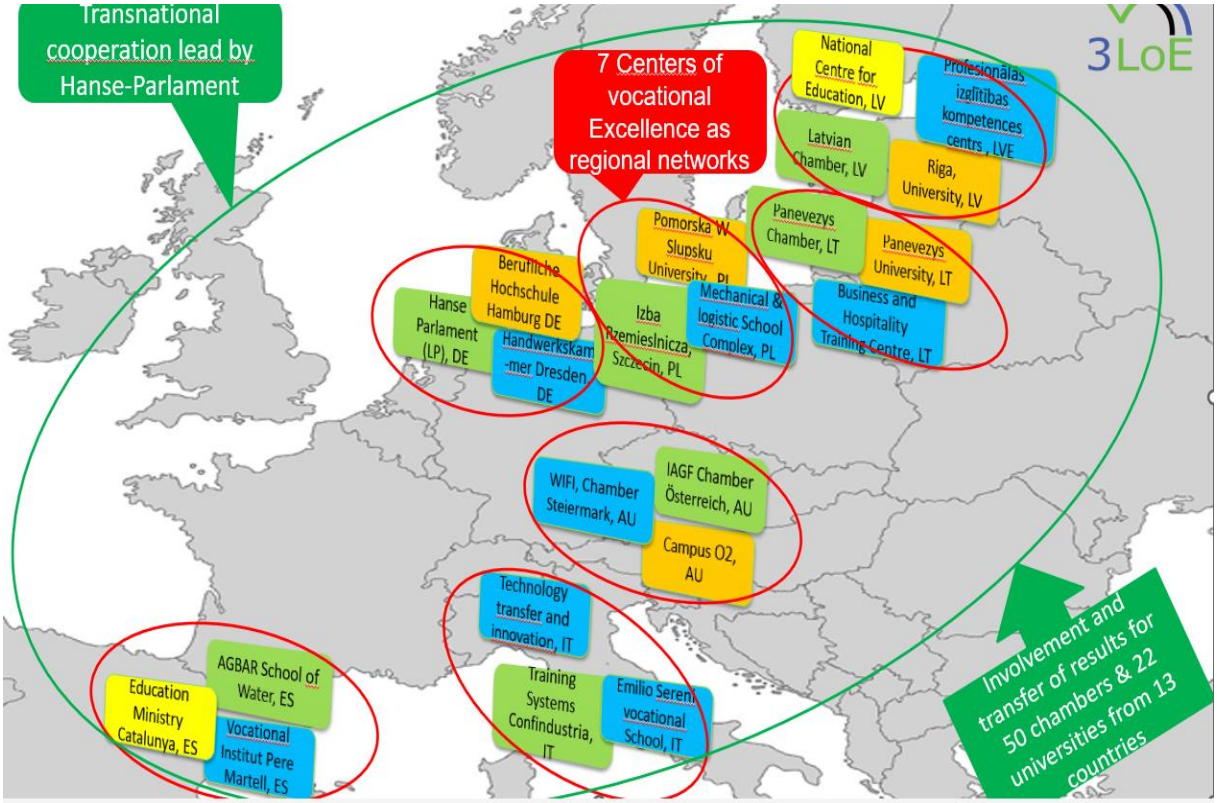
Result 4.6

Trainings Vocational Master and Technician

Implementation and Evaluation

Partner



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Project Summary and Introduction

1. About the 3LOE project

Around 99% of all EU businesses are SMEs, creating up to 70% of all jobs. In general, SMEs have good growth prospects for the future and are particularly well equipped to solve environmental problems and to enhance the green economy. However, in most of the project countries, SMEs are confronted with a shortage of skilled workers and young entrepreneurs. This shortage of skilled workers is even more alarming taking into account that due to aging of current entrepreneurs, a large and growing number of companies will have to be handed over to the next generation. Furthermore, young specialists and entrepreneurs often lack the qualifications and skills needed in order to respond to contemporary developments in the fields of energy, climate and environmental protection. The following problems have been identified in SMEs working in the fields of green economy, energy and environmental protection:

- Blatant and growing shortage of skilled workers.
- Large qualification deficits, especially in the Green Economy.
- Loss of attractiveness and low qualification of school-based VET.
- Low rates of further training and insufficient orientation of offers to SME needs.
- Ageing of entrepreneurs and increasing shortage of young people (demographic change).
- Failure of business transfers and low rates of business start-ups.
- Low innovation rates and insufficient productivity.
- Not enough cooperation between universities and SMEs and a lack of teaching geared to SME needs.
- Comparably low internationalization of SMEs and vocational training providers.
- Lack of national level support for SMEs”.

To meet these challenges, work-based learning and new paths in vocational training must be provided through cooperation between educational institutions, economic chambers and SMEs. University graduates are often well-qualified in theory, but lack practical knowledge, skills and abilities that are crucial for SMEs. For this reason, VET reforms must also involve higher education, and should implement dual bachelor's degree programs that combine a bachelor's degree with vocational training and on-sight work in companies.

In the 3LOE project, an innovative and complex project structure with 22 project partners from 7 countries as well as 60 associated partners from 13 countries was designed. In each country, centers of vocational excellence (COVEs) in Green Economy will be established, managed and their permanent continuation ensured. A transnational cooperation of the centers will be developed, extended to 60 education stakeholders from 13 countries and operated permanently in an institutionalized form. The centers will offer a wide range of dual education measures in vocational training, further education and higher education, that are being developed, tested and evaluated in the project. These educational measures on EQF levels 3-7 focus on Green Economy, Digitalization and Entrepreneurship. Furthermore, vocational and educational consulting and innovation support for SMEs will be developed and implemented. In total, seven Train-the-Trainer programs will be developed and implemented permanently by the project partners. All results will be transferred to the 60 associated partners together with implementation advice.

The objectives and aimed outcomes of the 3LOE project can be summarized as following:

1. Foundation of a three-level Center in each project country

1.1 Building the "Green Economy" skills alliance for qualifications in SMEs with educational and economic actors from the 7 project countries; development of information and cooperation tools.

1.2 Expansion of the skills alliance to the 60 associated partners from 13 countries, comprising chambers of commerce, SME associations, as well as universities of applied sciences/colleges.

1.3 Development, testing and evaluation of a curriculum and teaching materials for Train the Trainer courses for personnel and center management (vocational schoolteachers, trainers in SMEs and lecturers in further and higher education institutions).

1.4 Evaluation of the construction and operation of the seven centers of Excellence and of the transnational cooperation.

1.5 Development of business and financing plans and ensuring the long-term continuation of the seven centres and transnational cooperation.

1.6 Development, consulting and introduction of political strategy program.

2. Implementation and realization vocational training

2.1 Development and implementation of a tool for vocational and qualification counselling as well as a training for consultants and teachers to use the tool.

2.2 Implementation of the dual system, so that work-based learning is put into practice in the project countries.

Preparation and transfer of curricula and examination regulations for dual vocational training for different professions and implementations in Poland, Lithuania, Latvia and Spain.

Development, test and implementation Trainings for teachers to conduct dual vocational training as well as Training of trainers in SMEs.

2.3 Development political concept for the training and integration of young people with learning difficulties for young people with learning difficulties (EQF level 3).

Development, test and implementation of a dual vocational training "Specialist for Building Insulation”.

2.4 Development, testing and evaluation of education programme, teaching materials and examination regulations for the provision of sector-specific qualifications already during the initial vocational training for stronger learners. Implementation in the dual system, so that work-based learning is put into practice in the project countries.

2.5 Development and implementation five-year technician training „Ecologic Solutions in Logistics”.

3. Implementation and realization of further vocational training

3.1 Development and implementation of concepts and instruments for the management of continuing vocational training.

3.2 Development, test and implementation of a Train-the-Trainer program for teachers to conduct further training.

3.3 Development and implementation of a concept "SME-fair digitalization" as well as development, test and implementation of two train the trainer programs “Basic and advanced digital skills”.

3.4 Transfer and implementation of four further trainings Energy Saving and Renewable Energies.

3.5 Preparation, transfer and implementation of six further trainings in the Green Economy.

3.6 Development, testing and evaluation of different training programs and teaching material for owners, managers and qualified workers of SMEs (EQF level 5 and 6). The trainings are specifically tailored to SME needs and different qualification levels and combine the transfer of technical, professional and management know-how.

- Training Enterprise and Entrepreneurship in Green Economy
- Training Energy Service Manager
- Trainings vocational Master Carpenter and Electric
- Training Construction Technician
- Training Service Technician
- Training Sustainability in foodservice industry

3.7 Development of regulations for new continuing education occupational profiles with a focus on the green economy.

3.8 Development of an integration programme for the unemployed (EQF level 4) in order to be able to place the unemployed in permanent jobs through further training seminars and a further training qualification.

4. Implementation and realization of higher education

4.1 Preparation and transfer of curricula, evaluation and examination regulations for two existing dual Bachelor degree programmes "Management of Renewable Building Energy Technology” and "Business Administration for SMEs”.

4.2 Development and beginning of implementation of new dual Bachelor degree programs

- Business Administration & Sustainable Management of SMEs
- Entrepreneurship and Innovation in Green Economy
- Logistics - Green Supply Chains
- Service technician
- Tutorial “Sustainable management Climate neutrality for companies”

4.3 Development, test and implementation of four study modules (EQF level 6) on SME management in the Green Economy sector, which will be carried out in the dual study system and integrated into existing Bachelor degree programmes.

4.4 Development and implementation of concept for innovation promotion Solutions for manageable R&D tasks of SMEs and conducting manageable R&D projects for SMEs-

4.5 Development, testing and implementation of Training program for university lecturers and SME advisors.

5. Dissemination, transfer and use of the project results

5.1 Development of a concept and summary evaluation of the dissemination results of all partners

5.2Transfer of all educational measures to 60 educational institutions in 13 countries and needs-oriented implementation consultations as well as realization of a bundle of measures for further dissemination of the project results.

5.3 Further dissemination activities such as presentations online, at third-party events, press releases and conferences.

5.4 Book with all results of the project and distribution via book trade.

For each of the three levels of educational measures there will be:

- Target-group-specific educational programs.
- Curricula, teaching materials, etc. developed in a leading role by the educational institutions of the respective level, whereby the educational institutions of the other levels (in particular universities) participate in an advisory and supportive manner.
- Representatives of the participant target groups involved in the development work.

All educational measures will be tested with the respective target groups under different national conditions in the countries, evaluated and completed on the basis of the evaluation results with application notes.

2. About the Trainings Vocational Master and Technician

One aim of the 3LOE project is to develop two comprehensive vocational master training programs, test them practically under different national conditions, evaluate them, finalize them on the basis of the evaluation results and implement them in the eight Centres of Vocational Excellence.

- Vocational Master Electric
- Vocational Master Carpenter

The two professions were chosen because there was a particularly great need for them among the implementation partners. On the basis of these two master training programs, the Centres of Vocational Excellence can easily develop and implement demand-oriented master training programs for other professions after the end of the project.

The 3LOE project is aimed to train company successors, entrepreneurs and managers, based on a relatively high-level master qualification system. The curricula and examination regulations were developed on the basis of master craftsman training programmes in Germany, which were geared to national conditions and the needs of the eight Centres of Vocational Excellence and to a very high level of quality. All eight centres have received both training courses and implementation consultations. During the project period, practical tests were carried out under different national conditions in two countries, evaluations, revisions and completions based on the evaluation

results and transfers to all eight centres, which will in future provide this high-quality entrepreneurship training.

One aim of the 3LOE project is to develop two comprehensive technician training programs, test them practically under different national conditions, evaluate them, finalize them on the basis of the evaluation results and implement them in the eight Centres of Vocational Excellence.

- Construction Technician
- Service Technician

The two professions were chosen because there was a particularly great need for them among the implementation partners. On the basis of these two technician training programs, the Centres of Vocational Excellence can easily develop and implement demand-oriented technician training programs for other professions after the end of the project.

Like the technician's training, the master craftsman training is directly connected to the first level when a journeyman's or skilled worker's qualification is obtained. The master craftsman training comprises four parts as well:
Part I: Subject-related practice
Part II: Subject-related theory
Part III: Business Administration and Management
Part IV: Vocational and occupational education

Each part of the master craftsman training concludes with an independent examination; upon successful completion of all four examinations, the master craftsman's title is awarded in the chosen profession. At the same time, in Germany the graduates are entitled to study at a university. The master craftsman training is like the technician's training also located at EQF level 6.

The four curricula and examination regulations for the Vocational Master and Technician trainings were transferred electronically and in paper form to all eight COVEs. They have been made available in Google drive and are also published on the project website for free download for future ongoing use.

Implementation reports as well as evaluation concepts and reports are presented below.

Training Vocational Master[1]

1. Implementation Report Vocational Master Electric[2]

Introduction

The training to become a master craftsman includes four fields of activity/training parts. Parts 1 and 2 teach the theory and practice of the trade, which are specialised in the respective trades/occupations. Part 3 includes business administration in a company and Part 4 is the training of trainers according to AEVO with the trainer aptitude test.

The basic requirement for admission to master craftsman training is successfully completed vocational training (EQFI Level 4) in the respective occupation. After completing the master craftsman examination, the master craftsman is at EQFI level 5.

With this qualification, the master craftsman is entitled to set up and run a business in a trade requiring registration in accordance with Annex A of the Crafts Code (HWO). This also includes the authorisation to train apprentices.

If the master craftsman is employed, employment in a managerial position within the company is possible, for example as a trainer, assembly manager or foreman.

The master craftsman preparation course evaluated here comprises specialised practice and theory (parts 1 and 2). It was started in May 2022 at njumii - Das Bildungszentrum des Handwerks der Handwerkskammer Dresden with 12 participants and ends in February 2023 with a final examination.

Admission and organisation of the training

Participants are recruited for the planned qualification in various ways. These are e.g.:

- Promote the courses at relevant trade fairs
- Publish the courses in the social networks, homepage etc.
- Reporting of success stories in the craft and trade magazine
- Advertisements in the regional press.

Another way is the conscious decision of the participant for this special further education. The interested person can register for counselling in person at the customer centre of the education centre or online via the course portal (www.njumii.de).

Each participant receives comprehensive advice on the continuing education in advance. This includes the content, the time required and the costs involved, as well as advice on possible subsidies.

Course information:

- The course contents include all necessary/required modules for the final examination according to the nationwide standardised master craftsman examination regulation.
- The amount of time can be chosen:

o Full-time courses = direct studies or

[1] Curricula and examination regulations are published on the project website for free download for future ongoing use.

[2] Prepared by Chamber of Crafts Dresden

o Part-time courses = studying while working.

- The costs incurred include the course fees, examination fees and the necessary material costs for specialist literature.

- In Germany, the Upgrading Training Assistance Act (Aufstiegs-BAföG) offers a comprehensive funding programme under the Upgrading Training Assistance Act (Aufstiegsfortbildungsförderungsgesetz, AFBG), which participants can use to finance the costs of the course if necessary (see https://www.aufstiegs-bafoeg.de). AFBG funding includes grants that do not have to be repaid. In addition, there is the option of taking out a low-interest loan from the Kreditanstalt für Wiederaufbau (KfW) for the difference between the subsidy portion and the maximum subsidy amount.

- amount. The grant shares vary depending on the object of funding (costs of measures, maintenance requirements, etc.).

- In the Free State of Saxony there is also an additional "master craftsman bonus" (currently € 2,000), which can be applied for after successful training.

After registration and admission to the course, the administrators of the course organisation (the course administration) take over the further support of the participants.

At the beginning of the course, this includes extensive information on the framework conditions of the qualification at the training centre and on the organisational process of the course. This includes: A welcome by the head of department, information on break times, instruction on house and fire safety regulations, etc. The course administration is available for all questions that arise at the beginning or during the course. Questions about examinations and the preparation of certificates, on the other hand, are answered by the Examinations Office located in the Education Centre.

12 participants registered for the trial course and also participated fully.

This means that the course was booked with the maximum possible number of participants, as the workshops are equipped with 12 participant places. The course comprises 1,216 teaching units of 45 minutes each. The master craftsman preparation course in electrical engineering is offered and conducted twice a year as a full-time course. In addition, the training centre offers a part-time course every two years.

For the consent of the implementation in the project, a passing on of personal data to third parties was excluded. Therefore, this data is only used anonymously in the following.

The framework curriculum was developed on the basis of the examination regulations. Only the master craftsman's examination is compulsory for the master craftsman's diploma. Therefore, participation in this master craftsman preparation course is not compulsory.

However, this course is designed to impart necessary knowledge to the participants, which is relevant for the successful examination and, of course, for professional practice. Acquiring the knowledge to pass the master craftsperson examination is also possible via another career path. These may not be excluded from the master craftsperson examination.

Within the framework of this master craftsman preparation course, participants acquire additional qualifications which are integrated into the modules. For example:

- PLC specialist - basic level

- KNX Basic Course

For targeted employment opportunities, the trainer aptitude or the qualifications mentioned here can also be completed as an individual training course without obtaining the master craftsman's diploma. See course Trainer aptitude, which was evaluated last.

With this comprehensive training and the attainment of the corresponding educational level, the graduate can be deployed very individually in the company.

Experienced, well-trained specialist lecturers are used in the different modules to ensure high-quality knowledge transfer. Six lecturers taught in this course. They all have different developmental biographies. All of them have undergone basic training in their field and are then active as trainers/lecturers in the training centre through further training/studies (e.g. graduate engineer for information technology; mechatronics engineer, master electrician, ...) and various practical experience. The practical experience of the instructors occupied shows an instructor activity of at least 6 years up to more than 30 years.

About the individual lecturers appointed

Lecturer 1

- over 40 years ago he studied engineering education and is now a practical teacher/trainer for PC technology
- since 1998 he has been working in the training centre of the Chamber of Crafts Dresden
- he has 30 years of professional experience

Lecturer 2

- He was a skilled worker in the electrical field
- Served in the German Armed Forces as a technical repairman
- During his time in the army, he completed his training as a master craftsman

Lecturer 3

- over 40 years ago he studied engineering education and is now a practical teacher/trainer for PC technology
- since 1998 he has been working in the training centre of the Chamber of Crafts Dresden
- he has 30 years of professional experience

Lecturer 4

- The lecturer has a degree in electrical engineering.
- she has further training as a skilled electrician and, with appropriate further training and additional training in office and information technology, she can work as a trainer at the Chamber of Crafts' training centre

Lecturer 5

- he has completed training as a mechatronics engineer and further training as a technician

- has successfully passed the examination to qualify as a trainer
- has professional experience as a trainer and has been working at the Chamber of Skilled Crafts' training centre since 2019.

Lecturer 6

- He trained as an electronics technician and then obtained a master's degree in the electrical sector.
- worked as a trainer in the electrical sector
- has been working for the Dresden Chamber of Crafts for several years

Participants profile and organisation of the training

The evaluated master craftsman course was attended by 12 men. All of them proved that they had a journeyman's certificate in the electrical trade as a basic requirement for admission (= successfully completed apprenticeship training). The average age of the participants was 29. Individually, they were between 23 and 35 years old, with one exception. This participant was already 43 years old. All participants are from the Dresden Chamber of Crafts district and were employed in SMEs as skilled workers/journeymen until the start of the study programme.

Execution of the Training

The learning content was taught according to the curriculum. The basis for the curriculum is the "Prüfungsordnung Elektromeister" (Ordinance on the Master Craftsman's Examination Job Profile and on the Examination Requirements in Parts I and II of the master craftsman examination in the electrical engineering trade (Elektrotechnikermeisterverordnung - ElektroTechMstrV)*).

Each participant receives a certificate of attendance upon completion of the course, regardless of the subsequent examination result. The individual learning contents are documented on this certificate of attendance. (Annex 1)

The final examination comprises a theoretical and a practical part. The theoretical examination is written, takes 2 x 6 hours and is spread over two days. The practical part is the production of a "masterpiece". Here the examinee produces a technically demanding piece of his trade under supervision.

He works independently from planning to project planning to completion. The time required for this practical part is 6 working days. If the overall result from the written and practical examination is not clear, an additional oral examination can clarify the final result. The Examination Office has taken the examination, the results are not yet available at this time. We will submit them later as Annex 3.

After passing the examination, the participant receives a certificate. Condition: the examination must be passed with at least the grade "sufficient".

If the participant/master student has passed all 4 parts of the master craftsman course, then he receives the title "Master Craftsman".

The graduates of all master craftsman courses are honoured at an annual master craftsman celebration held by the Dresden Chamber of Crafts. Here they are traditionally presented with their jewellery master craftsman's certificates in a festive ceremony.

The feedback from the participants on the evaluation questionnaires is in the middle range. There were some good and neutral evaluations.

This questionnaire, as constructed, has a large margin of error in the evaluation.

The evaluation grades 1 = "very bad" to 5 = "very good"/"excellent" do not correspond to the usual German evaluation system and harbour the danger of incorrect assessment/evaluation.

In Germany, 1 is associated with very good quality/very good grades and 5 with poor quality/bad grades.One participant remarked that he understood the evaluation 1 - 6 as the awarding of marks and thus followed exactly the style of evaluation that is common in Germany.

The comments are therefore the most meaningful.

In terms of content, the following things were addressed:

- The time factor was criticised, too much material for the relatively small-time span.
- Some participants would have liked to see a higher practical component
- The topics should be more oriented towards current developments.
- It was also mentioned that the share of renewable energies is too low.
- The practical part was evaluated positively.

The lecturers have largely rated the course as "good". Points of criticism here are also the amount of material to be completed in the respective period. It should be noted that this course already has a very high number of hours compared to the national average.

The preparation time and also the teaching materials are another issue. For good teaching quality, more preparation time was desired, including for the preparation of teaching material, since there is no uniform teaching material from a publisher to work with for this course. It would be advantageous to be able to make uniform teaching materials available through a publisher.

The adaptation of the course to the current development with renewable energies would be very much appreciated. However, the prescribed regulations and examination regulations must also be adapted for this. This is not at the discretion of the lecturers.

It does not make sense to add more teaching hours to the course.

Only supplementary courses could then be offered until the examination regulations and the associated curriculum are adapted, if necessary.

Main Findings and Conclusions

From the participants' point of view, the course could do with an update. The lecturers would also be very happy to support this. In advance, however, the legal framework (nationwide uniform ordinance on the master craftsman's examination and on the examination requirements in Parts I and II of the master craftsman's examination in the electrical engineering trade) would first have to be revised and, in a second step, the custom-fit teaching materials would have to be developed and made available.

As a master craftsman in his trade, it is important to learn all the fundamentals and to own knowledge according to the principle of lifelong learning, depending on the company in which one works or the business focus of one's own company. This also includes the continuous acquisition of basics on new topics, such as renewable energies.

2. Implementation Report Vocational Master Carpenter[3]

Introduction

A carpenter, like a craftsman of any other craft profession, must be a professional in their trade, have the knowledge and skills to independently manage their company and train apprentices and journeymen.

A professional carpenter is able to manufacture, assemble, dismantle and restore buildings of various wooden constructions and build wooden constructions in new buildings, renovated and rebuilt buildings as well as perform restoration of solid wood constructions in accordance with technical drawings and work quality requirements.

In Latvia, Latvian Chamber of Crafts provides master certification to skilled and experienced carpenters who are willing to complete the qualification training and examination. The 3LoE project has provided an important and invaluable opportunity for the Chamber to test and implement the carpenter master training provided by the German partners. The Chamber sees this as a great opportunity to supplement and actualize the existing training, provide new ideas and knowledge for the lecturers and train yet another group of skilled addition to the local workforce.

The offered carpentry curriculum is very broad, and trainees must learn:

- determining customer requirements, advising customers, conducting contract negotiations and determining orders, calculating service costs and creating offers, concluding contracts.
- planning, organizing, conducting and monitoring order handling processes, order fulfilment.
- organization of the company, quality management, training and continuing education in the company.
- labour and environmental protection.
- information and communication technologies, data protection.
- professional legislation and technical standards, construction documentation.
- technologies, materials, equipment and guarantees, personnel, opportunities to employ interns and apprentices.
- preparation of projects, sketches, production drawings and plans using computerized systems.
- submissions and necessary documentation for the construction board coordination procedures.
- style trends, historical and contemporary design language in architecture, design, manufacturing, restoration and reconstruction.
- design, planning, construction, manufacturing and assembly of furniture, interior equipment.
- design, planning, construction, manufacturing, installation and assembly.

[3] Prepared by: Latvian Chamber of Crafts

- structural elements and components -windows, doors and stairs, ceiling coverings, floor coverings.
- planning, execution and documentation of restoration works.
- determining the use of ready-to-assemble, manufactured products and purchased parts, assembly of products and objects.
- types and properties of processed materials, application in the production of products and in the construction process.
- planning and monitoring the use of machines, equipment and tools.
- performance of quality and function tests, evaluation and documentation of results, service approval, documentation and post-calculations.

Admission and organisation of the training

Taking into account that the overall duration of the WP4 A10.2 Vocational Master - Carpenter training was 1300 hours, the recruitment of the group was quite problematic.

It was agreed that the lessons should be held on weekday evenings. Therefore, the studies were held over a nearly two year long period.

In order to recruit the study group, carpenters who had the means to study for such a long period and who had at least 4 years of work experience in the profession were approached.

The dissemination of information about the chance to participate in this course was done by phone and e-mail, as well as information on the Latvian Chamber of Crafts web page.

In the end the effort to attract participants resulted in 15 participants attending the training.

The lecturers were chosen in accordance with the Latvian legislation: the Regulation of the Cabinet of Ministers no. 569 "Rules on the necessary education and professional qualifications for teachers and the procedure for improving the professional competence of teachers" (11.09.2018):

6. A person whose education and professional qualifications meet one of the following requirements is entitled to work as a professional and interest education teacher:

> 6.3. Craftsman qualification granted by the Latvian Chamber of Crafts, which corresponds to the master craftsman level, (..)

In accordance with the aforementioned regulations of the Cabinet of Ministers of the Republic of Latvia, 9 lecturers, including 6 crafts masters, were recruited for the implementation of the professional training program for carpenters.

The training was composed of two parts:

Module	Focus	Study hours
Part A1	Practical training	200

A1/1	Planning final piece	30
A1/2	Customer order	150
A1/3	Practical situation task preparation	20
Part A2	Specialized theory	1100
1.	Design, construction and manufacturing technology	268
A1/1-1.1.	Manufacturing concepts and implementation options	72
A1/2-1.2.	Arrangement fundamentals	72
A1/3-1.3	Design and drawing technique	60
A1/4 -1.4	Product development	32
A1/5 -1.5	Construction requirements	32
2.	Assembly and maintenance	268
A2/6-2.1.	Assembly schedule	56
A2/7-2.2.	Construction site equipment and logistics	56
A2/8-2.3.	Monitoring and final acceptance, maintenance	56
A2/9-2.4.	Coordination of assembly services	28
A2/10-2.5.	Assembly techniques	28
A2/11-2.6.	Object-related protective measures	24
A2/12-2.7.	Locking and protection systems	20
3.	Order processing	268
A2/13-3.1.	Procurement	20
A2/14-3.2.	Offer preparation	28
A2/15-3.3.	Planning work	36
A2/16-3.4.	Rules and regulations	16
A2/17-3.5.	Use of materials and resources	36
A2/18-3.6.	Production documentation	16
A2/19-3.7.	Subcontracting	16
A2/20-3.8.	Technology deployment	40
A2/21-3.9.	Data switching and calculations	28
A2/22-3.10	Product treatment	32
4.	Company management and company organization	268
A2/23-4.1.	Determination of operating costs	40
A2/24-4.2.	Operating cost structure and key figures	40
A2/25-4.3.	Marketing and concepts for dealing with customers	32
A2/26-4.4.	Quality management	32
A2/27-4.5.	Human resources management	36
A2/28-4.6.	Occupational safety, health and environmental protection	28
A2/29-4.7.	Planning of the business premises and the logistics processes	32
5.	Craft history and organization	28
A2/30-5.1.	Craft history	20
A2/31-5.2.	Craft organization	8

Participants profile and organisation of the training

The training was held from October 3, 2022 to March 28, 2024.

All of the training participants were male and in the age range or 25 to 34 years old.

There were nine participants employed in a company and six self-employed participants.

The work experience of the participants ranged from 4-5 years (eight participants) to 5-10 years (seven participants).

Six of the participants had finished general secondary education, nine participants had vocational secondary education diploma.

The training was carried out in accordance to the dual training model: during the day, the training participants worked in their or their employer's companies, and attended lessons in the evenings.

A complete overview of the training content can be found in the next part of the report.

For the implementation of the training, workbook "Materials" that teaches trainees about different carpentry materials, as well as workbook "Wooden Building Construction Technology" were developed and handed out to the participants.

Execution of the Training

Further shown is a detailed plan of the content of each training unit. As mentioned before, the content was largely based on the curriculum provided by project partners. Modules such as Crafts history and Crafts organisation were added, based on implementation in previous Latvian Chamber of Crafts vocational master trainings.

No.	Focus	Curriculum	Study hours
Part A1	Practical training		200
1	Planning final piece		30
2	Customer order		150
3	Practical situation task preparation		20
Part A2	Specialized theory		1100
1	Design, construction and manufacturing technology		268
1.1.	Manufacturing concepts and implementation possibilities	• Basics of process management • Basics of process planning • Planning techniques • Risk analysis • Methods of determining targets • Problem-solving strategies and methods • Planning and decision-making processes • Quality planning and performance standard • Time and resource planning • Production planning • Operational principles • Manufacturing systems • Company structures • Manufacturing techniques • Manufacturing processes	72

		• Production and material flow diagram • Relevant groups of materials and forms of use • Selection criteria for materials • Materials management and procurement fundamentals • Procurement logistics • Procurement strategies • Supply chain management	
1.2.	Basics of the design	• Basics of art history • Basics of modern design development • Arrangement fundamentals • Product-related constructions	72
1.3.	Drafting and drawing technique	• Types of drawing • Basic geometric construction • Isometry, perspective • Exploded view drawing • Freehand drawing • Computer-aided design, construction, drawing and presentations	60
1.4.	Product development	• Taking customer order • Searching and selecting product ideas • Creativity techniques • Communication and argumentation techniques • Material classification • Material properties	32
1.5.	Requirements to construction	• Special requirements across products • Special requirements for windows and external doors • Special requirements for wall and ceiling paneling • Special requirements for the floors, ceilings as well as walls • Physical foundations • Technical and constructive measures for heat, moisture and noise protection, in particular to avoid thermal bridges and to ensure the heat insulation and wind tightness in building construction, avoidance of moisture pockets and sound bridges; technical and constructive measures for fire and smoke protection	32
2.	Assembly and maintenance		268
2.1.	Assembly sequence plan	• The importance of assembly on construction sites in the operation of the company • Planning and executing documents • Customer requirements • Order entry and specification • Measures to prepare special assembly • Delivery of products, materials and resources • Quality assurance on construction sites • Workflow and workplace design in a workday • Assembly planning • Cost and performance accounting • Planning for process-related deployment • Measurements and dimensional standards in construction • Site-related framework and planning conditions • Taking measurements during construction	56

2.2.	Construction site equipment and construction site logistics	• Rules, regulations and installation guidelines • Workplaces regulation • Workplace policies • Environmental law fundamentals • Traffic regulations • Conditions at the construction site and in the assembly • Assembly organization • Potential dangers during assembly work • Safety analysis and accident prevention measures during assembly work • Hazardous materials at construction sites • Work-and health protection • Safety engineering measures in the assembly • Ergonomy • Lighting • Infrastructure at the construction site • Conditions regarding product assembly purchased • Safety measures with regard to the production specifications, materials, tools and equipment • Assembly aids • Geometry, dimensions and mass of the • Assembled products • Stability/resistance to tipping • Load calculation • Delivery and deployment logistics • Disposal logistics • Environmental protection measures in the assembly • Packaging materials • Ecological balances	56
2.3.	Supervision and final maintenance	• Identification, evaluation and presentation of relevant project data • Methods of data collection, data analysis and data evaluation • Actual/target comparison • Post calculation • Design criteria for the creation of assembly-related • Documentation and reports as well as logs • Forms for recording the use of time and resources • Structure and content of the overall documentation and the final report • Archiving of documents and order documents • Product-related quality assurance through • Controls and tests • Test plans • Record forms • Measures of monitoring, correction and improvement of assembly processes • Fundamentals of personnel management • Acceptance of the assembly work	56
2.4.	Coordination of assembly services	• Importance of customer satisfaction • Types of customer contact and customer care in the assembly area • Information system in the assembly area	28

		• Communication system in the assembly area • Tasks and services of other construction trades • Organization of the flow of information between the work in the assembly area • Measures and means for coordination and alignment of the construction work in the assembly area • Conflict avoidance and conflict resolution strategies • Conditions for a conflict-free coexistence and a productive cooperation in the assembly area • Procedural instructions for handling other construction works in the assembly area • Measures to avoid disturbances, conflicts as well as of complaints in the assembly area	
2.5.	Assembly techniques	• Measuring and marking tools, hand tools, machine tools and machines for manufacturing and assembly technique for carpenters • Mounting systems and mounting aids • Fixing systems • Assembly and hardware technology • Electrical engineering and sanitary engineering fundamentals • Electrical and sanitary connections • Qualification requirements and qualification measures with regard to newly developed assembly and materials technologies	28
2.6.	Object-related safeguards	• Legal requirements with regard to thermal, acoustic, moisture, fire and smoke protection • Energy Conservation • Physical foundations (thermal insulation, ventilation heat losses, noise and soundproofing) • Building material classes and fire resistance classes • Technical and constructive measures • Provision of construction object protection measures • Sealing and insulation systems	24
2.7.	Closing and protection systems	• Locking systems • Safety glass • Composites	20
3.	Order processing		268
3.1.	Order	• The principles of sales and consulting psychology • Communication theory • Consulting techniques • Customer orientation, quality orientation, employee orientation • Meaning and importance of customer satisfaction • Customer management • Reliability	20
3.2.	Offer preparation	• The legal basis • Methods and procedures required for demand planning • Requirements planning • Cost and performance accounting • Time determination by estimation and comparison • Standard times • Evaluation and post-calculations	28

		• Tender procedures • Risk assessment methods • Processing tender documents • Preparing tenders • Form and content of order confirmation • Procedure for the follow-up of offers • Additional and/or supplementary offer, ancillary services	
3.3.	Work planning	• Production planning • Internal transport, handling and storage process • Delivery types • Handling • In-house logistics fundamentals • Production planning system • Material flow logistics • Fundamentals of work planning • Principles of work planning • Work preparation tasks • Preventive measures of occupational health and safety protection and environmental protection • First aid kit	36
3.4.	Regulations	• Legal fundamentals • State building regulations, standard, construction process scheme • Legal basis of occupational and health protection as well as environmental protection • Contract law fundamentals • Principles of warranty and liability and product liability • Regulatory documents related to the construction process • Waste management • Packaging Law • Road traffic law • Rules at the workplace • Equipment operating rules • Labor protection requirements in workplaces• Preventive measures of occupational health and safety protection and environmental protection • First aid equipment	16
3.5.	Materials and used resources	• Hand tools • Traditional manufacturing machines and tools • Computer-aided manufacturing • Devices for safe and efficient work • Maintenance of equipment and tools • Inspection and maintenance schedules • Material detection • Material calculations • Materials management tasks • Order-independent materials • Order-related materials • Semi-finished products • Material losses • Waste calculations	36

		• Waste optimization	
3.6.	Manufacturing documentation	• Work preparation documents • Work execution documents • Archiving of order, planning, production and controlling documents	16
3.7.	Assignment of subcontracts	• Accepting the customer's order • Order preparation • External procurement of services • Procurement strategies and processing • Materials management fundamentals • Supplier selection and management • Tender process, documentation • Subcontracting	16
3.8.	Use of technology	• Technological process of production, design • Manufacturing techniques • Transport and storage technology • Techniques of picking, packing, loading and unloading • IT technology • Communication technology	40
3.9.	Data exchange and calculations	• Methods of data collection, data analysis and data evaluation • Data management • Provision of information and procurement of information • Time management • Calculation principles and methods • Actual/target comparison • Industry software • Reporting system • Documentation	28
3.10.	Dealing with products	• Quality planning • Site-related safety and protective measures • Packaging materials • Load securing	32
4.	Company management and organization		268
4.1.	Determination of the costs	• Companies in the carpentry and joinery field • Business management fundamentals • Company organization • Document management • Data collection, data analysis and data evaluation • Time tracking methods • Basics of project management principles and methods of cost accounting and calculation	40
4.2.	Operational cost structure as well as calculations	• Business accounting • Investment calculation • Cost structures • Key figures of cost accounting • Comparison of companies • Representation and presentation of operational costs development and comparison	40
4.3.	Marketing and concepts for	• Market and customer analysis • Development tendencies	32

	customer service	• Corporate identity • Opportunities for external representation • Advertising and information medial • Research and presentation on the internet • Address databases and address management • Opportunities for positive and negative experiences of customers • Main reasons for complaints	
4.4.	Quality management	• Principles, goals and methods of quality • Quality and test planning as part of the production and assembly planning and as part the overall planning • Internal customer-supplier relationship • External customer-supplier relationship • Procedures to ensure the product and process quality as well as the documentation • Measures for quality assurance, quality monitoring and quality improvement with regard to the agreed quality standards • Evaluation of the effectiveness of the quality • Management by the supervisors • Company suggestion system	32
4.5.	Human resources management	• Principles of staff management • Teamwork • Communication • Suggestion system • Required qualifications for the provision • Measures for employee qualification • Knowledge management	36
4.6.	Work, business health and safety and environmental protection	• Legal basis of occupational health and safety and environmental protection • Environmental law fundamentals • Workplaces regulation • Workplace policies • Principles of occupational health and safety • Ergonomy • Basics of environmental protection • Personal protective equipment • Principles of workplace design • Hazardous materials	28
4.7.	Planning of place of work and the logistic processes	• requirement of operational planning • planning methods and procedures • operational analysis • production planning • workflow planning • layout planning • logistics fundamentals • forms of internal logistics, procurement and sales and disposal logistics • competent and objectives of the material flow • material flow planning and material flow logistics • materials management and procurement fundamentals	32

		• visualization of processes, interactions and dependencies • project management • budgeting fundamentals	
5.	Craft history and organization		28
5.1.	Crafts history	• craftsmanship development in Latvia • organized crafts: crafts corporations, guilds • establishment of the Chamber of Crafts • professional craftsmen: journeymen and masters	20
5.2.	Crafts organization	• craft legislation in Latvia • structure and tasks of the Chamber of Crafts • procedure for obtaining qualifications in crafts	8

At the end of each learning module, the participants' knowledge was tested.

In the practical part of the training, the participants were given the task of performing one of the following activities:

- carpentry (windows, doors, stairs, flooring) and assembly, or
- wooden constructions and their assembly on the construction site (wood frame construction or log building) or
- interior equipment and assembly.

The work to be done had to be calculated, drawings and photos should be added.

The participants had to provide a self-evaluation and conclusions about the carpentry work performed.

At the end of the training - on March 27 and 28, 2024, presentations and discussions of carpenters' work were held, in which they had to answer questions about the practically performed works.

Further are some photos from the practical parts of the training:




Main Findings and Conclusions

Within the framework of the 3LoE project, an extensive professional training curriculum of 1300 hours for the carpenter master qualification was adapted and implemented. The Latvian Chamber of Crafts has obtained a new and improved model for the professional training of carpenters, which the Chamber will be able to use to supplement the existing master training curriculum. The possible additions were confirmed both by the staff and lecturers of the Chamber, who were satisfied with the quality of the provided curriculum and noted that it could be of great improvement for areas such as order processing.

The training received positive reviews from its participants. The participants noted that despite the extensive and in-depth nature of the curriculum, the knowledge and skills provided throughout the vast topics of the different training units was engaging and not repetitive. Many of the trainees noted the great impact the training lessons had on their work in the companies. The number of lecturers, their teaching styles and expanse of experience was noted as a positive as well.

The difficulty of time management and attending training for nearly two years was noted as the partial downside. As it could be problematic to ensure a continuous learning process on such a large scale in the future, the solution could be to implement studies in separate modules.

The prepared training materials - workbooks - will be used not only for the training of carpenters, but also for other crafts in the woodworking industry.

In the implementation of the training of carpenters, the requirements set out in the Law on Craftsmanship (02.02.1993) and in the regulations of the Master of Craftsman examination on obtaining the qualification of a craftsman were taken into account:

> Master craftsman – 8 years of work experience (including vocational training) + LAK master training + qualification examination. Master diploma is a confirmation of the qualification of the craftsman, which is an attestation of the person's competence and the ability to organize, perform professional activities and establish a craftsmanship enterprise.

The training participants received certificates for participating in the Vocational Master training of Carpenters to obtain the master's qualification and complete the theoretical part of the master training in the amount of 1300 hours. All certified participants will be able to take the master's qualification exam after reaching 8 years of work experience in the carpenter profession.

3. Evaluation Concept[4]

3.1 Introduction

The objective of the evaluation is to determine whether the goals of the program will be achieved in the implementations evaluated, and how the program has impact on student's career and opportunities.

The type of the evaluation follows standard course evaluation methods, i.e. formative, process and outcome evaluation, the latter only partial: The formative evaluation will provide feedback to the curriculum designers, developers and implementers to ensure that designed and implemented courses really meets the needs of the intended audience, i.e. assure or improve the quality of program. The planned duration of the course varies depending to the educational level and purposes. Each lesson lasts 45 minutes.

Methods used in lessons will be lectures, teaching talks, working in small groups, case studies and examples from real world. Material used during the teaching consists of e.g. information material (basics & backgrounds, thematic introductions etc.), presentations, questionnaires, question guides, checklists, analysis results, good practice examples and so on. Course should contain at least following issues: Basics/overview of essential tasks and contents of business-oriented and productivity-enhancing measures in circular economy and workplace innovation (in each of the courses) [5] .

3.2 Main terms of the evaluation

Evaluation will answer to the following questions:

- Were the goals and objectives suitable for the audience?
- Were the training methods and course materials appropriate for the audience?
- Should the program or some part of it be developed further and how?
- What additional information would be beneficial for the development of the program, facilities, and timing.

The process of the evaluation will provide information about the training and lectures:

- Process of the evaluation will be focused on procedures and actions used to produce results.
- Evaluation process is supposed to take place during the training delivery and at the end of the training.
- The co-organizer (Responsible for the course) will:
    - monitor the training.
    - describe the training process as a whole, and
    - record the findings into the written report,
- The outcome of the evaluation tries to find out how the knowledge, attitudes, and behaviors of the audience developed.
- It takes a long time to find out the outcomes of the education and training, so in this stage only the main topics will be assessed. [6]

The evaluation process will be as follows:

[4] Prepared by Rigas Stradina Universitate, Latvia

[5] Dr. Kari Lilja and Dr Sirpa Sandelin. ***Further vocational training***. Satakunta University of Applied Sciences.

[6] Dr. Kari Lilja and Dr Sirpa Sandelin. ***Further vocational training***. Satakunta University of Applied Sciences.

- Questionnaires will be suggested by RSU and discussed with organizers of the training before the training starts.
- The questionnaires in a digital form will be applied.
- The co-organizer (responsible for the course) will suggest fulfilling the questionnaires available to the participants to be filled in before leaving the course and on-line.
- The purposes of the questionnaire and how the data will be used should be explained clearly to the participants. This will help to improve the response rate and encourage them to make comments that can be useful to improve future programs.
- The evaluation approach will be based on a combination of qualitative and quantitative methods.
- The Microsoft Excel package will be used to transcribe the feedbacks and interviews.
- Open questions will be categorized, and qualitative analysis of the groups will be done.

3.3 The evaluation procedure

Semi-structured questionnaires will be suggested to the participants (ANNEX A). Different topics [topic no. 1, topic no.2 etc.] should be proposed by the organizers of the training according to the programme for the training or parts of the course.

It is recommended**:**

1) Co-organizer (Responsible for the course) fills in all required information:
   - the Name of the school / institution.
   - the Title of the evaluated course and the number of the workshop (1st / 2nd) in the beginning of the questionnaire to make sure that the`identification data needed in the evaluation is correct.

Semi-structured questionnaires will be created for the leaders of the training/course - trainers / lecturers / teachers) (ANNEX B).

It is recommended:

1) Co-organizer (Responsible for the course) fills in all required information:
   - the Name of the school / institution.
   - the Title of the evaluated course and the number of the workshop (1st / 2nd) in the beginning of the questionnaire before printing it to make sure that the identification data needed in the evaluation is correct.
2) Time for the survey (approx. 10 minutes) will be allocated in the end of each workshop.
3) In the beginning of the course the co-organizer (Responsible for the course) will inform participants about the evaluation and its importance for further development actions.
4) The co-organizer (Responsible for the course) will make the link to the questionnaires available to the participants to be filled in before leaving the workshop. The purposes of the questionnaire and how the data will be used should be explained clearly to the participants. This will help to improve the response

rate and encourage them to make comments that can be useful to improve future programs.

Note: Survey for participants will be conducted twice, in the end of both workshops!

5) The participants complete the questionnaires and return them to the co-organizer.
6) The co-organizer distributes the lecturer`s questionnaire to each lecturer to be compiled immediately after his / her part of the course has been finished.

   Note: If the lecturer teaches in both workshops, he / she completes the questionnaire twice!

7) In the end of the learning on the job -phase, representant of each enterprise involved in the training will be interviewed by the co-organizer. Guidelines for the interview will be found in appendix C. Interviews can be conducted face to face or via Skype, Microsoft Teams or e-mail, some examples to be given.
8) The co-organizer collects the questionnaires and answers of interviews and deliver them to the evaluator. If there are free speech answers in some other language than English, it is recommendable that the co-organizer translates them to English.
9) The evaluator compiles all feedback and summarizes written analysis on the evaluations.

The evaluation approach will be based on a combination of qualitative and quantitative methods. The Microsoft Excel package will be used to transcribe the feedback and interviews. Open questions will be categorized, and qualitative analysis of the groups will be done.

3.4 Content of the final evaluation report

The final evaluation report will discuss the following issues

Did the curriculum reach the targets?
How well was the knowledge creation and sharing realized?
Did the participants assimilate knowledge and tools?
Was the venue and equipment appropriate for the training course?
What kind of further development will be needed, if any?

3.5 Annex

ANNEX A

Questionnaire for participants of the

……..course

Please mark with a cross where applicable

Gender	Female		Male	
Age	<50		>50	
Workplace	Education		Business	

Please mark the scale that applies to your opinion on the following aspects of the training that you participated.

1. **Please indicate in which training course you participated**
    - **……**
    - **……..**
    - **……..**
    - **……..**
2. **What is your background?**
    - I am a company owner/manager
    - I am a company employee
    - I am a student/trainee
    - Other (please indicate)
3. **Please rate the general conditions of the training course**
    - **The facilities (location, room, online tool etc.) for the training course were suitable**

Scale:

1=Strongly disagree
2=Disagree,
3=Neither disagree nor agree,
4=Agree,
5=Strongly agree

- **The time frame and schedule for the training course were suitable**

Scale:
1= Strongly disagree,
2=Disagree,
3=Neither disagree nor agree,
4=Agree,

5=Strongly agree

- **Comments**

4. **Please rate the overall content of the training course**

Scale:
1= Strongly disagree,
2=Disagree,
3=Neither disagree nor agree,
4=Agree,
5=Strongly agree

In common					

The topics and issues covered were relevant and responded to the goals of training	1	2	3	4	5
The lecturers explained topics of the lessons, additional questions, experiences, and topical issues arisen during the course well	1	2	3	4	5
There was enough time scheduled for each topic	1	2	3	4	5
I gained valuable knowledge from lessons and examples presented by lecturers	1	2	3	4	5
I believe that can apply knowledge gained from lessons and use it in my future career	1	2	3	4	5
I can use new skills trained and knowledge gained in my future career, e.g. when consulting my clients	1	2	3	4	5
Comments concerning the common issues					
5. What was most interesting for you during the training course?					
6. What could have been done better? (E.g. was some topic missing or unnecessary)					
7. Would you recommend the course to someone you know? If not, why not?					
8. Was anything missing that you might need in your (future) profession life ?					
9. Was the proportion of topics and time frame of the training course content suitable or should some parts be increased/decreased?					
10. Is there any other feedback on the training course you would like to share					

Thank you for your answers! Please press "done" to submit the survey!

ANNEX B

Questionnaire for lecturers of

the …….. course

Dear Lecturer,

Thank you for taking your time to evaluate a training course, that was developed and tested as part of the Erasmus+ project "3LOE". This survey is anonymous and will take 5-10 minutes.

1. **Please indicate which training course you were lecturing**
   - title of the course
   - title of the course
   - title of the course
   - title of the course
   - Other, please indicate

2. Please indicate how many years of experience in teaching you have

- **Less than 2 years**
- **Between 2 and 5 years**
- **More than 5 years**

3. Please rate the general conditions of the teaching during the training course

Scale: 1= Poor, 2=Satisfactory, 3= Good 4=Very good, 5=Excellent

- The facilities (location, room, online tool etc.) for the training course were...
- The time frame and schedule for the training course were...
- The curriculum provided was...
- The background knowledge of the training participants was...
- The motivation of the training participants was...

Comments

4. Please rate the overall content of the training course

Scale: 1= Poor, 2=Satisfactory, 3= Good 4=Very good, 5=Excellent

- The overall content of the training course was...
- The way the content responded to the needs and goals of the training participants was...
- The relevance of the training course content for the overall qualification was.

Comments:

1 **What could be been done better? (e.g. was some topic missing or unnecessary)**

2 **Is there any other feedback on the training course you would like to share?**

Thank you for your answers! Please press "done" to submit the survey.

ANNEX C

Questionnaire for interviews of enterprises

…… course

Date ___/___/2022___ Course_____ Enterprise _____

The interviewer will ask the following questions from each enterprise's representative.

1. Schedule: Was the schedule of theory and practice in line with the company's needs? Are you satisfied with the schedule and order of topics?

2. Content: Did the training contain topics and issues needed in your business? Was something missing? If is, please write what in your opinion was missing?

3. Implemented project: Did the project, implemented during the learning at the job - phase, achieve the goals set to it? If not, what remained incomplete?

4. What could have been done differently? And what should not be changed?

Thank you for your answers!

4. Evaluation Report[7]

4.1 Introduction

The objective of the evaluation is to determine whether the goals of the program were achieved and does the teaching instrument has an impact on student's career and opportunities.

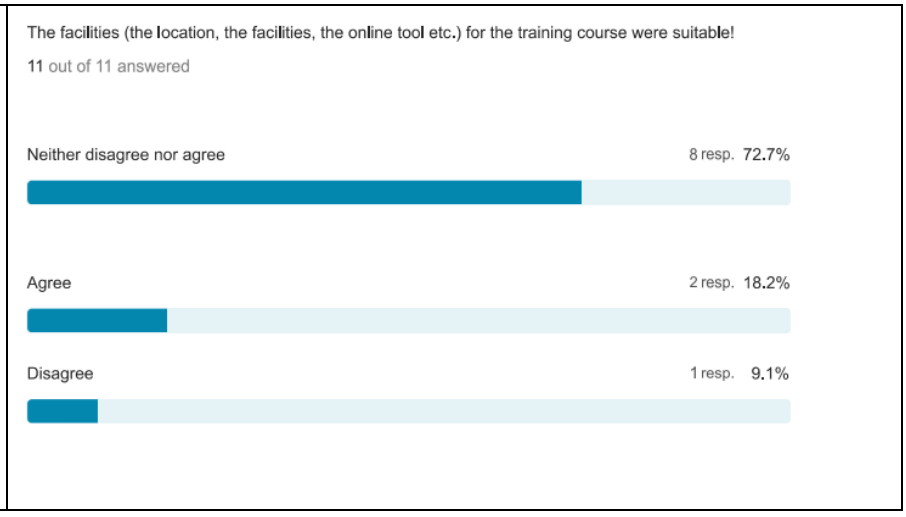
The type of the evaluation follows standard course evaluation methods, i.e. formative, process by analyzing feedback surveys (see annex no. 1&2) to ensure that designed and implemented training really met the needs of the training participants, i.e. assure or improve the quality of program.
Feedback surveys were designed to collect data from training participants and teachers of the course. Respondents were asked to fill in online survey designed in typeform.com platforms. Feedback surveys were filled in just after the finalization of the training following the invitation of training organizers. The organizers of the training have clearly explained to respondents' purposes of the feedback survey and further usage of data collected. The participation in evaluation by filling in the online feedback survey was voluntary.

11 training participants have submitted their feedback. The gender representation: female 11%, male 0%. Age groups: 50 or younger – 11 %, below 50 – 0%.

4.2 Results

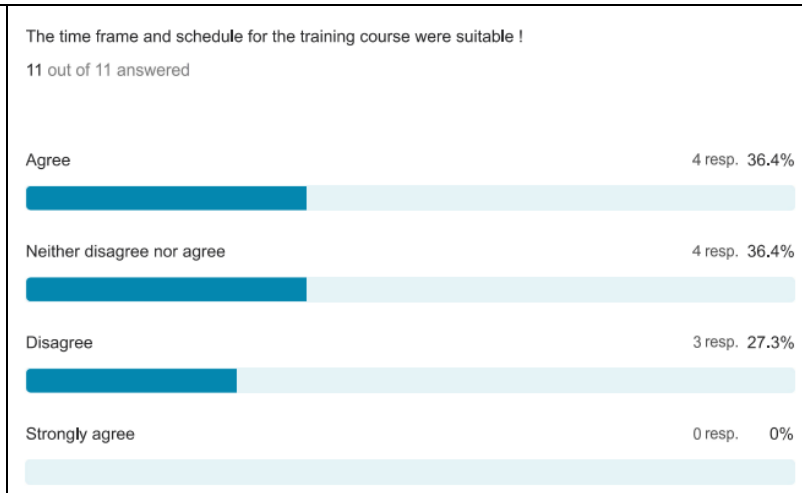
FEEDBACK FROM PARTICIPANTS

Evaluation of facilities represent satisfactory level:

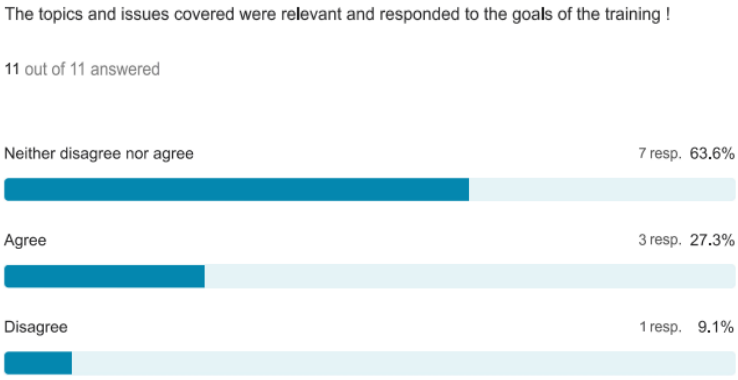
PP2 HWKD	

Evaluation of time frame and schedule represents satisfactory level:

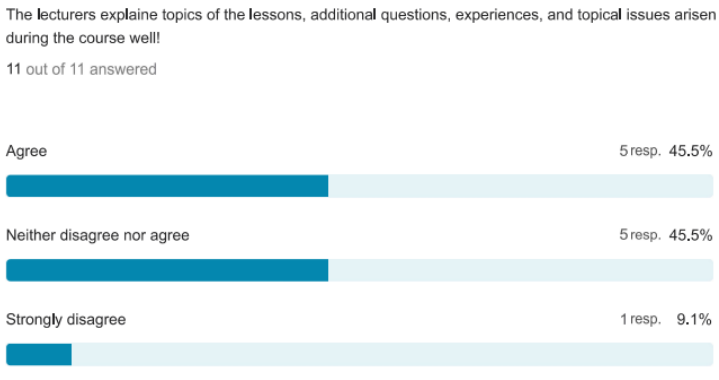
[7] Prepared by Riga Stradiņš University representatives Prof. Tatjana Muravska, Dr.adm. Sergejs Stacenko, Mg.iur, PhD cand. Liga Sileniece

PP2 HWKD	

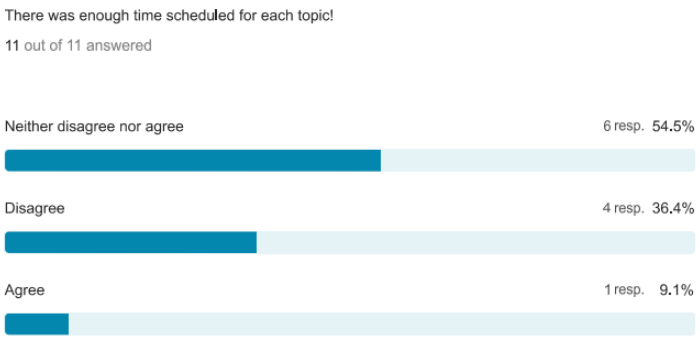
Evaluation of relevance of the topics and issues represents satisfactory level:

PP2 HWKD	

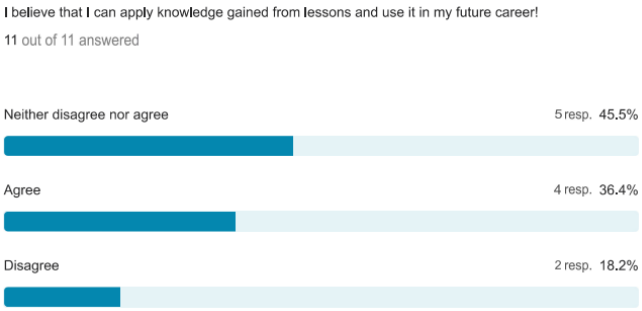
Evaluation of study content delivery process represents average satisfactory level:

PP2 HWKD	

Evaluation of time allocation to each topic represents satisfactory level:

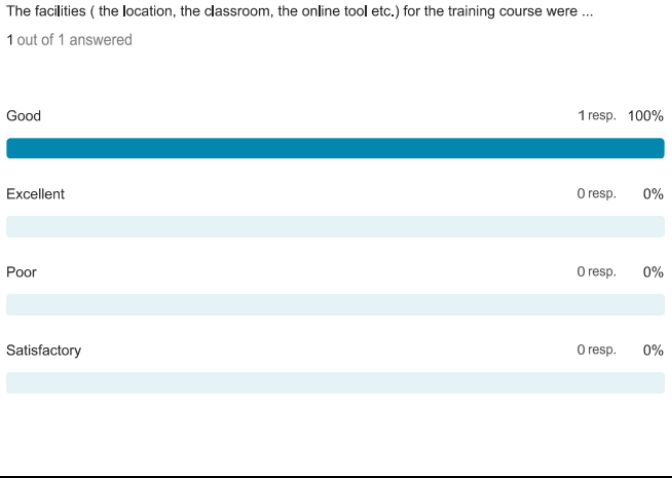
PP2 HWKD	

Evaluation of the outcomes and impact on professional carrier growth represents in average satisfactory level:

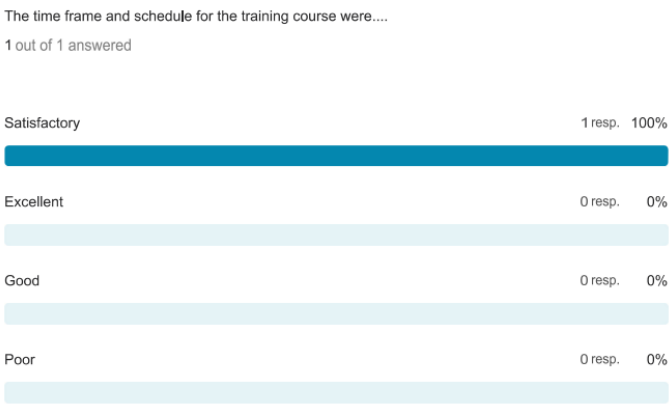
PP2 HWKD	

FEEDBACK FROM LECTUERS

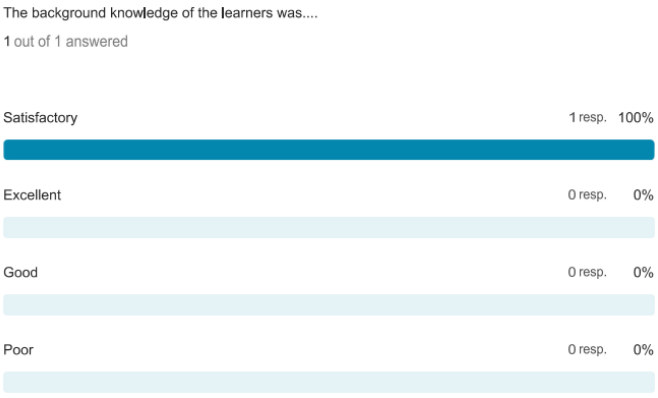
Facilities are evaluated as good and meets evaluation criteria.

PP2 HWKD	

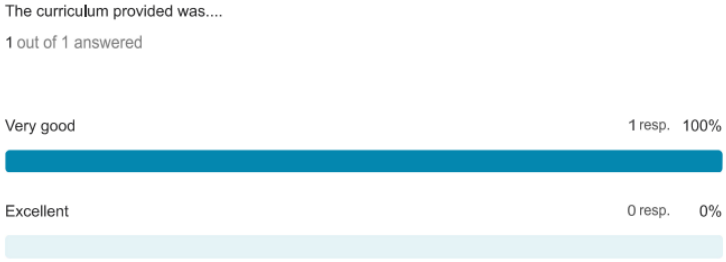
Time frame is evaluated as satisfactory and meets evaluation criteria.

PP2 HWKD	

Background knowledge of learners was evaluated as “satisfactory” and meets evaluation criteria.

PP2 HWKD	

The curiculum of the training instrumet was evaluated “very good” and meets evaluation criteria.

PP2 HWKD	

4.3 Conclusion

Based on the evaluation results it is concluded that the teaching instrument “Vocational Masters” developed and tested by Project partners PP2 HWKD with in 3LoE Project - Three-level centres of professional excellence: Qualification, entrepreneurship and innovation in the Green Economy meets the relevance of achieving the goal of teaching instrument and overall has expected impact on professional development of training participants.

Feedback form training participants and teachers suggest that the curriculum meets the targets of the teaching instrument. The knowledge creation and sharing were realized appropriately, and participants have participants assimilated knowledge and tools. Evaluation of the outcomes and impact on professional carrier growth meets evaluation criteria. The venue and equipment were appropriate for the training course.

Technician Training

1. Implementation Training Construction Technician[8]

Main information about course

Further Vocational Training for those working in the construction industry with a specialization in the use of digital tools in the work environment. 15 participants studied the program based on the European Digital Competence Framework (DIG COMP).

Although the project has not completely solved the workforce problems of the industry, the goals of the planned activity have been achieved by training 15 industry employees to improve the knowledge of the industry employees in the use of digital tools in planning daily work and increasing work efficiency in the construction industry. With pretested training programs and their comprehensive content, a training program adapted to the labor market and implemented in the amount of 120 academic hours, certificates issued.

Duration of training courses: 28.08.2024. - 27.09.2024.

Agenda (120 academic hours). To implement the further vocational training is used curricula block A for Digital training for the construction and finishing trades, practical skills are acquired in real working conditions by executing customer projects.

Topic (hours)
Topic 1: An introduction to digital training in construction and finishing (8h)
Topic 2: Practical examples of digital tools for construction and decoration, as well as testing of certain tools (8h)
Topic 3: Practical examples of digital tools for construction and finishing, as well as testing of certain tools (96h)
Topic 4: Summary of digital training in construction and decoration (8h)

[8] Prepared by Liepaja State Technical School

Curriculum topics

Phase 1	
Topic 1: An introduction to digital training in construction and finishing (8h)	Introduction and motivation - Introduction to KAIN-method - Digital tools & processes: What and why - Highlights the role of digitalization in companies o New tools and renewed needs o New concepts of working processes - Advantages offered by this development - Despite of the huge advantages, the risks must be known too.
	European wide legislation, country-specific and local regulation.
	Ways of digital change in companies, status quo, future perspectives, effectiveness.
	Discussion of concerns and other aspects of digital change in small groups. Exchange discussion results.
	Different problem-solving styles.

Phase 1	
Topic 2: Practical examples of digital tools for construction and decoration, as well as testing of certain tools (8h)	Examples of tools + testing certain tools. Practicing and testing free versions of certain tools, see examples right. Time for testing should be reserved at least 45 minutes per tool. Before the test, a brief presentation of tool is recommended. Digital technologies for working processes examples: Digital Calculation Tools e.g. Excel OneDrive BIM 2D-3D design Ortograph Artesa Handwerk Planer Archline XP QElectroTech
	Discussion
	Instructions and tasks for the working on the job phase - Information and instructions concerning the project phase, e.g., o How to choose a tool o How to implement and run a tool o How, when and whom ask for help o Contact information of available tutors / trainers o How to write a report and presentation - Learning tasks – if used o Tasks, deadline, tips for solving, how to return the answer Every participant should be given an opportunity to ask questions
	Coaching Program, opportunities, chances

Phase 2	**Topics**
Topic 3:	Learning on the job - Workplace learning

Practical examples of digital tools for construction and finishing, as well as testing of certain tools (96h)	- Trainee should implement a digital tool for working process at his / her workplace. Goal of the job phase should be connected with the topics of the course
	Learning tasks and assignments - Optional - Suitable in cases where e.g., employers expect that a trainee gets or improves certain special skills. - Tasks and / or assignments should be given in a way that enables a trainee to solve them independently, knowing, that help is available if needed. Tasks and assignments planned case by case depending to the needs of the trainees and goals of the training.
	Practical work, solving specific tasks and offering solutions. When choosing between possible programs. Optimization of work processes using: • Excel • One trip • BIM (Building Information Modeling) 2D – 3D design program • Orthography • Artesa Handwerk planer • Archline XP • QElectroTech

Phase 3	**Topics**
Topic 4: Summary of digital training in construction and decoration (8h)	Project reports - Trainees presents the brief reports on their “working on the job” phases and assignments - Discussion
	Concluding lecture - summarizes the course

Evaluation report

The curriculum was adapted in consultation with employers and those working in the construction industry. Addressed employers working in the industry recognized digital skill gaps for optimization of work processes as the biggest problem, so the training program "Digital training for the construction and finishing trades" was chosen.

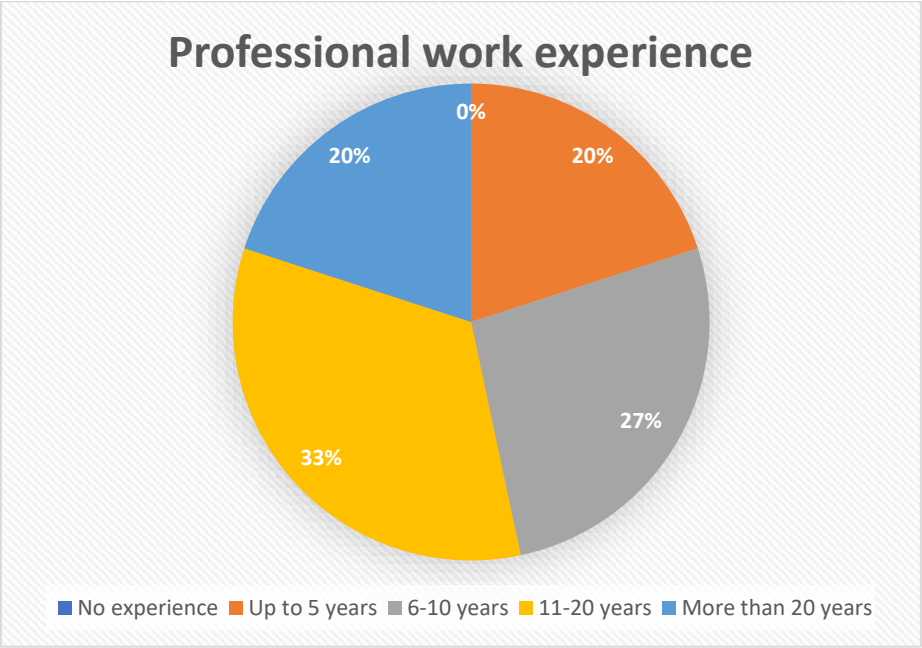
Taking into account the specifics of the work and the workload of the employees, the best solutions were found for the implementation of the training, where during the month both the theoretical explanation and extensive practical work were carried out in practice companies, solving the problems of that moment and looking for solutions for more effective work planning.

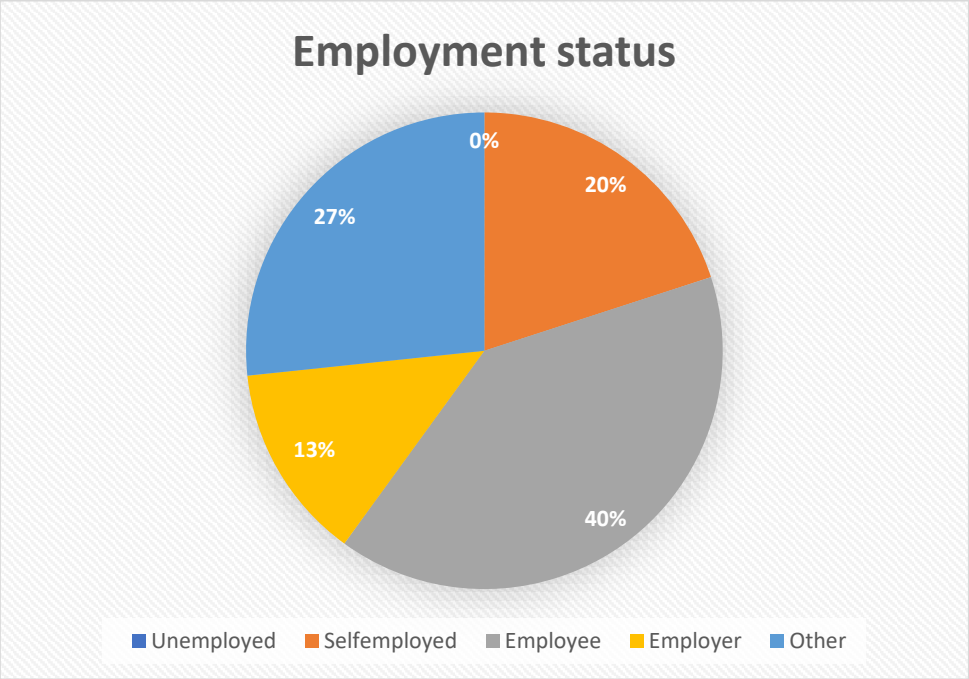
Course instructors are practicing experts in the field to provide a base of both theoretical and practical examples.

The results of the evaluation questionnaires pointed to the training program as necessary, which was especially noted by the employers, seeing that the proposed solutions

make a real contribution to the improvement of work processes. Employees and the self-employed gave slightly lower ratings, but overall, the program for learning digital tools is relevant and necessary.

At the end of the course, a survey was conducted, asking questions and receiving a rating, which is summarized below.





The participants of the training course provided feedback on both organizational and content questions, giving answers in gradations from strongly disagree to strongly agree. Accordingly, converting the point system from 1 to 5, the results are as follows.

No.	Question/ criteria	Average rating
1.	The location (auditorium, technical equipment, etc.) was suitable for the course	3,9
2.	The training time and schedule were appropriate	4,2
3.	The topics and questions discussed were relevant and corresponded to the learning objectives	4,5
4.	During the training, the instructors explained well the topics of the lessons, additional questions, experiences and current events that arose during the course	4,4
5.	Sufficient time was allocated to each course topic	4,4
6.	I gained valuable knowledge from the lessons and the examples presented by the lecturers	4,7
7.	I believe that I can use the knowledge gained in the courses in my future career	4,3
8.	I can use the new skills and knowledge in my professional activities, for example, advising clients/students	4,1

In the evaluation questionnaires, relatively little feedback was provided in the form of explanations, but after the summary, it can be seen that the lowest rating was received in the first question about the location and technical equipment of the course, which can be explained by the fact that most of the hours in the course were practical work that took place in different company environments with various technical equipment.

The other ratings are from 4.1 - 4.7, which can be considered high-quality. The content of the courses and the number of practical examples were rated very well, some questionnaires indicated that there could have been more practical work. Such an assessment also indicates that there is no more effective training than the real search for solutions to the needs of companies, rather than simulations and fictions.

2. Implementation and Evaluation Training Service Technician[9]

Introduction

The following report details the various activities that were undergone in order to carry out the activity (A) 12.1 “Test Service Technician” of Work Package (WP) 4 “Continuing vocational training (EQF Level 4-6)”.

The Service Technician was developed in the runtime of the project “Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy (3LoE)” which is funded through the Erasmus plus program of the European Union (EU).

The Service Technician was created by project partner (PP) 14 “Wirtschafts-Förderungsinstitut der Wirtschaftskammer Steiermark (WIFI)” in cooperation with PP15 “CAMPUS 02 FACHHOCHSCHULE DER WIRTSCHAFT GMBH (HS02)”. Counselling and support, especially regarding legal requirements, was provided by PP13 “Institut für angewandte Gewerbeforschung der Wirtschaftskammer Österreich (IAGF)”.

The newly developed “Service Technician” aims to provide a further educational opportunity for beginners as well as professionals in installation and building technology to counteract the huge demand and gap of experts in this sector, within the legal requirements of Austrian national law.

The objective is to impart knowledge in the field of installation and building technology on a, for Austria, relatively new educational level (NQR 5). Furthermore, the curriculum is part of a permeable training program that makes the transition of experts on EQF level 5 to EQF level 6 possible.

The course itself is a program for new professionals in the area of building and heating technology on NQR level 4 as well as people outside of the trade to educate themselves and to deepen their technological knowledge and gain professional experience. It is specifically designed for people who want to work as professional “Service Technicians” in the field of heating and building technology. The program can be attended by people carrying out an occupation. Furthermore, it is specifically aimed at people who have completed a vocational education on European Qualification Framework (EQF) Level 4, which in Austria comprises of people with a finished apprenticeship or with a high school diploma.

Thie whole program consists of five modules:

- Module I – “Basics of Thermodynamics, Electrotechnology, Combustion Technology and Heat Generation”
- Module II – “Heating technology, domestic hot water, renewable energies”
- Module III – “Hydraulics of heating systems, ventilation technology and measurement, control, regulation (practice)”
- Module IV – “Refrigeration technology & apprenticeship examination”
- Module V – “Customer orientation & Time management”

[9] Prepared by Wirtschaftsförderungsinstitut (WIFI) Steiermark

Completion of all courses in all modules results in obtaining the qualification requirements for a “Service technician” in installation and building technology on NQR Level 5.

Statement about the testing within the framework of the 3LoE - Project

It was planned to carry out the testing of the “Service Technician” within the scope of the running time of the 3LoE project. However, there were several external issues that made it impossible to organize a comprehensive testing of the “Service Technician” within this time frame, even though the interest of companies in this area was of high regard. These issues could not be resolved by the Austrian CoVE itself, as some issues arose due to the political and legal framework regarding further education at the time the project was carried out.

The most important issue was that there was no legal regulation for a professional qualification on EQF Level 5 in Austria. The so-called “Bundesgesetz über die höhere berufliche Bildung (HBB-Gesetz)“ or Federal Act on Higher Vocational Education and Training (HBB Act) only came into force on the 1st of May 2024.

The Higher Vocational Education and Training Act makes it possible to develop and offer new practical vocational qualifications in Austria. These respond to specific needs on the labor market, can be acquired alongside work and thus enable specialist and management careers.

Why is the HBB Act necessary? At present, many Austrians think of higher/tertiary education exclusively in terms of academic qualifications. Important professional qualifications such as “Meister:in (Craftsman)” or “Ingenieur:in (engineer)” are not perceived as equivalent. In many specialist areas, there is no master craftsman or qualifying examination. As a result, there is a lack of qualifications for highly competent specialists who want to develop further within the company.

The opportunity to obtain higher qualifications makes it easier to retain employees who are particularly willing to undergo further training and perform well. Furthermore, Austrian companies are at a disadvantage in international tenders that require officially verifiable, higher qualification levels from participating employees. With the shortage of labor and skilled workers, the need for higher professional qualifications is increasing.

The Austrian CoVE seized this opportunity and designed the “Service Technician” in such a manner that the participants receive an international recognizable formal degree of a finished further education on EQF level 5. However, before the HBB Act was formally recognized, it was not possible to obtain enough participants to formally start the program. It is one of the goals of this program that the employers or companies are paying for the tuition fees as they receive more skilled experts in important fields with a high demand.

The interested companies were very hesitant, to take part in or sent high-potential employees to a further education program that was not yet officially and legally recognized. Also, the costs were a problem, as it wasn’t sure when and if and in what manner

the new HBB Act will come into force. Thus, the employers didn't want to take the financial risk. However, the need for this "Service Technician" was expressed, but the legal uncertainty made it not possible in any way to conduct a holistic test with the aimed at target group.

However, this is not seen as a problem, but rather as an opportunity, as this delay allowed for more time to evaluate and generate the content of this new further educational program, which is described in the next chapter.

As the law came into force on May 1, 2024, and various different sectors are preparing qualifications, it is important to note, that an official accreditation of the program by the Ministry of Economic Affairs in Austria must be carried out. It is planned to submit the service technician at the earliest opportunity. If the time plan is not disturbed or somehow changed, it will be possible to officially offer the "Service Technician" on EQF Level 5 in 2025.

Testing of individual courses

As previously mentioned, it was not possible to test the whole new programme "Service Technician" as not enough participants could be reached before a legal groundwork for the EQF Level 5 education was established in Austria.

However, the whole curricula of the new course of the "Service Technician" were designed in a way that existing courses and contents that are already established at the premises of 3LoE Project Partner 14 "WIFI Styria" on EQF level 4 as well as 6 are utilized in the new program along newly developed courses to ensure a fast and high quality implementation and execution of the new program.

Furthermore, some of these courses have been carried out for quite some time and are designed according to legal, theoretical and practical requirements – thus, it is seen as advantage to integrate this existing material. Naturally, the contents will be adapted to EQF level 5 to be in line with the newly established further educational program.

Thus, in this chapter the feedback of participant of courses that contain large number of contents of the new study program is evaluated in order to gain an insight into the opinions of participants on the content of the new further educational program and how it will probably be perceived once it receives the official accreditation and is implemented.

Furthermore, it provides an evaluation on which courses require a more extensive adoption. The existing contents as well as the new contents are developed in close coordination with trainers, experts and companies, including employers and employees, to filter necessary contents and redesign existing knowledge to efficiently use available resources in a cost-effective manner and to detect the required knowledge and skills. It must be stated that obviously, new courses were created for the "Serve Technician" as well.

In this chapter the feedback of the courses, which contain contents and are either going to be adapted or directly integrated in the new program, is evaluated and

demonstrated. The feedback used for evaluation is from the last time the courses were carried out at the premises of PP14 WIFI Steiermark, during the runtime of the 3LoE project.

It is expected that additionally to the willingness of companies to further educate their employees and the shown interest in the further education program as well as the tendency of the political decision-making public bodies to realize a progressive change in further education, as demonstrated with the new HBB law, that these feedbacks provide a good overview of how the new course will be perceived once the contents, themes and subjects are covered by the EQF Level 5 program “Service Technician”.

Note: It was not possible to cover every module, course or content in the same manner. However, the cross-sectional quantity of feedback is used to establish and fine tune the contents of the “Service Technician” as a constant further educational measure at WIFI Styria.

Note: Not all participants answered any feedback questions or all feedback questions. Furthermore, it is common to give feedback on negative experience rather than on positive aspects. Thus, the below given feedback must be taken with caution.

The Modules of the Service Technician

Module 1: “Basics of Thermodynamics, Electrotechnology, Combustion Technology and Heat Generation”

This module deals with thermodynamics, electro technology, combustion technology and heat generation as a starting point for the education. The following courses will be offered in this module:

I - Fundamentals of Thermodynamics
II - Fundamentals of Electrotechnology
III - Basics of Combustion Technology and Heat Generation
IV - Electrotechnical instructed person according to EN 50110-1
V - Combustion technology - gaseous fuels
VI - Combustion technology - solid fuels
VII - Combustion technology - gaseous liquid fuels
VIII - Examination Combustion technology - Smoke and exhaust gas measuring element

Module 2: “Heating technology, domestic hot water, renewable energies”

This module deals with heating technology, domestic hot water technology and renewable energy. The following courses will be offered in this module:

I - Fundamentals of Heating Technology
II - Fundamentals of Domestic Hot Water Technology
III - Renewable Energy: Heating Pumps
IV - Renewable Energy: Solar
V - Renewable Energy: Photovoltaic

Module 3: “Heating systems hydraulics, Ventilation Technology, Measurement, control, regulation”

This module deals with heating systems, ventilation technology and measurement, control and regulation. The following courses will be offered in this module:

I - Hydraulics of heating systems and their balancing
II - Basics of ventilation technology

III - Measurement, control, regulation (practice)

Module 4: "Refrigeration technology"
This module deals with refrigeration technology. The following courses will be offered in this module:

I - Fundamentals of Refrigeration Technology
II - Final apprenticeship examination Refrigeration Technology

Module 5: "Customer orientation & Time management"
This module deals with managemental skills including customer orientation and time management. The following courses will be offered in this module:

I - Customer Orientation
II - Time Management

Evaluated courses:

Course title: "Master craftsman school for professionals in electrical engineering 1st year"

Contents covers (among others) content of "Service Technician" courses:

Module I: Course II
Module V: Course I

Feedback received from participants: 5

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	1/5	0/5	0/5
80 %	20 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	0/5	1/5	0/5
80 %	0 %	20 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	1/5	0/5	0/5
80 %	20 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	1/5	0/5	0/5
80 %	20 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/5	2/5	0/5	0/5
60 %	40 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable

4/5	0/5	0/5	0/5
80 %	0 %	0 %	0 %

Course title: "Master school for installation and energy technology - heating"

Contents covers (among others) content of "Service Technician" courses:

Module I: Course I, III

Module II: Course I, II, III, IV

Feedback received from participants: 8

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
2/8	4/8	1/8	1/8
25 %	50 %	12,5 %	12,5 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
1/8	3/8	2/8	2/8
12,5 %	37,5 %	25 %	25 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/8	3/8	0/8	1/8
50 %	37,5 %	0 %	12,5 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
2/8	3/8	3/8	0/8
25 %	37,5 %	37,5 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
1/8	2/8	3/8	0/8
12,5 %	25 %	37,5 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/8	2/8	3/8	0/8
37,5 %	25 %	37,5 %	0 %

Course title: "Electrotechnical safety regulations for interdisciplinary activities (sanitary and heating engineering)"

Contents covers (among others) content of "Service Technician" courses:

Module I: Course IV

Feedback received from participants: 19

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
18/19	0/19	0/19	1/19
94,73 %	0 %	0 %	5,2 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
15/19	4/19	0/19	0/19
78, 94 %	21,05 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
15/19	4/19	0/19	0/19
78, 94 %	21,05 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
15/19	4/19	0/19	0/19
78, 94 %	21,05 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
17/19	2/19	0/19	0/19
89,47 %	10,52 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
17/19	2/19	0/19	0/19
89,47 %	10,52 %	0 %	0 %

Course title: "Refrigeration, air conditioning and heat pump technology - basics"

Contents covers (among others) content of "Service Technician" courses:

Module II: Course I, III

Module III: Course II, III

Module IV: Course I

Feedback received from participants: 5

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	0/5	1/5	0/5
80 %	0 %	20 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
2/5	2/5	0/5	1/5
40 %	40 %	0 %	20 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
2/5	1/5	0/5	0/5
40 %	20 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/5	0/5	0/5	0/5
100 %	0 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	0/5	1/5	0/5
80 %	0 %	20 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	1/5	0/5	0/5
80 %	20 %	0 %	0 %

Course title: "Energy consultant course according to ARGE EBA - Basic module"

Contents covers (among others) content of "Service Technician" courses:

Module I: Course I

Module II: Course I, III

Module III: Course I, III

Feedback received from participants: 13

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/13	4/13	5/13	1/13
23,07 %	30,76 %	38,46 %	7,69 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/13	5/13	1/13	1/13
46,15 %	38,46 %	7,69 %	7,69 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/13	7/13	1/13	0/13
38,46 %	53,84 %	7,69 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/13	3/13	2/13	2/13
46,15 %	23,07 %	15,38 %	15,38 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/13	6/13	2/13	1/13
30,76 %	46,15 %	15,38 %	7,69 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/13	5/13	2/13	1/13

38,46 %	38,46 %	15,38 %	7,69 %

Course title: "Certified heat pump technician or heat pump installer"

Contents covers (among others) content of "Service Technician" courses:

Module I: Course V, VI, VII

Module II: Course I, II, III, IV

Module IV: Course I

Feedback received from participants: 12

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
10/12	1/12	0/12	1/12
83,33 %	8,33 %	0 %	8,33 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
9/12	3/12	0/12	0/12
75 %	25 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
8/12	4/12	0/12	0/12
66,66 %	33,33 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
11/12	0/12	0/12	1/12
91,66 %	0 %	0 %	8,33 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
10/12	1/12	0/12	0/12
83,33 %	8,33 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
10/12	1/12	1/12	0/12
83,33 %	8,33 %	8,33 %	0 %

Course title: "Hydraulics I - Introduction to oil hydraulics"

Contents covers (among others) content of "Service Technician" courses:

Module III: Course I

Feedback received from participants: 4

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/4	1/4	0/4	0/4
75 %	25 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/4	1/4	0/4	0/4
75 %	25 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/4	1/4	0/4	0/4
75 %	25 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/4	1/4	0/4	0/4
75 %	25 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/4	1/4	0/4	0/4
75 %	25 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/4	1/4	0/4	0/4
75 %	25 %	0 %	0 %

Course title: "Photovoltaic technician or photovoltaic planner course - Basic module"

Contents covers (among others) content of "Service Technician" courses:

Module II: Course V

Module III: Course III

Feedback received from participants: 9

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/9	2/9	0/9	0/9
77,78 %	22,22 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/9	4/9	0/9	0/9
55,56 %	44,44 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/9	2/9	0/9	0/9
77,78 %	22,22 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable

5/9	2/9	1/9	1/9
55,56 %	22,22 %	11,11 %	11,11 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/9	3/9	0/9	0/9
66,67 %	33,33 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/9	2/9	0/9	0/9
77,78 %	22,22 %	0 %	0 %

Course title: "Photovoltaic technician or photovoltaic planner course - Expert module"

Contents covers (among others) content of "Service Technician" courses:

Module II: Course V

Module III: Course III

Feedback received from participants: 9

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/9	3/9	0/9	0/9
66,67 %	33,33 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/9	3/9	0/9	2/9
44,44 %	33,33 %	0 %	22,22 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/9	1/9	1/9	0/9
77,78 %	11,11 %	11,11 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/9	1/9	0/9	1/9
66,67 %	11,11 %	0 %	11,11 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/9	4/9	1/9	0/9
55,56 %	44,44 %	11,11 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/9	4/9	0/9	1/9
44,44 %	44,44 %	0 %	11,11 %

Course title: "Sales in the field: recognizing and awakening customer needs"

Contents covers (among others) content of "Service Technician" courses:

Module V: Course I, II

Feedback received from participants: 7

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/7	0/7	0/7	0/7
100 %	0 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/7	0/7	0/7	0/7
100 %	0 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/7	2/7	0/7	0/7
71,43 %	28,57 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/7	0/7	0/7	0/7
100 %	0 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
7/7	0/7	0/7	0/7
100 %	0 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/7	0/7	0/7	0/7
85,71 %	0 %	0 %	0 %

Course title: "After sales - top support as a guarantee for customer loyalty"

Contents covers (among others) content of "Service Technician" courses:

Module V: Course I, II

Feedback received from participants: 5

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/5	0/5	0/5	0/5
100 %	0 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/5	0/5	0/5	0/5
100 %	0 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/5	1/5	0/5	0/5
80 %	20 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/5	0/5	0/5	0/5
100 %	0 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/5	0/5	0/5	0/5
100 %	0 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
0/5	0/5	0/5	0/5
80 %	20 %	0 %	0 %

Course title: "Customer orientation as basis - people buy from people"

Contents covers (among others) content of "Service Technician" courses:

Module V: Course I, II

Feedback received from participants: 3

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/3	0/3	0/3	0/3
100 %	0 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/3	0/3	0/3	0/3
100 %	0 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/3	0/3	0/3	0/3
100 %	0 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/3	0/3	0/3	0/3
100 %	0 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/3	0/3	0/3	0/3
100 %	0 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/3	0/3	0/3	0/3
100 %	0 %	0 %	0 %

Course title: "Customer communication. 'Yes we care' - We speak 'customer'"

Contents covers (among others) content of "Service Technician" courses:

Module V: Course I, II

Feedback received from participants: 4

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/4	0/4	0/4	0/4
100 %	0 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/4	0/4	0/4	0/4
100 %	0 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/4	0/4	0/4	0/4
100 %	0 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/4	0/4	0/4	0/4
100 %	0 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
3/4	1/4	0/4	0/4
75 %	25 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/4	0/4	0/4	0/4
100 %	0 %	0 %	0 %

Course title: "More success through efficient time management"

Contents covers (among others) content of "Service Technician" courses:

Module V: Course II

Feedback received from participants: 6

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/6	1/6	0/6	0/6
100 %	0 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/6	0/6	0/6	0/6
100 %	0 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/6	0/6	0/6	0/6
100 %	0 %	0 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
4/6	2/6	0/6	0/6
66,66 %	33,33 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
6/6	0/6	0/6	0/6
100 %	0 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
0/6	0/6	0/6	0/6
100 %	0 %	0 %	0 %

Course title: "Reduce stress! - Efficient time and self-management in office management"

Contents covers (among others) content of "Service Technician" courses:

Module V: Course II

Feedback received from participants: 9

- Q1: The information and advice were optimal.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
8/9	1/9	0/9	0/9
88,89 %	11,11 %	0 %	0 %

- Q2: The rooms/workshops/laboratories are equipped to support learning.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
5/9	4/9	0/9	0/9
55,56 %	44,44 %	0 %	0 %

- Q3: The description of the event on folder/flyer etc. corresponded to the content conveyed.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable

6/9	1/9	2/9	0/9
66,67 %	11,11 %	22,22 %	0 %

- Q4: The learning materials are clear and easy to understand.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
8/9	0/9	0/9	0/9
88,89 %	0 %	0 %	0 %

- Q5: Overall, my expectations were met.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
8/9	1/9	0/9	0/9
88,89 %	11,11 %	0 %	0 %

- Q6: I am happy to recommend this event to others.

Exceeds Expectations	Meets Expectations	Needs Improvement	Unacceptable
9/9	0/9	0/9	0/9
100 %	0 %	0 %	0 %

Results and future outlook

As can be seen in the feedback provided by the participants in the already existing courses a strong interest in the topics as well as a rather well perception of the advice and information given is clear. This is underlined by the fact that 71% of all participants of all courses answered to the statement that “the information and advice were optimal” that their expectations were exceeded, while 19% stated that their expectations were met. Only 7% stated that the information, and thus the contents, should be improved, while only 3% didn’t agree with the statement.

When looking at the feedback regarding whether “the rooms/workshops/laboratories are equipped to support learning” 59 % stated that their expectations were exceeded, while 26 % stated that their expectations were met. 5 % stated that improvements are required and 7% that the conditions were unacceptable. Here it must be noted that on the 12th of September 2024 the WIFI Styria opened a new “Center of Excellence”, which after 20 months of construction, provides new training facilities for the welding, electrical engineering and mechatronics trades as well as air conditioning, energy and building services engineering. Further new buildings are in construction, including the purchases of new state of the art machinery. Thus, it is expected that this criterion will not be an issue in the foreseeable future as the Service Technician is planned to be conducted in these novel buildings.

64 % of the participants stated that the description of the event in folders/flyers or online etc. corresponded to the conveyed content in an expectation exceeding manner. 27 % stated that it met their expectations. Only 2 % stated that improvements were required, while 1 % stated it is unacceptable. This is a huge indicator that the contents provided in the service technician will meet the expectations from the participants as well as their companies.

71 % of all participants said that their expectations regarding whether the materials provided were developed in a clear and easy to understand manner were exceeded while 16 % stated that their expectations were met. Again, only 6 % stated that improvements a required and only 5% were unhappy about the materials. Again, this is a great indicator that the materials that will be used in the Service Technician are of high standard and are developed in a manner that the participants gain the provided knowledge.

When it comes to the question, if the participants expectations were overall met, 65 % stated that their expectations were exceeded while 23 % said their expectations were met. 8 % stated that improvements are required and 1 % said they were not satisfied. This indicates that contents that will be covered in the Service Technician are already on a very high level and only slight improvement is required from the side of the training provider.

69 % stated that they will definitely recommend the individual courses and 19 % stated that as their expectations were met, they will do so as well. Only 2 % would not recommend the courses, while only 6 % required improvement before recommendation. This feedback leads us to believe that the “Service Technician” once it is established will be perceived as a high-quality further education training that will be demanded not only because of the taught skills and knowledge, but also due to the fact of very positive feedback.

In summary, the feedback received by the participants in the individual courses, indicate that there is an interest in the provided contents. Furthermore, the contents, training methods, materials etc. are exceptionally well perceived.

This is further underlined by the fact that the companies want to have a training for “Service Technician” specialists but were only hesitant since no legal framework was existent until 2024. The second barrier of pricing is not seen as a challenge, as it is common in Austria that companies pay for further educational courses of their employees. Usually, an agreement is reached with the employee that he will utilize the knowledge and skills gained by the education within the company for a certain number of years or an agreed pay back sum will become effective.

As it was not possible to conduct a holistic test of the service technician within the 3LoE project an outlook will be given:

Once the Service Technician is officially filed and accredited by the Federal Ministry of Economic Affairs it is planned to fully integrate the “Service Technician” as a new further education program at WIFI Steiermark. The starting date is planned to be in 2025, depending on how long the official way is taking. If the “Service Technician” is offered and promoted, the 3LoE Project as well as the support of the Erasmus+ Program of the European Union will be fully advertised, even after the projects end.

3. Evaluation Concept[10]

The following form is an evaluation for participants in the training program "Installation and Building Technology - Service Technician" carried out by Wirtschafts-förderungsinstitut (WIFI) Steiermark.

The structure of the evaluation for the participants is divided into three parts.

- Firstly, the evaluation includes an assessment of the participants' satisfaction with the organisation and support provided by the educational institution offering and running the courses.
- This is followed by an assessment of the participants' competences and personal interaction with the trainer.
- Finally, the participants should assess the benefits of the course for their professional and personal development, the promotion of competences and the application in practice.

Notes for the organisation of the evaluation:

The basic standards for participant evaluations in educational institutions or comparable organisations should be observed. These include, in particular,

- voluntariness,
- confidentiality,
- anonymity,
- data protection
- and security.

The evaluation is aimed at the participants of the dual study programme "Installation and Building Technology - Service Technician" of the *WIFI Steiermark* who have completed the respective course in full.

The evaluation should be carried out after each individual course. The name of the course must therefore be entered at the beginning so that it can be allocated accordingly.

In principle, the evaluation should not be changed. If changes are made, these should be briefly described. If changes have been made, the relevant part cannot be aggregated with evaluations from other evaluated courses.

[10] Prepared by Campus 02, Graz

COURSE EVALUATION - TRAINING PROGRAM
"INSTALLATION AND BUILDING TECHNOLOGY - SERVICE TECHNICIAN"

Course title: _____

Assessment of satisfaction with the organization/educational institution

I received appropriate information about the timetable before the start of the course.

I agree ○—○—○—○—○ I do not agree ○ No answer/ not applicable

I received appropriate information about the main content before the start of the course.

I agree ○—○—○—○—○ I do not agree ○ No answer/ not applicable

Before, during and after the course, my contacts at the organisation were always friendly and competent.

I agree ○—○—○—○—○ I do not agree ○ No answer/ not applicable

The contact persons in the organisation helped me with any uncertainties, questions or problems.

I agree ○—○—○—○—○ I do not agree ○ No answer/ not applicable

The training institution should have informed me more intensively about the following aspects:

Satisfaction with the trainers' skills/competences for the course

Our lecturer had a friendly and competent demeanor.

I agree — I do not agree — No answer/ not applicable

The presentation of the content of the course was clearly and comprehensibly.

I agree — I do not agree — No answer/ not applicable

For me, the "common thread" of the course was recognizable.

I agree — I do not agree — No answer/ not applicable

The lecturer was able to motivate me well for the content of the course.

I agree — I do not agree — No answer/ not applicable

My questions were addressed and answered satisfactorily.

I agree — I do not agree — No answer/ not applicable

The lecturer managed to establish a link between the teaching content and practice.

I agree — I do not agree — No answer/ not applicable

What else I would like to say about the lecturer:

Evaluation of the personal benefit for the course

I can transfer and apply what I have learnt to my practical and planning activities in the company.

I agree — I do not agree

No answer/ not applicable

I can apply what I have learnt in the form of solution-oriented approaches to service-related problems.

I agree — I do not agree

No answer/ not applicable

The following topics and content in this course were particularly important for me:

The following topics or content in this course were less important to me:

I would have liked to see the following topics or content added to this course:

I would recommend this course to colleagues at work or in the industry.

I agree — I do not agree

No answer/ not applicable