;
- reduce the incidence of occupational diseases and accidents at work;
- minimize costs;
- improve business efficiency;
- adapt to changes in laws and regulations, safety requirements and changes within the organization (e.g. new technologies, organizational changes, etc.).

Risk Assessment is one of the components of an HSW management system, has the aim to improve working conditions for employees and create conditions for safer operation.

HSW Management Systems tasks:

- Comply with regulations;
- Identify and control risks:
    - Collect relevant information;
    - Identify possible hazards;
    - Assess risks arising from the hazards;
    - Plan actions to eliminate or reduce risks;
    - Document the risk assessment.
- Train Employees.

2 Task analysis (TA)

- an instrument for linking professional spheres of activity and learning in continuous vocational education and training (CVET)

2.1 Introduction

This chapter aims to provide guidance for the implementation of Task Analyses (TA) in industrial footwear production based on examples from different European countries. It has been prepared within the framework of the project "Development of innovative and attractive training programmes" (DIA-CVET). The aim of this project is to raise qualified personnel in industrial footwear production to the competence level of master craftsmen (or comparable, European Qualifications Framework (EQF) level 5-7) through attractive further training measures. To this aim, suitable programmes are to be developed that can enable or ensure this development of competences. In addition to the identification of essential spheres of activity of the foremen/master craftsmen, the so-called TA were identified as decisive instruments for the development and implementation of further training programmes.

Task analyses (TA) are an important instrument to determine the prerequisites for learning in the work process. Since continuing education measures are not ordered and defined by curricula to the same extent as initial vocational training, it is necessary to identify learning contents, learning modalities and learning environments as well as their design conducive to learning by means of suitable instruments and procedures, such as TA. The TA is oriented to actual (real) work processes by analysing the essential tasks at a certain level of competence and identifying their learning potentials.

However, this chapter does not provide a ready-made recipe for the implementation of TA, as the conditions and institutional developments of IVET as well as CVET are very specific in the different European countries. For example, the level of professional competences possessed by initial vocational education and training (IVET) to graduates must be taken into account to ensure that continuing education and training measures can adequately link to these competences.

Likewise, it should be noted whether there are already certified further training programmes (CVET) for foremen (or comparable, EQF level 5, 6 or 7) in certain production areas, on which further training programmes for the industrial footwear sector can be based. In this context, analysing the possibilities of recognizing previous learning outcomes, whether through courses already completed or acquired informally, is absolutely part of developing new programmes. Moreover, industrial footwear production can and does differ to a greater or lesser extent in different countries in terms of production organization. Therefore, task analyses must be adapted to the respective job descriptions, division of labour and specific forms of work processes.

Thus, this manual only provides guidelines, benchmarks and basics for the implementation of TA. Adaptations to regional or national specifics are to be made by those who conduct task analyses in their countries.

It is advisable to avoid the concept of learning based exclusively on experience at this point. Since the use of TA focuses on the development of continuing education programmes that are assigned to a high EQF level, more theoretical content will also have to be included in the programmes. Learning will therefore not take place exclusively in the work process (or at the workplace), but will

be supplemented by theoretical (classroom) teaching units. However, these learning units are always complementary or theoretically in-depth to the work-integrated learning and thus also follow the structure and content of the current work processes (cp. SoA training management, chapter 1.4.).

To conclude these introductory remarks, the context of the emergence and development of TA should be briefly discussed: This manual is an adapted and shortened version of a Learning Station Analysis (LSA) manual, which was jointly developed by the Institute for Technology and Education (ITB) of the University of Bremen with trainers from Airbus Industries during the projects 'Move Pro Europe' and 'AERONET' in the field of aviation. This procedure has already been successfully re-used in the Leonardo project 'APPRENTSOD' and in the Erasmus+ project 'DualTRAIN' in other countries and industries. A first adaptation of the manual to industrial footwear production has already taken place through the Erasmus+ project ICSAS, but in this case the method was used exclusively for initial vocational training. In the present case, the modified method is applied for the first time to selected jobs with a high level of competence, i.e., a foreman or technician (EQF 5, 6 or 7) and in the context of the development of continuing education programmes. The procedure has been renamed task analysis (TA), but the workplaces in the company that offer learning potentials are still referred to as "learning stations".

2.2 TA – Objective and procedure

The task analysis is primarily aimed at uncovering the learning potential of exemplarily described jobs with increased occupational demands. Together with the analyses of other workplaces and the activities carried out there, it is intended to provide indications as to which further training measures can or should be implemented to achieve the competence profile of a foreman/master craftsman in industrial shoe manufacturing. The labelling as task analysis (TA) procedure thus already clarifies what it aims at.

"Learning stations" are created where essential work for the company and the company's work and business processes occurs. TA are therefore carried out at workplaces where the core tasks can be assigned to an occupational sphere of activity – although at a competence level that is to be located above skilled labour. These spheres of activity describe the required occupational activities on the basis of elementary work contexts and characteristic tasks that are typical for the occupational activity and comprise a complete work action. With this definition, spheres of activity can be delimited and specified as follows:

No individual activities are analysed, but tasks in the sense of a complete professional or technical action, which follow a structure defined in process and goal. A general process structure of a sphere of activity comprises the definition of the concrete task (e.g., the optimization of processes), of its planning (including the procurement of information) and execution as well as the control and evaluation of the work result up to the documentation. The concept of task analyses takes into account the following criteria:

- Task analyses must include the overall context of the professional work process.
- Task analyses must refer to the relevant spheres of activity.
- A Task analyses always describes a work context and a complete work action, emphasizing the connection between planning, executing and evaluating.

- The formulation of the documentation also includes the contents and forms of the specialized work.
- The analyses includes the meaning, function and significance of the specific work process in the context of the higher-level operational business process.
- Special attention is paid to the design potential that a foreman or technician can use.

The procedure of a TA is divided into four phases:

- Preparation of the analysis,
- Carrying out the analysis,
- Evaluation and documentation of the analysis
- Use of the results for training programmes.

2.3 Task analysis - the approach

2.3.1 Preparation of the Task analysis

Although identified spheres of activity should be referenced for each TA, it is possible that no corresponding occupation or advancement qualification can be identified for certain work tasks. If this is the case, then the following practical approach is recommended: On the basis of the above-mentioned conditions that delimit spheres of activity from occupations, it is important to check whether a work process selected for analysis meets these requirements, because only then can learning stations contribute to competence development. However, it must also be taken into account that the competences aligned to spheres of activity cannot be fully developed in the learning stations, so that certain content (theoretical knowledge) must be acquired in the form of classical teaching.

Investigation Team

The preparation of a TA particularly includes the selection of the participants for the study. For reasons of an efficient, goal-oriented execution of a TA, a group of two persons is recommended, which should include an operational expert and a researcher or teacher. The following four functions are to be performed within the investigation:

1. conducting a conversation (interview);
2. preparation of a protocol (keywords);
3. preparation of photos and sketches;
4. organisation of working materials (e.g., drawings).

Choice of learning stations

If a sphere of activity, such as maintenance management, is assessed as relevant for a foreman or technician in industrial shoe production, it is necessary to select company workplaces as (possible) learning stations in a company or department, where qualified specialists can handle requirements that are representative for the sphere of activity. Company representatives in the investigation team are responsible for selecting the workplaces, as they have detailed insights into the business and work processes and can ensure the organizational prerequisites of the investigation >on site<.

As a rule, spheres of activity cannot be regarded as distinct from one another in practice. At many workplaces and thus also learning stations or task areas, work tasks of several spheres of activity are mastered, which are often closely linked to each other.

For the analysis, it is advisable to select workplaces or task areas with the "core characteristics" of a sphere of activity. Although the analysis only focuses on a single sphere of activity, the interfaces to other spheres must also be taken into account.

An overly broad simultaneous examination of several spheres can restrict the view of the essentials. If the organization of the technical work, e.g., in the case of findings (functional tests, disassembly, malfunction analysis), requires that several spheres of activity are involved at their core, it may be necessary to conduct several analyses, each from a different perspective.

One factor influencing the selection of jobs in departments and companies that should not be neglected is the willingness of the skilled employees working there to participate in an analysis of their work. Here it is particularly important to make it clear that we are not talking about analyses in preparation for rationalization measures, personnel restructuring or evaluations of individual performance.

2.3.2 Analysis guideline

Both for already established investigation teams and for those groups of people who are assembled for an analysis on a selective basis, it is important to deal with the analysis guideline for the investigation in detail beforehand:

- What qualifications do the specialists need for this sphere of activity?
- Is there a legal framework as a prerequisite?
- In which working environment is the work done?
- What tasks of qualified skilled work must be performed?
- What knowledge and skills are required?

Analysis category: Qualification for the task area

Many work processes of foremen, master craftsmen or technicians are linked to formal qualifications and/or verifiable work experience. These can vary greatly from country to country or even company to company. Furthermore, a distinction should be made in this category between mandatory and desirable qualifications.

Analysis category: legal framework

Particularly in the case of safety-relevant activities, it is not only experience or qualifications that matter; certificates not related to vocational training can also play a role. For example, when working in environmental or sustainability management, minimum requirements according to the corresponding ISO standard must be met.

Analysis category: Work environment

When describing the subject of the skilled work or the work environment, the work context and the work process are considered. For an industrial maintenance foreman/master craftsman, the object of work and the methods used differ from a maintenance foreman on the shop floor. Whilst the latter must determine the cause of the fault in the machine or production plant in the event of a malfunction and therefore requires detailed knowledge of the malfunction-free functional sequence in order to be able to determine the cause of the malfunction by comparing it with the

faulty condition, the foreman/foreman for maintenance requires knowledge of prescribed maintenance and repair strategies.

Although at first glance maintenance is the target of the work, both the expertise and the method of skilled work differ significantly between the skilled work of maintenance at the workshop level and the skilled work of the foreman in industrial maintenance management.

Analysis category: Tasks of the specialized work

The foreman/maintenance supervisor must know and be able to improve the company maintenance plan. He must therefore know and implement various maintenance strategies. He must be able to analyse production processes and use this knowledge for maintenance. He must be able to analyse complete production processes and develop strategies for operational maintenance with this knowledge.

Analysis category: required knowledge and skills

What is identified here are the different requirements placed on the work process and the work object by the various interest groups. The company, for example, sets specific quality standards that result from competition and must be adhered to in skilled work, and demands compliance with time and cost specifications. Requirements on the part of legislators and regulators, e.g., in the form of technical standards and accident prevention regulations, must also be taken into account. Last but not least, the same applies to the foremen's own requirements for themselves and their work. It is only when these different and sometimes contradictory requirements are compared that the ability and the need to shape technology and skilled work become clear.

2.3.3 Carrying out the analysis and documentation

The professionals employed at the selected workplaces whose work is to be analysed are informed about what the Task analysis is about. It should be made clear to them that they should perform their everyday work: It is not about a "production" of unique craftsmanship or a demonstration of ideal practice, but about the professional's accomplishment of everyday work requirements. If there is no "highlight" as a work task on the analysis day, but rather unspectacular "routine work", this is not detrimental to the analysis, but reflects normality.

The workplaces are visited and examined according to the list. In the process, the foremen/masters are interviewed in order to also make the "invisible" visible. It is advisable to obtain consent for the recording of conversations, since the wealth of information is easier to master when evaluating on the basis of original recorded conversations and fewer mistakes, errors or misunderstandings are made that have to be corrected later.

The time required for the analysis depends heavily on the complexity of the tasks at the specific workplace. Experience shows that the time required is usually a few hours.

The documentation of a TA must be proofread and approved by employees of the respective department before further use.

2.4 Evaluation

The TA has two objectives: First, to compare the organization of work at the learning stations with spheres of activity, and second, to determine and evaluate the learning potential of these stations. The information given by the skilled workers interviewed at the workstations should provide the necessary clarity about this learning potential. However, the TA team should first consider what to expect when using the term "learning potential" in the context of continuing vocational education. "Potential" is certainly not a colloquial term like "learn." Potential expresses that something specific (e.g., a situation in everyday life or at work) offers opportunities or even good opportunities for something. So, in this case, potential is the (good) opportunity to learn. Unlike in colloquial language and in everyday life, "learning" in vocational pedagogy and in competence research does not simply mean providing a person with positive and, above all, effective support, but actually means increasing the level of professional competence (e.g., through competence enhancement) in the - here very narrow - sense that someone proactively learns to master something in the course of a learning process that he or she was not able to do previously.

In the DIA-CVET project, 13 spheres of activity have been identified for the professional profile of a foreman in industrial shoe production. Learning stations, whose learning potentials are revealed by the TA, are linked to each individual sphere of activity. With the latter, the possibilities and opportunities to learn in the process of work are addressed in particular, but not exclusively. Since not every workplace guarantees this to the desired extent, the results of the TA can also provide indications of how workplaces can be developed much more strongly in the direction of learning stations, which is synonymous with improving the learning opportunities.

For each learning station, core competences can be identified which, in the aggregation of all learning stations, represent core competences of an occupational profile foreman/master craftsman. When evaluating the TA, hierarchical dependencies between individual core competences as well as overlaps must be taken into account. For example, overlaps between the learning stations "Maintenance Management" and "Quality Management" are not only conceivable for the occupational profile of the foreman/master craftsman, but also probable.

The evaluation of TA must therefore be conducted under two central questions:

- What do you learn in one learning station and what of it is necessary for which other learning station?
- What competences do you need to have already to be able to learn something in any learning station?

In principle, these two questions must be answered in the analysis of each learning station. The most important two results of the analysis of a learning station are therefore firstly the specification of a prerequisite for learning and secondly the specification of a learning outcome, which itself becomes a condition for completing further learning stations.

A series of TA carried out comprehensively in a company results in a coherent sequence of the necessary learning steps determined by the operational processes. The evaluation should therefore be carried out from the point of view of the internal linking of all work processes, so that it can be checked whether the actual process nature of the work organization enables orientation to the spheres of activity, because according to the TA, this is where the requirements are located that individual learning must follow as a competence development process. With a view to the result of this evaluation step, it must then be examined whether the requirements characteristic for an individual spheres of activity - i.e., for the analysed learning stations - can also be acquired in the process of work or to what extent classical teaching must take place as a supplement.

2.5 Template

The documentation is naturally oriented towards the analysis categories. The template is semi-open, i.e., it can be adapted according to profession or context. In some cases, subcategories are pre-structured - of course always with the possibility to add free answers.

Sphere of activity **Date** **Location**		
Qualification for the sphere of activity		
Legal framework		
Working environment	Products	
	User	
	Interfaces internal	
	Interfaces external	
	Organization	
	Level of autonomy	
	Workplace	
Tasks		
Required knowledge and skills		

Tab. 1: Task analysis (TA) copy template

3 TA Example: DESIGN / How to create a shoe collection

Venue	Date
ISC Pirmasens	August 2021
Qualification for the sphere of activity	
Shoe maker apprenticeship with focus on model department, shoe technical school: shoe technician (2 years) with focus on design	
Legal framework	
Means of order: Training framework; Framework curriculum	
Working environment	
Products	Prototypes and sample shoes
Users	
Interfaces internal	Material purchasing (internal supplier) Technical development Sales manager Product manager
Interfaces external	Trend and material fairs
Organization	Alone
Production steps that already took place	-
Level of autonomy	Independent, in coordination with product manager, technical development (operations manager)
Workplace	Office (Photoshop software, hand drawing, CAD, 3-D programs), workshop
Tasks	
• Identify trends and material innovations at trade fairs • Finding topics and developing creative concepts • New graphical development of models • New ideas for lasts, outsoles, heels, jewelry parts /accessories and their developments. • 3D printing of prototypes of, for example, heels, outsoles, in medium sizes ladies: 37 or 4.5; men: 41 or 7.5 • Ornaments development • Submission of the sketches to the product manager who, in cooperation with the sales manager, decides which models are to be produced as physical model/prototype • Production of a physical prototype, modifications, if necessary, after consultation. • Production of the representative samples/collection (entire model selection) • Visit to key accounts with selection of sales samples to check attractiveness • Handing over the prototype to technical development for duplication of the products for representatives and trade fairs • Visits to trade fairs with model to check acceptance of the series and competitor products	
Required knowledge and skills	
• Creativity • Feeling for price calculation • Experience with material purchasing for the reasonableness of the choice of material for the planned use of the shoe	
Others	
-	

Tab. 2: Task analysis (TA) Example DE

4 Comparative Analysis

One of the basic assumptions of DIA-CVET project is: Each vocation, independently of being part of Initial Vocational Education and Training (IVET) or Continuous Vocational Education and Training (CVET) can be described by a series of "Spheres of Activity" (SoA). Our research in various sectors and countries showed that the number of "spheres of activities" varies between 8 and 20 (>20 only for researchers), depending on the concrete vocation and normative decisions of curriculum designers and other stakeholders involved; neither number nor differentiation between spheres are God-given.

Spheres of Activity describe the skilled labour on the respective European Qualification Framework (EQF) levels chosen – based on purposeful and meaningful work contexts. Spheres cover a complete vocation and are typical for a particular métier.

Our previous project ICSAS revealed that skilled work on EQF levels 3 and 4 in shoe manufacturing can be described by 9 spheres of activity, out of which 5 spheres (cutting, stitching, lasting, assembly, finishing) are core elements of the vocation, whereas the other 4 (design, technical development, production planning, quality assurance) are peripheral spheres:

Project ICSAS

Core spheres				
Cutting	Stitching	Lasting	Assembly	Finishing

Peripheral spheres			
Design	Technical development	Production planning	Quality assurance

Tab. 3: Updated spheres of activity of industrial shoemakers according to findings of ICSAS-project

In the current project, "Developing Innovative and Attractive CVET programmes in industrial shoe production" (DIA-CVET), we aimed at comparable results for "more challenging" spheres, that are (or could be) part of CVET-qualifications like foreman or technician (EQF levels 5 or 6). Via expert interviews and sector surveys, 13 Spheres of Activity for CVET-qualified have been identified.

There was evidence from all 3 countries (Germany (DE), Portugal (PT), and Romania (RO)), where the Task Analyses (TA) were undertaken, that all these spheres are of (potential) relevance, but not equally in all companies/shoe competence centres. Unfortunately, this does not imply that national curricula on EQF levels 5 or 6 (if existing) are in-line with these findings and this tension between companies` needs and offered qualifications will be discussed again when analysing the results of IO6 (piloting).

Spheres of relevance were:

Sphere / Country	DE	PT	RO
Design / How to create a shoe collection	+	+	+
Shoe Technology - Production Planning	+	+	+
Technical Development	+	+	+
Training Management	+	-	+
Maintenance Management	-	+	+
Quality Management	+	+	+
New Materials	-	+	+
Supply Chain Management	-	+	+
Social Responsibility Management	+	+	+
Sustainability Management	Together with environmental management	-	+
Environmental Management	Together with sustainability management	+	+
STEM in the Footwear Industry	+	-	-
Health and Safety at Work	-	+	+

Tab. 4: Spheres of Activity (SoA) of CVET-qualified and their relevance in the participating companies / competence centres

It can be summarised that –as in IVET– learning potentials for blended approaches that include Worked Based Learning (WBL) in CVET are quite promising, as well – which of those will be exploited during the piloting (IO6) will be a result of IO4 (curriculum design (CD)).

For detailed descriptions of the Spheres of Activity, the method “Task Analyses” and the findings: Please refer to the respective results.

5 Recognition of Prior Learning (RPL)

5.1 Introduction

Besides formal school, people also learn at work, in social life, in civic life.

Nobody would deny that it is a waste of time and de-motivating if people who acquired already some knowledge, skills and competences during their educational or working life have to re-acquire those when changing the educational track.

Everything that people accumulate as knowledge, skills and competences (KSC) is not always credited to them for the purposes of certification, to obtain a diploma. The acquired KSC should be recognised, in other words, incorporated in the stairway of each individual qualification.

However, how to measure and assure the equivalence of these prior knowledge, skills and competences and the requirements of the new track?

It's important thus, to recognize and validate skills acquired based on life and work experience, with a view to help all individuals to:

- design professional and personal development pathways;
- legitimate and socially certify those KSC in terms of employability;
- enhance the level of qualification recognized by a country / member state;
- facilitate the integration in labour market;
- allow starting an own business in crafts and/or other legislated jobs.

In fact, the recognition of all forms of learning results is a precondition to create an open lifelong learning system and to ensure that the transition between the education sub-sectors is facilitated.

In this way, any person, throughout life, must be able to see their KSC evaluated and complete them for the purpose of obtaining a diploma, being able to resume, at any time, their education / training process, according to their personal and professional perspective.

Developing Innovative and Attractive Continuous Vocational Education and Training (DIA-CVET) project includes this subject in its work-plan, namely in the Intellectual Output 2 (IO2); which envisages at:

- finding and applying a method for ***structural*** Recognition of Prior Learning via:
    - analysing different approaches of RPL in different countries through literature analysis and benchmarking.
    - jointly deciding which approaches to apply and agreeing on a method which should be translated to potentiate its dissemination and assimilation.
    - comparing the findings of the Task Analyses and the relevant IVET (Initial Vocational Education and Training) curricula from the project countries in the sector for potential structural RPL.
- finding and applying a method for ***individual*** RPL via:
    - identifying existing methods to apply RPL, such as interviews, assessment centres or work samples.
    - jointly deciding which methods to use.
    - selecting the candidates for piloting which will happen in Intellectual Output 6 dedicated to the Piloting.

This report aims at comparing the mechanisms and examples following a pragmatic approach, envisaging answers to leading questions such as:

- Has the mechanism real benefit for both the learner and the educational provider?
- How is the quality assured? Are the prior learning outcomes (LO) really comparable to the new requirements?
- Who is responsible for the process of RPL? How are the relations between the providers of the new track and the institution being in charge for RPL?
- Which of the mechanisms detected fit best to DIA-CVET project aims (to develop, pilot and evaluate CVET-profiles in industrial shoe production) in terms of RPL?
- Which of the mechanisms are, according to national laws and regulations, legally applicable for CVET on European Qualification Framework levels 5 to 7?

This report joins the Portuguese, Romanian and German approaches and drafts a comparative analysis, focusing on the questions listed above, and introduces a RPL mechanism to be applied within DIA-CVET project piloting phase (IO6), when choosing the beneficiaries.

5.2 Recognition of Prior Learning in Germany, Romania and Portugal

Different stakeholders in different countries have developed a wide number of mechanisms in the recent years. This report presents briefly the most relevant respective successful ones in Portugal, Germany and Romania, the 3 countries of the consortium.

Portugal

The Recognition of Prior Learning in Portugal allows the "Recognition, validation and certification of competences (RVCC)" acquired and developed throughout life by adults, in non-formal and informal contexts, with a view to obtain a school (basic or secondary level), professional or dual qualification certification.

This process is developed within the framework of the national network of specific centres - QUALIFICA Centres - promoted by the Employment Centres / Employment and Vocational Training Centres of the IEFP, IP network. The Professional and Educational RVCC processes constitute the main attribution of these structures, along with the attribution of providing candidates with training/education orientation processes.

In this context, the recognition of prior learning has assumed, in recent years, as the return of the bet on the qualification of Portuguese adult population, promoting investment in bringing hundreds of thousands of people together in a qualification, namely through the promotion of the recognition of competences and learning and the adequacy of training paths to the profiles and individuals' needs.

Moreover, after decades stacked to the level 2, 3 and 4, in 2022 a new possibility of RVCC has arrived for active population wit level 4 EQF willing to progress to level 5. In fact, the new regulation of RPL in Portugal focuses on encouraging people who have left incomplete routes so that, using different paths, they can complete their paths and to see their training completed, as well as in the deepening of recognition responses, validation and certification of competences (RVCC) under the QUALIFICA Program.

Germany

Formal qualifications play traditionally a very important role on the German labour market. When applying for a job, the most important question is: "What qualification do you hold?", not "What skills do you have?". Two examples might illustrate this, partly bizarre, relation:
To work as a researcher at a university, a university master degree is needed, independent of the experience in the subject.

Entrepreneurship in certain sectors such as crafts obliges to hold the degree of a handicraft foreman certified in Germany (EQF 6).

Two different ways of RPL must be distinguished: Whether attending the lessons/courses and passing the assessments is mandatory or whether passing the exams is sufficient. Examples for the first case are general schooling and Initial Vocational Education and Training (IVET, EQF 3 or 4), for the latter Continuous Vocational Education and Training (CVET, EQF 6) and, with some exceptions, Higher Education (HE, EQF 6 or 7).

Romania

The recognition of prior learning is regulated by the Romanian National Education Law and coordinated by the Romanian National Authority for Qualifications; a public institution subordinated to the Ministry of Education. The Romanian National Authority for Qualifications elaborates the National Qualification Framework which targets the national system of qualifications obtained in formal, informal and non-formal contexts, allows the recognition, evaluation and linkage of all learning outcomes and ensures the coherence of qualifications and certifications.

The recognition of prior learning in Romania is covered by three National strategies: National Lifelong Learning Strategy, National Strategy for Tertiary Education and Romanian Education and Training Strategy.

Romanian National Authority for Qualifications also authorizes evaluation centres and bodies, coordinates the authorization of professional competence assessment centres and evaluates and certifies the evaluators of professional competences. Authorized centres and bodies assess and recognize the professional competences obtained through other ways than formal ones.

To support the process of recognizing prior learning, additional guides were developed and made available: Guide for the user of the European transfer and accumulation system of ECTS / SECT credits and Guide for recognizing professional experience and qualifications gained abroad.

Romania needs to further develop its model for recognizing previous learning and the administrative capacity of existing competence assessment centres needs to be improved to recognize the learning acquired in non-formal and informal contexts. Education institutions should develop recognition policies for non-formal or informal learning and implement them through consultancy, counselling and recognition centres.

In the following sections, a more concrete description is made about the 3 countries involved.

5.2.1 CVET systems in Portugal, Germany and Romania

Which are the qualification based on which is possible to implement RPL processes at the moment in the 3 countries involved?

Portugal offers the possibility to recognize all qualifications existing in the Portuguese Sectoral qualification framework for Footwear composed by 6 qualifications:

- Footwear Manufacturing Operator – which comprehends all footwear production process – EQF level 2
- Footwear Production management technician – EQF level 4
- Footwear machinery maintenance technician - EQF level 4
- Footwear handcraft production technician (very dedicated to niches) – EQF level 4
- Footwear pattern making technician – EQF level 4
- Technical Specialist in Footwear Design – EQF level 5 which is recent and lack referential for RPL

Adults can obtain basic education through recurrent education, completion of an adult education and training courses (EFA – Education and Training of Adults), through a process of Recognition, Validation and Certification of Competences (RVCC), or through certified modular training (FMC). The system also provides a training offer linked to literacy – the training program in basic skills (FCB).

Adults can obtain secondary education through attending an adult education and training (EFA) course, through a process of Recognition, Validation and Certification of Competencies (RVCC), through certified modular training (FM) or through other pathways to secondary education completion.

In RPL the result of the comparison between the competences demonstrated by the candidate and those foreseen in the respective RPL referential allows determining the certification to be awarded, which may correspond to all or parts of the foreseen competences.

Thus, the completion of an RPL process in which all units of competence have been certified assigns:

- Certificate of Qualifications, if the candidate does not yet have the schooling associated with the respective qualification level (Level 2 - 9th year; Level 4 - 12th year);
- Qualification Diploma, level 2 or level 4, if the candidate already has the schooling associated with the respective qualification level.

In case that the candidate obtains a partial certification, a Certificate of Qualifications is also issued, which contains only the validated competence units and a Personal Qualification Plan (PPQ) that identifies the training units that must be attended to obtain full certification.

Germany provides two important CVET qualifications being potential subjects of RPL:

- Industrial foreman (EQF 6) All German foreman profiles consist of 3 (industry, then part 3 and 4 are joined) or 4 (handicraft) parts:
    - Vocation-overlapping skills (entrepreneurship, bookkeeping, etc).
    - VET trainer ordinance.
    - Vocation-specific, practical.
    - Vocation-specific, theoretical.

Holders of a corresponding IVET qualification with some years of work experience are allowed to register for the 3 respective 4 examinations on the parts, but without preparation via seminars they would probably fail. Offering these preparation seminars is a business model for German chambers of commerce and industry respective handicraft, participants must pay quite a lot. Often parts of the (or even the whole) amount are paid by the company, for which the candidate is working.

- State-certified Technician (EQF 6, as well). Beside the foremen, who are the focus of the DIA-CVET project, another established CVET-qualification exists: State-certified technicians. Compared to the foremen qualification, technicians usually acquire more academic knowledge (science, materials, etc.) and less work practice-relevant skills. Technicians are sometimes named as "the little brother of an engineer". This report neglects the technician qualification as DIA-CVET focusses on operational Spheres of Activity (SoA).

In *Romania* the implementation of Romanian National Qualification Framework targets the national system of qualifications obtained in general secondary education, in vocational and technical education, in continuing vocational training, in apprenticeship, in higher education, both in formal, informal and non-formal contexts, from the perspective of lifelong learning and allows the recognition, evaluation and linkage of all learning outcomes acquired in formal, non-formal and informal learning contexts and ensures the coherence of qualifications and certifications. The existence of Romanian National Qualification Framework helps to avoid duplicate and overlapping qualifications, helps learners to make informed decisions about career planning and facilitates professional development, in the perspective of lifelong learning.

5.2.2 Objectives of recognition of prior learning in Germany, Portugal and Romania

The objectives of RPL in all the 3 countries are common as follow:

- to increase the level of professional and educational qualifications of adult population.
- to improve the employability levels of the active population.
- to encourage lifelong learning by valuing all the lessons learned.
- To facilitate the integration in labour market.
- To allow starting their own business what concerns crafts and/or other legislated job (for Germany).

5.2.3 Legal framework

Portugal

- Ordinance No. 232/2016, of 29 August, which regulates the creation and organization and operation of QUALIFICA Centres.
- Ordinance No. 60-C/2015, of 2 March, amended by Ordinance No. 181-A/2015, of 19 June, no. 190-A/2015, of June 26th and 148/2016, of May 23rd, which publishes the specific regulation of the domain of Human Capital that applies to the processes of Recognition, Validation and Certification of Competences (RVCC).
- Ordinance No. 61/2022 January 31 EDUCATION AND WORK, SOLIDARITY AND SOCIAL SECURITY regulates the recognition, validation and certification of competences within the scope of the QUALIFICA Program.

Germany

No formal law exists.

Recognition of Prior Learning, as well as of foreign qualifications, are regulated via the "recognition ordinance" (cp: https://www.anerkennung-in-deutschland.de/html/en/index.php#).

Romania

- System / mechanism elaborated by the Ministry of Education through the "Education Law" for recognizing the competences acquired / obtained in other contexts / in other ways than the formal / non-formal ones;
- Romanian National Authority for Qualifications - institution with attributions in recognition of the competences acquired / obtained in other contexts / in other ways than the formal / non-formal ones.

5.2.4 National Authorities involved and responsible for the processes and other promotors

In *Portugal*, the National Agency for Qualification and Vocational Education, I.P. (ANQEP, I.P.) is a public institute integrated in the indirect administration of the State, with administrative, financial and pedagogical autonomy. It has oversight and joint supervision of the Ministries of Education, and of Labour, Solidarity and Social Security, in coordination with the Ministry of Economy and Digital Transition. ANQEP mission is to contribute to the improvement of the qualification levels of young people and adults in Portugal, promoting both a growing demand for educational and professional qualifications (double certification), at the non-higher level, as well as an offer of initial and long-term training of life that is broadly attractive, of good quality and relevant to the labour market (Decree-Law no. 36/2012, of 15 February).

Within the scope of the National Qualifications System, ANQEP I.P. has the following attributions:

- To design and permanently update the National Qualifications Catalogue, an instrument that regulates non-higher level dual certification qualifications;
- To regulate and boost the offer of dual certification education and professional training aimed at young people and adults, the offer of specialized artistic education and the system of recognition, validation and certification of competences (RVCC), in the school and professional scope, aimed at adults;
- To promote and guarantee the necessary information and guidance devices, the complementarity and flexibility of the education and vocational training systems and the quality of the aforementioned offers, in articulation with the other entities responsible for these matters;
- To coordinate the design of pathways, curriculum development and specific methodologies for dual certification professional education and training aimed at young people and adults and RVCC processes;
- To participate in the development of references for initial and continuous training of teachers, trainers and other professionals involved in the qualification of young people and adults;
- To contribute to the international comparability of qualifications and mobility between education and vocational training systems for young people and adults, through mechanisms of representation and cooperation at European and international level.

The Qualifica Centres support the National Agency for Qualification and Vocational Education, I. P. (ANQEP, I. P.), with regard to their specific competences' definition of network structuring criteria and implementation of monitoring mechanisms and monitoring of education and training offers.

They are responsible for:

- Information, guidance and referral of candidates, namely for vocational education and training offers, based on the different qualification modalities and seeking to adapt existing offers to the profiles, needs, motivations and expectations of candidates and the dynamics of the labour market;
- Recognition, validation and certification of skills developed by adults throughout their lives by formal, informal and non-formal ways, in the school environment, professional or dual certification, based on the references of the National Qualifications Catalogue;
- The development of information and dissemination actions aimed at young people and adults, companies and others employers, about education and training offers available for professionals and on the relevance of lifelong learning;
- Stimulating and participating in partnership territorially based networks that contribute, in the context of education and professional training, to a more integrated and consistent, in the identification of needs concrete qualifications and in the organization of responses useful for the populations, namely that they facilitate the signalling and identification of young people who are outside the education and training system and promote its path towards adequate qualification responses;
- Monitoring the path of candidates referred to qualification offers.

In *Germany*, there are 79 regional Chambers that are entitled to perform RPL in VET.

- For IVET, they compare the differences between foreign qualifications or the learning outcomes of previous work of unskilled workers and the curricula of the aspired vocation. Afterwards they decide which parts of the qualification have to be acquired to be allowed to participate in the examination.
- In CVET, they are responsible to check whether a holder of a master foreman certificate from another sector is allowed to exempt from parts of the examinations.

In Higher Education (HE), each university applies its own rules.

In *Romania*, the recognition of prior learning is regulated by the National Education Law and coordinated by the Romanian National Authority for Qualifications (in Ro: Autoritatea Nationala pentru Calificari – ANC).

The recognition of prior learning is regulated by legal framework and procedures:

- Legal framework:
    - system / mechanism elaborated by the Ministry of Education through the "Education Law" for recognizing the competences acquired / obtained in other contexts / in other ways than the formal / non-formal ones;
    - Romanian National Authority for Qualifications - institution with attributions in recognition of the competences acquired / obtained in other contexts / in other ways than the formal / non-formal ones.
- Procedures developed by the Ministry of Education and Ministry of Labour.

Regarding Recognition of Prior Learning, the Romanian National Authority for Qualifications has the following responsibilities:

- authorizes evaluation centres and bodies, based on evaluation reports prepared by external evaluators;
- coordinates the authorization of professional competence assessment centres and the certification of professional competence evaluators;
- evaluates and certifies the evaluators of professional competences, the evaluators of evaluators and the external evaluators;
- draws the National Register of professional competence evaluators, evaluators of evaluators and certified external evaluators.

5.3 Mechanisms of RPL process

5.3.1 General view

Portugal

The recognition of competences consists of the identification of skills developed over the course of life, in formal, non-formal and informal contexts, through the development of specific activities and the application of a set of assessment instruments suitable, through which the candidate evidences the previously carried out learning, namely through the construction of a reflective portfolio and documentary.

In the processes of recognition, validation and certification of school competences, the portfolio is an instrument of a reflective nature, in which evidence of skills acquired by the candidate throughout life, which aggregates documents of a biographical and curricular nature, in order to allow the validation of the same against the competence requirements is documented.

In the processes of recognition, validation and professional skills certification, the portfolio aggregates documents and other supporting evidence intended to demonstrate competences and prove the execution of professional achievements. It may also have a reflective dimension depending on the candidate's profile, in order to allow their validation against the reference of professional competences.

The validation of competences comprises the self-assessment by the candidate and the assessment carried out by the trainers or teachers of the different areas, formalized in a meeting called and chaired by the coordinator of the QUALIFICA Centre.

The process of recognition, validation and certification of competences must be registered in standardized instruments, based on a model defined by the ANQEP, I.P. – PASSPORT QUALIFICA.

The portfolio, in paper or electronic form, must include a copy of all instruments mobilized during the process of recognition, validation and certification of competences, as well as the reports that support the validation of competences.

Germany

When talking about Recognition of Prior Learning (RPL), two different ways of regular acquiring qualifications must be distinguished:

- whether attending the lessons/courses and passing the assessments is mandatory – Example: general schooling and Initial Vocational Education and Training (IVET, EQF 3 or 4);
- whether passing the exams is sufficient. Example: Continuous Vocational Education and Training (CVET, EQF 6) and, with some exceptions, Higher Education (HE, EQF 6 or 7).

From a quantitative perspective, RPL in Germany is most important in IVET: Unskilled or semi-skilled workers with vast working experience or people qualified in other countries without bilateral agreements of accepting qualifications might prove evidence that they learnt what an average apprentice in Germany has learnt.

In order to do so, there are different options:

1. The worker can get information on the website "Recognition in Germany" (https://www.anerkennung-in-deutschland.de/html/en/index.php#). There he can find out whether it is possible to get enrolled in an equivalence assessment in order to get an equivalence certificate for Germany of his professional qualification. It takes about 1-3 month and costs approximately 100-600 Euros.
2. If there is not enough proof that the foreign qualification is equivalent to the German, it is also possible (if certain formal requirements are met) to undertake the final examinations of a regular apprenticeship (examination of externals/Externenprüfung (cp. IHK 2022)).
3. If the evaluation of the work evidence has the result, that some spheres of activity of the corresponding vocation are missing, certain constrains might be negotiated; for example, to visit seminars or to undergo practical training to close the skills gap in these spheres before being accepted as an external candidate for exams.

Romania

The process of assessing professional competences obtained through other ways than formal ones has the following characteristics:

- it is a voluntary process;
- refers to the occupational / professional training standards;
- for each unit of competence, the evaluation is completed with the result "competent" or "not yet competent".

The professional competencies can be evaluated and certificated by authorized Legal entities of public or private law (Romanian or foreign) who wish to carry out activities of evaluation and certification of professional competencies obtained in other ways than formal ones, completed by certificates of competence with national recognition.

The legal entities are authorized for occupations / qualifications for which there are existing occupational / professional training standards and can assess all competence units within an occupational / training standard or only for one or more competence units from that standard, depending on the request of the person concerned.

5.3.2 Different mechanism in Portugal, Germany, Romania

Portugal

The RPL process in Portugal is characterised by being an intervention very centred and oriented to the individual, in the following fundamental stages:

Register - The reception consists of the attendance, the registration and in the clarification of the candidates about the mission and the scope of intervention of the QUALIFICA Centre.

Diagnosis - The diagnosis consists of analysing the candidate's profile, namely through clarification sessions, curricular analysis, assessment of the respective life course and professional experience, consideration of your motivations, needs and expectations, application of diagnostic tests, conducting individual and collective interviews or using other appropriate strategies, depending on whether young or adult.

Information and guidance -The information and guidance process aims to provide the candidate with support in the identification of individual education and professional training projects and make available the necessary information that allows the choose the answer that best suits your profile and that contributes to realistically making possible the paths of further studies and/or market integration of work.

Routing - The referral to an offer of education, professional training or dual certification is the result of an agreement between the QUALIFICA Center's team and the candidate, based on prior process diagnosis and/or guidance.

Training - Candidates must attend complementary training, namely in the development of the process of recognition, validation and certification of competences, ensured by the trainers or teachers of the QUALIFICA Centre team or by other training entities to which candidates are referred. The minimum number of hours of additional training that candidates must attend is 50 hours.

Recognition of competences - consists in the identification of the competences developed by the adult throughout life, in formal, non-formal and informal contexts, having as support a competency framework. For the purposes of recognition of school and professional skills, the adult prepares a reflective and documental portfolio that, in a structured way, aggregates documents of biographical and curricular nature. Within the scope of the competence recognition process, in addition to the mobilization of the assessment instruments provided by ANQEP, I. P., the Qualifica Centre team can also mobilize other assessment instruments considered necessary, depending on the candidate profile. Adults must actively participate in the recognition process, being responsible for defending the process, provide additional evidence if necessary and to be able to carry out a self-assessment of their competences.

Validation of competences - consists of the verification and evaluation of the competences of the candidates against the competences defined in the respective referential. For the purposes of the provisions of the previous number, the use of instruments of assessment specifically designed for this purpose, according to the respective benchmarks. The validation referred to in the previous numbers is formalised in a validation session convened and chaired by the coordinator of the Qualifica Centre, with the presence of members of the team involved in the respective process, and from which minutes are drawn up.

Certification of competences **-** The certification of validated competences requires the presentation of the candidate before a certification jury, made up in accordance with the provisions of the following article, which call from the promoting entity of the Qualifica Centre. The decision of the jury regarding certification of competences is based on the candidate's performance in a certification test, combined with the analysis of the portfolio and of the evaluation instruments applied during the stage of recognition and validation of competences. In the certification of school skills, the test certification consists of the presentation, before the jury, of an exhibition and reflection subordinated to an integrative theme worked within the scope of the portfolio that evidence knowledge and skills of the different areas of key competences of the respective referential. In the certification of professional skills, the certification test consists of an eminently practical demonstration, before the jury, of the skills held within the framework of professional competences. The certification of competences can be total or partial, the latter occurring whenever the assumptions mentioned below are not verified. Obtaining a full school certification, it is always verified that the candidate:

- At the basic level, certify all units of competence listed in the key competence framework the level at which it is proposed;
- At secondary level, certify at least two competencies in each competency unit of each key competence area.

Obtaining a full professional certification depends on the certification of all units of competence, identified in the competence framework professionals concerned. The methodological guidelines and regulatory standards relating to the competence certification stage are prepared and published by ANQEP, I. P. The Qualifica Centre files a copy and/or record of the certification test carried out by the candidate.

Germany

There 2 main mechanisms applied to all educational areas:

A. General/structural RPL: Each holder of a certain qualification receives an exemption. A non-bureaucratic approach, applied on different levels:

   IVET: Each apprentice with good grades and/or the university entrance diploma (Abitur) might shorten the length of their apprenticeship programme by ½ year.

   IVET: The certificate of a 2-year/EQF level 3 qualification (in our sector the leather processing worker/Fachkraft Lederverarbeitung) is fully accredited against the corresponding 3-year/EQF level 4 qualifications (in our sector the industrial shoemaker/industrieller Schuhfertiger). If leather-processing workers want to proceed to level 4, they have to participate only in the third (last) year of this apprenticeship programme.

   CVET (EQF 6): A holder of any foreman qualification (EQF6) is exempted from examinations on the (by far smallest) part 2 (VET trainer ordinance) when acquiring the foreman qualification in another sector.

   HE (EQF 6/7): Students who change their programmes (f. e. from engineering to technical VET-teacher) are exempted from lessons already learned in the previous programme. Students qualified in technical IVET/CVET programmes are exempted from few lectures, f. e. technical drawing.

   All the drafted examples rely on identical curricula/exams or established good practice; thus, no additional quality assurance (QA) measures are applied.

B. Individual RPL applies mainly when talking about exemptions from visiting courses or seminars or undertaking an apprenticeship, thus it plays only a minor role in CVET. Interesting examples are:

   As drafted above, RPL in IVET (EQF3/4): Workers with experience or qualified in other countries without bilateral acceptance of qualification might apply at their local chamber for RPL via a portfolio. As Germany has 79 chambers (responsible for their region), measures applied are manifold and often do not follow QA principles; the local labour market and political beliefs nebulise objective measures. In regions of Germany, where the lack of skilled workers is already obvious, chambers developed generous concepts: They accept a lot of evidence and offer tailor-made support to pass the exams. On the other side, in poorer regions unskilled workers, especially from abroad (refugees) are seen as competitors: Regional chamber bureaucrats and other stakeholders are brilliant in throwing obstacles in the processes of RPL.

   CVET (EQF 6): A holder of any foreman qualification (EQF6) might be exempted from examinations on part 1 (Vocation-overlapping skills) when acquiring the foreman qualification in another sector. Comparable to the approach applied by chambers drafted above, the acceptance and the procedure depend strongly on the sector and the region.

   1. “Upon application, the competent body may exempt the candidate from the examination in the examination section "Vocation-overlapping skills" [...], if in the five years preceding the application, an examination has been successfully passed before a competent body, a public or state-recognized educational institution, or before a state examination board, which meets the requirements of the relevant examination content under this Ordinance. In the area of the foremen's examination there is (mostly) no automatic recognition, but there is an exemption after an individual case examination by the committee. The decision then naturally also applies to comparable cases. Since the examinations are often structured differently, however, one field of activity is usually not completely covered. The most likely exemptions are in the areas of order processing or operations management.” (own translation of the answer of the chamber in charge for industrial shoe sector.)

   2. Thus, a complete exemption from examination is hardly possible – independent of former qualifications. Here it is important to highlight again, that CVET is a business model for chambers and educational providers: People, qualified via corresponding IVET and with a certain work experience (6 months or 1 year) are allowed to apply for the examinations without visiting any course. But examinations are linked this close to the courses that most candidates would fail. The reason is very simple: People, participating only in the examination, have to pay a fee of 550€ (2019) – if they visit the courses, as well, they have to pay additionally 7380€ (2019).

      HE (EQF 6/7): Students who studied already at another faculty, in another country or have experience as skilled workers might apply for individual RPL. Again, no general or reliable QA measures exist; it depends strongly on the person being in charge of RPL. A rather curious side-effect of Bologna reforms, aiming (beside other) at increasing transnational mobility, can be reported: Before Bologna, students who spent a semester abroad, were depending on the good-will of their professors when talking about recognition of their learning outcomes (LO) from abroad. Nowadays, with all the detailed module descriptions, that differ at least slightly from university to university, begrudging professors have evidence for non-acceptance ...

Romania

Professional competences assessing mechanism:

- The persons who wish to be evaluated in order to recognize their professional competencies obtained in other ways than the formal ones, address an authorized centre for the respective occupation / qualification.
- Each candidate submits a written application to the authorized centre.
- Each candidate is assigned a professional skills evaluator who is responsible for implementing the entire assessment process.
- Before entering the evaluation process, the candidate analyses, assisted by the professional skills evaluator, his own professional performance in relation to the content of the occupational / professional training standard.
- Depending on the result of the self-assessment, the professional skills evaluator recommends the candidate to enter the assessment process for the entire standard or for part of the occupational standard or not to enter the assessment process.
- The decision to enter the evaluation process belongs to the candidate, who attaches to the submitted application the list of competence units for which he wants to be evaluated and the list of competence units of the occupational standard.
- by following legal requirements, each centre establishes a concrete way of evaluation, so that the applied methods to demonstrate the competence as a whole.
- It is mandatory that the written test and a method of practical demonstration of competence be part of any combination of methods chosen by the centre / evaluator of professional skills.

The process of granting credits has four main stages:

1. Initial advice and guidance (process, costs, roles and responsibilities, learning paths);
2. Support (understanding and identifying learning outcomes, collecting and selecting evidence);
3. Recognition / evaluation of evidence regarding learning outcomes;
4. Granting credits.

For recognizing professional experience and qualifications gained abroad, a guide covers the following scenarios:

1. Recognition / equivalence of pre-university and university diplomas;
2. Recognition of professional experience gained in EU, EEA or Swiss Confederation;
3. Recognition of a certificate of qualification acquired outside the education system, through an authorized vocational training providers / competence assessment centre;
4. Recognition of prior experience (with/without supporting documents) with or without a qualification certificate.

5.3.3 Quality control of RPL processes

Portugal

The monitoring and evaluation of the operation and activity of the Qualification Centres is the responsibility of ANQEP, I. P. The functioning, results and impacts resulting from the activity of the Qualifica Centres network may be subject to regular external evaluation, to be contracted with entities of recognized merit and scientific competence.

Germany

All the above described examples of *structural* RPL rely on identical curricula/exams or established good practice; thus no additional quality assurance (QA) measures are applied.

Laws do not regulate the examples of individual RPL, any QA measures are up to the recognizing institution.

Romania

To ensure the compatibility of prior learning results with the existing requirements, the recognition process has to report to the existing occupational / training standards which are constantly updated and the competence assessment centres should be constantly monitored by the National Authority for Qualifications.

5.3.4 Strengths and weaknesses

Portugal

RPL in Portugal, also called RVCC (Recognition, Validation and Certification of Competences) is a well-structured process based on a PROGRAM (Qualifica Program) and developed Referential, implemented by well-trained teams (Qualifica Centres), with interventions reported in Qualifica Passport.

The referential will be renovated in a very near future.

One of the weaknesses was the tied range of level of EQF qualifications possible to apply – from 1 to 4. With the new regulation in force in February 2022, the level is extended to 5.

The program is flexible and dedicated to a wide range of target-group, mainly adults in labour market.

Strengths

- Well-structured process based on a PROGRAM (QUALIFICA)
- The program is flexible and dedicated to a wide range of target-group, mainly adults in labour market.
- RPL process centred in the individual
- Existence of Portfolio
- Referential for RPL process

Weaknesses

- Tied range of level of EQF qualifications possible to apply – from 1 to 4

Opportunities

- Now to be extended to level 5 EQF
- New referential are coming

Threats

Germany

Strengths
- Structural RPL well established.
- Many options of individual RPL.

Weaknesses
- Overwhelming relevance of formal qualifications.
- Individual RPL without QA standards and depending on good-willingness of competent institution.

Opportunities
- Options for mutual learning from other countries.
- Lack of skilled workers might accelerate German inert system

Threats
- Established and recognized CVET-qualifications might be challenged by "plug and play" certificates.

Romania

According to the National Strategy for Lifelong Learning, to facilitate the transition between the sub-sectors the education system the recognition of all forms of learning is prerequisite and a well-established system for recognizing prior learning is essential for the efficient use of the National Qualification Framework.

Romania needs to further develop its model for recognizing previous learning and the administrative capacity of existing competence assessment centres needs to be improved to recognize the learning acquired in non-formal and informal contexts. One option to improve the learning recognition structure is to extend the geographical coverage of these centres. Part of the improvement measurements should be designed to inform potential beneficiaries about the benefits of the assessment and certification process and the opportunity to improve their chances on the labour market. Additionally, it is important that the training provided by organizations from the public sector to be validated and certified. To support learners preparing their portfolios, education institutions should develop recognition policies for non-formal or informal learning which should include elements such as advice, feedback for students on the results of the evaluation and the possibility to file an appeal. These policies should be implemented through consultancy, counselling and recognition centres.

Strengths

- Well established system for recognizing prior learning

Weaknesses

- Administrative capacity of existing competence assessment centres.

Opportunities

- Further develop of the model for recognizing previous learning
- To extend the geographical coverage of RPL centres.
- Improve information to potential beneficiaries about the benefits of the assessment and certification process and the opportunity to improve their chances on the labour market.
- Training provided by organizations from the public sector to be validated and certified.
- Develop recognition policies for non-formal or informal learning which should include elements such as advice, feedback for students on the results of the evaluation and the possibility to file an appeal

Threats

5.4 Exploitation of the findings in DIA-CVET

Which of these mechanisms can be put in place on CVET-levels 5 or 6 respective in-line with the national regulations for these levels?

Portugal

According to the legislation, the mechanism of recognition of prior learning targets part of national system of qualifications from 1 to 5, not including level 6. It's feasible to apply to level 5 professional RPL.

Germany

As the aim of DIA-CVET in Germany is not to invent a new system, but to revive the industrial shoemaker foreman, we recommend applying within DIA-CVET mechanisms comparable to those drafted above. The DIA-CVET approach is more modular (5 or 6 modules to be tested in the participating countries); thus, participants who have already learnt the content of a sector-independent Sphere of Activity (e. g. environmental management) elsewhere should receive structural recognition for this sphere.

Romania

According to the legislation, the mechanism of recognition of prior learning targets the whole national system of qualifications (covered by general secondary education, vocational and technical education, continuous professional training, apprenticeship, and higher education) obtained in formal contexts and in informal and non-formal ones, from the perspective of lifelong learning. It's then possible to test the correspondent 5 to 6 level.

6 Didactic Design Options

In line with the DIA–CVET project's goal to develop and implement attractive Continuing Vocational Education and Training (CVET) programmes, which qualify for tasks beyond machine operation on the shop floor in the shoe industries in three countries, it is essential to appropriately design training units for the projected target groups. This chapter provides the didactic principles for the training measures to be carried out. They are intended as an orientation for the training staff (CVET trainers and teachers) and should be taken into account when drafting the sphere-specific leaning and teaching manuals.

Since the didactic principles are presented as general guidelines, their implementation in teaching and learning processes requires the appropriate consideration of the framing conditions in the companies and particularly the consideration of the actual learning contents. In order to determine these contents, during the project studies were carried out, on the basis of which 13 spheres of activity could be identified. Each sphere of activity includes certain processes, functions and activities that are more demanding in their qualification requirements and necessary competence levels than productive machine work (please refer to Intellectual Output 1 for more details). Thus, the proposed CVET program is suitable to open career opportunities in the footwear sector that are above the qualification level of an initial vocational training. The targeted EQF levels range between levels 5 and 7.

Besides the above-mentioned spheres of activity, which serve as content orientation, the learning station analyses (LSA)/Task Analyses (TA) already developed and tested in the previous project provide the information necessary for didactic conception on the work processes, the conditions at the workplaces, the required competences as well as on the learning content and the curricular content to be realised. What the LSA/TA also brought to light, however, are – in addition to the sectoral similarities – also clear differences between the cases, which are based on the particular characteristics of the underlying national VET systems, but also on company-specific peculiarities in dealing with vocational education, in particular with CVET.

Taking into consideration these framing references that were made apparent in the first phase of the project, the following basics of didactic considerations guide the didactics of further training measures to be carried out:

- The training measures are oriented towards the spheres of activity, i.e. they address activities or processes such as shoe design, technical development, quality assurance or training management, and the respective dominant (partial) work processes.
- The training measures refer to the results of the learning station analyses (LSA) insofar as they identify the special features of the respective workplace and describe sub-tasks and the learning opportunities inherent in them.
- The planned measures are CVET activities, i.e. they tie in with the participants' previous vocational knowledge and experience-based work process knowledge, so the further training is not an academic but a vocational measure.

Three didactic pillars can be derived from these basic didactic considerations. First, the continuing vocational education and training measures must be aligned with a work and business process orientation; second, they must be oriented towards competences and thirdly, the measures must be geared towards the occupational capability to act and ensure its development (see figure 1).

In the following, the didactic principles which should guide the teaching and learning processes to be implemented are described in more detail. In addition, some less strict didactic considerations are made concerning the "time after the acquisition of competences" (or the framework conditions of the acquisition of competences). With the formulated didactic pillars (competence orientation, work process orientation and vocational ability to act), predominantly knowledge-oriented didactics are just as much excluded as constructivist or identity/subject-related didactics – however, borrowings from these special didactics can be sensibly made. Especially since competence-oriented didactics can comprise several components, e.g. phases of knowledge acquisition and phases of work-integrated, practical learning, whereby different didactics are used in the different phases.

Building on the well-known didactic triangle which relates learners, educators/teachers and learning contents, the challenges of didactic approaches particularly to CVET courses lie firstly in the specifics of the learning contents that have direct practical relevance and should promote the competence development of the learners, secondly and thirdly in the specifics of the learners and educators/teachers. In contrast to learners in schools or other areas of adult education, learners in CVET courses are adults who usually do not have a large 'distance' to the mentioned learning contents, because these contents are related to their field of experience, i.e. to work processes. Against this background, the didactic task of the teacher is to bridge the distance between the learner and the learning content. For basic didactic principles guiding the CVET measures this means designing the learning processes and learning arrangements in such a way that they

- are appropriate for the target group, i.e. appropriate to the learning styles of the learners which are more practical experiential rather than abstract academic;
- are designed along business and work processes;
- are introducing and presenting the content in such a way that it connects to the learner's prior knowledge and experience in shoe production;
- are embedded in the real world of production, i.e. learning processes are work-integrated or close to the work processes;
- integrate experience-based learning with other forms of knowledge acquisition.

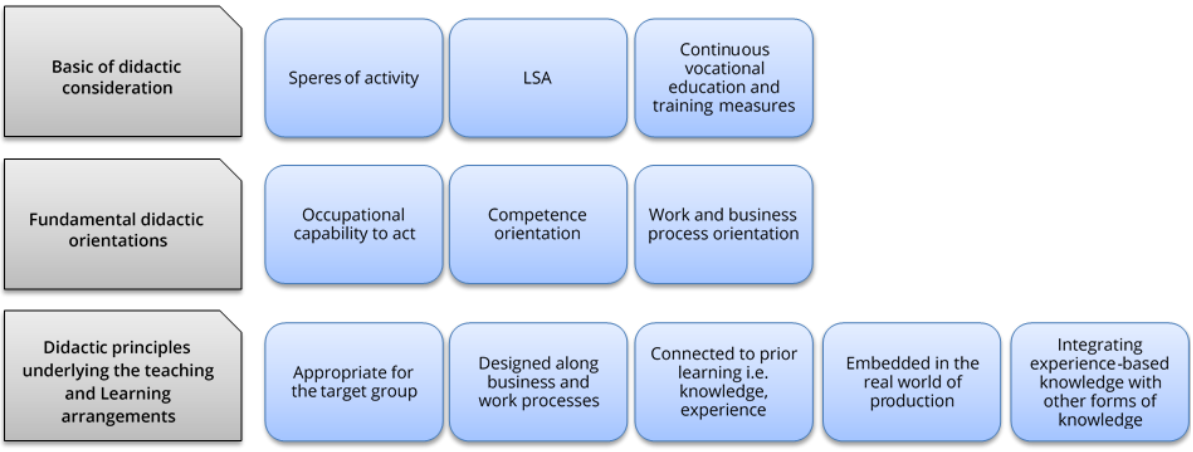


Fig. 1: Overall Didactic Approach

Based on the above described and illustrated (see figure 1) fundamental didactic pillars (competence orientation, work process orientation and vocational ability to act) the implementation of these 5 dimensions is explained in the following paragraphs. But it has to be kept in mind that the practical implementation cannot be the same in all countries, since contexts such as national VET systems or company-specific work and (vocational) learning cultures may differ considerably.

The didactic implementation of target group adequacy must be connected to the competences and knowledge already acquired by the learners. It also requires recognising the predominant learning styles of the addressees, which in the case of CVET programmes are usually more practical and experiential by nature. The learning arrangements have to be adapted accordingly by focusing more on doing things, i.e. learning by acting in real work processes. Since the competence level to be achieved with the CVET program is significantly higher than the one corresponding to EQF level 4, it will also be important to impart theoretical knowledge (basics and overview knowledge) in suitable learning environments and with appropriate didactic methods. The guiding concept for target group adequacy is individualised learning, i.e. recognising individual strengths first, picking up on them, promoting them and enabling them being lifted up to a higher level of competence. For example, a learner's existing competencies, such as developing maintenance plans for a machine, can be expanded to the ability to develop general maintenance plans and lead to the competence to implement these plans for a production line (incl. personnel allocation, work safety and quality assurance).

The didactic consideration of business and work process orientation is reflected in the design and arrangement of learning stations insofar as the latter can represent a partial business or work process. Within the framework of a training programme, not all learning stations can be run through according to the course of the complete business process, for example because some spheres do not correspond to sub-processes, but are to be understood as overarching (overview knowledge). Therefore, it will be necessary to include overview knowledge related to the entire business process in the training programme.

The connectivity of the planned training measures to the learner's prior knowledge and experience in shoe production has to be ensured. The identification of previous learning outcomes can be accomplished, for example, by means of portfolios. Besides being subject of accreditation this also means that the learning contents of the CVET programme need to be designed as an extension and deepening of existing knowledge. This also means taking into account the learners' learning modes of the past, building on them and also developing them further. Some more details on the role of experience-based learning are given in the above section on the target group adequacy.

Embedding the CVET programme in the real world of production is an eminently important requirement for the design of learning processes and learning arrangements in so far as it turns the workplace simultaneously into a learning place and thus enables work-integrated learning to be pursued. If not work-integrated in the strictest sense (i.e. not de-coupled from the real production process) learning in such an environment must at least take place close to the workplace or at a work and learning place that is (partially) decoupled from the work process. This is important because embedding learning in the work and production process ensures that the design (layout) of the workplace, all the tools and machines to be used, all the necessary information and also the interfaces to neighbouring and up- or downstream areas are available.

More detailed information on these preconditions are provided by the Learning Station Analyses as well as by the documentation of the spheres of activity of foremen in industrial shoe production.

A key point for designing learning processes and learning arrangements is the integration of experience-based learning with the acquisition of other forms of knowledge, such as overview knowledge, functional knowledge etc. As already mentioned above, experience-based or work-integrated learning is required to take place in or close to the production process which applies to almost all vocational learning processes. Compared to initial vocational education and training, CVET programmes aiming to reach the level of a specialist technician at lower management level will be even more dependent on linking practical learning with theory-based learning that is more focused on basic knowledge, overview knowledge and in-depth specialised knowledge. Thus, practical learning phases will have to alternate with more traditional "classroom learning" phases. The extent to which the latter can be realised through self-teaching depends on the contextual conditions in the respective countries and companies.

In order to ensure the integration of the various learning outcomes, the transfer of theoretical knowledge into practical action must be arranged as smoothly as possible from a didactic point of view, just as, conversely, practical knowledge should find its way into the acquisition of theoretical learning content. This is particularly important because in continuing vocational training it is a matter of implementing competence orientation (and not the expansion of knowledge) with the concrete goal of improving vocational and professional action competence.

Last but not least it should be noted here that learning to learn must also be learned by the learners so that they can control, organise and determine their learning processes themselves to a large extent. However, self-determined learning must be made possible by the didactic actions of the educators and trainers. The role of the educators and trainers is not that of a teacher/instructor, but that of an enabler.

Concluding advices for the implementation of the didactic principles

This brief elaboration of didactic principles and design guidelines for didactic action is of a general nature and largely lacks concrete recommendations for educators' and trainers' action. The lack of 'recipe instructions' is mainly due to the fact that the implementation of the didactical principles in the context of the implementation of CVET programmes in different countries requires adaptation to the respective national, sectoral, organisational and also situational specificities. In particular, the specifics of national education systems (especially vocational education and training) as well as prevailing learning cultures have to be taken into account when implementing the unfolded didactic principles. In moving from the abstract to the concrete, the spheres of activity developed and documented in the project as well as the learning station analyses (LSA) are particularly well suited to serve as a starting point for didactics guiding action of educators and trainers. But it must also be taken into account that, for example, the detailed process steps listed in the LSA as well as the described curriculum contents (could) require adjustments or at least different emphases in the participating countries. Likewise, if individual spheres or learning stations cannot be covered by one company, it may be necessary for learners to pass through these at another company or a company-independent training centre.

Despite the need to make adjustments, Klafki's maxim of always focusing on the learners and their appropriation (i.e. learning) processes should not be forgotten.

7 Design Manual

7.1 Introduction

7.1.1 Aims of the DIA-CVET Project

The aims of the Erasmus+ project «Developing Innovative and Attractive CVET programmes in industrial shoe production» are

- to develop, pilot and implement comprehensive courses for the Spheres of Activity (SoA) of foremen in industrial shoe production on European level; available in English (EN) as well as in DE, RO and PT,
- and to develop a sector qualification framework level 5 and 6 and to reference existing or newly drafted national qualifications from Germany, Portugal and Romania.

7.1.2 Manuals to Guide Tutors and Trainers

The purpose of the manuals is to prepare designated trainers for their role and to provide content and support. Due to the nature of the SoA of foremen, they do not include specific forms of training; but we suggest a blended approach. Successful Continuous Vocational Education and Training (CVET) programmes combine theoretical lessons with application of the acquired Knowledge, Skills and Competences (KSC) in real work environments. The tasks of a trainer are to

- impart SoA-specific KSC,
- demonstrate operations which the learners are expected to learn to perform,
- introduce the learners to each new task and supervise them during their first approaches,
- organise and supervise blended activities (i. e. projects),
- guide them towards an independent performance of the tasks of the respective SoA.

The manuals are not meant to replace a textbook. They are meant to provide support to the trainers to plan and execute their teaching. The trainers are invited to gather more information from other sources.

7.1.3 Refer your training to the business process of industrial shoe production

Industrial production is a complex process, where the Sphere of Activity, described in this manual, is embedded in the business process. Before you start the training on a specific SoA, please make sure that the learners are familiar with the other SoA of industrial foremen in shoe production.

For example, the learners should be introduced to the types of products the company manufactures and their intended use, the different customer segments, the distribution channels etc. They should be aware of the product creation and manufacturing processes, i.e. product design, pattern making, purchasing department, production planning, and all production departments to warehouse and logistics.

The production process (not part of DIA-CVET, for insights see: http://icsas-project.eu/) is in the core of the business process; the SoA of DIA-CVET play a preparatory, supporting or accompanying role (see Fig. 2).

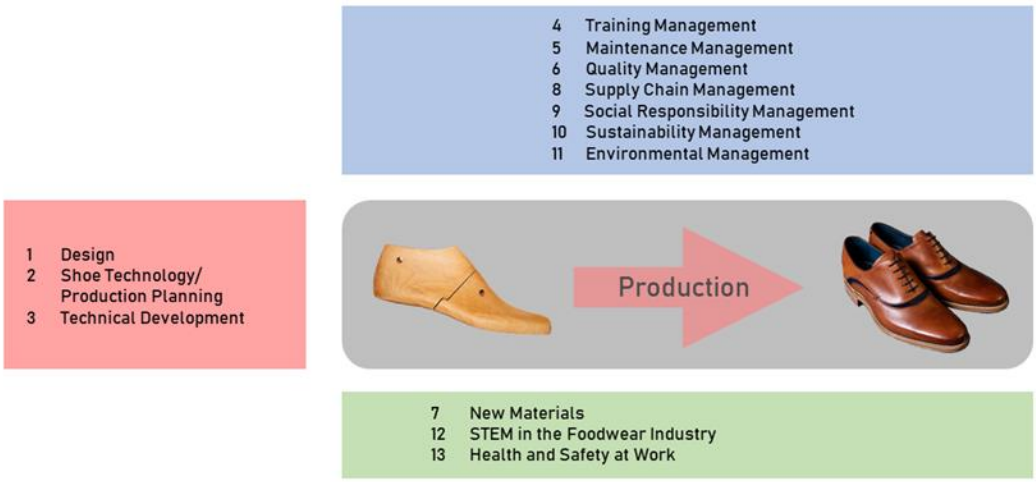


Fig. 2: Spheres of Activity of DIA-CVET and their relation to the production process.

7.2 Design

Footwear design is a complex process that involves a variety of individuals, including consumers, retailers, marketing, designers, product developers, engineers, technicians and even scientists and doctors.

Footwear design stages:

- Research – brand identity, consumer requirements, current trends, materials, technologies, innovations, competitors etc.;
- Brief – establishing parameters like features, characteristics, construction, technical solutions, materials, design constraints, target group, target price;
- Design – inspiration, concept, sketches, virtual modelling, renderings;
- Develop – patternmaking, technical sheets;
- Prototype – rapid prototyping, samples, testing, modifications;
- Validate – final products approval by company management, marketing team and customers.

7.2.1 Footwear trends

Footwear has to be both functional and aesthetic appealing in the same time and has to offer consumers a way to express themselves.

Trends that are shaping the footwear industry:

- **Sustainability** - consumers are growing more aware of global and ecological issues and start to prioritize brands that make a positive impact by recycling, using eco-friendly materials, adopting sustainable manufacturing technologies and promoting durability and quality over fast-fashion.
- **Comfort** - manufacturers should focus on comfort and health features, for footwear categories occasion and formal, by adopting innovative materials and constructions.
- **Multifunctional and smart -** consumers want more from their products, to cover both leisure and outdoor activities by merging style and performance and also by incorporating smart wearable technologies.
- **Personalization** - customers are willing to pay for the possibility to express themselves and to have something specifically designed by them and for them.

7.2.2 Virtual prototyping

Virtual prototyping (VP) is defined as a computer-aided design process that implies the construction of digital product models and realistic graphical simulations that address the broad issues of physical layout, operational concept, functional specifications, and dynamics analysis under various operating environments.

Virtual Prototyping has several benefits like flexible design, short development time, reduced time to market, easy detect errors, realistic simulation, reduced costs, reduced number of physical prototypes and increased productivity.

Fig. 3: Footwear Virtual Prototype. Source: www.compasslist.com/insights/4d-shoetech-digital-design-platform-helps-shoemakers-to-slash-production-time-by-over-60

7.2.3 Digital Materials and Rendering

True realism in virtual design and prototyping can be achieved by using rendering software and digital materials that reproduce the aspect (brightness, roughness, transparency) and texture of real materials (textile, leather).

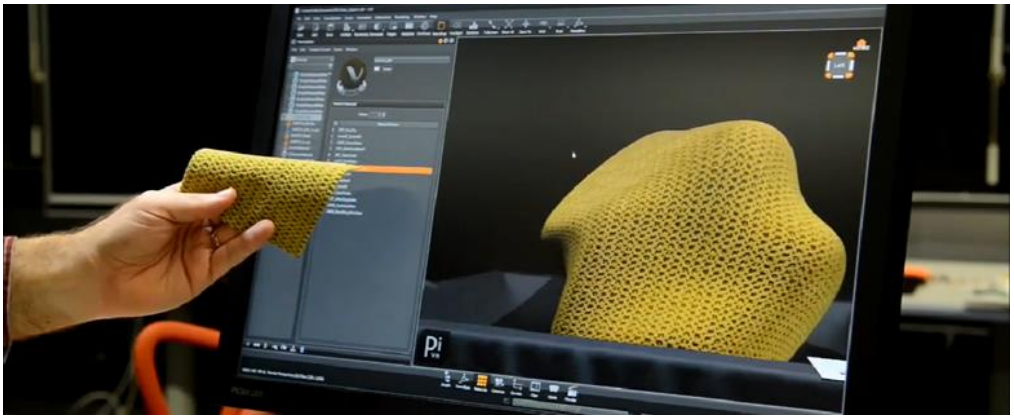


Fig. 4: Digital material. Source: https://blog.ranchcomputing.com/capture-of-real-materials-next-step-of-photorealism

7.2.4 Rapid prototyping

Rapid prototyping is the fast fabrication of physical components and models by using virtual tools and additive manufacturing. The use of additive manufacturing shortens the development process time and also represents a more viable solution than traditional manufacturing techniques by enabling complex parts to be manufactured directly from a digital format without using specific tooling.

An example of using rapid prototyping for 3D printing of footwear components (sole, heel and counter) is given in the following figure:

Fig. 5: 3D printed prototypes of footwear components. Source: TUIASI

7.2.5 Virtual Reality and Augmented Reality

Virtual reality (VR) and Augmented reality (AR) are technologies that enhance and simulate physical environments by using virtual computer-generated information. Augmented reality enhances/augments the environment by adding digital elements to a live view. Virtual reality is a completely immersive experience that replaces and simulates a real-life environment.

Virtual prototyping applications can incorporate virtual reality technologies, augmented reality or mixed reality technologies.

Fig. 6: Augmented reality application. Source: https://scanblue.com/augmented-reality-and-shoes/

Fig. 7: Virtual reality technology in footwear design. Source: https://www.worldviz.com/post/footwear-company-deckers-uses-vr-to-reduce-travel-and-drive-collaboration

7.2.6 Virtual testing

Testing footwear is an expensive and time-consuming process, each concept has to be manufactured, tested and if it does not meet the desired performance requirements it is sent back to the drawing board and the entire development process is started all over again. One solution is to use virtual testing.

For each footwear design a prototype must be manufactured, and tested and if it does not meet stipulated performance criteria, another design iteration is required. One method to reduce the number of iterations, improve efficiency, and improve the pre-production process, is to use virtual testing. For example, Finite Element Analysis (FEA) software can be used to test the performance of different footwear geometries and footwear materials.

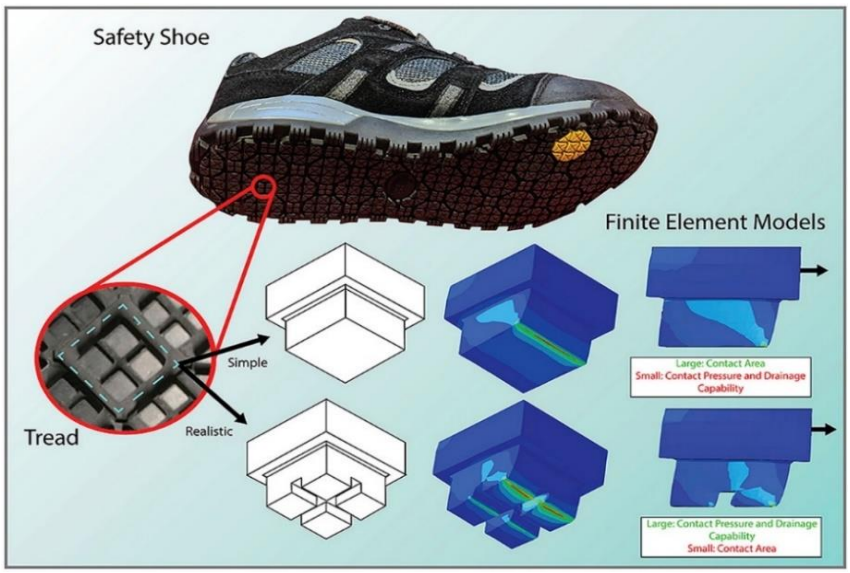


Fig. 8: Virtual testing of footwear outsole. Source: J. Hale, A. O'Connell, R. Lewis, M.J. Carré, J.A. Rongong, An Evaluation of Shoe Tread Parameters using FEM, Tribology International, Volume 153, 2021, 106570, ISSN 0301-679X, https://doi.org/10.1016/j.triboint.2020.106570.

8 Curricula DE

8.1 Design

Topic	Content	Proposed duration (days)	Mode
SWOT and market analysis	Positioning and strategy development, risks and opportunities	0,5	On site
Benchmarking	Comparative analysis of market position, competitive analysis	0,5	On site
Product concept	Defining the target group, new product concepts or expansion of the target group, creation of a product concept	1	On site
Production planning	Capacity planning, investment and budget planning, distribution control, Contribution margin	1	On site
Collection development	Methodology design process, specifications, aspects: Consumer demand, impact, Benefits, appearance, durability, colors or materials, design, sample production / prototyping, collection, functionality test, presentation	1	On site
Moodboard	Work tools and presentation tools	0,5	On site
Virtual collection	Photoshop 2D / 3D Rendering	1	On site

Excursions	Content	Proposed duration (days)	Mode
Excursions	Transparent shoe factory, shoe museum, material manufacturer	0,25 0,25 0,5	On site

Assessment method Learning success	Content	Mode
Discussion	Recap, Teaching content and conclusions Evaluation scheme	On site, end of course, 0,5 days
Questionnaire	Suggestions for improvement	End of course

Materials
See Trainer Manual Design
Hale, J., O'Connell, A., Lewis, R., Carré, M. J., & Rongong, J. A. (2021). An evaluation of shoe tread parameters using FEM.*Tribology International*, *153*, 106570.
Motawi, W. (2021) *How shoes are made* (Vol. 1). Walid Motawi.
Motawi, W. (2015) Footwear Pattern Making and Last Design Walid Motawi.
Motawi, W. (2018) *Shoe Material Design Guide* (Vol. 3). Walid Motawi.
Luximon, A. (Ed.) (2021). *Handbook of footwear design and manufacture*. Woodhead Publishing.

8.2 Production Planning

Topic	Content	Proposed duration (days)	Mode
ERP systems	What are ERP systems, ERP systems for the textile sector?	0,5	On site
Industry 4.0.	Introduction, degree of automation, risks and opportunities, status in the footwear industry	0,5	On site
Digitalisation	Digital transformation of various industries, benefits of artificial intelligence (AI), digitalisation of company processes vs. digitalisation of products, individualisation of customer wishes, platform economy/online trade	0,25	On site
Organisation chart - company structure	Hierarchies, positions, departments, tasks and management responsibilities	0,25	On site
The following topics under workflow			
Product data management	Classification of articles, sizes, models, variants, design, target market, materials, components, technical instructions, etc.	1	On site
Order processing	Inventories, production and delivery planning according to deadlines and available resources	1	On site
Production planning and monitoring	Planning and coordination of all production phases as well as tracking of orders and consumptions	1	On site
Material and component planning and inventory management	Ordering materials and components for production orders, invoice management, inventory management	1	On site
Delivery and management of stock of finished goods:	Plan, organize and track all logistics and supply chain activities	0,5	On site
Human resource management	Ensure that sufficient personnel are available to process the production orders; track daily working time and productivity	0,5	On site

Excursions	Content	Proposed duration (days)	Mode
Excursions	PSP Logistik, Ring Maschinenbau	0,25 0,25	On site

Assessment method Learning success	Content	Mode
Discussion	Recap, Teaching content and conclusions Evaluation scheme	On site, end of course, 0,5 days
Questionnaire	Suggestions for improvement	End of course

Materials
see Trainer Manual Production planning
Zangiacomi, Andrea, et al. "Process planning and scheduling for mass customised shoe manufacturing." *International Journal of Computer Integrated Manufacturing* 17.7 (2004): 613-621.
Fung, Y. N., Chan, H. L., Choi, T. M., & Liu, R. (2021). Sustainable product development processes in fashion: Supply chains structures and classifications. International Journal of Production Economics, 231, 107911.
Wen, X., Choi, T. M., & Chung, S. H. (2019). Fashion retail supply chain management: A review of operational models.*International Journal of Production Economics*,*207*, 34-55. https://www.researchgate.net/publication/328711222_Fashion_Retail_Supply_Chain_Management_A_Review_of_Operational_Models
Muthu, S. S. (Ed.). (2020).*Leather and Footwear Sustainability: Manufacturing, Supply Chain, and Product Level Issues*. Springer Nature.
Schuh, G., & Stich, V. (Eds.). (2012). Produktionsplanung und-steuerung 1: Grundlagen der PPS. Springer-Verlag.
Kim, Min-Gyu, et al. "Robot-based Shoe Manufacturing System." *2018 18th International Conference on Control, Automation and Systems (ICCAS)*. IEEE, 2018.

8.3 Technical Development

Topic	Content	Proposed duration (days)	Mode
Last	Moulding development/wood mouldings/production mouldings/plastic, metal, properties, closure type, net to gross construction mouldings	2	On site
Last copy	Changing of the 3D surface of the moulding to 2D basis for basic model	1	On site
Basic model	Additions to the last copy result in the basic model outline. Model section is inserted in the basic model. Detailing creates the individual parts of the section	1	On site
Rapid Prototyping	Is the first physical output of the sole after 3D construction	0,25	On site
Models	Sole and maquette are joined together, model can be physically assessed for the first time > Approval	2	On site
Sample	Production of samples and patterns as true to production as possible	2	On site
Makes	The most common types of manufacture such as Ago, Strobel, California, Moccasin, Flexible, GoodYear, Opanke, etc.	1	On site
Shaft construction	Joining of the individual parts to the upper, different variations depending on the type of construction.	1	On site
Base construction	Insole, cover sole, insole, outsole, heels	2	On site

Excursions	Content	Proposed duration (days)	Mode
Excursions	Transparent shoe factory, Shoe museum, PSA shoes (Seibel)	0,25 0,25 0,5	On site

Practice	Content	Proposed duration (days)	Mode
Shoe making	Practice different methods of constructions	5	On site

Assessment method Learning success	Content	Mode
Discussion	Recap, Teaching content and conclusions Evaluation scheme	On site, end of course, 0,5 days
Questionnaire	Suggestions for improvement	End of course

Materials
see Trainer Manual technical development
Hale, J., O'Connell, A., Lewis, R., Carré, M. J., & Rongong, J. A. (2021). An evaluation of shoe tread parameters using FEM.*Tribology International*, *153*, 106570.
Blattner, M. (2009). Everything about shoes. Lüdin AG.
Motawi, W. (2021) *How shoes are made* (Vol. 1). Walid Motawi.
Motawi, W. (2015) Footwear Pattern Making and Last Design Walid Motawi.
Motawi, W. (2018) *Shoe Material Design Guide* (Vol. 3). Walid Motawi.
Luximon, A. (Ed.) (2021). *Handbook of footwear design and manufacture*. Woodhead Publishing.

8.4 Sustainability Management

Topic	Content	Proposed duration (days)	Mode
Fundamentals of sustainability	Definition, models	1	On site
Standardization and certification	National and international standardization, quality management systems, environmental management systems	0,5	On site
Ecological and social perspectives	Conventions, initiatives	1	On site
Legislation and policy	National, European and international markets, authorities and regulatory issues	1	On site
Media and public perception	Green marketing, greenwashing, success stories and failures	1	On site
Corporate Social Responsibility (CSR)	Definition and scope, CSR strategies	0,5	On site
Toxins, pollutants and metrics	REACH, Greenhouse Gas Protocol, CO2 footprint	1	On site
Sustainable materials and components for footwear	Plastics, leather, eco-labelling and environmental certification. Contrasting manufacturing of materials versus durability	1	On site

Topic	Content	Proposed duration (days)	Mode
Eco-design	Design for manufacture, design for recycling, material selection and cutting for least possible waste/consumption.	0,5	On site
Sustainable packaging for footwear	Key challenges, reusable and recyclable packaging	0,5	On site
Sustainable manufacturing for footwear	Production Planning	0,5	On site
Supply chain and logistics for footwear	Logistics and transport	0,5	On site

Excursions	Content	Proposed duration (days)	Mode
Excursions	e.g. local shoe manufacturer, leather goods supplier or recycling station	0,5	On site
Guest speaker	e.g. a textile company about its sustainability concept, its supply chain management and its recycling strategy	0,5	Online

Practice	Content	Proposed duration (days)	Mode
Case study	Analyze and compare the sustainability strategies of two or three apparel companies.	0,5	Homework
Case study	Analysis of sustainability efforts in own company/development of a CRS strategy.	0,5	On site, group work

Assessment method Learning success	Content	Mode
Discussion	Recap, Teaching content and conclusions Evaluation scheme	On site, end of course, 0,5 days
Questionnaire	Suggestions for improvement	End of course

Material
see Trainer Manual Sustainability management
17 UN Sustainability Goals https://sdgs.un.org/
OECD Due Diligence Guidance for Responsible Supply Chains in the Garment & Footwear Sector https://www.oecd.org/industry/inv/mne/responsible-supply-chains-textile-garment-sector.htm
EU CommissionEU strategy for sustainable and circular textiles https://ec.europa.eu/environment/strategy/textiles-strategy_en
DIN EN ISO 14001:2015

Material
https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/iso-14001-umweltmanagementsystemnorm
„Eco-Management and Audit Scheme“ – EMAS https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/emas-umweltmanagement-guetesiegel-der-europaeischen#systematisches-umweltmanagement-mit-emas https://ec.europa.eu/environment/emas/index_en.htm
DIN EN ISO 26000 – 2021 https://www.bmas.de/SharedDocs/Downloads/DE/Publikationen/a395-csr-din-26000.pdf;jsessionid=4D13AB08B49ABEEC351806FA3187FF75.delivery2-master?__blob=publicationFile&v=1 https://ec.europa.eu/environment/emas/pdf/factsheets/EMASFactsheet_ISO26000.pdf https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100258.pdf
DIN EN ISO 9001 - 2015
CSR in Deutschland https://www.csr-in-deutschland.de/DE/CSR-Allgemein/csr-allgemein.html
Step2Sustainability https://step2sustainability.ctcp.pt/pag.asp?idp=130&op=0

8.5 STEM

Topic	Content	Proposed duration (days)	Mode
Automation and Robots	Basics, robots and people, types of robots, functionality, programming, existing automation processes in industry.	0,5	On site
3D Printing - Additive Manifacturing	Different techniques e.g. Stereolithography, Fused Deposition Moulding, Selective Laser-Sintering, Selective Laser-Melting, Material Beam Process, Binder Jetting, Print Preparation, Problems and Challenges	0,5	On site
Machine Vision	Basics, key components (light, lens, camera sensor), image processing, recognition of barcodes and QR codes, colour control, area measurement, defect detection, position recognition, augmented reality	0,5	On site
Artificial Intelligence	Automation, digitalisation, image processing, data processing	0,25	On site
Sensors	Basics, measurement parameters, measurement methods, local sensors, mobile sensors, sensors in shoes, evaluations	0,25	On site
Anatomy and Biomechanics	Locomotor system, foot anatomy, development with age, gait, forces, pressures, measurement methods	0,5	On site

Practice	Content	Proposed duration (days)	Mode
Measurements in the biomechanics laboratory	Foot measurements (blueprint, caliper, scanner). Gait analyses, application of measurement methods (pressure, force, EMG, video)	0,5	On site

Excursions	Content	Proposed duration (days)	Mode
Excursions	Transparent shoe factory, shoe museum, Ring GmbH, DESMA	0,25 0,25 0,5 0,5	On site

Assessment method Learning success	Content	Mode
Discussion	Recap, Teaching content and conclusions Evaluation scheme	On site, end of course, 0,5 days
Questionnaire	Suggestions for improvement	End of course

Materials
see Trainer Manual STEM
Kim, Min-Gyu, et al. (*2018) "Robot-based Shoe Manufacturing System",* 18th International Conference on Control, Automation and Systems (ICCAS), IEEE, 2018.
Oliver, Guillermo, et al. (2021), "Towards footwear manufacturing 4.0: shoe sole robotic grasping in assembling operations".The International Journal of Advanced Manufacturing Technology, 114.3, 811-827. https://www.researchgate.net/publication/348705383_Towards_footwear_manufacturing_40_Shoe_sole_robotic_grasping_in_assembling_operations
Dispan, J., & Mendler, L. (2021). „*Branchenanalyse Leder-und Schuhindustrie: Entwicklungstrends und Herausforderungen*" (No. 210). Working Paper Forschungsförderung.
Goonetilleke, R. S. (Ed.). (2012), "*The science of footwear",* CRC Press.
Luximon, A. (Ed.). (2021) "*Handbook of footwear design and manufacture*. Woodhead" Publishing.
Ludwig, O. (2012), „*Ganganalyse in der Praxis: Anwendung in Prävention, Therapie und Versorgung*". Maurer.
Baumgartner, R., Möller, M., & Stinus, H. (2011), „*Orthopädieschuhtechnik*". Maurer.
Platzer, W., & Shiozawa-Bayer, T. (2018), "*Taschenatlas der Anatomie Band 1: Bewegungsapparat*", Thieme.

9 Quality Assurance Guidelines

9.1 Introduction

Quality assurance activities in VET projects are not desirable add-ons to the operative project works, neither can they be assigned to a single work package. Rather, quality assurance is always a crucial integrated activity across all phases of various kinds of research and development projects. Therefore, it is essential for the DIA-CVET project to implement quality assurance measures that are applied during all major work steps.

Generally speaking, quality assurance aims to ensure that defined quality requirements are met for products, services as well as for the processes employed to produce both. During the last decades a number of quality assurance systems, measures and international standardisations such as ISO 9000 have been developed. A rather influential quality assurance concept was developed by W.E. Deming in the USA in the 1940s. It was successfully adapted by Japanese industrial companies in post-war Japan and amalgamated with the kaizen principle it spread globally as Total Quality Management. The core of Deming's concept, the so-called Plan-Do-Check-Act (PDCA) cycle, can still be found in many variations in today's QA systems as we will see when having a closer look to the EQAVET system (European Quality Assurance for Vocational Education and Training, see: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009H0708(01)&qid=1611571795661) in the following paragraphs.

Although QA systems claim to be in principle suitable for all types of production and service provision, there are some sectors that do not correspond to the structures of (industrial) production and general service sectors. The exceptions indicated include particularly software development, the medical sector and the sphere of vocational education and training – especially continuing vocational education and training (CVET).

The CVET sector differs from other sectors in that there is an almost uncountable number of providers of courses and learning programs, and at the same time there are only uniform quality standards for very few courses. The main reason for this is that, in contrast to the industrial production of products for the outcomes of educational processes, i.e., competencies or learning aims, it is much more difficult to establish standards. For one thing, learners are a very heterogeneous group in terms of motivation, performance and previous learning experiences. In response, the pedagogical-didactic concepts of the courses have to take this into account by using adapted – and that means non-standardized – contents and teaching/learning concepts.

For the DIA-CVET project, it follows that the quality assurance measures used must take into account the special features of the development and exemplary implementation of a further training program for industrial shoe production in 3 European countries. At the same time, the QA measures propose a quality framework for CVET programs in industrial shoe manufacturing.

The following outlines the functions that the QA system must fulfil. Then the QA principles guidelines and the measures that might be applied are explained. Finally, the tools that might be used are presented.

9.2 Functions

The quality assurance measures in the DIA-CVET project essentially serve two functions. Firstly, they are intended to ensure the quality of the operational work in the project, i.e. the development of a CVET concept for shoe makers at EQF level 5-7 and the piloting of the concept in the three countries involved. In second place, but no less important, is the documentation of the quality of the developed concepts in order to create transparency and to make the quality of the developed, implemented and evaluated CVET concept verifiable. This not only exposes the quality, but also lays a foundation for the recognition and validation of learning outcomes and a transparent basis for possible certifications. The joint development work on the CVET concept and the pilots in three participating countries as well as the consensual agreement on a quality framework for CVET in the footwear industry play an important role in this.

9.3 Essential QA principles

For the reasons mentioned above, the QA principles underpinning the DIA-CVET project are building on the framework concept developed by EQAVET, which is based on the Quality Assurance Cycle (QAC). The QAC represents, easily recognisable, an adaptation of the Deming Cycle to the specifics of vocational education and training. The QAC also defines four work steps, namely planning, implementation, evaluation and review (see Fig. 9). The EQAVET concept foresees to go through all steps to generate a high level of quality and to continuously improve it, and to apply appropriate measures in each step of the process, such as stakeholder involvement, establishment of quality circles or similarly.

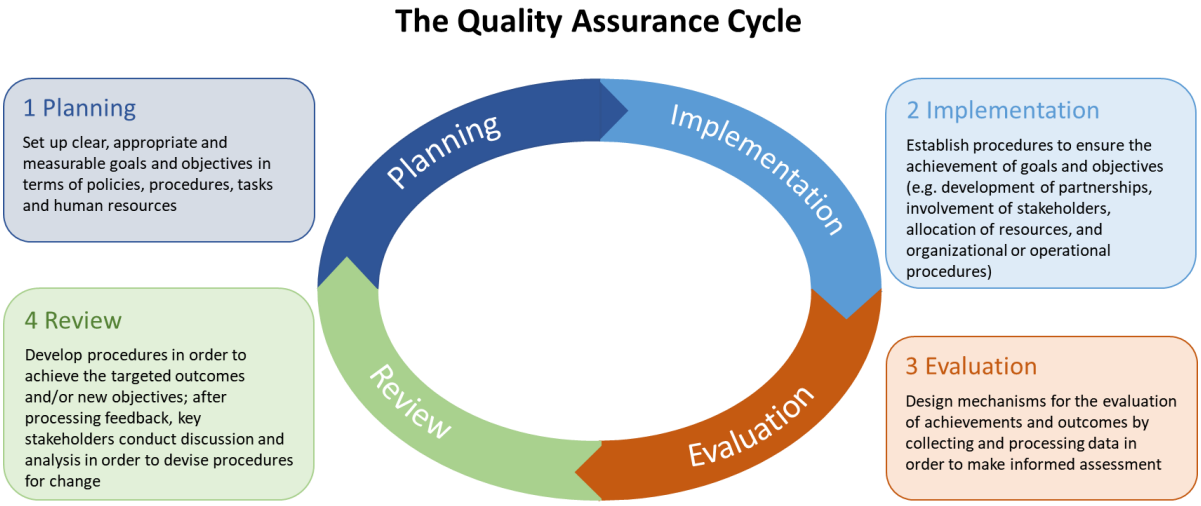


Fig. 9: The EQAVET Quality Assurance Cycle
Source: https://ec.europa.eu/social/main.jsp?catId=1546&langId=en 13-12-2021

This model is applicable for quality assurance on different levels, e.g. on the system level (of vocational education and training) as well as for training providers (of CVET courses). The DIA-CVET project is comparable to the latter in that its core task is to develop and implement a continuing education curriculum for workers in the footwear industry.

The guiding principles for quality assurance are therefore designed along the *criterion of appropriateness*. This means on the one hand the appropriateness of the developed CVET curriculum for qualification requirements at technician level in the footwear industry, and on the other hand it includes the suitability of the measure related to a sectoral training concept (CVET)

for the European footwear industry. In addition to this general alignment, all procedures (incl. sub-processes) and QA tools developed in the project must also be assessed for their appropriateness.

Another fundamental orientation of the quality assurance implemented in the project is the focus on both *formative and summative* QA procedures. The formative approach, in the sense of the EQAVET quality cycle (see figure 9), aims to involve stakeholders in the essential work phases of the project in the form of workshops. In essence, the aim is to validate intermediate results developed in the course of the project, which are reflected in documents or materials. For all four phases of the QA cycle, this approach provides the most comprehensive feedback, and as an in-process instrument, formative QA is basically designed as a tool for improving outcomes and as a basis for interventions.

The summative approach has a very special significance for DIA-CVET, since it touches the core task of the project, i. e. implementing/piloting and evaluating courses for technical and managerial competences for shoe makers at EQF level 5-7. At this point, it is extremely important to determine the expansion or broadening of competencies of the learners in order to validate the courses (content and pedagogical principles) developed on the basis of expertise from professionals and project participants. Different instruments to implement this are explained in detail in the following section on measures and instruments.

At this point, the central role of a SWOT analysis should be pointed out. During piloting the developed courses all stakeholders involved will be invited to participate at workshops directly after the termination of the training courses, in the frame of which a SWOT analysis is conducted. The detailed feedback collected in this way will be used to develop suggestions for improving the CVET courses and, at the same time, provide recommendations for further sectoral CVET measures.

Eventually, another key concept of QA includes a comprehensive assessment of developed CVET programmes and a transparent account of the results which will also stimulate the *critical reflexion*. Furthermore, it will contribute to increasing the acceptance of the CVET courses in the sector and at the same time provides the basis for transfer measures into the footwear sector.

9.4 Measures and Instruments in detail

The basic QA principles translate into a bundle of different measures. As mentioned in the previous sections, the overall quality of the essential final outcome of the project, which will be an exemplarily implemented CVET programme for specialist workers of the footwear industry, strongly depends on the quality of preceding project steps insofar as they are prerequisites for achieving and assuring the quality of the final outcome.

In this sense, the development and exemplary implementation of CVET courses for the competence development of skilled workers in the footwear industry on EQF level 5-7 builds on a *critical path* consisting of different planning, information collecting and development steps. In the following sub-chapter, these steps are described with regard to the respective measures and instruments for quality assurance.

In the subsequent chapter QA measures and instruments for competence assessment are presented, which are crucial for the project success, since the evaluation of the competence development of the shoe workers in the course of the piloted CVET training measures can assess the validity of the training units and the project success as a whole.

9.4.1 Measures and instruments in the survey and development phase

To determine the competency requirements for an industrial footwear manufacturing specialist at an advanced level (technician or specialist level), the DIA-CVET project identifies the core work areas. These are elaborated by so-called Task Analyses (TA), whose orientation is based on the elicitation of the skill needs of work processes and tasks, on the potential learning outcomes when learning in a work process, and on the necessary prior skills for succeeding in a concrete learning environment.

The TAs are preceded by the identification of so-called Spheres of Activity. These describe typical work areas for qualified personnel at technician level and are oriented to existing requirements, while at the same time also attempting to prospectively incorporate emerging requirements. Using an instrument already developed in the ICSAS project and adapted to the conditions of CVET in DIA-CVET, the project partners in the participating countries were able to consensually determine 13 relevant Spheres of Activity. To validate the taxonomic definition, external experts (stakeholders) were also consulted and, if necessary, changes were made to the description of the SoA (cp. chapter 1).

Based on the classification of the Spheres, Task Analyses are carried out for the different SoA (cp. chapter 2 and 3). For quality assurance, a multi-step procedure was developed that uses semi-standardised instruments. Different instruments and measures for QA are used in the individual process steps (preparation/planning, implementation and evaluation). In the preparation phase, the learning environments to be analysed in companies are selected roughly according to their representativeness with regard to the core characteristics of the SoA. The composition of the analysis team follows the guiding principle of a mixed team, consisting of a company expert and a vocational researcher, in order to exclude biases and integrate different perspectives. The resulting diversity of perspectives is an important contribution to quality assurance. A template with guiding questions along different analysis categories is used for the implementation. This structured, semi-open questionnaire was developed cooperatively in the partnership and tested before use, so that on the one hand national differences are taken into account and on the other hand a high degree of validity can be ensured. The findings of the TA are entered into a semi-open template, which corresponds to the analysis categories.

By using the TA instrument, which has already been successfully used in previous projects in industrial shoe production, but modified for the purposes of the DIA-CVET project, a high quality of results can be ensured. The standardised instruments (templates) and the cooperative collaboration in the project consortium – for example in the adaptation of the instruments – have contributed to this. The involvement of stakeholders in the implementation of the TA is also an essential factor for quality assurance.

With the results of the Spheres and TA a deeper insight into the competences required to successfully work in one (or some) of the 13 spheres identified is provided. But even more, also the tasks to be performed, work content, environmental conditions of the workplace, the organisational integration and the required competence prerequisites/qualification requirements surveyed by the TA are included in the curricula of the CVET courses. The curriculum development for the CVET courses to be implemented again relies on the involvement of stakeholders who contribute their expert knowledge in the framework of 3 national workshops and thus contribute to the validation and improvement of the curricula developed through mutual understanding within the partnership. This also means introducing the completed templates as a basis for discussion in the workshops. The course of the discussions as well as the results of all workshops are carefully documented and serve as a basis for the discursive understanding in the project

consortium about the contents of the CVET courses to be developed, e.g. which core competences should/must be promoted. In addition, the workshops also provide information on necessary adjustments to the instruments (templates).

9.4.2 Measures and instruments in the piloting and evaluation phase

The piloted implementation of the curricula into training courses will be evaluated through short workshops. Five short workshops are planned in each country, following five CVET courses. Over the piloting period of one year, 5 of the 13 spheres will be covered in each country. Immediately after the completion of the sphere-specific CVET courses, course participants, trainers and stakeholders will take part in workshops aimed at assessing the appropriateness of the course contents and whether or not the competence level of the course participants is raised (in their self-assessment and in the assessment of the trainers). At the current stage it is not yet decided, which instruments will be used, a decision will be made among the project consortium. So far the following options for a skills and competence assessment exist:

- The course participants may fill out questionnaires on the quality of the course (didactic and content) and provide a self-assessment of the learning outcomes (lessons learned) and the achieved level of competences.
- Testing the learning outcomes through questionnaires.
- Assessing the learning outcomes and extension of competence level by qualitative interviews.
- Assessing learning outcomes and improvement of competence level by portfolios
- Assessing learning outcomes and improvement of competence level by carrying out a practical examination in a work place.

Obviously, a mix of these approaches is also conceivable, but above all there is the feasibility within the given time frame and the conditions of applicability in the countries involved.

Overall, these workshops including the instruments used for competence assessment serve the purpose to initiate and to foster a reflexing on the lessons learnt through the workshops. As the workshops follow each other at longer intervals, conclusions from the previous workshops can be taken into account in the design of subsequent CVET courses in all participating countries - as long as the conclusions are not Sphere-specific. This is linked to the expectation of improving the pedagogical-didactic as well as the content quality of the CVET courses in the course of the pilot phase. From a cross-sectional perspective, the national workshops conducted can provide feedback and advice for adapting the technical content of the CVET courses. For this reason, this aspect, i.e. the mutual exchange of experiences and feedback from the workshops, will be the subject of discussion at one or more partnership meetings.

In the final stage of the project there will be carried out a final workshop in each country, which will serve the purpose of a summative quality assurance measure; more specific: With the participation of all actors involved during the course of the project the developed CVET curricula and the implemented courses will be assessed along a SWOT analysis and evaluated regarding:

a) their appropriateness for qualification requirements at technician level in the footwear industry, and

b) the suitability of the measure related to a sectoral training concept (CVET) for the European footwear industry.

The inclusion of all project-relevant actors as well as the relatively strong structuring of the workshop through the SWOT analysis and the clear target of proposing practical recommendations for further CVET in the sector at the end of the workshop will safeguard a high quality level.

All the QA measures and instruments listed so far ultimately serve to ensure the transparency and credibility of the proposed, developed and exemplarily implemented CVET programme for the European footwear industry at the highest possible level. At the same time, the novel instruments such as SoA and TA lay the foundation for an innovative quality assurance framework for CVET in the footwear industry.

A high degree of transparency of the process quality and the results will be ensured through a continuous assessment of the appropriateness of the instruments accompanying the piloting and with the validation of the findings, which will be reflected in the medium term in an improved recognition, validation and accreditation of learning outcomes of CVET courses in the footwear industry. Tab. 5 provides an overview of all QA tools implemented and the actors involved.

	Project phase	Implemented QA instruments	Agents
chap. 4.1	Analyses	- Spheres of Activity (SoA) - Task analyses (TA) - Workshops	Project partners, Experts Project partners, Experts Stakeholders, Experts
	Curriculum Development	- Workshops	Project partners, Stakeholders, Experts
chap. 4.2	Assessment of Competence Development	- Questionnaire on course quality and outcomes - Testing outcomes - Qualitative interviews on learning outcomes and competence level - Portfolio on learning outcomes and competence level - practical examination on learning outcomes and competence level	Project partners, Experts, Stakeholders, Learners
	Final Project Assessment	Workshop (SWOT analysis)	Project partners, Experts, Stakeholders, Learners

Tab. 6: Synopsis of the most important QA measures

10 Quality Assurance Questionnaire

IO5

Quality Assurance

Evaluation Questionnaire for courses

1. Organisation of the course

Please give feedback on the organisation of the course.

You are kindly asked to indicate how strong you agree or disagree to the statements by marking the appropriate.

	strongly disagree				strongly agree
The venues and facilities were suitable.	☐	☐	☐	☐	☐
The course was well structured. Evidence of good planning.	☐	☐	☐	☐	☐
The trips/sessions had realistic timescales.	☐	☐	☐	☐	☐
The agenda covered interesting subjects.	☐	☐	☐	☐	☐
Information on travel and accommodation was appropriate.	☐	☐	☐	☐	☐

2. Content and appropriate range of sessions/ activities

In the following some statements on the content and appropriate range of sessions/ activities are given.

Please indicate whether you agree or disagree.

	strongly disagree				strongly agree
The course provided appropriate content that was clearly related to the objectives of the sphere of activity.	☐	☐	☐	☐	☐
The presentations and activities were relevant.	☐	☐	☐	☐	☐
The schedule provided enough opportunities to discuss and exchange ideas.	☐	☐	☐	☐	☐
The selection of contributors / speakers was appropriate.	☐	☐	☐	☐	☐

Please turn the page.

3. Do you mean to say:

I understood the content of the course and how I could use it to further improve my current or upcoming working tasks.

Yes	The essential elements	Only in parts	No	No answer
☐	☐	☐	☐	☐

Comments:

What did you find positive about the seminar?

What did you find negative or that could be improved in the seminar?

Do you have any other comments or suggestions?

Thank you for your cooperation!

11 Pilot Experiences and SWOT

11.1 Pilot Experiences: Germany

11.1.1 Introduction

The objective of the report is to showcase the implementation process and outcomes of the piloting courses for Continuous Vocational Education and Training (CVET) in the sector of Industrial Footwear Production in Germany. In the social and educational context where Vocational Education and Training (VET) is often perceived as a secondary option for individuals who did not succeed in Higher Education, this project aims to empower vocational career choices and enhance the significance of Continuous Vocational Education and Training.

The applied teaching method of blended courses focuses on combining theoretical lessons with practical tasks or exercises on the same sphere of activity.

Piloting of CVET is based on a developed curriculum covering five out of 13 spheres of activity identified as necessary to build on from qualifications acquired via Initial Vocational Education and Training (IVET): Sustainability management; STEM, Design, Technical development and Production planning.

The responsible teachers evaluated the trainees' performance and documented their progress. To further improve the courses, trainees were asked to answer a series of questions after each course and during a final validation workshop to assess the structure, content and usefulness of the courses.

11.1.2 Participants

All participants in the courses were employed in the shoe industry, but they came from diverse backgrounds and worked in different areas within the industry. In Germany, there were no restrictions on access to courses based on previous certifications. However, all participants either had an education in the areas of shoe, leather, or textile or had relevant working experience.

A total of 21 people, including local, national and international participants, attended one or more DIA-CVET pilot courses. Four PFI employees participated in various courses to further their education in areas that are not part of their core competencies.

11.1.3 Teachers

The teachers were crucial contributors to the apprenticeship programs, playing an integral role by imparting both practical skills and theoretical knowledge. The teachers were employees of the PFI who gained their expertise from their industry experience and/or research background. They also possessed extensive training expertise.

Prior to commencing the pilot activity, the tutors were informed about the objectives of the pilot, provided with the Train the Trainers manuals, and given access to the spheres of activity webpage. All of them also contributed to the development of the curricula. At least three trainers took part in one or both LTTA workshops.

11.1.4 Courses

The sustainability course spanned two weeks, consisting of a total of 80 hours, while all other courses had a duration of one week, totalling 40 hours each.

The teaching at the ISC has integrated the new curricula and topics. STEM and Design courses were conducted twice within the project time, and we included all data gathered through participant surveys for both courses.

Learning spheres	Example of Learning content	Time	Number of participants
Sustainability	• Introduction Sustainability, Environment & Social • Legal regulations • Pollutants • Metrics in sustainability • Carbon footprint • Polymers, Bioplastics • Recycling & Recovery • Development of a CSR strategy (Corporate Sustainability Reporting) • Sustainable Materials • Eco Design	2 weeks (80 hours) 16. 20.5.22 &. 20.-24.06.22	8
STEM	• Anatomy and Biomechanics • Sensors and measurement equipment • 3D Printing • Automation and Robots • Artificial Intelligence	1 week (40 hours) 14. - 17.11.22 30.01. - 03.02.23	8 3
Design	• SWOT and market analysis • Benchmarking • Product concept • Production outline • Collection development • Moodboard • Virtual collection	1 week (40 hours) 10. – 15.10.22 06. – 10.03.23	2 6
Technical Development	• Last • Last copy • Copy of base model • Models • Sample • Construction methods	1 week (40 hours) 19. – 23.06.23	3
Production Planning	• Production planning and monitoring • Material and component planning and inventory management • Delivery and management of finished goods inventory: • Personnel management	1 week (40 hours) 08. – 12.05.23	3

Tab. 7: Spheres for piloting

11.1.5 Piloting impressions

For the video with impressions of the STEM course go to the PFI youtube channel.

https://www.youtube.com/@pfipirmasens529/videos

11.1.6 Formative Quality Assurance

11.1.6.1 Learning Outcomes evaluation

At the end of the training module, participants' performance and development were evaluated using various methods, depending on the specific sphere of activity. These evaluation methods included:

- Written test: participants were assessed through a written examination designed to test their knowledge and understanding of the course's content. This evaluation method typically consisted of multiple-choice questions and/or required written explanations regarding a topic.
- Oral discussion with teacher: participants engaged in one-on-one or group discussions with the teacher to assess their comprehension, critical thinking skills, and ability to articulate their ideas. These discussions provided an opportunity for participants to demonstrate their understanding of the material and engage in deeper analysis.
- Task in individual work: participants were assigned individual tasks or assignments relevant to the course's content. These tasks could involve a practical exercise or any other activity that required participants to apply their newly acquired knowledge and skills.
- Task in group work: in some cases, participants were required to collaborate in a group project. The evaluation of group work assessed participants' ability to work effectively as a team, communicate and collaborate with others, and produce a collective output that reflected their combined efforts and understanding of the course's material.

The choice of evaluation method(s) depended on the nature of the course material, its learning objectives, and the desired outcomes. Often, a combination of these methods was used to provide a comprehensive assessment of participants' performance and evolution in the specific sphere of activity.

During the assessment process, all participants demonstrated commendable performance and displayed a solid grasp of the newly acquired knowledge. However, it is important to acknowledge that certain individuals experienced significant anxiety related to the assessments. To alleviate their concerns, we made sure to thoroughly prepare them and provide reassurance throughout the process.

It is worth mentioning that the sample size was relatively small, but the issue of anxiety during assessments may be particularly pronounced among individuals who have not been in an examination setting for an extended period. Consequently, older employees might face greater challenges in adapting to the specific circumstances of examination. Nonetheless, we made efforts to create a supportive environment and address their concerns as best as we could. The positive test results show that all participants performed well in the tests under these conditions.

11.1.6.2 Feedback from participants

To further improve the content of the courses a questionnaire was filled out by all participants at the end of each course regarding content, possible improvements, and practical appliance of the gained knowledge. The questionnaire was developed as part of IO5 (Chapter 10).

11.1.6.3 Results of the participant survey

The results of the questionnaire have been analysed and are presented below. The questions have been displayed in abbreviated form in the diagram, for the full question please consult the questionnaire as presented above.

Based on the analysis, it is evident that the participants expressed a high level of satisfaction with all the courses. The lowest rating recorded was 4 out of 5 points. It should be noted that the rating ranged from “highly disagree” (1) to “highly agree” (5), but was represented numerically (1-5) for analysis purposes.

The majority of the participants choose the highest rating for all questions, indicating a highly positive response. However, when asked about the understanding and usefulness of the course content for future tasks, the results were somewhat divided between agree and highly agree. This is understandable as the courses cover a wide range of topics, and not all of them may be directly relevant to each individual's specific workplace and tasks.

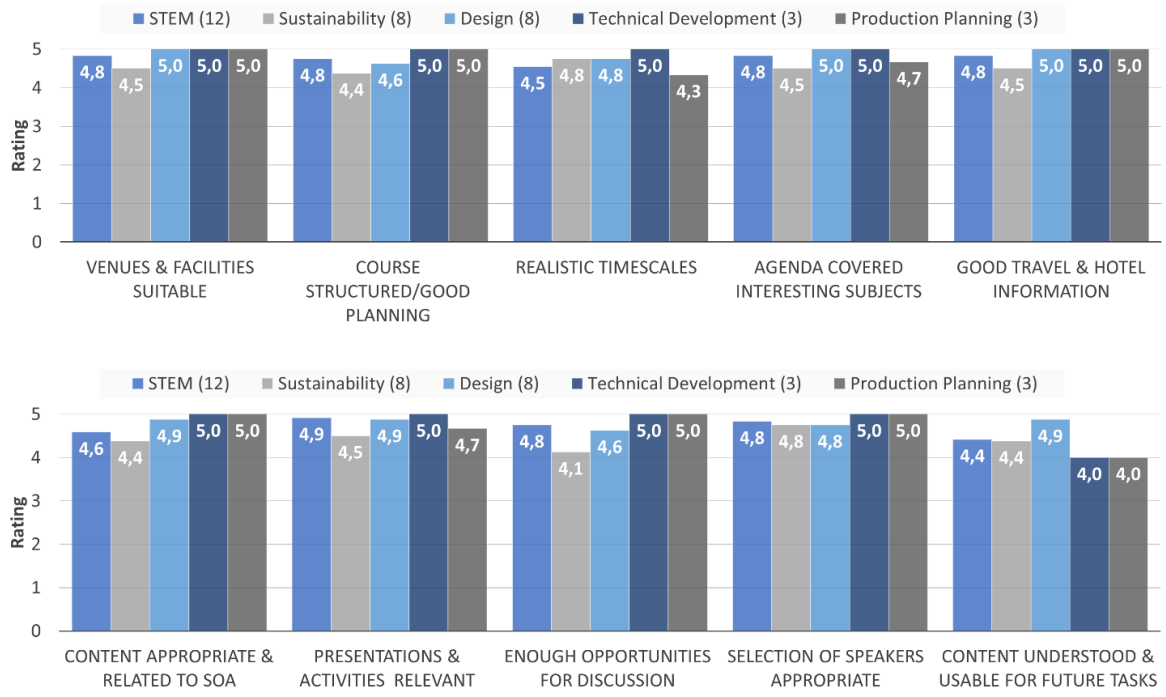


Fig. 10: Rating from the course questionnaires for each of the five courses. Number of participants in brackets. Rating 1 = strongly disagree, 5 = strongly agree.

The diagram presented below illustrates the results for each question across all courses.

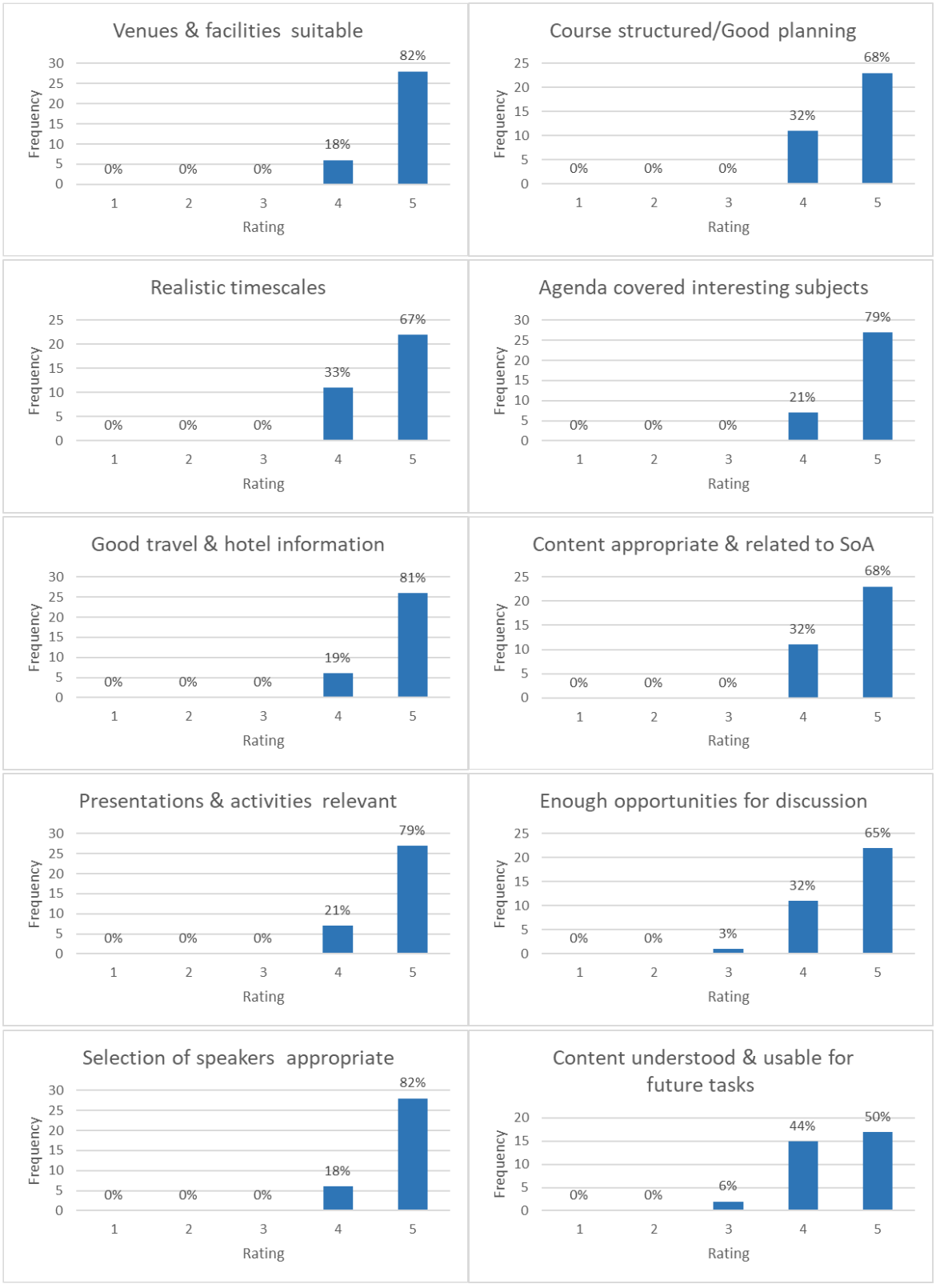


Fig. 11: Summary of evaluation by the participants over all five courses. Rating 1 = strongly disagree, 5 = strongly agree. Frequency equals the number of answers.

11.1.6.4 Summary of survey comments and feedback discussion

Here is a summary of the feedback gained through the questionnaire and the feedback discussion held at the end of each course and the final validation course.

Summary of feedback for sustainability course

The course and events were overseen by highly skilled professionals and demonstrated excellent organization. The course itself was well-prepared and comprehensible to all participants, irrespective of their prior knowledge. However, some individuals found it challenging to absorb the substantial amount of material within the given timeframe. Nonetheless, participants gained valuable knowledge and insights from the course, even though its practical application is still pending. The instructors' explanations were outstanding, and the provision of information and handouts was highly valued. Participants recommended incorporating more practical and group work, as well as introducing the topic of carbon footprint in the exam.

Summary of feedback for STEM course

Participants had a great experience in a well-organized course with effective theory-practice combination. The individuals involved were nice, kind, and professional. The learning materials were well-prepared, and the content was highly regarded. One suggestion was to shorten the section on foot diabetes and explore other topics more. Overall, the course received positive feedback, with participants finding it useful for their tasks. Biomechanics and its connection to the shoe industry interested them. They desired even more practical demonstrations and one participant requested more information on safety shoes. Good equipment facilitated learning and skill enhancement in shoe-making. Limited space in the lab was the one minor drawback mentioned. Some participants suggested extending or dividing the course into shorter sessions.

Summary of feedback for design course

Participants found the practical work and insights from industry speakers highly interesting. They appreciated the distribution of topics throughout the day and the well-structured content. One suggestion was to improve the sequence of steps on the first demanding day. The course effectively coordinated theory and practice, providing valuable practical skills for understanding and collaborating in various work settings, such as production and design.

Summary of feedback for technical development course

Good group dynamics and interesting, practical content made the course engaging. The week offered a good mix of theory and visits, such as to the shoe museum and factory, providing real-life examples. The seminar was well-structured in terms of time.

Summary of feedback for production planning course

The course had a strong focus on practical content that offered detailed and hands-on learning experiences. Participants suggested that the theoretical sessions be conducted in the morning, followed by the practical sessions in the afternoon. They emphasized the benefit of having received an overview of the quality standards, which improved their understanding of each step of the process. The practical aspect of the course was highly valued, with participants praising the collaboration, task demonstrations and support available. The course was well organized, with a clear daily schedule and timetable.

11.1.6.5 Quotes

Below are quotes from the questionnaire. Note that some of them are translated from German to English. Not all comments were legible.

Sustainability

"High professionals leading the course and events!"

"The course was very well organized and the teachers were very well prepared. Very much material in a few days without prior knowledge is difficult to process."

"I take away a lot, but the application will be seen."

"Extremely well prepared and very organized. Professionally well structured - from my point of view for everyone to understand even without much prior knowledge in the individual areas."

"Positive: very good explanations also on industry related questions. Good information flow and handouts for the participants by the lecturers."

"Everything good, informative conveyed in an understandable way, huge scope of tasks that must first be "sifted" by oneself in order to apply it to the company."

"Super round up information to fullfill my daily tasks."

"Content – positive."

"Homogeneous group – positive."

"Participants of the group – positive."

"More own practical or group work on examples – suggestions."

"Carbon footprint (bigger area) in the exam – suggestion."

STEM

"Everything super!"

"Very pleasant atmosphere, lecturers combine theory and practice very well."

"Very good organization and preparation of learning materials."

"I would shorten the foot diabetes part a bit, but go more into other things."

"All aspects were positive."

"Yes, I understood right and if I have tasks related the gained knowledge would be very useful."

"The positive was everything, the content of the seminar is great to have a better understanding. The only thing was limited space in the lab. No it was great thanks!"

"I have no knowledge about biomechanics from school. So, that I am a really sporty person I like this theme and for me it was so interesting."

"Lots of space for discussion."

"I want to see more about measuring feet (practically) and scanning pressure on the desk while we walking and compare each other."

"This was for me the best theme of the course. I like the others but this was interest me every time about human body and connection to the shoe industry."

"All sessions were logical and cover the topics."

"The course could be longer or divided in shorter sessions."

"The seminar was interesting. It was general Information about problem."

"The seminar was very interesting. I learned a lot of new things. The lectures were excellently prepared. I was most interested in the biomechanics of walking. I am passionate about hand made shoes."

"Very nice and kind persons."

"Very professionally."

"Good machinery – nice experience work with this."

"We could make our shoes perfect."

"Practice and learning together."

"Perfect presentation about anatomy, foot and others. I would appreciate more information about safety shoes."

Design

"Practical work was very interesting. Speakers from the industry have given great insights into the economy."

"I found it very positive how much practical occupation this week was and the distribution of the topics over the day."

"I would improve the first day the sequence of steps, because that was very demanding on the first day."

"Very well structured content."

"Suggestion for improvement: show groin copy once at the front."

"Theory and practice were well coordinated."

"The course was very practical."

"Even through I won't use the skills on a daily basis in my everyday worklife, they will help me a lot in understanding and working e.g. with production, designers etc."

Technical Development

"Very good group dynamics."

"Interesting contents - very practical."

"Varied week, theoretical parts and visits."

"Good ratio practice and theory."

"At shoe museum and shoe factory very interesting to understand the learned contents in practice Seminar was well structured in terms of time."

Production Planning

"High practical content."

"Very detailed."

"Theoretical units better held in the morning. Practical part then in the afternoon."

"Better review of quality standards, as individual work steps were made more comprehensible."

"High practical part."

"Very good cooperation: tasks were demonstrated and help was given."

"Good organization: daily schedule, timetable, etc.."

"Improvement: theory in the morning, practice in the afternoon."

11.2 SWOT Analysis in Germany

During an evaluation session, the German teachers thoroughly examined the benefits and weaknesses of Work-Based Learning (WBL) in general, using their insight gained in the DIA-CVET project and the implementation of the course content for the five Spheres of Activity (SoAs) that were piloted in Germany.

STRENGTHS

- Improved employment and career opportunities: the courses have the potential to offer participants better employment and career opportunities by enhancing their qualifications and knowledge. This, in turn, boosts their confidence in their own abilities and may reduce stress levels associated with job search, career progression or even the challenges associated with everyday work.
- Motivation through practical application: the integration of theory and practical application greatly motivates participants. They can witness the direct use and benefits of theoretical lessons, making the learning process more engaging and relevant.
- Broaden the horizon: the project provided participants/member of the AB and teachers with opportunities to visit their international partner organizations, their facilities and observe established training processes, collaborations and productions. This exposure opens eyes to further opportunities and fosters a broader perspective in accomplishing their own tasks.
- Professional development for teachers: The project allowed teachers to participate in Learning, Teaching, and Training Activities (LTTAs). This experience expanded their expertise beyond their core subjects and provides valuable lessons in effective communication.
- Valuable resources: the training manuals and curricula developed during the project hold value for both companies and providers of Continuing Vocational Education and Training (CVET). These resources can be used for ongoing training and serve as valuable references for future programs. While five SoAs have been piloted by the PFI in Germany and their content has been incorporated into all future teaching activities, the remaining eight manuals also hold much potential for further improvement.

WEAKNESSES

- Limited Resources: There might be a constraint of resources. This includes limitations in the number of qualified teachers or trainers available, the time and commitment required from both employers and trainees, availability of necessary equipment or facilities, and the associated costs for implementing the training.
- Limited Access: Not all employees might have equal access to the training opportunities. The accessibility of training may vary across different departments or divisions within an organization. Additionally, the willingness and support of supervisors or managers in offering training opportunities to their staff can also influence access. Furthermore, employees' motivation levels to access available resources might be limited by their individual learning backgrounds and history.
- Limited Availability: Training may not be universally available, and in some cases, they might not be available at all. This limitation can be due to a lack of cooperation, insufficient awareness, or interest among employers.
- Regulatory issues: Internal and external regulatory barriers may pose hindrances to the establishment of training initiatives by impeding the recognition of increased qualifications.

OPPORTUNITIES
• Improved workforce: Training results in a more qualified workforce. This, in turn, leads to increased production, enhanced quality, and promotes innovation within the industry. Thus, benefiting both the company and the shoe industry as a whole. • Relevance for industry: Work-Based Learning allows for targeted training, addressing the specific needs of the industry and ensuring that the content is both relevant and applicable to daily tasks, enhancing the skill set of the participants, thus increasing quality and speed of their work. • Continuous learning opportunities: Training beyond initial vocational education, provides individuals with opportunities for continuous skill development and adaptation to the ever-evolving demands of the workplace. • Mental flexibility: training opportunities allow people to use their minds, master new challenges and keep them engaged and interested in their work. • Enhanced company loyalty: Offering training opportunities and supporting the professional development of employees fosters a sense of loyalty and commitment to their companies. This, in turn, reduces the need for frequent replacements and training of new employees, contributing to a more stable and dedicated workforce and saving money due to a reduction in constant hiring efforts. • Scalability and replicability: The success of the training opens up possibilities for its successful implementation in other companies in different regions, benefiting a broader range of individuals and industries.
THREATS
• Rapid development: The industry is subjected to trends, changes in consumer preferences, and technological advancements (e.g. digitalisation), changing regulations especially regarding sustainability (e.g. Green Deal, circular economy). Training must adapt quickly to ensure relevance and to meet the evolving needs of the industry. Therefore, it requires continuous efforts to keep the content up to date. • Ensuring quality: maintaining consistent quality and standardization of work-based learning experiences across diverse workplaces and companies can be challenging. This might be particularly true when utilizing the opportunity to provide specialized training for niche or specific tasks while still upholding overall quality standards. • Lack of employer support: Inadequate support and mentorship from employers may impede the effectiveness of the training, leading to a diminished overall learning experience. Training initiatives might be deprioritized when other challenges emerge, such as the impact of events like the COVID-19 pandemic, economic fluctuations, or staff shortages. • Employee engagement challenges: A lack of interest among employees can arise due to uncertainty about the benefits of work-based learning, insufficient encouragement, additional effort that is required, or fear of examinations and assessments.

Tab. 8: SWOT analysis for WBL applicability in Germany

11.3 Pilot Experiences: Romania

11.3.1 Introduction

The Report on Experience and SWOT from piloting Work Based Learning in Romania developed as part of the Erasmus project *Developing Innovative and Attractive CVET programmes in industrial shoe production* aims to highlight the implementation process and results of applied dual/blended pilot of Continuous Vocational Education and Training (CVET) in Romania. This type of CVET programme – oriented towards the sector of industrial shoe production – is completely new in Romania, and it has the potential of being used as "apparent good practice" for other CVET programmes in other countries or sectors.

In the social and educational context where Vocational Education and Training (VET) is considered a second choice as a career path for those that have failed in their Higher Education endeavours, this project is thought to empower vocational career choices and strengthen Continuous Vocational Education and Training in the sector of Industrial Footwear Production, thus preparing the participants for a sector qualification framework for levels 5-7. The applied teaching method of blended courses focuses on combining theoretical lessons with a Work-Based Learning (WBL) project on the same sphere of activity.

WBL piloting of CVET is based on a developed curriculum covering five spheres of activity identified as necessary to build up from qualifications acquired via Initial Vocational Education and Training (IVET): environmental management; sustainability management; corporate social responsibility (CSR); design and technical development.

Six pilot participants were chosen among applicants based on their motivation and interests. As the project started, the selection criteria demanded that all participants should be enrolled / graduate from University Programs (DIA-CVET piloting is for EQF/NQF level 7). Each participant's recognition of prior learning (RPL), as guided in IO2/A2, was performed according to all Romanian Regulations.

The WBL pilot programme in Romania was implemented at Papucei footwear company and lasted six months, starting from January 2023. It involved three apprentices at other companies, enrolled in higher education studies from "Gheorghe Asachi" Technical University of Iasi, and three employees from Papucei.

The apprentices faced theoretical studies and real work processes specific to the main spheres of activity shared in the WBR curricula for industrial footwear manufacturing:

- Environmental Management (125h): conceptual approaches, reasons, causes, importance and objectives associated with EM, environmental factors, and polluting factors of a company.
- Sustainability Management (125h): identify the polluting factors for a footwear product, identify the value chain links for the studied product, improve the impact of a footwear product by implementing different sustainable solutions, life cycle impact assessment, selection of impact categories for footwear, carbon footprint calculation.
- Corporate social responsibility (CSR) (125h): raising CSR awareness, assessing the corporate purpose of the organisation in the current social context, establishing CSR mission and vision, CSR evaluation, development of an integrated CSR strategic plan, implementation of the integrated CSR strategic plan, maintaining internal and external communication, evaluation of integrated strategies and the communication process associated with CSR, real integration (institutionalisation) of CSR.

- Design (125h): define design concepts and prepare presentation panels, translate the design concept into a 3D model, define model components and technical details, develop a model collection, evaluate and analyse the footwear concept.
- Technical Development (125h): digital last, upper pieces, bottom components, textures and colours.

The responsible tutors evaluated the apprentices' achievements and documented their progress. To further improve the WBL activity, the apprentices were asked to answer a set of questions during an open interview to evaluate the atmosphere of the learning process.

The results of implementing WBL in Romania were shared and analysed during an evaluation session that gathered representatives from TUIASI and Papucei, academic staff, company managers, and heads of departments. Participating experts shared their opinions on implementing WBL, the progress made by trainees, benefits and future collaborations. The results of the WBL pilot were evaluated through a SWOT analysis and are presented in the final chapter of this report.

11.3.2 Recognition of Prior Learning

According to Romanian legislation, the mechanism of recognition of prior learning targets the whole national system of qualifications (covered by general secondary education, vocational and technical education, continuous professional training, apprenticeship and higher education) obtained in formal contexts and informal and non-formal ones, from the perspective of lifelong learning. At a national level, recognising prior learning is seen as essential for establishing an inclusive lifelong learning system and facilitating smooth transitions between different education sectors. The process is governed by the National Education Law and coordinated by the Romanian National Authority for Qualifications (ANC). As a public institution under the Ministry of Education, the ANC plays a crucial role in developing the Romanian National Qualification Framework (CNC) based on the European Qualifications Framework (EQF). It also manages the National Register of Qualifications (RNC) and the National Register of Adult Vocational Training Providers (RNFPA). These institutions ensure the recognition, evaluation, and alignment of learning outcomes acquired through formal, non-formal, and informal contexts, promoting the coherence of qualifications and certifications. Implementing the Romanian National Qualification Framework aims to prevent duplication and overlapping qualifications, empower learners in career planning, and facilitate lifelong professional growth.

Assessing professional competencies obtained through non-formal means is voluntary and aligned with occupational/professional training standards. Each unit of competence is evaluated, and the final result is determined as either "competent" or "not yet competent." Authorised public or private entities, Romanian or foreign, can evaluate and certify professional competencies, issuing certificates with national recognition. These entities are authorised for specific occupations/qualifications based on existing occupational/professional training standards. Each candidate is assigned a professional skills evaluator responsible for the assessment process. Before the evaluation begins, the candidate, with assistance from the evaluator, analyses their professional performance concerning the standard's content. Based on this self-assessment, the evaluator recommends whether the candidate should undergo assessment for the entire standard, part of the standard, or not enter the assessment process. The decision ultimately rests with the candidate, who specifies the competence units they wish to be evaluated. Each evaluation centre establishes its evaluation methods, ensuring the assessment covers written tests and practical demonstrations of competence.

The DIA-CVET project proposes a solution for people in the workforce seeking a vocational reorientation of their career. Footwear factories need qualified personnel but lack the facilities and didactic means to offer educational training in an authorised and recognised qualifications framework standard. In their support, the DIA-CVET project has implemented a program considering the trainees' prior knowledge and the new expertise they need to assimilate into the footwear industry.

Taking the national methodologies into account and based on the developed curriculum in IO4 for the DIA-CVET project, a series of evaluation forms were compiled to measure the trainees' prior knowledge. The same evaluation form was applied at the end of the Work Based Learning (WBL) program to quantify their evolution.

The proposed RPL recognition forms / final evaluation forms are presented below and cover the topics debated in the developed curricula.

To proceed with the WBL piloting, an official Agreement was signed between **"Georghe Asachi" Technical University of Iasi** and the company **Papucei**.

Sphere of Activity: Environmental Management				
Work task:	What are the polluting elements in the footwear industry			
Objective:				
Reading & understanding the required task;				
Identify the types of waste in the footwear industry;				
Perform an analysis of the polluting impact of the footwear industry;				
Acknowledge the current legislation supporting Environmental Management;				
Asking for support if needed.				
Evaluation:				
Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐
Tutor name:		Place:	Date:	Signature:
Work task:	Basic Principles and Elements of the Environmental Management System			
Objective:				
Reading & understanding the required task;				
A short analysis of the current Environmental Management standards;				
Notions and terms specific to an environmental management system;				
Advantages and disadvantages of implementing an Environmental Management System;				
Asking for support if needed.				
Evaluation:				
Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐
Tutor name:		Place:	Date:	Signature:
Final assessment (for this module)				
Environmental Management, including all work tasks above				
Evaluation:				
Not yet competent (Needs further training)		Competent (Can perform all work tasks independently)		
☐		☐		
Tutor name:		Place:	Date:	Signature:

Sphere of Activity: Sustainability Management

Work task:	What are the Standards and regulations supporting Sustainability Management

Objective:

Reading & understanding the required task;
Identify the current standards supporting Sustainability Management;
Describe the REACH regulation and its importance;
Understanding why standards and regulations supporting Sustainability Management are necessary;
Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Work task:	What are the management methods supporting a sustainable approach

Objective:

Reading & understanding the required task;
Understand the processes driving sustainable management decisions;
5S principles;
Total Quality Maintenance (TQM) and Total Productive Maintenance (TPM);
Gemba and Kaizen (principles and importance);
Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Work task:	Principles of manufacturing eco-friendly footwear

Objective:

Reading & understanding the required task;
Criteria that should be considered for eco-friendly footwear;
Material and accessories selection;
End-of-life considerations for the footwear products;
Possible uses for footwear components after disassembly;
Energy efficiency and CO2 Emissions;
Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Final assessment (for this module)

Sustainability Management, including all work tasks above

Evaluation:

Not yet competent (Needs further training)	Competent (Can perform all work tasks independently)
☐	☐

Tutor name:	Place:	Date:	Signature:

Sphere of Activity: Corporate social responsibility (CSR)				
Work task:	Assessing the corporate purpose of the organisation in the current social context			
Objective:				
Reading & understanding the required task;				
Identify the tools and documentation needed for the required task;				
Perform a short analysis of the current social context;				
Define the company mission and purpose;				
Auditing current norms, practices, and standards associated with CSR;				
Asking for support if needed.				
Evaluation:				
Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐
Tutor name:		Place:	Date:	Signature:
Work task:	The importance of implementing a CSR plan			
Objective:				
Reading & understanding the required task;				
Understanding the CSR benefits;				
Acknowledging the CSR principles;				
Raising CSR awareness;				
Asking for support if needed.				
Evaluation:				
Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐
Tutor name:		Place:	Date:	Signature:
Final assessment (for this module)				
Corporate social responsibility (CSR), including all work tasks above				
Evaluation:				
Not yet competent (Needs further training)		Competent (Can perform all work tasks independently)		
☐		☐		
Tutor name:		Place:	Date:	Signature:

Sphere of Activity: Design

Work task:	Identify market trends and the particularities of design in the footwear industry

Objective:

Reading & understanding the required task;

Identify market trends and select design inspiration for a footwear collection;

Create mood boards and a fashion trend report;

Cooperating with colleagues;

Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Work task:	Apply and analyse design concepts

Objective:

Reading & understanding the required task;

Create sketches and elaborate a briefing for a footwear collection;

Perform product design optimisation and value analysis;

Select materials, accessories, and components for the footwear collection;

Cooperating with colleagues;

Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Work task:	Translate the design concepts into 3D models

Objective:

Reading & understanding the required task;

Use CAD systems to create virtual footwear prototypes;

Apply digital materials and rendering;

Cooperating with colleagues;

Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Final assessment (for this module)

Design: Understand and participate in the tasks required for this module

Evaluation:

Not yet competent (Needs further training)	Competent (Can perform all work tasks independently)
☐	☐

Tutor name:	Place:	Date:	Signature:

Sphere of Activity: Technical Development

Work task:	Transfer the physical last into digital form

Objective:

Reading & understanding the required task;
Identify the tools needed for the required task;
Perform the last digitalisation and editing using the indicated CAD system;
Making a last copy;
Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Work task:	Create 3D models and 2D patterns for the footwear prototype

Objective:

Reading & understanding the required task;
Create a 3D design for a selected footwear prototype;
Using 2D pattern-making software to create the necessary patterns for the selected footwear prototype;
Print cardboard patterns for the production of all upper parts and label them correctly;
Pattern testing and validation;
Optional: Create and add 3D printed components;
Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Work task:	Prototype production in a factory environment

Objective:

Reading & understanding the required task;
Pattern and tech info review and validation;
Material and accessories selection;
Coordinating the footwear manufacturing process through the technological steps of production (Cutting, skiving, splitting, marking, pre-stitching, stitching, pre-lasting, lasting, and finishing);
Operation control and identifying possible defects;
Re-grouping the pieces and preparing them for the following tasks;
Cooperating with technicians and operators on the assembly line;
Asking for support if needed.

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:

Final assessment (for this module)

Technical development, including all work tasks above

Evaluation:

Not yet competent (Needs further training)	Competent (Can perform all work tasks independently)
☐	☐

Tutor name:	Place:	Date:	Signature:

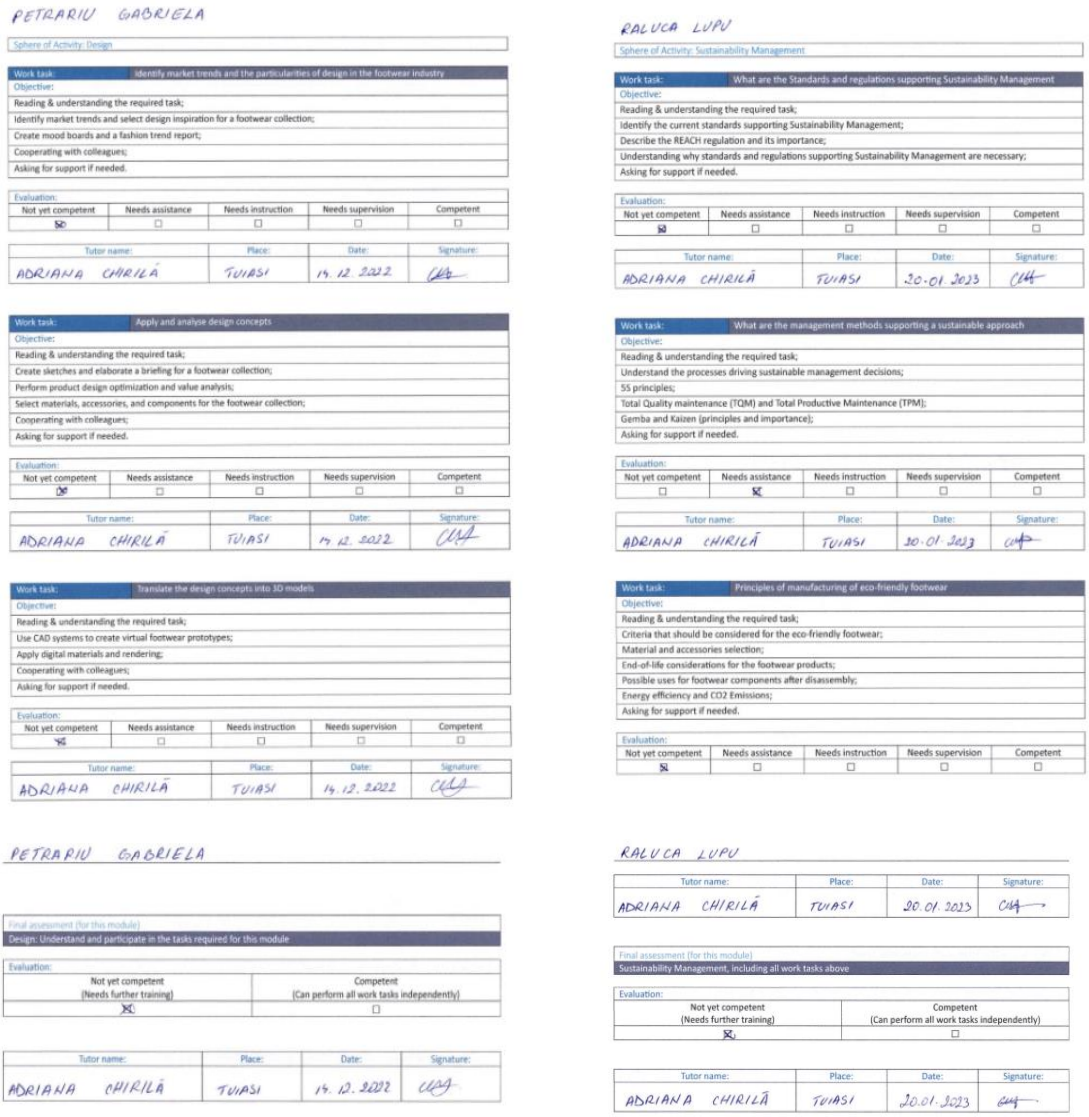
11.3.3 Selection of apprentices

The selection of apprentices for the Work Based Learning pilot was based on interviews with potential trainees and assessing their growth potential in industrial footwear technology. The tutors applied the proposed RPL & Formative evaluation form, and based on the results, trainee distribution on different study modules was performed. Apprentices engaged in Work Based Learning have diverse backgrounds. The three apprentices assigned to "Environmental Management" and "Corporate Social Responsibility" study modules are the footwear company Papucei employees and already have footwear production experience. The rest of the trainees were engaged in the modules of "Design" and "Technical Development", as these were necessary for their career development in industrial footwear manufacturing. Another trainee was assigned to the "Sustainability Management" study module because the knowledge covered was deemed necessary for their career goals. The three trainees involved in these stages are students enrolled in the "Gheorghe Asachi" Technical University of Iasi study programmes.

The results of the PRL forms and trainee distribution are displayed below:

Trainee	Background / Current Position	Study Module
Stefana Larisa Suchar	Sales Specialist	Environmental Management & Corporate Social Responsibility
Anastasia Bannaia	Designer	
Marin Cojocari	Engineer in the Cutting Department	
Raluca Lupu	TUIASI Master Student	Sustainability Management
Maria-Georgiana Geangu	TUIASI Student	Design & Technical Development
Gabriela Petrariu	TUIASI Student	
Raluca Lupu	TUIASI Master Student	

Tab. 9: Trainees' distribution on study modules



PETRARIU GABRIELA

Sphere of Activity: Design

Work task:	Identify market trends and the particularities of design in the footwear industry
Objective:	
Reading & understanding the required task;	
Identify market trends and select design inspiration for a footwear collection;	
Create mood boards and a fashion trend report;	
Cooperating with colleagues;	
Asking for support if needed.	

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☒	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	14.12.2022	

Work task:	Apply and analyse design concepts
Objective:	
Reading & understanding the required task;	
Create sketches and elaborate a briefing for a footwear collection;	
Perform product design optimization and value analysis;	
Select materials, accessories, and components for the footwear collection;	
Cooperating with colleagues;	
Asking for support if needed.	

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☒	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	14.12.2022	

Work task:	Translate the design concepts into 3D models
Objective:	
Reading & understanding the required task;	
Use CAD systems to create virtual footwear prototypes;	
Apply digital materials and rendering;	
Cooperating with colleagues;	
Asking for support if needed.	

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☒	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	14.12.2022	

PETRARIU GABRIELA

Final assessment (for this module)

Design: Understand and participate in the tasks required for this module

Evaluation:

Not yet competent (Needs further training)	Competent (Can perform all work tasks independently)
☒	☐

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	14.12.2022	

RALUCA LUPU

Sphere of Activity: Sustainability Management

Work task:	What are the Standards and regulations supporting Sustainability Management
Objective:	
Reading & understanding the required task;	
Identify the current standards supporting Sustainability Management;	
Describe the REACH regulation and its importance;	
Understanding why standards and regulations supporting Sustainability Management are necessary;	
Asking for support if needed.	

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☒	☐	☐	☐	☐

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	20.01.2023	

Work task:	What are the management methods supporting a sustainable approach
Objective:	
Reading & understanding the required task;	
Understand the processes driving sustainable management decisions;	
5S principles;	
Total Quality maintenance (TQM) and Total Productive Maintenance (TPM);	
Gemba and Kaizen (principles and importance);	
Asking for support if needed.	

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☐	☒	☐	☐	☐

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	20.01.2023	

Work task:	Principles of manufacturing of eco-friendly footwear
Objective:	
Reading & understanding the required task;	
Criteria that should be considered for the eco-friendly footwear;	
Material and accessories selection;	
End-of-life considerations for the footwear products;	
Possible uses for footwear components after disassembly;	
Energy efficiency and CO2 Emissions;	
Asking for support if needed.	

Evaluation:

Not yet competent	Needs assistance	Needs instruction	Needs supervision	Competent
☒	☐	☐	☐	☐

RALUCA LUPU

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	20.01.2023	

Final assessment (for this module)

Sustainability Management, including all work tasks above

Evaluation:

Not yet competent (Needs further training)	Competent (Can perform all work tasks independently)
☒	☐

Tutor name:	Place:	Date:	Signature:
ADRIANA CHIRILĂ	TUIASI	20.01.2023	

Fig. 12: RPL Evaluation example

11.3.4 Pilot planning

The piloting phase had a duration of six months, scheduled from January 2023 until July 2023. The apprentices passed through all spheres of activity and started their activity on January 23rd, 2023. Considering the learning-teaching activities of each sphere, Papucei and TUIASI decided on the following distribution (Table 9):

Learning spheres	Learning content	Time distribution	Total hours
Environmental Management	• International and European Environmental • Management Framework. • ISO 14000 series • Development of an Environmental Management System (EMS) • Developing and implementing an Environmental Management System (EMS) • Environmental performance • Integrated management systems	14 weeks	Theoretical teaching/learning classes: 56 hours (28 lectures + 28 project work) Self-learning: 69
Sustainability Management	• Sustainable Materials and Components for Footwear • Eco-labelling and eco-certification of footwear materials and products • REACH regulation and consumer product safety • Sustainable technologies and manufacturing processes • Managing methods supporting a sustainable approach • Carbon footprint – a sustainability measurement indicator	14 weeks	Theoretical teaching/learning classes: 56 hours (28 lectures + 28 project work) Self-learning: 69
Corporate social responsibility (CSR)	• Corporate social responsibility (CSR) • CSR benefits • Social Responsibility and community involvement • Implementation of CSR • Study cases	14 weeks	Theoretical teaching/learning classes: 56 hours (28 lectures + 28 project work) Self-learning: 69
Design	• Footwear Design tools, methods and practices • Consumer-Orientated Footwear Design • Modular design • Digital Design	14 weeks	Theoretical teaching/learning classes: 56 hours (28 lectures + 28 project work) Self-learning: 69
Technical Development	• Shoe lasts • Footwear uppers development (3D modelling) • Footwear uppers development (2D modelling) • Footwear bottom components development	14 weeks	Theoretical teaching/learning classes: 56 hours (28 lectures + 28 project work) Self-learning: 69

Tab. 10: Spheres distribution for piloting WBL

The detailed schedule of the WBL is presented in the following table (Table 3):

Trainees from	Month	22-Dec				23-Jan				23-Feb				23-Mar				23-Apr				23-May				23-Jun			
	Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Papucei	**Environmental Management**																												
	Lectures/Theoretical training								PRL	PRL				Prep activ.															
	WBL/Project																								Ev				
TUIASI	**Sustainability Management**																												
	Lectures/Theoretical training										PRL																		
	WBL/Project											Prep.activ.											Ev						
Papucei	**Corporate Social Responsibility**																												
	Lectures/Theoretical training				PRL	PRL																							
	WBL/Project									Prep.activ.											Ev								
TUIASI (prototype to be done at Papucei)	**Design**																												
	Lectures/Theoretical training								PRL																				
	WBL/Project									Prep.activ											Ev.								
TUIASI (prototype to be done at Papucei)	**Technical Development**																												
	Lectures/Theoretical training										PRL																		
	WBL/Project											Prep.activ.											Ev.						

Tab. 11: WBL pilot Timetable in Romania

11.3.5 Tutors guiding WBL

The tutors played an integrated part in the apprenticeship programmes, such as:

- passing on practical skills alongside theoretical know-how
- tutoring on internal knowledge management (& transfer) system
- coaching apprentices towards social responsibility

Work-based learning, which is closely tied to the production process, is essential for most vocational learning processes, mainly if the vocational education programs aim to develop specialised technicians with management skills. Because a strong connection between practical and theory-based learning was necessary, the tutors came on behalf of TUIASI and the footwear company Papucei. Additionally, it is worth noting that apprentices were required to develop the ability to learn how to learn, enabling them to control and organise their learning processes to a great extent and prepare their final project work.

Before starting the WBL pilot program in Romania, Tutors were made aware of the aim of the pilot activity, Train the Trainers manuals, spheres of activity and WBL planning and coordination.

11.3.6 WBL pilot implementation

According to the agreed WBL pilot program and guided by tutors from Papucei and TUIASI, the apprentices followed all the study modules presented in the curricula specific to footwear industrial manufacturing.

Spheres for piloting: Design (56h)

- Define design concepts and prepare presentation panels

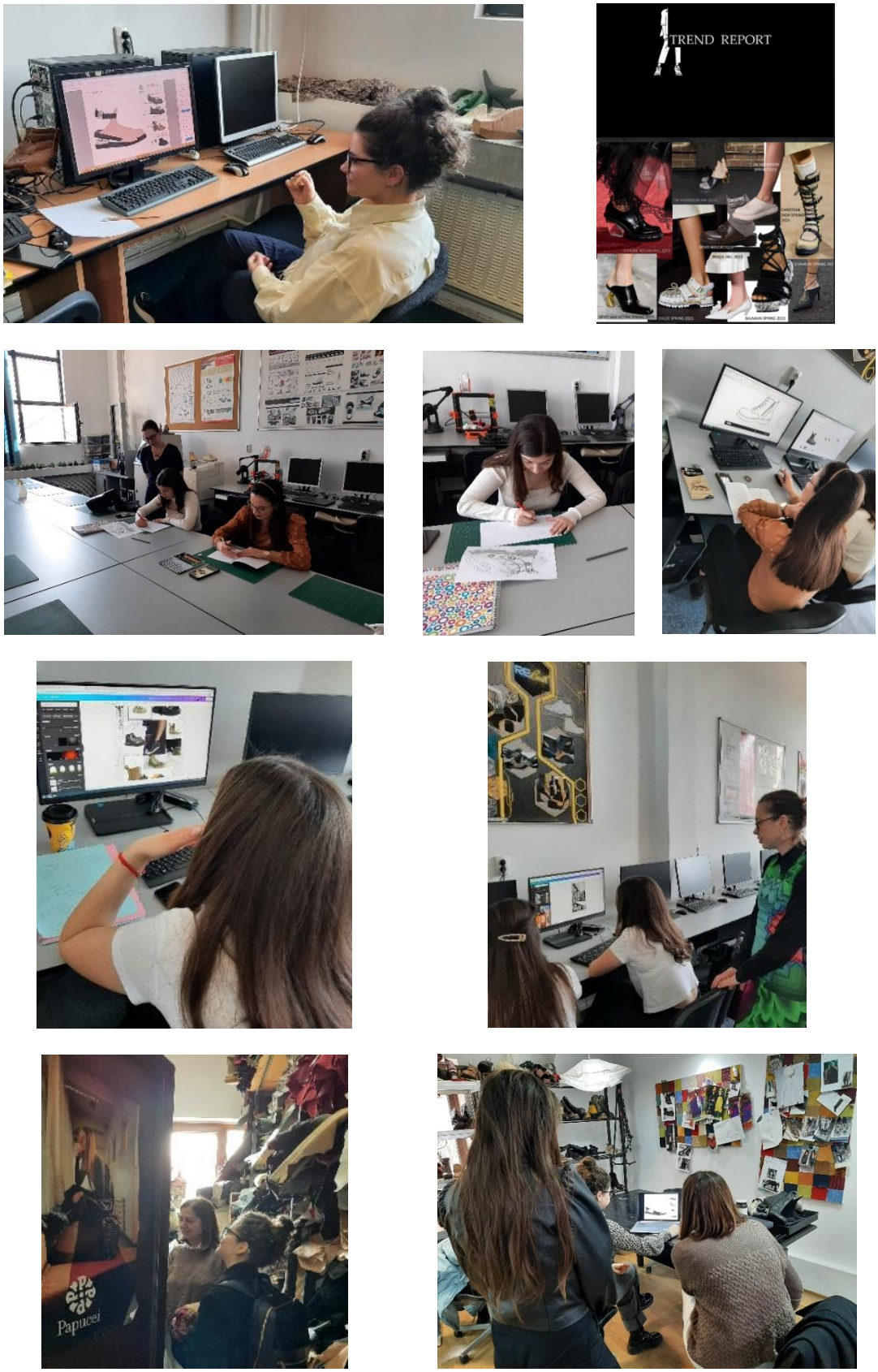


Fig. 13: Apprentices preparing the design concepts as part of their WBL at TUIASI and Papucei

- Define model components and technical details

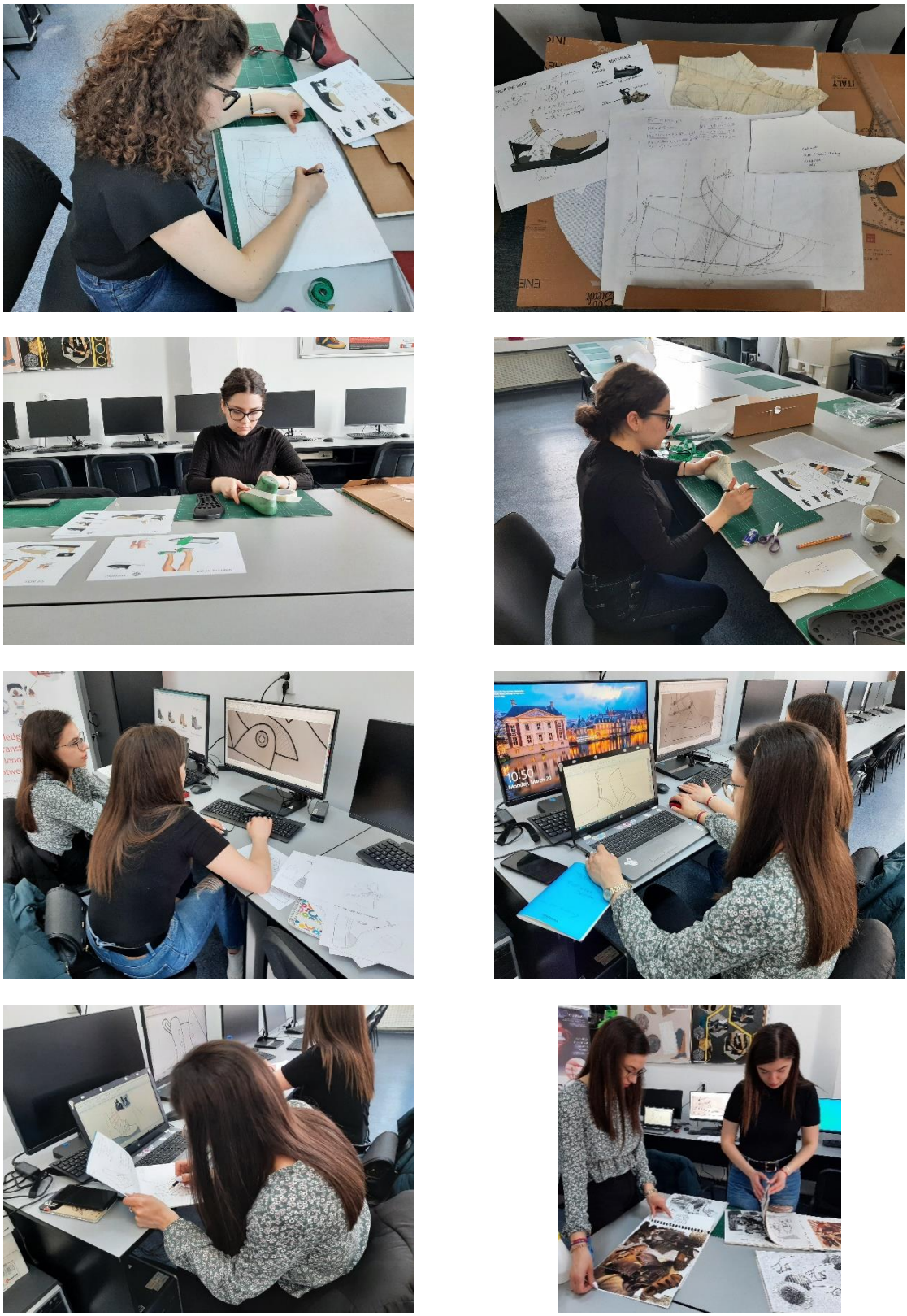
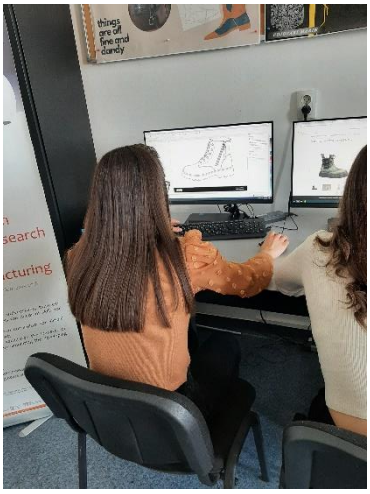


Fig. 14: Apprentices defining the technical details of their design concepts as part of WBL at TUIASI

- Develop a model collection



- Translate the design concept into a 3D model

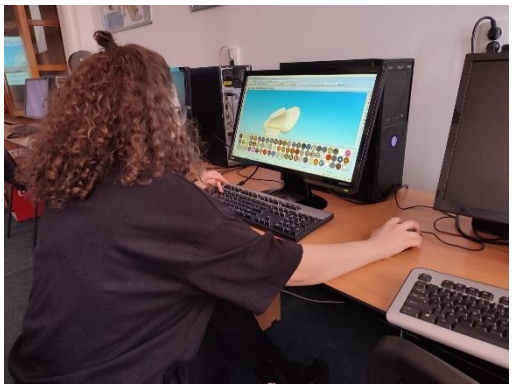


Fig. 15: Apprentices preparing the 3D design concepts as part of their WBL at TUIASI

- Evaluate and analyse the footwear concepts.

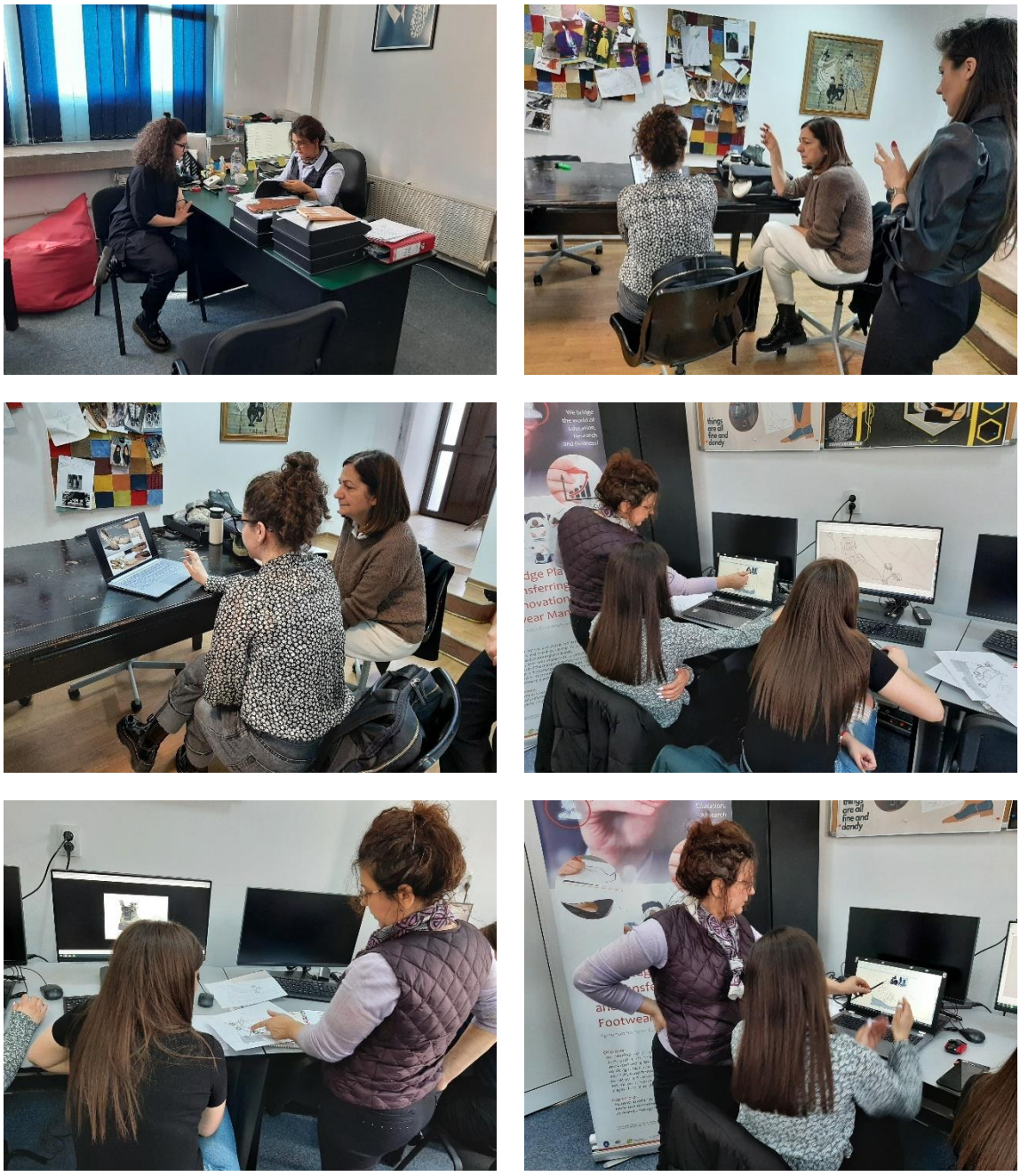


Fig. 16: Apprentices presenting their design concepts as part of their WBL at TUIASI and Papucei

Spheres for piloting: Technical Development (56h)

- Digital last

Fig. 17: Apprentices preparing digital last as part of their WBL at TUIASI

- Footwear uppers development (3D modelling and 3D printing)

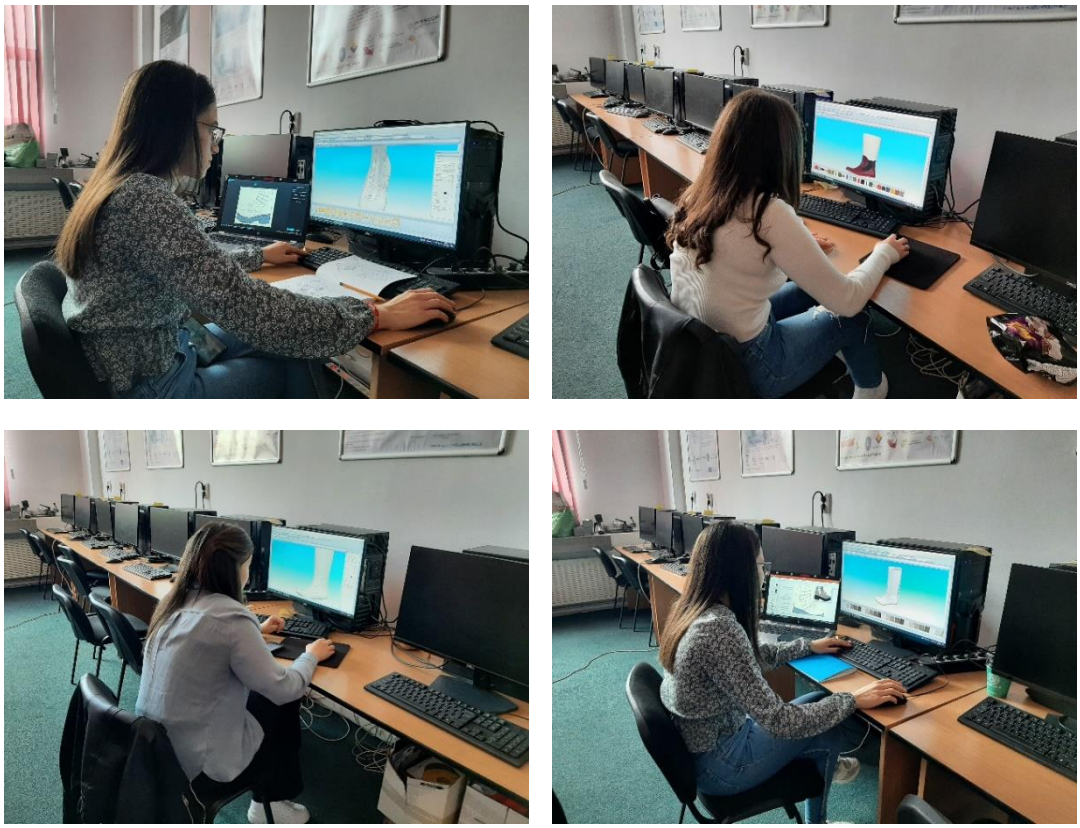


Fig. 18: Apprentices working on 3D technical files as part of their WBL at TUIASI

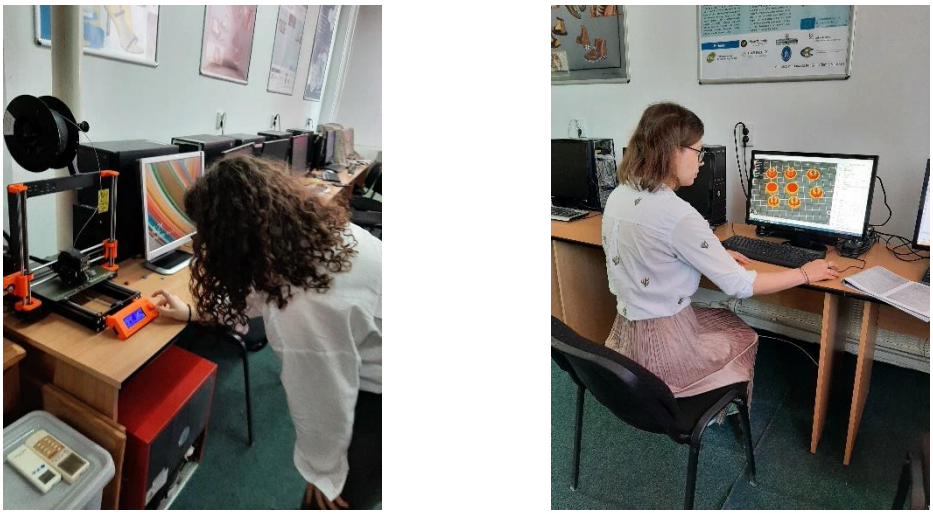
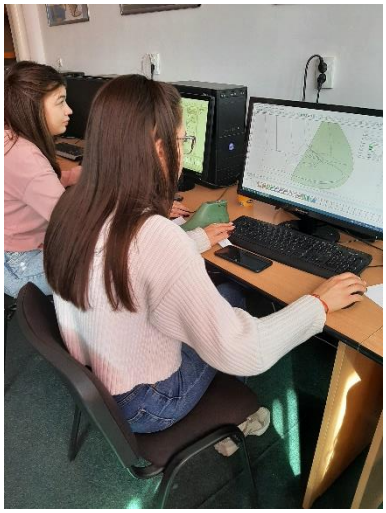
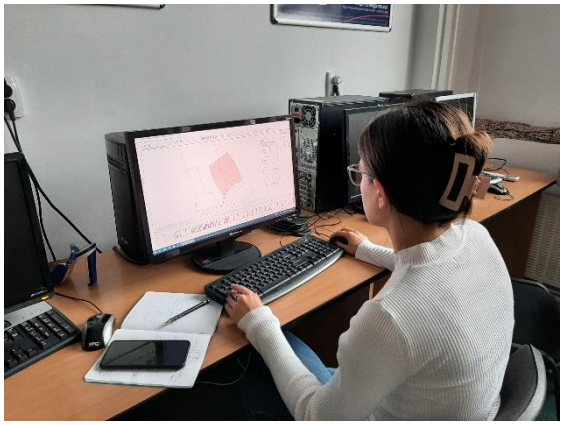


Fig. 19: Apprentices preparing the 3D files and the 3D printed components for their footwear models at TUIASI

- Footwear uppers development (2D modelling and concept testing)





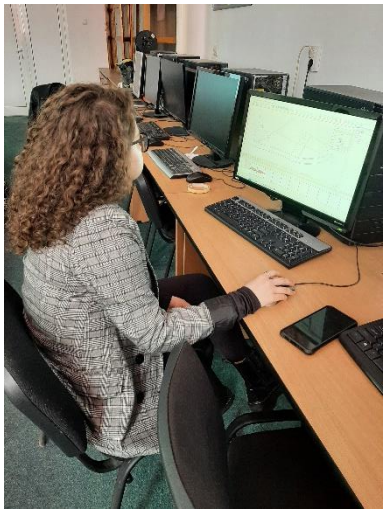
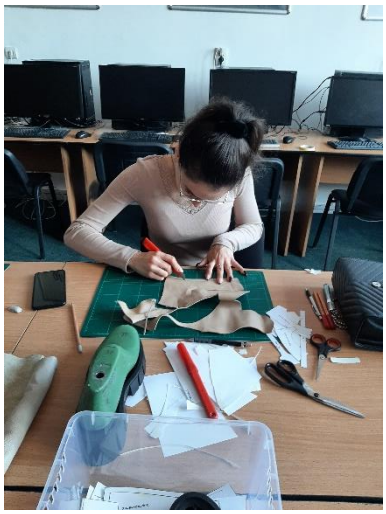


Fig. 20: Apprentices working on the 2D technical files, developing the part pieces and testing design concepts as part of their WBL at TUIASI



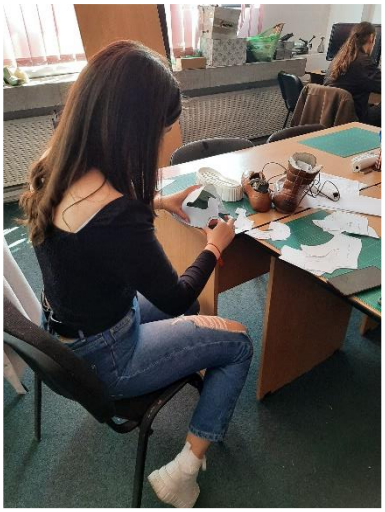
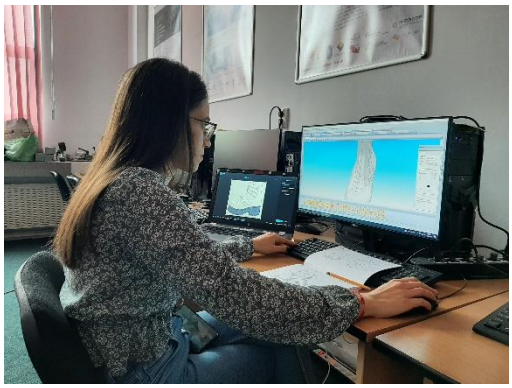
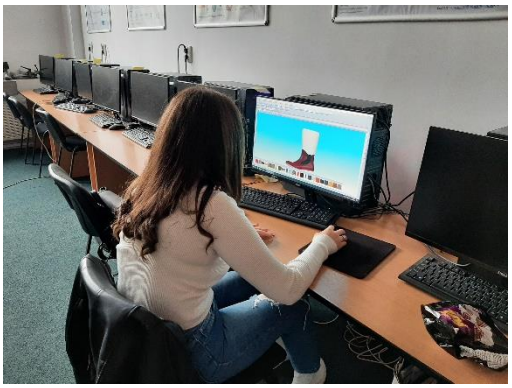





Fig. 21: Apprentices testing design concepts and footwear pieces as part of their WBL at TUIASI

- Footwear bottom components development

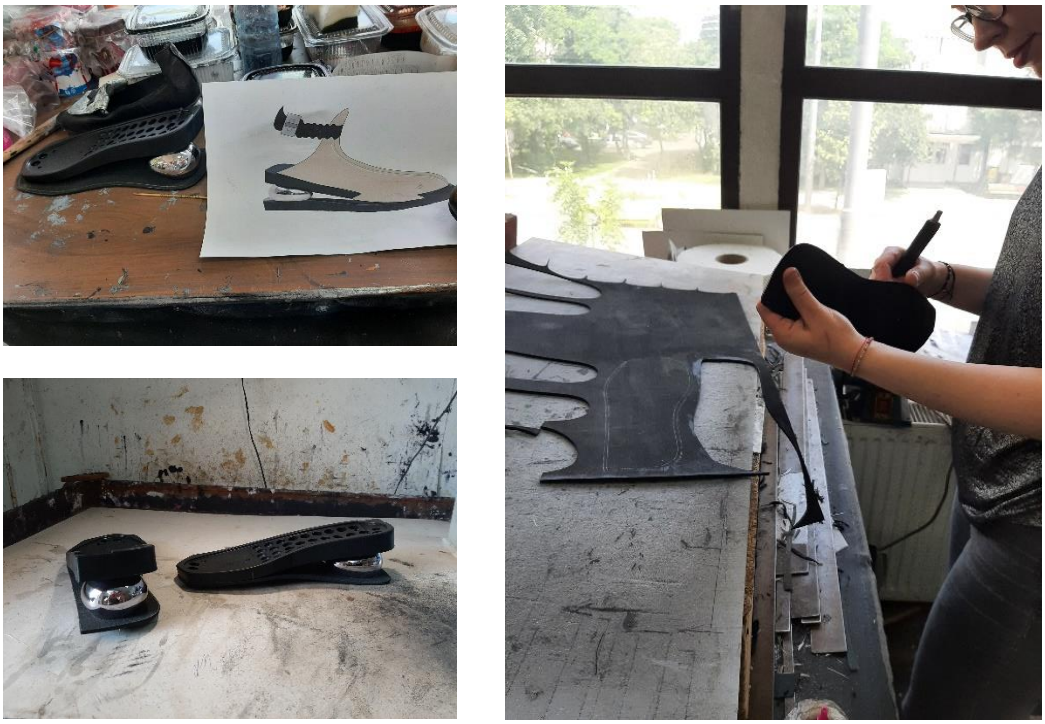


Fig. 22: Developing an original sole concept at Papucei

- Footwear production and factory environment

Fig. 23: Apprentice guiding their footwear prototype and collection on the production process at Papucei

Fig. 24: Apprentice guiding their footwear prototype on the production process at Papucei

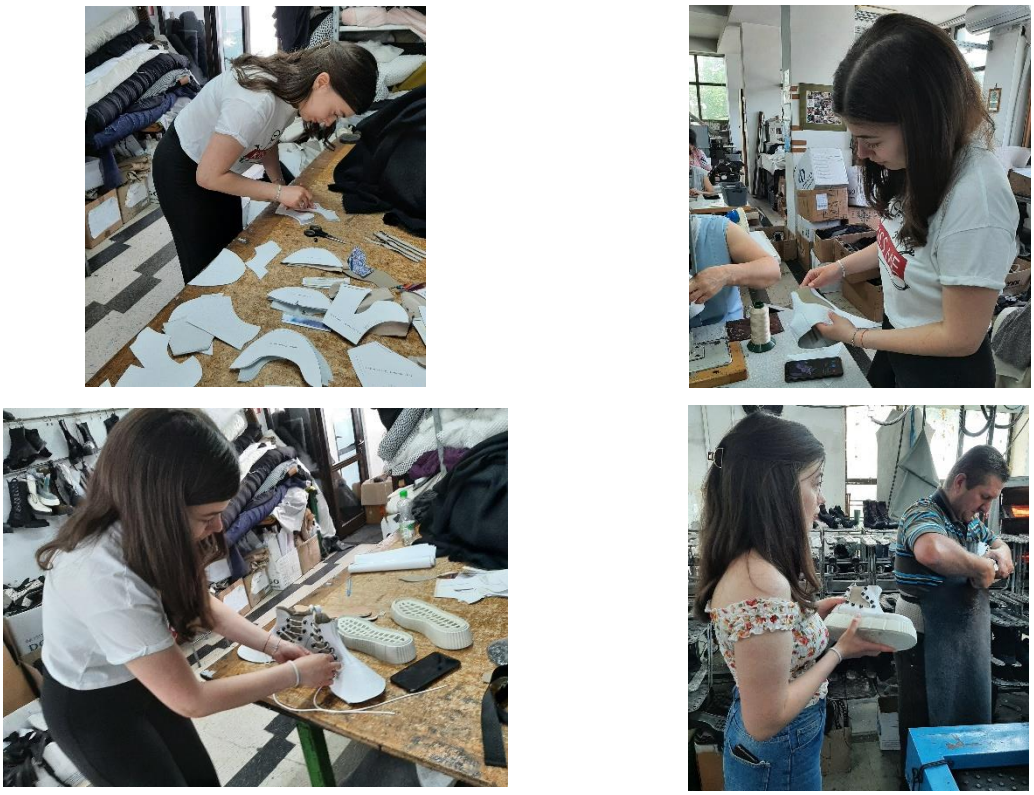


Fig. 25: Apprentice following their footwear prototype in the production process at Papucei

Spheres for piloting: Environmental Management (56h)

Fig. 26: Apprentices participating at the EM lectures and project work at Papucei

Spheres for piloting: Sustainability Management (56h)

Fig. 27: Apprentice participating at the SM lectures and project work at TUIASI

Spheres for piloting: Corporate social responsibility (CSR) (56h)

Fig. 28: Apprentices participating at the CSR lectures and project work at Papucei

Apprentices' Projects

Additionally, the apprentices` documented all their work and prepared final projects containing drawings, samples and observations.

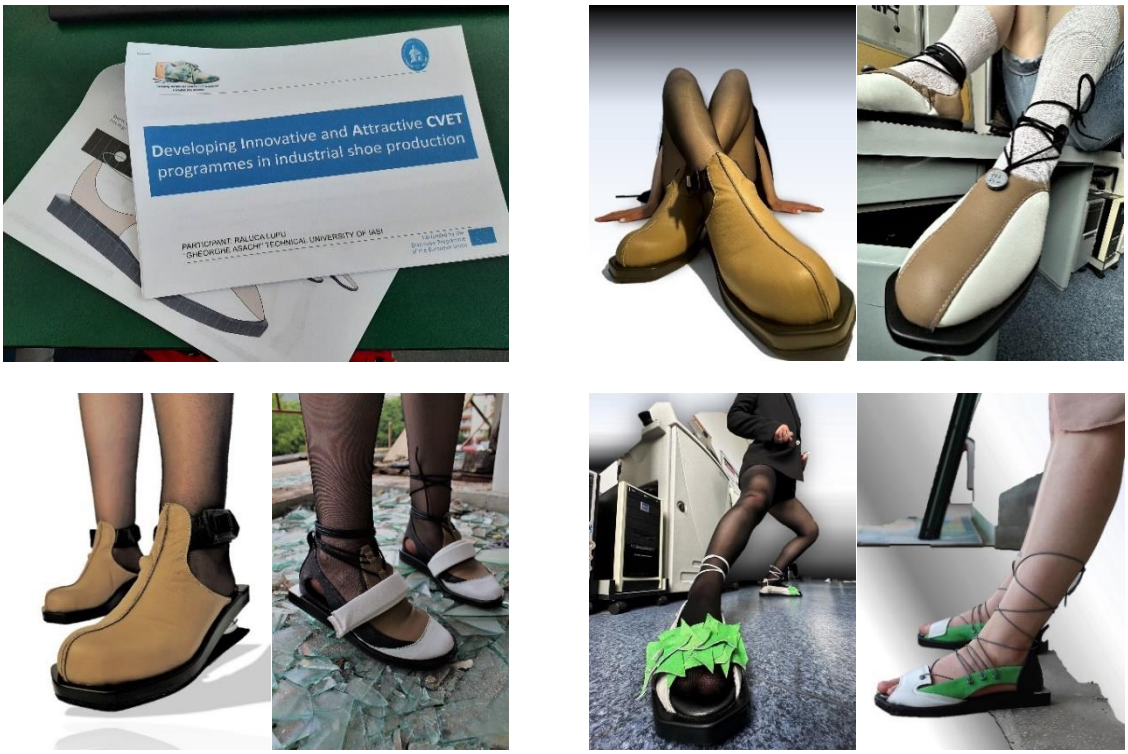


Fig. 29: Trainee Raluca Lupu: final project and footwear prototypes

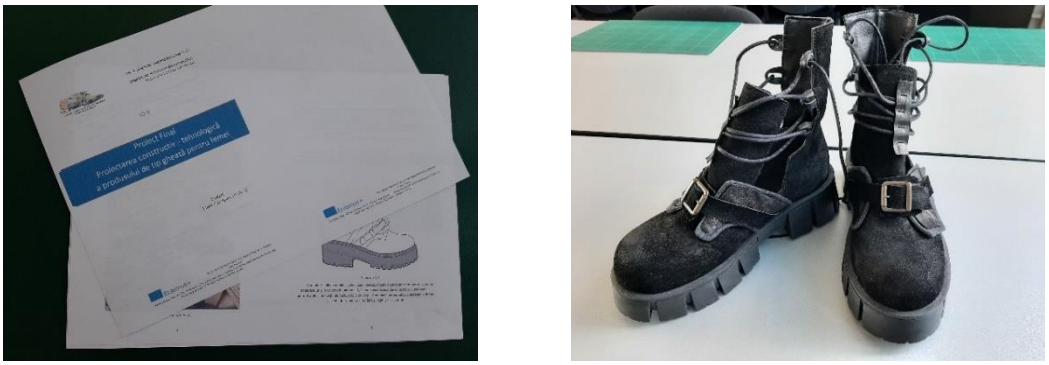


Fig. 30: Trainee Geangu Maria-Georgiana: final project and footwear prototype

11.3.7 Formative Quality Assurance

Learning Outcomes feedback

For each sphere of activity, at the end of the training in that module, the participants' performance and evolution were evaluated by the responsible tutors from TUIASI by using the proposed evaluation forms found in chapter 2 of this report developed to support tutors involved in the WBL process. The final evaluation of the trainee's performance was also based on the final projects they have prepared documenting their footwear concept, activities and learning process.

The trainees are fully competent for all learning modules or need supervision to perform the respective work tasks. For the Design and Technical Development spheres, the apprentices received the highest possible rating, "Competent", meaning they can perform all work tasks (almost) independently. This is justified by the active interest of the trainees in industrial footwear manufacturing, their prior knowledge of design principles and their learning pace in an actual work environment, and their ability to assimilate theoretical knowledge in the field of industrial footwear manufacturing. An example of filled evaluation forms is presented in Figure 20.

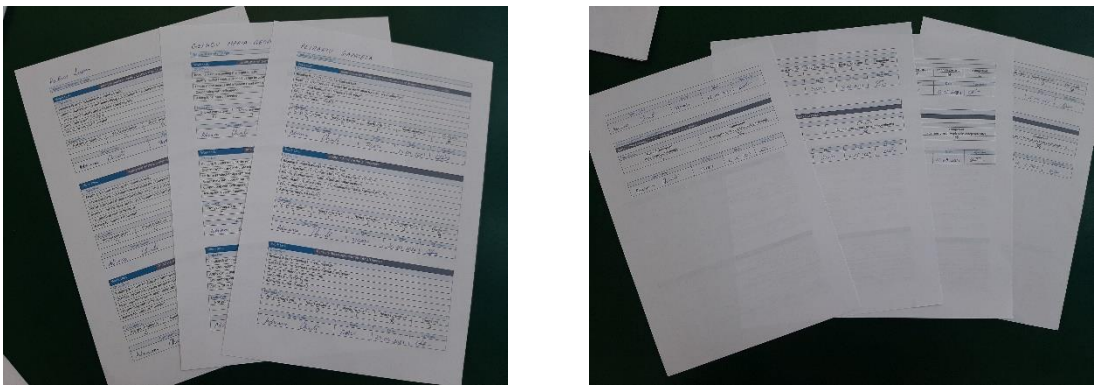


Fig. 31: Example of filled evaluation forms

The main findings of the Romanian trainees' learning outcomes assessment are presented in the following table:

Learning module	Findings
Environmental Management	All trainees are competent or need supervision for performing the requested tasks.
Sustainability Management	Trainees can read and understand work requests independently. Additional supervision is required for proceeding with complex management methods.
Corporate social responsibility (CSR)	Trainees need supervision to perform a CSR analysis for the company but are competent in understanding the principles and methods.
Design	Trainees are competent to perform the majority of operations independently.
Technical Development	Trainees can read and understand work tasks independently and are competent in performing most operations independently or under supervision but as always more practice is always recommended to achieve autonomy.

Tab. 12: Learning outcomes feedback main findings

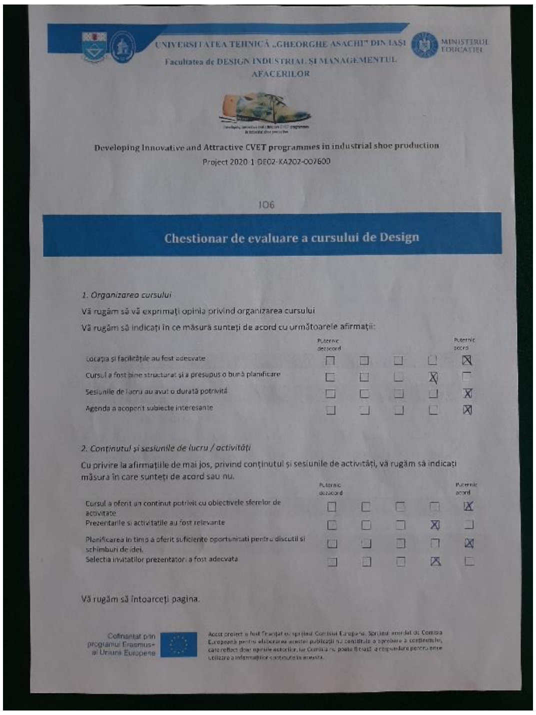
Feedback from trainees

To further improve the WBL activity, after they completed each study module, the trainees were asked to complete a short evaluation form during an open interview to understand better the atmosphere of the learning process quality and outcomes.

The questionnaire as documented in chapter 10 has been used.

Main findings:

- All learning spheres were recommended as being dynamic and interesting
- Tutors provided adequate support and explained in detail the study subject
- Allocated time was considered sufficient to learn the main tasks
- Additional time could be allocated to planning the activities and WBL in a factory environment
- The practice and challenges helped them to better prepare for their professional career
- Experienced colleagues were always open to providing support and assistance.



UNIVERSITATEA TEHNICĂ „GHEORGHE ASACHI" DIN IAȘI
Facultatea de DESIGN INDUSTRIAL ȘI MANAGEMENTUL AFACERILOR
MINISTERUL EDUCAȚIEI

Developing Innovative and Attractive CVET programmes in industrial shoe production
Project 2020-1-DE02-KA202-007600

106

Chestionar de evaluare a cursului de Design

1. Organizarea cursului

Vă rugăm să vă exprimați opinia privind organizarea cursului

Vă rugăm să indicați în ce măsură sunteți de acord cu următoarele afirmații:

	Puternic dezacord				Puternic acord
Locația și facilitățile au fost adecvate	☐	☐	☐	☐	☒
Cursul a fost bine structurat și a presupus o bună planificare	☐	☐	☐	☒	☐
Sesiunile de lucru au avut o durată potrivită	☐	☐	☐	☐	☒
Agenda a acoperit subiecte interesante	☐	☐	☐	☐	☒

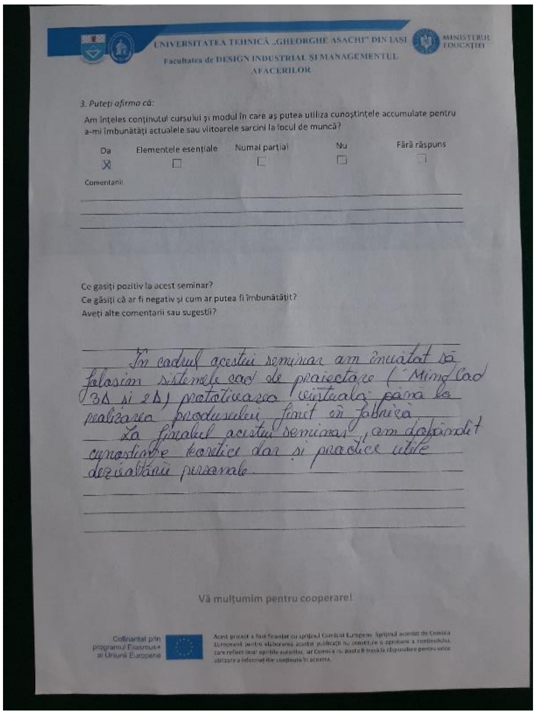
2. Conținutul și sesiunile de lucru / activități

Cu privire la afirmațiile de mai jos, privind conținutul și sesiunile de activități, vă rugăm să indicați măsura în care sunteți de acord sau nu.

	Puternic dezacord				Puternic acord
Cursul a oferit un continut potrivit cu obiectivele sferelor de activitate	☐	☐	☐	☐	☒
Prezentarile si activitatile au fost relevante	☐	☐	☐	☒	☐
Planificarea in timp a oferit suficiente oportunitati pentru discutii si schimburi de idei.	☐	☐	☐	☐	☒
Selectia invitatilor prezentatori a fost adecvata	☐	☐	☐	☒	☐

Vă rugăm să întoarceți pagina.

Cofinanțat prin programul Erasmus+ al Uniunii Europene



UNIVERSITATEA TEHNICĂ „GHEORGHE ASACHI" DIN IAȘI
Facultatea de DESIGN INDUSTRIAL ȘI MANAGEMENTUL AFACERILOR
MINISTERUL EDUCAȚIEI

3. Puteți afirma că:

Am înțeles conținutul cursului și modul în care aș putea utiliza cunoștințele accumulate pentru a-mi îmbunătăți actualele sau viitoarele sarcini la locul de muncă?

Da	Elementele esențiale	Numai parțial	Nu	Fără răspuns
☒	☐	☐	☐	☐

Comentarii:

Ce gasiți pozitiv la acest seminar?
Ce găsiți că ar fi negativ și cum ar putea fi îmbunătățit?
Aveți alte comentarii sau sugestii?

În cadrul acestui seminar am învățat să folosim sistemele cad de proiectare (MindCad 3D și 2D) prototiparea virtuală până la realizarea produsului finit în fabrică.
La finalul acestui seminar, am dobândit cunoștințe teoretice dar și practice utile dezvoltării personale.

Vă mulțumim pentru cooperare!

Cofinanțat prin programul Erasmus+ al Uniunii Europene

Fig. 32: Example of feedback from trainees

11.4 SWOT analysis of WBL in Romania

The implementation of WBL in Romania was analysed during a final evaluation session that gathered professionals from TUIASI and Papucei, that shared their opinions regarding the progress made by trainees, benefits, and future collaboration. The results of the SWOT analysis made during the workshop is presented in the following table:

STRENGTHS
• Practical Application: Work-based learning allows learners to apply their knowledge and skills in real-world settings, enhancing their understanding and competence. • Skill Development: It provides opportunities for developing industry-specific skills, technical expertise, and job-related competencies. • Employability: Work-based learning enhances participants' employability by providing hands-on experience, industry connections, and a deeper understanding of workplace dynamics. • Motivation and Engagement: Learning in a practical work environment can boost motivation and engagement as learners see their efforts' immediate relevance and impact. • The project facilitated the collaboration between Industry (practical skills) and University (theoretical knowledge). • Training Manuals and Learning-Teaching manuals are valuable for the company and the CVET providers. • Portfolios elaborated by the trainees have didactic use. • The training program and manuals benefit CVET providers and companies.
WEAKNESSES
• Limited Scope: Work-based learning may focus on specific activities of the footwear industry, limiting its applicability to broader educational contexts. • Access and Equity: There may be challenges in ensuring equal access to work-based learning opportunities for all learners, particularly those from disadvantaged backgrounds. • Resource Requirements: Implementing work-based learning programs can be resource-intensive, requiring collaboration between educational institutions, employers, and regulatory bodies. • Estimated and allocated hours for some of the departments: too many or too few hours; for example: were too many hours for the theoretical knowledge transfer, while for the factory experience, more hours would be required.

OPPORTUNITIES
• Closing the Skills Gap: Work-based learning can address the gap between theoretical knowledge and practical skills demanded by employers, contributing to a more skilled workforce. • Industry Relevance: By aligning with industry needs, work-based learning programs can ensure graduates possess the skills and knowledge that employers seek, increasing their job prospects. • Lifelong Learning: Work-based learning can be extended beyond initial vocational education and training, allowing individuals to upgrade their skills and adapt to evolving workplace demands continuously. • The WBL programme can be successfully implemented in other footwear companies and technical schools from other regions of Romania. • Papucei and TUIASI will continue to develop and strengthen their collaboration in the next years.
THREATS
• Quality Assurance: Maintaining the quality and consistency of work-based learning experiences across different workplaces and companies in industrial footwear production can be challenging. • Inadequate Workplace Support: Insufficient support and mentorship from employers could hinder the effectiveness of work-based learning, reducing the overall learning experience. • Technological Advancements: Rapid technological advancements may require continuous updates to work-based learning programs to keep pace with changing skill requirements. • Changes in Romanian legislation are unpredictable. • The motivation and support for career reorientation in Romania at a later point in life is generally underestimated, and the interest is hard to push and maintain towards the footwear industry.

Tab. 13: SWOT analysis for WBL applicability in Romania

11.5 Pilot Experiences: Portugal

11.5.1 Introduction

The Report on Experience and SWOT from piloting Work Based Learning in Portugal developed as part of the Erasmus project *Developing Innovative and Attractive CVET programmes in industrial shoe production* aims to highlight the implementation process and results of applied dual/blended pilot of Continuous Vocational Education and Training (CVET) in Portugal. This type of CVET programme – oriented towards the sector of industrial shoe production – is new in Portugal, and it has the potential of being used as "apparent good practice" for other CVET programmes in other countries or sectors.

This project is thought to empower vocational career choices and strengthen Continuous Vocational Education and Training in the sector of Industrial Footwear Production, thus preparing the participants for a sector qualification framework for levels 5-7. The applied teaching method of blended courses focuses on combining theoretical lessons with a Work-Based Learning (WBL) project on the same sphere of activity.

WBL piloting of CVET is based on a developed curriculum covering five spheres of activity identified as necessary to build up from qualifications acquired via Initial Vocational Education and Training (IVET): Design, Technical development, Social Responsibility Management, Quality Management and Environmental Management.

The WBL pilot programme in Portugal was implemented at Carité footwear company. It involved 4 trainees in the spheres of Design and Technical Development, 7 trainees in the sphere Social Responsibility Management and 10 trainees in the spheres Quality Management and Environmental Management.

The pilot also included the Recognition of Prior Learning (RPL) /Recognition, Validation and Certification of competences (RVCC) of 1 Participant certified QL5 and 2 participants QL5 and 1 QL4 (ongoing), employees of the company Carité with experience in Design and Technical Development / Pattern Making. The participant certified QL5 Specialist Technician in Footwear Design was the first in Portugal that obtained this kind of certification.

The responsible tutors evaluated the apprentices' achievements and documented their progress. To further improve the WBL activity, the apprentices were asked to answer a set of questions during an open interview to evaluate the atmosphere of the learning process.

The results of implementing WBL in Portugal were shared and analysed during an evaluation session that gathered representatives from CTCP, CFPIC, APICCAPS and Carité. Participating experts shared their opinions on implementing WBL, the progress made by trainees, benefits and future collaborations. The results of the WBL pilot were evaluated through a SWOT analysis and are presented in the final chapter of this report.

11.5.2 Recognition of Prior Learning

With the support of DIA-CVET it was possible to implement a Process of Recognition of Prior Learning (RPL) /Recognition, Validation and Certification of competences (RVCC).

A process in which the adult demonstrates competences acquired and developed throughout life by formal, non-formal and informal ways, which are subject to validation and certification for the purpose of obtaining a qualification.

The participants were employees of the company Carité with experience in Design and Technical Development / Pattern Making, 3 participants for QL5 and 1 for QL4.

Experts develop the validation and certification of competences through the Portfolio, interviews, practical exercises, observation at the workplace and in accordance with regulated references: Footwear Design Specialist Technician (QL5) and Footwear Pattern Making (QL4).

11.5.3 Participants

The participants were all from Carité staff, selected according to their connection with the spheres of activity selected for the pilot experience.

Four trainees assigned to the modules of "Design" and "Technical Development", seven trainees assigned to the module of “Social Responsibility Management" and ten trainees assigned to the modules of “Quality Management” and “Environmental Management".

11.5.4 Pilot planning

The piloting phase had a duration of six months, scheduled from November 2022 until July 2023. The learning contents, distribution of hours for each sphere are presented below.

DESIGN

Training – Footwear Design: 25 Hours

- Curriculum adapted to the company –

→ Structuring – 5 hours

- Research: brand identity, consumer demands, fashion trends, materials, technology, innovation, ...
- Overview - definition of parameters: target audience, design constraints, construction, materials, technical features, indicative price, ...

→ Project and experimentation – 10 hours

- Design: Inspiration, concept, sketches, virtual pattern making, rendering.
- Development: pattern making, technical guidelines.

→ Development – 10 hours

- Prototype: rapid prototyping, samples, tests, modifications.
- Validation: approval of final products by company management, marketing department and customers.
- Digital Design

WBL Project: Design and technical development project of footwear model – 50 Hours

TECHNICAL DEVELOPMENT

Training – Technical development: 25 Hours

- Curriculum adapted to the company -

→ CAD systems: from 3D to 2D – 5 hours: CAD software for pattern making; From 3D lines to 2D lines; Digitization systems.

→ Last technology – development and graduation – 3 hours: Data base of lasts; Creation of new lasts from previous last geometry; Last measurements and grading.

→ 2D pattern engineering – 7 hours: From manual pattern making to CAD pattern-making: advantages, improvements; Technical pattern making of the upper and the insole.

→ Grading and allowances – 2 hours: Definition of the size grading and functions of grading of the patterns.

→ Nesting and consumption of materials – 2 hours: Optimization and calculation of material consumptions.

→ From pattern making to production – 6 hours: Preparation of the patterns and of the file for exportation; Preparation of the model technical envelope; Technical sheets: types and detailed information.

WBL Project: Design and technical development project of footwear model – 50 Hours

SOCIAL RESPONSIBILITY MANAGEMENT

Training – SOCIAL RESPONSIBILITY MANAGEMENT: 25 Hours

- Curriculum adapted to the company -

→ Labor law – 6 Hours

- Labor law: Concept and general principles, Rights and duties of the parties
- Employment contract: Essential elements of a contract; Forms of termination; Conditions for signing and expiry of the fixed-term employment contract; Duration and organization of working time: holidays and absences, other contractual aspects - applicable legislation
- General Data Protection Regime
- Hiring migrants

→ Business ethics – 9 Hours

- Notion of Ethics and evolution of the concept
- Application of Ethics in the company's universe
- Contextualization of Business Ethics in business
- Application of Ethics in a business environment - case studies
- Ethics as a competitive factor
- Gender equality
- Code of ethics and conduct

→ RGPC - General Regime for the Prevention of Corruption and GDPR – General Regime for the Protection of Whistleblowers – 6 Hours

- Principles and requirements of applicable regulations
- Implementation and impact of your application on the organization

→ Sustainability Reports – 4 Hours

- Advantages/gains for the organization
- Contents to include
- Analysis of reference reports

WBL Project: Prepare a Code of Conduct, a Reporting Channel, a Risk Analysis and a First Draft of a Sustainability Report for Carité – 50 Hours

QUALITY MANAGEMENT

Training – Quality MANAGEMENT: 25 Hours

- Curriculum adapted to the company -

→ Introduction – 3 Hours

- Fundamental concepts of quality management
- Quality vs Production

→ Standards, their evolution and application – 12 Hours

- The ISO 9000 family of standards
- Articulation with other families of standards (for example, ISO 14001)
- ISO 9001 requirements
- Process approach
- Monitoring and measurement/KPIs
- Continuous improvement
- Practical examples

→ Process Control – 10 Hours

- Customer requirements
- Laboratory tests – instructions, recording and treatment of results
- Quality control in different sectors and final control
- Quality tools
    - Data processing and computerization

WBL Project: Start the process of computerizing the recording and processing of data from all quality control points. Create database of material technical data sheets

ENVIRONMENTAL MANAGEMENT

Training – ENVIRONMENTAL MANAGEMENT: 25 Hours

- Curriculum adapted to the company -

→ The environment and the industry – 3 Hours

- Principles of prevention and Environmental Management System

→ Develop an Environmental Management System – 19 Hours

- The ISO 14001 standard – requirements
- Applicable legislation
- Environmental responsibility
- Product life cycle
- Environmental performance indicators and their monitoring (atmospheric emissions, water, waste, ambient noise, energy)
- Dashboard for environmental management
- Examples of sustainable practices

→ Integrated management systems – 3 Hours

- The quality-environment integrated concept
- SO quality-environment standards (ISO 9000 and ISO 14000 series)

WBL Project: Identify and plan more sustainable practices to be implemented in the company. Structuring the Environmental component for the Sustainability Report

Process of Recognition of Prior Learning (RPL) /Recognition, Validation and Certification of competences (RVCC)

The Process of Recognition of Prior Learning (RPL) /Recognition, Validation and Certification of competences (RVCC) began in October 2022 and finished, for the Footwear Design Specialist Technician (QL5) in May 2023 in a final session with a Certification Jury - Qualifica Coordinator / RVCC Technician, Trainers, Union Representative and Representative of the business sector, where the participant received a Certificate and Qualification Passport.

11.5.5 Trainers and Tutors guiding WBL

The trainers and the tutors were crucial contributors to the apprenticeship programs, playing an integral role by imparting both practical skills and theoretical knowledge. The trainers and the tutors were from CTCP and from CFPIC who gained their expertise from their industry experience and/or research background. They also possessed extensive training expertise.

Prior to commencing the pilot activity, the tutors were informed about the objectives of the pilot, provided with the Train the Trainers manuals, and given access to the spheres of activity webpage. They also contributed to the development of the curricula. Some of the trainers took part in one or both LTTA workshops.

11.5.6 WBL pilot implementation

According to the agreed WBL pilot program and guided by teachers/tutors from CTCP and CFPIC, the trainees followed all the study modules presented in the curricula designed for the pilot experience, and so, adapted to the needs of Carité.

Spheres for piloting: Design (75h)

Spheres for piloting: Technical Development (75h)



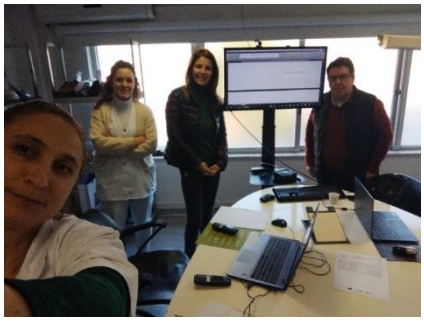




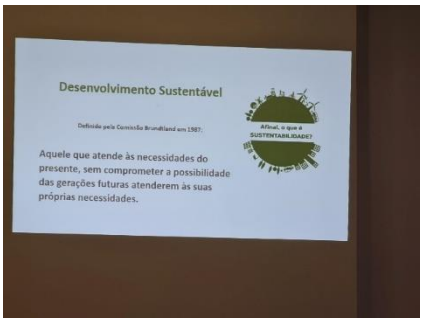




Spheres for piloting: Social Responsibility (75h)



Spheres for piloting: Quality Management (75h) and Environmental Management (75h)



11.5.7 Formative Quality Assurance

Learning Outcomes feedback

For each sphere of activity, at the end of the training in that module, the participants' performance and evolution were evaluated by the responsible tutors from CTCP/CFPIC by using the proposed evaluation forms developed to support tutors involved in the WBL process.

The most correct way to evaluate the results of trainees' participation in pilot actions in the selected spheres of activity was through the results obtained with the proposed projects.

We can highlight the product lines developed in the pilots of the Product Design and Development spheres and the Carité Sustainability Report, for 2022, developed with inputs from the areas of Social Responsibility, Environment and Quality, the other three areas in which were pilot actions implemented.

We should also highlight the Final Certification of Carlos Araújo, QL5 Footwear Design Specialist Technician.

Certificado de Qualificações

Certifica-se que Carlos Alberto Costeira de Andrade Araújo, nascido em 07/12/1978, com o Cartão de Cidadão n.º 11378075, concluiu o processo de Reconhecimento, Validação e Certificação de Competências[1], tendo obtido a qualificação Técnico/a Especialista em Design de Calçado, de acordo com o Catálogo Nacional de Qualificações, em 30/05/2023, obtendo o nível de qualificação 5 do Quadro Nacional de Qualificações que corresponde ao nível de qualificação 5 do Quadro Europeu de Qualificações[2], com as seguintes unidades de competência:

RVCC	Código	Unidades de Competência
Profissional	514642	Representar valores gráficos e expressivos através do desenho
	514643	Aplicar normas de desenho técnico, anatómico e de perspetiva
	514644	Aplicar a cor no domínio da ilustração de moda e no design de calçado
	514645	Aplicar as teorias da perceção na comunicação visual e no design de calçado
	514646	Desenhar modelos de calçado no sistema CAD 3D
	514647	Criar e tratar imagens matriciais
	514648	Criar e manipular imagens vetoriais
	514649	Conceber e desenvolver catálogos animados
	514650	Calcular o preço real e de venda de um produto
	514651	Desenvolver um projeto de tendências para uma coleção de calçado
	514652	Construir um portefólio de moda
	514653	Conceber um projeto de design de moda - primavera/verão
	514654	Conceber um projeto de design de moda - outono/inverno

SÃO JOÃO DA MADEIRA, 13 de junho de 2023

O(A) Responsável pelo(a) CFPIC - Centro de Formação Profissional da Indústria do Calçado - S. João da Madeira

(Assinatura e selo branco ou carimbo ou assinatura digital)

Certificado n.º 13/2023

https://www.passaportequalifica.gov.pt

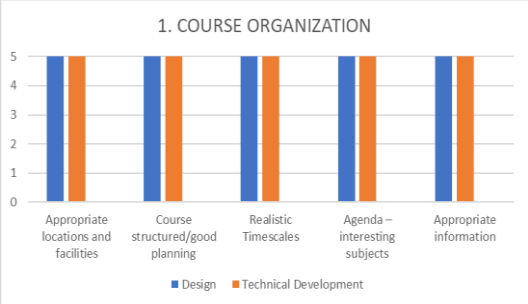
Feedback from trainees

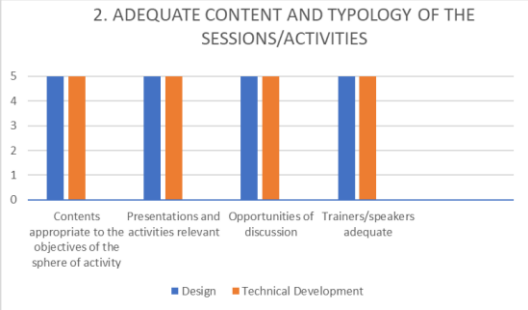
To further improve the WBL activity, after they completed each study module, the trainees were asked to complete a short evaluation form during an open interview to understand better the atmosphere of the learning process quality and outcomes.

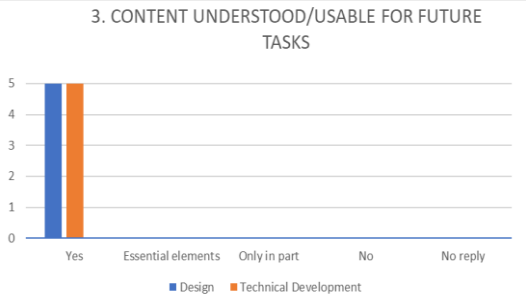
For feedback the questionnaire from chapter 10 has been used.

Main findings:

Design and Technical Development







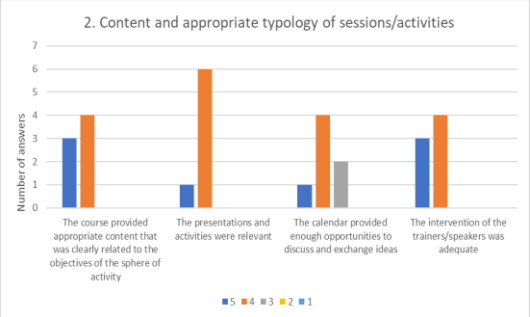
DESIGN:

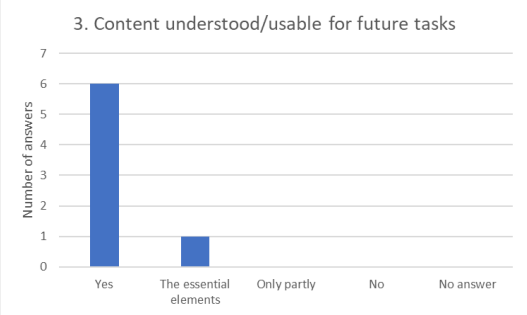
POSITIVE ASPECTS	NEGATIVE ASPECTS
The training allowed me to be more aware of design aspects and the use of colours in the creative process of footwear collections. It was useful to get an idea of the stages of creating a collection and its importance for its realization.	*Nothing to point.*
It was very good to deepen knowledge of the development and process of designing and creating a collection. It was good to broaden and/or remember knowledge of product creations and developments and, above all, to better understand the capabilities and ideas of coworkers.	*Nothing to add.*
Design training helped a lot in terms of strategy on how to start the design process of a collection, that is, understanding all the logistics from start to finish of the creative process.	_____
- Interesting group dynamics. - Development of a mini-collection project. - Learning illustration techniques. - Learning notions of colour theory. The content was interesting and served to reinforce the acquired knowledge.	*Nothing to report.*

TECHNICAL DEVELOPMENT:

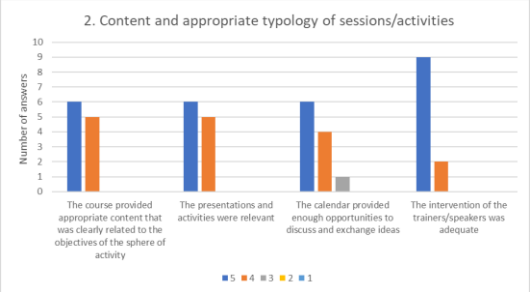
POSITIVE ASPECTS	NEGATIVE ASPECTS
The training made it possible to address issues of some gaps and perfect, improve our skills and daily needs.	*Nothing to comment.*
It was important to clarify doubts and learn more efficient work methods.	*I have nothing to say.*
The training helped to consolidate the knowledge I already had and even to learn new ways for our day to day in the shoe pattern making process.	_____
- Development of less used assembly systems. - Construction of high boots. - Good interaction with Trainees. - Clear and well explained contents. The program met the needs, for that reason its content served to reinforce and learn other pattern making techniques.	*Nothing to report*

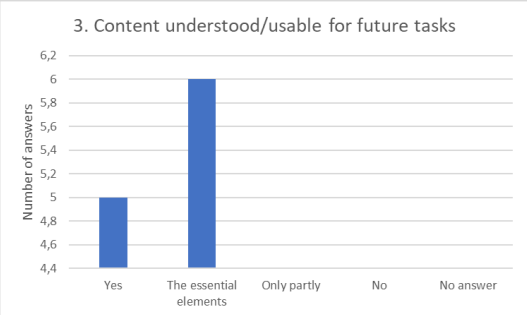
Social Responsibility





Quality Management and Environmental Management





11.6 SWOT analysis of WBL in Portugal

The implementation of WBL in Portugal was analysed during a final evaluation session that gathered professionals from CTCP, CFPIC, Carité, APICCAPS, that shared their opinions regarding the progress made by trainees, benefits, and future collaboration. The results of the SWOT analysis made during the workshop is presented in the following table:

STRENGTHS
• Practical Application: Work-based learning allows learners to apply their knowledge and skills in real-world settings, enhancing their understanding and competence. • Skill Development: It provides opportunities for developing industry-specific skills, technical expertise, and job-related competencies. • Employability: Work-based learning enhances participants' employability by providing hands-on experience, industry connections, and a deeper understanding of workplace dynamics. • Motivation and Engagement: Learning in a practical work environment can boost motivation and engagement as learners see their efforts' immediate relevance and impact. • The project facilitated the upgrade of learner's knowledge in new techniques and technologies connected with the new trends in the fields of the pilot actions. • Training Manuals and Learning-Teaching manuals are valuable for the company and the CVET providers. • Portfolios elaborated by the trainees have didactic use. • The training program and manuals benefit CVET providers and companies • The project facilitated the collaboration between Industry and other Portuguese partners (knowledge centres) • The Process of Recognition of Prior Learning (RPL) /Recognition, Validation and Certification of competences (RVCC)
WEAKNESSES
• Too few hours mainly for the practical work • Some of the manuals should be more explicit in its contents and objectively define the expected results. • Practical activities consume resources that can be difficult to combine.

OPPORTUNITIES
• This project could be an added value in the training of existing staff in the company, as a response to the lack of specialized labour felt by the sector. • This kind of programmes (WBL) can be successfully implemented in other footwear companies and technical schools. • Extent the piloting to other functional areas inside the company • Extend the RPL scheme o other collaborator, technicians and managers, taking the opportunity opened by the National Qualification Framework update, which integrates now more level 4 and 5 qualifications. • Tailoring the manuals for trainers according to the company needs • Green and digital transformation open opportunities to extend the work inside the company within similar model: dedicated manuals, train the trainers, new qualifications.
THREATS
• Lack of competitiveness/capacity to attract new employees who choose other industries. • Technological Advancements: Rapid technological advancements may require continuous updates to work-based learning programs to keep pace with changing skill requirements. Future difficulties in making automation and robotization in the sector compatible with the necessary upgrade in the skills of human resources in the footwear sector. • Green and digital transformation open opportunities but also threats.

Tab. 14: SWOT analysis for WBL applicability in Portugal

12 SQF industrial shoemaker level 5 – 7

12.1 All qualifications 5 – 7 von DE, PT und RO

Legend:	autonomous performance	initiation	Partly; e. g. planning of a single product (not production line)	not tackled	part of previous qualification

Country	Level according to EQF (Qualification)	Spheres of activity in footwear sector																		
DE	Level 6 (DIA-CVET programme)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training Management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
DE	Level 6 (Footwear foreman)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
DE	Level 6 (Footwear technician)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
DE	Level 6 (HE Bachelor, Leather- and Textile-technics)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
PT	Level 5 (DIA-CVET programme)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
PT	Level 5 (Technical Specialist in Footwear Design)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
RO	Level 5 (Footwear Manufacturing Technician/Foreman)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
RO	Level 7 (DIA-CVET programme)	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
RO	Level 6 (BSc) Footwear Design and Production Engineer	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety
RO	Level 7 (MSc) Footwear Design and Production Engineer	Cutting	Stitching	Lasting	Assembly	Finishing	Design	Production planning	Technical development	Training management	Maintenance Management	Quality Management	New Materials	Supply Chain Management	Social Responsibility Management	Sustainability Management	Environmental Management	STEM	Health and Safety

12.2 Level 5

Legend:	autonomous performance	initiation	Partly; e. g. planning of a single product (not production line)	not tackled	part of previous qualification

Level 5			
Level according to EQF (Qualification)	**Level 5 (DIA-CVET programme)**	**Level 5 (Technical Specialist in Footwear Design)**	**Level 5 (Footwear Manufacturing Technician/Foreman)**
Country	**PT**	**PT**	**RO**
Spheres of activity	Cutting	Cutting	Cutting
	Stitching	Stitching	Stitching
	Lasting	Lasting	Lasting
	Assembly	Assembly	Assembly
	Finishing	Finishing	Finishing
	Design	Design	Design
	Production planning	Production planning	Production planning
	Technical development	Technical development	Technical development
	Training management	Training management	Training management
	Maintenance Management	Maintenance Management	Maintenance Management
	Quality Management	Quality Management	Quality Management
	New Materials	New Materials	New Materials
	Supply Chain Management	Supply Chain Management	Supply Chain Management
	Social Responsibility Management	Social Responsibility Management	Social Responsibility Management
	Sustainability Management	Sustainability Management	Sustainability Management
	Environmental Management	Environmental Management	Environmental Management
	STEM	STEM	STEM
	Health and Safety	Health and Safety	Health and Safety

12.3 Level 6

Legend:	autonomous performance	initiation	Partly; e. g. planning of a single product (not production line)	not tackled	part of previous qualification

Level 6					
Level according to EQF (Qualifi-cation)	**Level 6 (DIA-CVET programme)**	**Level 6 (Footwear foreman)**	**Level 6 (Footwear technician)**	**Level 6 (HE Bachelor, Leather- and Textile-technics)**	**Level 6 (BSc) Footwear Design and Production Engineer**
Country	**DE**	**DE**	**DE**	**DE**	**RO**
Spheres of activity	Cutting	Cutting	Cutting	Cutting	Cutting
	Stitching	Stitching	Stitching	Stitching	Stitching
	Lasting	Lasting	Lasting	Lasting	Lasting
	Assembly	Assembly	Assembly	Assembly	Assembly
	Finishing	Finishing	Finishing	Finishing	Finishing
	Design	Design	Design	Design	Design
	Production planning	Production planning	Production planning	Production planning	Production planning
	Technical development	Technical development	Technical development	Technical development	Technical development
	Training Management	Training management	Training management	Training management	Training management
	Maintenance Management	Maintenance Management	Maintenance Management	Maintenance Management	Maintenance Management
	Quality Management	Quality Management	Quality Management	Quality Management	Quality Management
	New Materials	New Materials	New Materials	New Materials	New Materials
	Supply Chain Management	Supply Chain Management	Supply Chain Management	Supply Chain Management	Supply Chain Management
	Social Responsibility Management	Social Responsibility Management	Social Responsibility Management	Social Responsibility Management	Social Responsibility Management
	Sustainability Management	Sustainability Management	Sustainability Management	Sustainability Management	Sustainability Management
	Environmental Management	Environmental Management	Environmental Management	Environmental Management	Environmental Management
	STEM	STEM	STEM	STEM	STEM
	Health and Safety	Health and Safety	Health and Safety	Health and Safety	Health and Safety

12.4 Level 7

Legend:	autonomous performance	initiation	Partly; e. g. planning of a single product (not production line)	not tackled	part of previous qualification

Level 7		
Level according to EQF (Qualification)	**Level 7 (DIA-CVET programme)**	**Level 7 (MSc) Footwear Design and Production Engineer**
Country	**RO**	**RO**
Spheres of activity	Cutting	Cutting
	Stitching	Stitching
	Lasting	Lasting
	Assembly	Assembly
	Finishing	Finishing
	Design	Design
	Production planning	Production planning
	Technical development	Technical development
	Training management	Training management
	Maintenance Management	Maintenance Management
	Quality Management	Quality Management
	New Materials	New Materials
	Supply Chain Management	Supply Chain Management
	Social Responsibility Management	Social Responsibility Management
	Sustainability Management	Sustainability Management
	Environmental Management	Environmental Management
	STEM	STEM
	Health and Safety	Health and Safety

13 Memorandum of Understanding (MoU) and Position Paper

13.1 Memorandum of Understanding

Memorandum of Understanding for the recognition of the results of the EU co-funded project "Developing Innovative and Attractive CVET programmes in industrial shoe production (DIA-CVET)".

Taking into account that:

Supporting work-based learning (WBL) is very high on the agenda of European Union (EU) policies: "Promote work-based learning in all its forms, with special attention to apprenticeships, by involving social partners, companies, chambers and [Vocational Education and Training] (VET) providers as well as stimulating innovation and entrepreneurship." (https://education.ec.europa.eu/document/riga-conclusions, p.4, consulted 27.01.2023).

Often apprenticeships or WBL are reduced to Initial VET (IVET), but EU policies refer to Continuous VET (CVET), as well: "The underlying principles also include the need to maintain high-quality apprenticeships and work-based learning, to consolidate achievements as well as the need for the better integration of initial and continuous VET to ensure reskilling and upskilling, including pathways from IVET to CVET." (Osnabrück declaration on vocational education and training as an enabler of recovery and just transitions to digital and green economies, p.5, https://www.cedefop.europa.eu/en/content/osnabruck-declaration-2020-vocational-education-and-training-enabler-recovery-and-just-transitions consulted 27.01.2023)

The relevance of lifelong learning (LLL), especially with focus on key competences: "The European Pillar of Social Rights states as its first principle that everyone has the right to quality and inclusive education, training and lifelong learning in order to maintain and acquire skills that allow full participation in society and successful transitions in the labour market." (https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32018H0604(01)&from=EN, consulted 27.01.2023)

The increasing need to implement reliable measures to assure the recognition of prior learning (RPL): "The objective of the proposed Council Recommendation is to ensure that any student, apprentice or pupil who has a learning experience abroad, whether for a qualification or learning mobility, has that experience automatically recognised for the purposes of further study." (https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018DC0270&from=EN, consulted 27.01.2023)

The European Qualifications Framework (EQF) that improves the transparency, comparability and portability of citizens' qualifications (https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32017H0615(01)&from=EN, consulted 27.01.2023).

The parties agree as follows:

13.1.1 Objectives

The purpose of this Memorandum of Understanding (MoU) is to endorse the results of the EU-funded DIA-CVET project. Main objective is the strengthening of CVET as a crucial element of increasing attractiveness of VET and assuring its high quality. As mobility of skilled workers within Europe increases, furthermore a Sector Qualification Framework (SQF) is necessary for more transparency between qualifications from different national CVET-systems.

In pursuing these objectives, the parties will commit to:

- Recognizing that educational reforms cannot be imported or implemented “top-down”; stakeholders and practitioners from the sectors must be taken onboard and their experiences and beliefs must be taken into consideration as well. The approach of mutual learning referring to apparent good practice from other European countries in this project has led to valuable results and fruitful relations within the stakeholders of all partner countries;
- Recognizing Work Based Learning as a necessary part of VET, might it be initial or continuous, and therefore support the integration of extensive in-company training periods in the national CVET curricula;
- Promoting recognition of prior learning (RPL) as an adequate way to credit prior learning in work-processes as a base for the awarding of CVET-qualifications;
- Welcoming the developed "train the tutor" manuals, which focus on sector-specific and general skills as a valuable tool for supporting learners and take it into account for own training activities;
- Acknowledging that the tutors in companies are key factors to the success of the in-company training. Therefore, they should be constantly supported and developed through training;
- Seeking to promote the developed Sector Qualification Framework level 5 to 7, linked to the European Qualification Framework (EQF), as it offers an opportunity to develop transparency and mutual trust between the stakeholders of the industrial shoe sector.

13.1.2 List of endorsers

No	INSTITUTION`S NAME	LOGO
1	Institute Technology and Education (ITB), DE Universität Bremen Am Fallturm 1 28359 Bremen www.itb.uni-bremen.de/	
2	Prüf- und Forschungsinstitut Pirmasens e. V., DE PFI Germany Marie-Curie-Straße 19 66953 Pirmasens / Germany www.pfi-germany.com	
3	Centro Tecnológico do Calçado de Portugal (CTCP), PT Rua de Fundões – Devesa Velha 3700-121 S. João da Madeira www.ctcp.pt	
4	Carité Calçados Lda, PT Rua Nicolau Coelho nº2729 Sendim 4610-909 Felgueiras Portugal www.carite.pt	
5	Centro de Formação Profissional da Indústria de Calçado (CFPIC), PT Ruai Visconde, 990 3700-990 São João da Madeira Portugal www.cfpic.pt/	
6	Universitatea Tehnică Gheorghe Asachi din Iaşi, RO Bulevardul Profesor Dimitrie Mangeron 67 Iași 700050 Romania www.tuiasi.ro/	
7	Papucei, Angela International, RO Sc Angela International Srl Calea Chisinaului, nr. 2 bis 700264 Iasi Romania www.papucei.eu/	

8	W. L. Gore & Associates GmbH Hermann-Oberth-Strasse 22 85640 Putzbrunn Germany	
9	Deutsche Schuhfachschule in der BBS Pirmasens Adlerstraße 31 66953 Pirmasens Deutschland	
10	SFERA Factor Romanian Leather Manufacturers Organisation Strada Tatarasi 67 700397 Iasi Romania	
11	CONDUR by Alexandru Iuliu Maniu 7, corp Q, parcela 86, Sector 6 061072 Bucharest Romania	
12	NISSA Romania Parcul Industrial Electronica, clădirea El Prof, aripa A, etaj 2 strada Baicului, nr. 82, sector 2 021784 Bucharest Romania	
13	Activ Ortopedic Petru Maior 61, Sector 1, Bucharest Romania	
14	VAGABOND REPUBLICA S.R.L. Str. DR. SAVINI, nr. 5 Iasi Romania	

15	Alpina van Beers Strada Ierbuşului 10 RO-545300 Reghin, MŞ Romania	ALPINA active lifestyle performance
16	FIBALCO SRL Strada Unirii 48A 205400 Segarcea Romania	FIBALCO SRL
17	GINO ROSSI PRODUCTION SRL. Str. STR. SPLAIUL UNIRII, Nr. 160A, Sector 4 BUCUREȘTI, Romania	GINO ROSSI
18	SC KRS Shoes Forever 21 SRL Strada Ion Nonna Otescu nr 17 Sector 6 Bucuresti, Romania	Helwig Shoes SINCE 1921
19	SC PESTOS SRL str. Alexandru cel Bun, nr. 9 Iasi Romania	IL PASSO
20	Lust of Creation SRL B-dul 1 Mai nr. 30, Sector 6 Bucuresti, Romania	LUST of CREATION
21	MYKA SHOES LEATHER SRL Sat Valea Lupului Com. Valea Lupului, Str. Nicolae Grigorescu, Nr.36 Jud. Iasi Romania	

22	S.C. MUSETTE EXIM S.R.L. Str Drumul Intre Tarlale, 160-174, Apollo Center, Depozit nr 5, Hala B, 032982 Sector 3 Bucuresti, Romania	MUSETTE
23	Maricel Com Prod SRL Calea Șerban Vodă 41, 040202 București Romania	Maricel® Original Leather
24	OMNIA PLAST SRL Sat Chiajna Sos. De Centura 10-11 B Jud. Ilfov, Romania	OMNIA PLAST
25	S.C. Pache Junior SRL Soseaua Berceni Nr.8, Etaj 3, Cam 3 Sector 4 Bucuresti, Romania	PJ Shoes
26	REKORD SRL ALBA IULIA, CONTEA ALBA STR. ALEXANDRU JOAN CUZA 40/A Romania	REKORD
27	SOMAREST S.R.L. Orş. Cisnădie, Str. Transilvaniei, Nr.1 Jud. Sibiu Romania	SOMAREST
28	TINO SA Strada Avram Iancu 66 Brașov 500075 Romania	TINO Fondat in 1898

29	APICCAPS - Associação Portuguesa dos Industriais de Calçado, Componentes, Artigos de Pele e seus Sucedâneos Rua Alves Redol, 372 4050-042 Porto Portugal	APICCAPS Associação Portuguesa dos Industriais de Calçado, Componentes e Artigos de Pele e seus Sucedâneos
30	Escola Profissional de Felgueiras Rua dos Bombeiros Voluntários, 104, Felgueiras Portugal	
31	AEOJ – Agrupamento de Escolas Oliveira Júnior Avenida Adelino Amaro da Costa 3700-023 São João da Madeira	
32	IEFP – Instituto do Emprego e Formação Profissional Avenida de Santiago 88 Rio Meao 4520-462	INSTITUTO DO EMPREGO E FORMAÇÃO PROFISSIONAL

13.2 DIA-CVET Position Paper

Position Paper on Recognition of Prior Learning (RPL) and the relevance of Continuous Vocational Education and Training (CVET) developed within the EU-co-funded project "Developing Innovative and Attractive CVET programmes in industrial shoe production (DIA-CVET)".

The purpose of this paper is to contribute to policy-making in the European industrial shoe production sector and beyond with respect to curricula-driven work-based learning (WBL) within Continuous Vocational Education and Training (CVET). The European industrial shoe production sector is mainly focussed on high quality products. Key factors are innovative design, quality, quick reaction to fashion trends as well as a wide range of styles and colours. Some companies also focus on small but demanding markets, such as safety shoes or shoes for healthcare e.g. orthopaedic shoes.

However, the competitiveness of the sector is highly depending on knowledge, skills and competences (KSC) of the staff gained through Initial Vocational Education and Training and further developed within CVET. These competences are needed to design, produce, operate and maintain cutting-edge products and manufacturing systems.

In the last decade, however, industrial shoe producers have seen a shortage of skilled workers and innovative mind-sets, hampering the competitiveness of EU shoe production industry and the employability of workers. WBL within CVET helps to maintain the quality standards of products and provides new opportunities for industry and its staff.

With that in mind, this position paper aims to help decision-makers all over the EU to recognise the importance of curricula-driven WBL within CVET in the European industrial shoe production sector and to provide them with a series of recommendations to support the development of competences and skills in this area. The DIA-CVET project mainly aimed at strengthening CVET as a crucial element of increasing attractiveness of VET and assuring its high quality. Target groups are colleagues, having been qualified via Initial Vocational Education and Training (IVET) in the sector of industrial shoe production in Germany, Portugal and Romania. Furthermore, project partners developed a Sector Qualification Framework (SQF) for levels 5-7 and referenced the national qualifications of Germany, Portugal and Romania.

In this position paper, we would like to highlight the project recommendations for further developing curricula-driven WBL as a promising approach in CVET in Germany, Portugal, Romania and all other EU countries, as well.

Due to rapidly changing technological developments and to altering trends in fashion, WBL becomes more and more crucial for today's learners in industrial shoe production industry. The competitiveness of manufacturing companies depends on the skills possessed by its workforce, especially on medium level. Often these positions are filled with staff holding a degree in Higher Education (HE) with poor knowledge of sector-specific conditions and tasks. To increase sector-specific skills, CVET should be strengthened; we call on VET regulatory bodies across Europe to integrate substantial curricula-driven WBL as part of all CVET programmes.

It is necessary for the CVET-systems of any country that all stakeholders work together in order to define comprehensive learning outcomes in accordance with national legislation. Therefore modernisation of CVET-curricula should be executed jointly by responsible regional or national authorities, employers, vocational education and training institutions, chambers of industry, commerce and crafts, professional and sectorial organisations and trade unions to ensure a fair balance between work, job specific skills, knowledge and key competences of the beneficiaries.

In order to recruit more young people for an apprenticeship in industrial shoe production, the sector needs to become more attractive. Therefore, improving CVET programmes and drafting clear career opportunities should be high on the agenda of the competent bodies from shoe sector.

Educational reforms cannot be imported from one EU member state to another or implemented "top-down". Thus we recommend that stakeholders from any country reflect on approaches from various different CVET-systems – and adopt respective develop their system with respect to national traditions and beliefs.

In-company trainers are essential for WBL. They should cooperate closely with vocational education and training institutions and external teachers or trainers to provide guidance for beneficiaries of CVET and to ensure mutual and regular feedback. Therefore, they need to be supported in gaining sector-specific and general (didactical) skills. For instance, this could be done by promoting the use of the DIA-CVET train the trainer manuals as well as the feedback questionnaires, which were developed and launched by this EU project.

Trainers need to be supported by industry and authorities to update their skills, knowledge and competences in order to train apprentices according to the latest teaching and training methods and labour market needs. We recommend that countries develop and provide adult education courses for trainers and mentors and offer those via CVET providers, for example by using the manual of the sphere of activity "training management".

The developed SQF level 5-7 is a guiding document for transparency and mobility within industrial shoe production. It includes a comparison of qualifications in industrial shoe production sector in Germany, Portugal and Romania based on a common understanding of what defines competences and taking into account the diversity and traditions of continuous vocational education, training systems and policy priorities in the partner countries. It offers an overview on competences and skills of qualified staff in all partner countries. We recommend that any new or updated profile in the sector from partner countries as well as qualifications from other EU countries should be levelled in this SQF.

13.2.1 List of endorsers

NO	INSTITUTION`S NAME	LOGO
1	Institute Technology and Education (ITB), DE Universität Bremen Am Fallturm 1 28359 Bremen www.itb.uni-bremen.de/	
2	Prüf- und Forschungsinstitut Pirmasens e. V., DE PFI Germany Marie-Curie-Straße 19 66953 Pirmasens / Germany www.pfi-germany.com	
3	Centro Tecnológico do Calçado de Portugal (CTCP), PT Rua de Fundões – Devesa Velha 3700-121 S. João da Madeira www.ctcp.pt	
4	Carité Calçados Lda, PT Rua Nicolau Coelho nº2729 Sendim 4610-909 Felgueiras Portugal www.carite.pt	
5	Centro de Formação Profissional da Indústria de Calçado (CFPIC), PT Ruai Visconde, 990 3700-990 São João da Madeira Portugal www.cfpic.pt/	
6	Universitatea Tehnică Gheorghe Asachi din Iaşi, RO Bulevardul Profesor Dimitrie Mangeron 67 Iași 700050 Romania www.tuiasi.ro/	
7	Papucei, Angela International, RO Sc Angela International Srl Calea Chisinaului, nr. 2 bis 700264 Iasi Romania www.papucei.eu/	

8	SFERA Factor Romanian Leather Manufacturers Organisation Strada Tatarasi 67 700397 Iasi Romania	
9	CONDUR by Alexandru Iuliu Maniu 7, corp Q, parcela 86, Sector 6 061072 Bucharest Romania	
10	NISSA Romania Parcul Industrial Electronica, clădirea El Prof, aripa A, etaj 2 strada Baicului, nr. 82, sector 2 021784 Bucharest Romania	
11	Activ Ortopedic Petru Maior 61, Sector 1, Bucharest Romania	
12	VAGABOND REPUBLICA S.R.L. Str. DR. SAVINI, nr. 5 Iasi Romania	
13	Alpina van Beers Strada Ierbuşului 10 RO-545300 Reghin, MŞ Romania	
14	FIBALCO SRL Strada Unirii 48A 205400 Segarcea Romania	

15	GINO ROSSI PRODUCTION SRL. Str. STR. SPLAIUL UNIRII, Nr. 160A, Sector 4 BUCUREȘTI, Romania	GINO ROSSI
16	SC KRS Shoes Forever 21 SRL Strada Ion Nonna Otescu nr 17 Sector 6 Bucuresti, Romania	Helwig Shoes® SINCE 1921
17	SC PESTOS SRL str. Alexandru cel Bun, nr. 9 Iasi Romania	IL PASSO
18	Lust of Creation SRL B-dul 1 Mai nr. 30, Sector 6 Bucuresti, Romania	LUST of CREATION
19	MYKA SHOES LEATHER SRL Sat Valea Lupului Com. Valea Lupului, Str. Nicolae Grigorescu, Nr.36 Jud. Iasi Romania	
20	S.C. MUSETTE EXIM S.R.L. Str Drumul Intre Tarlale, 160-174, Apollo Center, Depozit nr 5, Hala B, 032982 Sector 3 Bucuresti, Romania	MUSETTE
21	Maricel Com Prod SRL Calea Șerban Vodă 41, 040202 București Romania	Maricel® Original Leather

22	OMNIA PLAST SRL Sat Chiajna Sos. De Centura 10-11 B Jud. Ilfov, Romania	
23	S.C. Pache Junior SRL Soseaua Berceni Nr.8, Etaj 3, Cam 3 Sector 4 Bucuresti, Romania	
24	REKORD SRL ALBA IULIA, CONTEA ALBA STR. ALEXANDRU JOAN CUZA 40/A Romania	
25	SOMAREST S.R.L. Orş. Cisnădie, Str. Transilvaniei, Nr.1 Jud. Sibiu Romania	
26	TINO SA Strada Avram Iancu 66 Braşov 500075 Romania	
27	W. L. Gore & Associates GmbH Hermann-Oberth-Strasse 22 85640 Putzbrunn Germany	
28	Deutsche Schuhfachschule in der BBS Pirmasens Adlerstraße 31 66953 Pirmasens Deutschland	

29	APICCAPS - Associação Portuguesa dos Industriais de Calçado, Componentes, Artigos de Pele e seus Sucedâneos Rua Alves Redol, 372 4050-042 Porto Portugal	APICCAPS Associação Portuguesa dos Industriais de Calçado, Componentes e Artigos de Pele e seus Sucedâneos
30	Escola Profissional de Felgueiras Rua dos Bombeiros Voluntários, 104, Felgueiras Portugal	epf
31	AEOJ – Agrupamento de Escolas Oliveira Júnior Avenida Adelino Amaro da Costa 3700-023 São João da Madeira	
32	IEFP – Instituto do Emprego e Formação Profissional Avenida de Santiago 88 Rio Meao 4520-462	INSTITUTO DO EMPREGO E FORMAÇÃO PROFISSIONAL

14 References

Portugal

Ordinance No. 232/2016, of 29 August, which regulates the creation and organization and operation of QUALIFICA Centres.

Ordinance No. 60-C/2015, of 2 March, amended by Ordinance No. 181-A/2015, of 19 June, no. 190-A/2015, of June 26th and 148/2016, of May 23rd

Ordinance No. 61/2022 January 31 EDUCATION AND WORK, SOLIDARITY AND SOCIAL SECURITY

National Catalog for Certification

ANQEP IP website

IEFP website

Germany

IHK (2022): https://www.ihk.de/schwaben/produktmarken/meine-pruefung/ausbildungspruefungen/besondere-wege-zum-abschluss/externenpruefung-553400

recognition ordinance: https://www.anerkennung-in-deutschland.de/html/en/index.php#

Romania

Romanian National Education Law, https://edu.ro/sites/default/files/_fi%C8%99iere/Legislatie/2020/LEN_actualizata_octombrie_2020.pdf

Romanian National Authority for Qualifications, http://www.anc.edu.ro/

National Lifelong Learning Strategy 2015-2020, http://www.anc.edu.ro/wpcontent/uploads/2019/11/strategia-de-invatare-pe-tot-parcursul-vietii-2015-2020.pdf

National Strategy for Tertiary Education 2015-2020, http://www.anc.edu.ro/wpcontent/uploads/2019/11/Strategia-Na%C8%9Bional%C4%83-pentru-%C3%8Env%C4%83%C8%9B%C4%83m%C3%A2nt-Ter%C8%9Biar-2015-2020.pdf

Romanian Education and Training Strategy in the period 2016-2020, http://www.anc.edu.ro/wpcontent/uploads/2019/11/Strategia-Educa%C8%9Biei-%C8%99i-Form%C4%83rii-Profesionale-dinRom%C3%A2nia-%C3%AEn-perioada-2016-2020.pdf

National Register of Qualifications, http://www.anc.edu.ro/rncp/

National Register of Adult Vocational Training Providers, https://www.edu.ro/registrulna%C8%9Bional-al-furnizorilor-de-formare-continu%C4%83-actualizat

Guide for the user of the European transfer and accumulation system of ECTS / SECT credits, https://www.upt.ro/img/files/legislatie/2019/Anexa_la_OMEN_5146_Ghid_de_studii.pdf

Guide for recognizing professional experience and qualifications gained abroad, https://cnred.edu.ro/ro/Ghid-recunoastere-experienta-profesionala-si-calificari-dobandite-in-strainatate

15 Figures

16 Tables