

Learning workshop „Sustainable environmental protection“



Qualification concept for educational staff

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The following qualification concept for educational staff to design and implement learning workshops on "Sustainable climate and environmental protection" in vocational education and training was developed under the direction of Ralf Kaufmann and Heike Arold from nordprojekte "Kaufmann & Partner". As a basis for the development of the concept, the results of an extensive investigation and numerous case studies at the national level of all partner countries involved in the project were used, these were discussed with the partners and the structure was determined. In addition to nordprojekte Kaufmann & Partner should also be mentioned here:

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Introduction

The qualification concept presented here for educational specialists in training and further education, who shall implement the newly developed concept for vocational-specific learning workshops on sustainable climate and environmental protection is based on the results of an extensive vocational-scientific investigation in the five partner countries (Spain, Slovenia, Poland, Austria and Germany) involved in the Erasmus+-project “Learning workshop for sustainable environmental protection”.

It pointed out, among other things, that learning workshops are an innovative and highly flexible method for imparting specific content as part of training and further education and, in particular, for imparting knowledge about environmental and climate protection goals in the world of work. They enable a practical, focused teaching of a wide range of teaching content based on vocational-specific tasks and thus complement existing training framework plans and further training opportunities for different professional groups.

Furthermore, the results of the investigation in all partner countries have shown that the basic method of learning workshops can be used universally. In Germany and Austria, for example, it is already being used successfully in connection with other teaching content. And it is seen as a promising by educational experts from other EU countries, because the method has a strong practical relevance. Therefore, learning workshops can be used well in the various vocational education training (VET) systems of the EU in initial trainings but also in internal and inter-company further training.

With the qualification presented in this concept, educational specialists who want or should carry out a learning workshop receive in-depth further training that expands their technical and didactic know-how. Furthermore it provides them a method to impart different content about sustainable climate and environmental protection in a practical way and even though only in relation to the working and professional world. The focus on sustainable climate and environmental protection was chosen in the project because the topic is hardly taken into account in training regulations across the EU and even though only in a rudimentary manner in connection with other technical topics and teaching content.

The following qualification concept can also be used as a guideline for any other vocational-specific content and increase the methodological diversity of those taking part in the qualification. The details presented here are taken from the world of training in 2023 and are intended as examples and suggestions.

During the qualification, special attention is paid to the constantly and ever faster changing conditions in the working and professional world and thus also to the training. This means the respective teaching content that goes along with the changes and where they can be found and how they should be taken into account.

1. General explanations about the qualification concept

1.1 Background of the qualification

Sustainable climate and environmental protection has been for a long time one of the most important goals of the European Union. In order to achieve this, climate and environmental protection must be anchored in all areas of society and especially in the world of work. Thus the main focus of the Erasmus+ program is also on this goal.

As part of the Erasmus+-project “Learning Workshop for Sustainable Environmental Protection - LWS”, the topic of sustainable climate and environmental protection was taken up with a focus on training/apprenticeship and further education. So an extensive vocational research investigation was carried out with partners from Germany, Poland, Austria, Slovenia

and Spain to determine the extent to which the topic is already taken into account in training/apprenticeship and further education, whether there is a legal basis for this and, in particular, where in different vocational fields (or professions) sustainable climate and environmental protection takes place. This was done against the background to implement the topic increased through learning workshops as part of training/apprenticeship and further education. Based on the results, in addition to a general concept for learning workshops for sustainable environmental protection, five vocational field-specific learning workshops were also developed.

The approach of imparting the necessary and identified know-how on sustainable climate and environmental protection in the world of work (or in the course of practicing various professions) through learning workshops was based on the fact that these are particularly characterized by practical learning. Learning workshops enable a more open and participatory teaching design, as it is increasingly required in the VET systems in numerous EU countries. Especially the use of this teaching method in VET for sustainable development enables a rapid adaptation to the rapidly changing conditions in the working and professional world.

The investigation made it clear that sustainable development is playing an increasing role in the context of education in all partner countries. Thus in Germany, for example, principles for anchoring education for sustainable development (ESD) were laid down in the state of Schleswig-Holstein, particularly for school-based training. The Schleswig-Holstein Institute for Vocational Education (SHIBB) describes it as follows: “The graduates of a course in the VET system will be able to help shape their living and working environment optimal after a successful completion, in the sense of the 17 (sustainability) goals; in this regard, they will be viewed as experts as well as role models and multipliers in their respective vocational fields and will be able to act accordingly.” (see State Strategy Education for Sustainable Development, 2021, Ed.: Ministry for Energy Transition, Agriculture, Environment, Nature and Digitalization of the State of Schleswig-Holstein)

Against this background, it is necessary at first to sensitize teachers and specialists (trainers, instructors, etc.) to the topic, provide further training and enable them to implement appropriate learning workshops. This objective is to be taken into account by means of the newly developed and subsequent qualification concept for specialists in the field of VET and further education.

The following qualification concept includes all cross-nationally relevant aspects in order to ensure comparability of the level of qualification achieved and is still so general that it can be easily adapted to the individual needs and VET systems of the EU countries and used. However, it also includes concrete examples of possible vocational field-specific teaching content as well as the implementation of learning workshops, which is also described in detail in the document “Learning workshop concept – development and implementation of learning workshops on sustainable climate and environmental protection”.

In order to ensure the quality of skilled worker qualification across countries, an extra document “Quality standards for the qualification concept” describes standards that must be met and which describe the basic framework of the qualification developed here.

1.2 Type and benefit of the qualification

The qualification concept is the basis for a specific further training for teachers and specialists (e.g. trainers and instructors) in VET and further education. It describes the further training for carrying out learning workshops for sustainable climate and environmental protection in VET and further education. The qualification of the specialists should be as practical as possible and should be based on a learning workshop. This means that the elements of a learning workshop should be present and used during this further training.

The qualification should also open the view to innovative teaching methods and enable a form of participatory learning, in which the participants' experience of learning workshops or the thematic focus can and should be incorporated and used in large parts of the qualification. This teaching method can be used in a variety of ways and, due to its high flexibility it can be used particularly well in a rapidly changing learning environment. This means that the subsequent qualification can be easily adapted to new conditions at any time and can be used sustainably.

1.3 Objective of the qualification

In order that the learning workshops for sustainable environmental protection can be successfully implemented in VET and further education, the educational specialists who implement them must be or, if they are not yet so, appropriately qualified.

The objective of the qualification is to provide the qualification participants a tool to plan, implement and carry out learning workshops for sustainable environmental and climate protection. They should be enabled to provide young people in training/apprenticeship and skilled workers in a wide range of professional fields the knowledge and skills required to implement sustainable climate and environmental protection in their work. The objectives of the qualification are to be described in detail as follows.

Those being qualified should know at the end of the qualification:

- what possibilities and limitations learning workshops offer,
- how a learning workshop for sustainable environmental and climate protection can be set up, organized and carried out,
- which legal principles must be followed,
- which methodological and didactic principles can be applied,
- how a work organization and work process analysis is carried out to identify the required teaching content for vocational-specific learning workshops with a focus on sustainable climate and environmental protection in the working and professional world.

The qualification concept as such is the basis for national adaptations and also aims at the comparability of the acquired competences and skills.

1.4 Target groups and beneficiaries of the qualification

General beneficiaries of the qualification concept are all educational specialists such as teachers, trainers and instructors who are active in VET field and further education and who are concerned with environmental and climate protection in the world of work

The qualification is aimed at different target groups. However, it always focuses on the implementation of learning workshops with a focus on sustainable climate and environmental protection in the working and professional world and all associated aspects, both in general and with regard to vocational field-specific or profession-specific aspects of sustainable climate and environmental protection. As such, the qualification of educational specialists can be integrated into existing training courses (e.g. teacher training) of them or used and offered independently as further training for educational specialists.

The target group includes, for example:

- Teachers in vocational education in general
- Teachers who teach trainees at vocational schools
- Trainers in inter-company teaching facilities and institutions
- Trainer in independent vocational training
- Actors (experts) from specialist chambers that offer further education for their members
- Those who are responsible for further training in companies

The implementation of the qualification is aimed at various institutions that are active in the field of training, further education and vocational training and that train or further train educational specialists. These include:

- Universities (as part of vocational school teacher training)
- Chambers and professional associations
- Institutions for further education and training

1.5 Comments on additional quality standards

In addition to the identified structure and the implementation options and the work steps required to carry out learning workshops on sustainable climate and environmental protection, the requirements for the educational specialist staff and the procedure for identifying the necessary specialist knowledge for sustainable climate and environmental protection, the additional developed quality standards for the qualification are the basis for an EU-wide uniform qualification concept.

These quality standards must be taken into account when adapting the concept to the different national framework conditions of individual EU countries and should be adhered to. The quality standards are criteria that are valid regardless of a region or teaching institution. This makes it possible to ensure that the qualification is comparable across countries in addition to the general teaching objectives and core content, which are also an integral part of the qualification.

The quality standards that are also a basis for the concept describe, on the one hand, the framework for the qualification and, on the other hand, they reflect the requirements for the qualification in general and the objectives to be achieved. They can be used to measure, among other things, whether the requirements for those to be qualified and the qualifying institutions are met and whether certain objectives and characteristics could be achieved in the course of implementing the qualification and against the background of the established framework.

Therefore they also make a contribution to the comparability of the imparted competencies and skills that are acquired through the qualification.

For a better classification, the different quality standards were clustered and assigned to specific categories such as input, process and output quality standards. The “input” quality standards include all relevant framework conditions of the qualification, which should generally be adhered to. The “process” quality standards, in turn, describe specific and content-related criteria and the “output” quality standards refer to the results that are achieved through the qualification (cf. Arold, Windelband, 2011, quality standards for a sector-specific qualification concept in the European Second hand sector).

The individual quality standards as a basis and the objectives assigned to them as well as the recommended instruments for implementing the quality standards are presented in the document “Learning workshop for sustainable environmental protection - quality standards for the qualification concept for educational staff”. The corresponding document is available for download on the website www.nordprojekte.de or the BBZ Rendsburg-Eckernförde website or can be requested by using the contact details mentioned above.

1.6 Used teaching methods

The teaching and learning methods used as part of the qualification concept were selected against the background of the theoretical and practical use of the acquired know-how and the objectives of the qualification. The selection of the used teaching methods should be closely based on the teaching methods that are used in a learning workshop. In this way, an additional learning effect should be achieved for those being qualified with regard to the objectives of the qualification. This means that they not only learn how a learning workshop works in its entirety, but also experience how it can work in an exemplary manner. Therefore, teaching methods that can also be used in a learning workshop should be used for them, whereby in addition to the theoretical transfer of know-how, the focus should be on the practical development of work tasks.

The transfer of theoretical basics, especially the legal basis and the sources for it, as well as the legal hierarchy should initially be done by using theoretical teaching methods. And also basic knowledge about the structure and process of learning workshops as well as the core content and the identification techniques for identifying them can be theoretically provided. In general, all content that covers basic and overview knowledge can be transferred by using theoretical teaching methods. In addition to classic frontal teaching and teacher lectures, this also includes methods such as action-oriented learning, cooperative learning such as group or team work, but also self-organized learning, for example when working on theoretical questions. Furthermore discussions, individual works and presentations should also be mentioned here. As diverse as the teaching of theory can be, the use of different media and materials is equally diverse. Thus those being qualified have also the opportunity to learn something about the advantages and disadvantages of different media and will later find it easier to decide which media they want to use when implementing learning workshops. In addition to boards, flipcharts and projectors, particular attention should be paid to the use of digital media, because these are also increasingly used in learning workshops and are now indispensable both for teaching theory and for solving practical work tasks.

In addition to imparting basic and background knowledge, the qualification should primarily teach the practical implementation of learning workshops. This should be given as much time as possible. Those to be qualified should learn practically how to plan, implement and carry out a learning workshop for sustainable environmental protection through self-organized learning.

This means they can incorporate the acquired know-how as experiential knowledge into their later work as a specialist implementing learning workshops. And it also makes them more aware of possible complications that may arise when planning and implementing the learning workshops. The learning process takes place through a practical task that includes the planning, implementation and realisation of an exemplary learning workshop. The independently developed results (e.g. by own effort, team or group work) should then be prepared, presented and discussed in order to benefit from the know-how and the experiences gained by other participants on the one hand and, on the other hand, to identify own mistakes and to avoid them later.

A possible example for implementing the qualification is described in Chapter 6.5 and offers starting points for implementing this concept.

2. Requirements for those to be qualified

The requirements and expectations to those to be qualified were analyzed in a separate qualification analysis in the five partner countries in order to identify the common interfaces. Because the qualification is aimed at educational specialists, it can be assumed that they have already acquired a certain level of basic pedagogical knowledge and skills as well as methodological skills and basic social and personal skills in the course of their previous pedagogical training or in the course of their everyday work. The experiences, knowledge and skills that are listed below are not taken into account or only marginally taken into account in the course of the qualification.

Since the learning workshops can be implemented by specialists with different previous qualifications, it should be noted that the following requirements cannot be transferred to every specialist. In particular, these refer to specialists who are directly involved in VET (such as trainers, instructors, vocational school teachers). And it refers to specialists in further training who know the respective professional field (or profession) that is being considered in the learning workshop well. If the specialists implementing the learning workshop do not meet individual requirements, they should acquire the relevant knowledge and skills before implementing a learning workshop.

Summary of identified requirements:

Category	Experiences, knowledge, skills
Required pre-qualifications	<ul style="list-style-type: none"> - Trainer/instructor certificate or teacher in VET - Experience in teaching - Vocational-specific expertise - Didactic, pedagogical method and media competence
General knowledge about concrete vocational fields (which the learning workshop covers)	<ul style="list-style-type: none"> - Knowledge of work procedures and processes - Knowledge of different "settings" in the vocational field - Knowledge of possible profession-specific materials, tools, machines and how to handle them - Knowledge of work-related connections between, for example, different departments - Knowledge of teaching/training (apprenticeship) framework plans and training regulations - Knowledge of the effects of laws and regulations on training/apprenticeship and everyday work

<p>Knowledge/experience on the implementation of climate/environmental protection (CaEP) in specific professional fields (which the learning workshop covers)</p>	<p>Knowledge or experience:</p> <ul style="list-style-type: none"> - on CaEP in institutions/companies and in everyday work - about catering concepts - in energy management - in water management - on CaEP in relation to work organizations - on heat protection measures, climate crisis and its effects - on the energy transition and its effects <p>Especially in the “construction” vocational field</p> <ul style="list-style-type: none"> - to ecological building - on sustainable materials and waste management - on best practice examples for ecological building
<p>Methodological competencies</p>	<ul style="list-style-type: none"> - Know and be able to implement different teaching methods of cooperative learning - Cooperative learning according to the principle of “Thinking – exchanging – imagining” with the help of methods such as placemat procedures, partner work through partner puzzles, group work through group puzzles, learning tempo duet - be able to use digital teaching methods, e.g. mind map with Miro, task cards, Oncoo - be able to establish collaborations with relevant companies and training centers/companies (networking skills)
<p>Further competencies</p>	<ul style="list-style-type: none"> - Social/personal skills such as teamwork, conflict resolution, organizational skills, creativity, communication skills, care, empathy - Knowledge about evaluation techniques - Analytical ability

3. Qualification focusses

Because these are learning workshops on sustainable environmental protection with reference to the world of work or to vocational fields/professions, the focus of the content should not only be on sustainable environmental protection, but also consider climate protection. Furthermore, the focus should not only be on current measures for sustainable climate and environmental protection with reference to real work procedures and processes and organizations, but should also take into account possible future changes in the vocational fields or professions in order to achieve a sustainable learning effect with the learning workshop.

Since both climate protection and also environmental protection are very broadly defined, they will be narrowed down and explained again below and a statement will be made on the changes in the professional world due to this. This makes it easier to differentiate later when developing learning workshops for sustainable environmental protection.

3.1 General environmental protection aspects in the world of work

Environmental protection as such can be described as follows: This includes all measures that contribute to preserving people's natural environment and protecting soil, air, water, plants and animals (see G. Schneider, C. Toyka- Seid, The young political lexicon, Federal Agency for Civic Education 2023). The demand is politically anchored in, among other things, the Charter of Fundamental Rights of the European Union. It stays so: "A high level of environmental protection and the improvement of the quality of the environment must be integrated into Union policy and ensured in accordance with the principle of sustainable development." (see article 37) And so the issue of environmental protection is not only politically anchored in all EU countries, but is also becoming more and more in the focus of action. However, it has been shown that environmental protection has different legal bases in the EU countries. While in Germany, for example, environmental protection has been a state goal since 1994 and has been formulated in the Basic Law in Article 20a (GG) and in Slovenia in the "Environmental Protection Act" (EPA) in the Basic Law in 1993, in Spain it anchored at different levels of responsibility and with regard to different areas. In Austria, this is ensured, among other things, by the Environmental Impact Assessment Act (UVP-G), as well as in Poland, which is closely based on the EU guidelines. So all countries follow the EU regulations and implement environmental protection.

In general and across countries, environmental protection is viewed as an umbrella term that subsumes several sub-areas like

- Climate protection
- Forest protection
- Water protection and
- Health protection

On the one hand, the sub-areas must be considered individually with their specific features and, on the other hand, the connections and interactions between them, because these lead to a better environmental protection in total. Ultimately, it's about preserving the "natural" environment by using and consuming as few resources as possible and thus also having as little influence on the environment as possible through human activity. With regard to materials and goods in particular reducing, reusing and recycling, and with a view to the future refuse (environmentally harmful products) are playing an increasingly important role.

Ein großer Teil dieser Aspekte wie o.g. in nationalem, aber auch supranationalem und internationalem Recht geregelt. Zur Erreichung eines umfassenden Umweltschutzes bedarf es aber immer noch einer Bewusstmachung von umweltschädlichem Verhalten auch in der Arbeitswelt. Daher sollen Arbeitsabläufe und Arbeitsprozesse unter Umweltschutzaspekten analysiert und wenn möglich so geändert werden, dass ein besserer Schutz der Umwelt möglich ist.

3.2 General climate protection aspects in the world of work

Climate protection is the collective term for measures that counteract global warming caused by humans and to mitigate or prevent possible consequences of global warming. The core element of climate protection is the drastic reduction of emissions of greenhouse gases (CO₂, methane, nitrous oxide, fluorocarbons, water vapor, including hydrogen, ozone, aerosols and soot particles), which are used in energy production and in energy use in the industrial and agricultural production, in transport and released in private households.

In order to achieve this, as in the case of general environmental protection, an analysis of all work processes must be carried out with regard to their relevance to climate protection. This requires intensive education, which leads to changes in awareness and behaviour in the respective workplace.

3.3 Vocational changes due to climate and environmental protection

The working and professional world is subject to a variety of changes due to the required climate and environmental protection at all levels of society. Above all, the unbridled use of energy in any form will have to be reconsidered in the future. Accordingly, work organizations, procedures and processes as well as the design of work locations and workplaces must be adapted due to political demands for more sustainable climate and environmental protection. This will inevitably change profession profiles and require skilled workers in all sectors of the economy not only to have new know-how, but also to have a new environmental awareness in relation to their work and changes in their actions.

And also journeys to work, which have so far been completed primarily individually, transport of goods as well as through commuting traffic and thus the separation of work and living environments must also be taken into account and will lead to changes in the future if we want to meet the demands for more climate and environmental protection.

However, these changes always require an analysis of the overall use of resources. This means that the different sectors have to ask themselves questions and clarify following

- Which materials are needed for what?
- Which materials can be saved?
- Which work procedures and processes can be adapted to the demand for more climate and environmental protection?
- Are there new work materials and instruments that meet the demand for more climate and environmental protection.
- What is energy used for and how can energy be saved?
- Which routes, including passenger journeys, have to be taken and which not?

Ultimately, companies and businesses must subject all of these analysis to their specific cost-benefit calculations as well as an environmental balance.

In the course of vocational field- and profession-specific learning workshops, both as part of training/apprenticeship and further education, these changes as well as the mentioned aspects in Chapters 3.1 and 3.2 must be considered in relation to the vocational fields or professions that is item of the learning workshop. Therefore the content has to be viewed and worked out. However, this should take place both with the aim of raising awareness of the topic and gaining know-how. In order to be able to impart this in the best possible way in specific learning workshops, the educational specialists should first be taught this knowledge in the qualification presented here and they should be enabled to acquire this knowledge beyond the qualification.

4. Learning workshops – Meaning, benefit, design and implementation

Learning workshops are a good method to impart specific aspects of a profession in a practical and realistic manner. A learning workshop in the sense of this project is a training/apprenticeship or further education unit that enables those to be qualified (trainees, specialists and skilled worker in further training) to learn together and to develop results on a specific topic in a self-organized manner by the means of a task or work assignment. A learning workshop requires self-organized action, the identification of the consequences of this action and, through reflection, learning from it.

Vocational field- or profession-specific learning workshops with a focus on sustainable environmental protection (including climate protection) stand out from other learning workshops, particularly in terms of content, and therefore require their own topic-relevant equipment as well as structure, organization and planning steps. At their core, however, they are based on familiar concepts from learning workshops and learning laboratories.

Learning workshops with a focus on sustainable environmental protection in relation to the working and professional world are intended to impart in particular where and how environmentally and climate-friendly procedures and processes can be used and how “clean” technologies and materials can be used in relation to the work processes of a vocational field or profession, resources protected and environmental and climate awareness can be raised. In this regard, tasks should be formulated that are closely based on the profession-specific everyday work and real work processes and that need to be mastered practically in the learning group. What has been learned and developed should then be reflected on, particularly with regard to its environmental and climate relevance. In addition, the tasks, i.e. the learning content, should be linked to the content of the existing training/apprenticeship framework plans insofar as the learning workshop is implemented as part of training/apprenticeship.

The location for a learning workshop should be chosen so that it is easily accessible. The equipment should correspond to the work task and be very similar to real workplaces in the respective vocational field or profession in order to establish a connection to the world of work

The core teaching content of the learning workshop should be exclusively vocational field- or profession-related content with a focus on climate and environmental protection or at least have a strong connection to it and should reflect everyday working life or situations from it. The work tasks should be formulated in an understandable manner and offer scope for independent implementation and solutions so that different results are possible. The theoretical knowledge transfer should be limited to a minimum. It should be limited to an introduction to the learning workshop (objectives and organizational process) as well as a few technical basics that are necessary to implement the work tasks.

At least 80% of the learning workshop should be focused on practical work. Since self-organized learning is a priority in a learning workshop, the role of the educational staff accompanying the learning workshop should essentially be limited to advisory guidance and support. They are asked in the context of the reflection and evaluation of the achieved results when they are placed in the context of climate and environmental protection and conclusions are drawn for the respective everyday work.

How exactly such a learning workshop is planned, organized and implemented, what needs to be taken into account when structuring it and how tasks can be formulated must be transferred through this qualification. For this purpose, the “General concept for learning workshops for sustainable environmental protection with reference to the working and professional world”, that was developed as part of the project, can and should be used. It is available for download on the website www.nordprojekte.de or the BBZ Rendsburg-Eckernförde website or can be requested by using the contact details mentioned above. The aspects developed here should be an essential part of this qualification and can be used as teaching materials.

5. Technical content and acquisition of skills

5.1 Identification of vocational-specific learning content

The teaching staff must be able to identify the profession-specific content of a learning workshop in order to be able to plan and organize a corresponding learning workshop. Therefore, in the framework of the qualification should imparted how these profession specifics can be identified with a view to sustainable climate and environmental protection in relation to the respective vocational field or profession.

The profession specifics arise from the relevant laws and regulations, ultimately from the training/apprenticeship and professional regulations on the one hand and, on the other hand, from a work organization analysis, a workplace analysis and a work process analysis with a focus on aspects of climate and environmental protection. By using these analysis, both profession- and workplace-specific content can be identified, which can then be incorporated into the learning workshops in order to transfer it to the learners.

How such a identification works, who the contact person is or how sources can be identified should also be imparted as part of the qualification. Evidence for this can also be found in the above-mentioned “General concept for learning workshops for sustainable environmental protection” in Chapter 7.1. For example, six key questions are recommended here

1. What is the meaning of sustainable climate and environmental protection in your profession or vocational field?
2. How is sustainable climate and environmental protection regulated with regard to your profession (regulations and laws)?
3. In which work areas does sustainable climate and environmental protection take place?
4. Where does sustainable climate and environmental protection take place in relation to individual work processes and procedures and how is it implemented? In terms of handling materials, machines, working with others?
5. Where and how does sustainable climate and environmental protection take place in relation to your place of work (e.g. production hall, laboratory, workshop, construction site) and your individual workplace (e.g. office, workbench, sales room)?
6. Where do you see the greatest need for qualification on sustainable climate and environmental protection in your vocational field or profession?

The qualification of the educational specialists should also enable them to develop their own key question for analysis purposes.

5.2 Learning content on the example of five vocational fields

The respective learning content on sustainable climate and environmental protection with reference to different vocational fields and the professions that can be assigned to them have been identified by using various vocational research instruments.

In addition to a vocational-scientific analysis of existing documents on the vocational fields to be examined (or selected professional profiles), relevant learning content was identified, particularly in the course of case studies, through interviews with specialists in the relevant vocational fields or professions (see questionnaires Chapter 5.1) and then the results were partly assured by additional expert discussions. The following vocational fields and the assigned professions were considered in particular in that investigation

1. Industrial-technical vocational field (primarily cross-border general and well-known metal and electrical professions)
2. Vocational field health and care (primarily nursing professions)
3. Vocational field service (primarily service professions in the catering, hotel and tourism sectors)
4. Commercial vocational field (primarily cross-national, general and well-known commercial professions)
5. Vocational field crafts (primarily classic construction professions that can be assigned to the field of building construction)

In particular, three key aspects on climate and environmental protection were identified in the working and professional world, which apply differently in the vocational fields and which an appropriate educational specialist who plans and carries out the learning workshop should have knowledge of. The required knowledge should include cross-professional knowledge as well as knowledge specific to the vocational field in relation to the focus of the learning workshop. As the research has shown, the required know-how can be divided into three main aspects

1. Climate and environmental protection in relation **to the infrastructure** that describes the framework of the workplace. In relation to the learning workshops and the corresponding vocational fields or professions, the higher-level workplace such as a shop, a production hall, a restaurant, an office and the local environment of the workplace should be mentioned in particular. But also the direct workplace itself and the instruments, tools, machines, etc. that are used there must also be included here.
2. Climate and environmental protection in relation **to work organization and work organizational processes**, both across vocational fields and across professions, as well as profession-specific details. This includes the type, scope and conditions of how the work - i.e. the work processes and procedures - is organized. In particular, knowledge should be acquired about vocational field- or profession-specific climate and environmental protection aspects that are related to the type of work tasks, the division of tasks between employees and the organization of their collaboration (i.e. forms of work), as well as the used resources, needed working hours and work structures.
3. Climate and environmental protection in relation **to the work processes and procedures** that have to be carried out directly in everyday work and which ultimately affect the vocational field considered in the learning workshop (i.e. the profiles of the associated professions) or individual professions. This includes all direct activities and actions that are necessary to practice a profession, such as e.g. advisory activities, dealing with customers, operating machines, using tools and materials.

With regard to the learning content listed below, the respective educational specialists who plan and carry out a profession-specific learning workshop should have the appropriate technical know-how or be able to obtain it. The learning content of the five example vocational fields must be imparted as part of the qualification of the educational specialists, in addition to the ability to develop corresponding content related to other vocational fields or professions.

1. Learning content with a focus on industrial-technical professions

Subtopic	Assignment C = Climate protection U = Environmental protection	Description
Save resources	C, E	<ul style="list-style-type: none"> • Circular economy: refuse, reduce (e.g. share), circular design, repair, reuse, use of recyclable materials, cascade use of resources • Economical use of materials • Use of environmentally friendly materials • Nature protection
Save energy	C, E	<ul style="list-style-type: none"> • Measures for energy efficiency (economical use of energy sources) and energy saving (discard, reduce), e.g. insulation of buildings, use of standby functions for electrical and electronic devices
Environmentally friendly energy transition	C, E	<ul style="list-style-type: none"> • Increased use of renewable energy sources, but avoidance of combustion processes (biomass) • Sector coupling (e.g. heat and power coupling, heat pumps, electro mobility)
Appropriate waste treatment	E	<ul style="list-style-type: none"> • Waste reduction • Avoiding hazardous waste • Waste separation and proper recycling or disposal
Environmentally friendly mobility and transport	C, E	<ul style="list-style-type: none"> • Avoiding long transport routes • Use of biofuels • Increased use of environmentally friendly means of transport
Local economy	C	<ul style="list-style-type: none"> • Use local supply chains for material procurement • Connection of existing infrastructures
Healthy working environment	E	<ul style="list-style-type: none"> • Healthy nutrition at work • Involving employees in decision-making processes • Team building • Offers for sporting activities

2. Learning content with a focus on nursing professions

Subtopic	Assignment C = Climate protection U = Environmental protection	Description
Save energy	C	<ul style="list-style-type: none"> • Long use of computers, mobile phones, tablets • Use of standby functions • Climate-neutral way to work • Green electricity from water, wind or sunlight • Solar systems • Use elevators only when necessary
Working material	C, E	<ul style="list-style-type: none"> • Use of recyclable materials • Economical use of materials • Use of environmentally friendly materials
Food/ catering	C, E	<ul style="list-style-type: none"> • Use of regional products • All food is consumed • All meals are freshly prepared • Less meat consumption
Ressources	C, E	<ul style="list-style-type: none"> • Use of organic bed linen, organic workwear • Use of recycled paper • Drink tap water • Reduced water consumption for personal car • Have bedding repaired
Heat	C	<ul style="list-style-type: none"> • Heat waves are a result of climate change and have health consequences • Heat action plans are required

3. Learning content with a focus on service professions in the catering and tourism industries area

Subtopic	Assignment C = Climate protection U = Environmental protection	Description
Save energy	C	<ul style="list-style-type: none"> • Long use of computers, mobile phones and tablets • Use of standby functions
Work materials	E	<ul style="list-style-type: none"> • Use of recyclable materials • Economical use of materials • Use of environmentally friendly materials
Sustainability training	C, E	<ul style="list-style-type: none"> • Education and information for employees • New sustainable quality standards
Waste of food	E	<ul style="list-style-type: none"> • Education in food and waste management

Recycling	C, E	<ul style="list-style-type: none"> • Recycling in all areas of hospitality • Waste less, separation and recycling of waste • Packaging rests of food • Recycling food oil for other uses • Decorating with recycled materials
Reduce the consumption of resources	C,E	<ul style="list-style-type: none"> • How to save water, gas and electricity for cooking with quality. • Using Km-0-products to save transport costs. • Calculating the right quantity of food • How to save water/gas/electricity in hotel • Managing for sustainable decisions
Protecting environment	E	<ul style="list-style-type: none"> • Less chemical products • Less sprays (mosquitos for example) • Avoid noise pollution • Less air conditioner over the streets
Cleaning and maintenance	C, E	<ul style="list-style-type: none"> • Organize new way of cleaning to save energy, money and be more sustainable

4. Learning content with a focus on commercial professions

Subtopic	Assignment C = Climate protection U = Environmental protection	Description
Save energy	C	<ul style="list-style-type: none"> • Replace light bulbs • Turn off lights when not in use • Turn off the computer or standby function • Switch off unused devices • Use and maintain energy efficient cooling and heating systems
Adaptation of the working environment	C	<ul style="list-style-type: none"> • Plants in the office or workplace to increase productivity and improve well-being • Reduce the temperature in the workplace and set the heating low
Work materials	E	<ul style="list-style-type: none"> • Use of recyclable materials • Economical use of materials • Digitalisation of workflows • Digital documentation to save paper • Use of environmentally friendly materials • Reduce – reuse – recycle
Waste management	E	<ul style="list-style-type: none"> • Waste separation • Waste reduction
Mobility	C, E	<ul style="list-style-type: none"> • Travel considerably on business trips (e.g. by train, bus) • Use public transportation to get to the office or ride a bike or walk • Make sure to reduce your carbon dioxide footprint
Reuse	C, E	<ul style="list-style-type: none"> • Reduce – reuse – recycle, with this mentality all resources can be conserved • Develop reuse mentality

5. Learning content with a focus on classic construction professions

Subtopic	Assignment C = Climate protection U = Environmental protection	Description
Save energy	E	<ul style="list-style-type: none"> • Long use of computers, mobile phones and tablets • Use of standby functions
Work materials	E	<ul style="list-style-type: none"> • Use of recyclable materials
Basics of the environmental protection and components	C, E	<ul style="list-style-type: none"> • Basics of water, soil, air and acoustic climate protection • Elements of meteorology • Characteristics and types of environmental pollution
Basics of nature protection	E	<ul style="list-style-type: none"> • Characteristics of ecosystems and the influence of environmental factors on organisms • Resources and forms of nature protection; Ecosystem • Basics of monitoring living nature, methods for protecting the natural environment
Water and wastewater treatment	E	<ul style="list-style-type: none"> • Types and properties of water – exploitation of water intakes • Water purification processes and equipment; documentation of water supply chains • Wastewater treatment, domestic sewage treatment, documentation of wastewater networks • Water treatment, wastewater treatment
Soil protection	E	<ul style="list-style-type: none"> • Sources of pollution and causes • Methods of soil protection, soil remediation
Waste	E	<ul style="list-style-type: none"> • Waste classification, methods of waste management, methods of waste disposal of municipal/industrial waste • Waste disposal operation, operation of waste incineration plants, sludge management • Classification, management methods, transportation and storage of hazardous waste
Air pollution and protection	C	<ul style="list-style-type: none"> • Sources and types of air pollution, methods of air protection • Air protection measures, use of renewable energies, noise and vibration protection measures

Energy, noise and vibration protection	C	<ul style="list-style-type: none"> Energy and its relationship to the environment, methods and measures for noise and vibration protection
Environmental law	C, E	<ul style="list-style-type: none"> Environmental approvals Environmental protection laws and regulations and their implementation
Balances and permissible levels of pollution	C, E	<ul style="list-style-type: none"> Environmental hazardous substances – detailed information, hazardous substances balances, permissible pollution levels according to standards Environmental assessment, hazardous substances emissions
Research and assessment of the environment	C, E	<ul style="list-style-type: none"> Technical documentation, methods for environmental studies, environmental sampling methodology, control and measuring devices and apparatus, study of environmental processes
Soil protection work	C, E	<ul style="list-style-type: none"> Methods for protecting soils from deterioration, methods for soil remediation

6. Structure of the qualification

6.1 Qualification modules

In order to be able to plan and implement specific learning workshops for sustainable environmental protection with a focus on the working and professional world in its entirety and against the background of the different pre-qualifications of the involved educational specialists, the qualification was structured modularly. This means that, depending on the needs and previous knowledge, on one hand all modules as a whole course can be taught or just individual modules (content units) of which the specialists have qualification gaps.

In addition it is also possible to divide the qualification into several time periods, which is particularly helpful when it is offered as further training for the qualified specialists, because so they do not have to interrupt their everyday work for too long at a time. And even as part of a basic pedagogical training, the individual modules can be linked to other teaching topics, for example in a teacher training course.

In order to impart in the qualification as described, basic knowledge of sustainable climate and environmental protection in relation to the working and professional world as well as the necessary know-how to implement learning workshops and to enable those to be qualified to acquire the necessary content know-how after the qualification, a total of five qualification modules were set up, which are presented in more detail below:

1. Module „**Normative basics**“
2. Module „**Work process analysis**“
3. Module „**Work place-/work organization analysis**“
4. Module „**Learning workshop - Objectives, possibilities and limits**“
5. Module „**Evaluations and conclusions for the respective workplace**“

6.2 Teaching and learning objectives of the qualification modules

6.2.1 Module 1 „Normative basics“

Environmental and climate protection in the working and professional world are largely standardized. Work steps and workplaces must meet legal requirements for environmental and climate protection, as much as the use of resources and materials. Therefore, Module 1 is dedicated to the identification and application of specific standards in learning workshops.

The objective of the module is:

- to know basic standards for environmental and climate protection. These include, among other things, the relevant EU regulations, valid international treaties and agreements.
- to know the relevant national laws and regulations and to be able to apply them to the respective professional situation,
- to know and be able to apply possible regional or local regulations,
- to know and be able to apply the climate and environmental protection objectives of the respective national professional and training regulations.

6.2.2 Module 2 „Work process analysis“

Different vocational fields and, in particular, professions have different work processes. These are already being implemented or are to be implemented in a climate- and environmentally friendly manner in the future. This includes not only the profession-specific work processes as such, but also the procedures, machines and instruments used, as well as materials and resources. These must be identified and analyzed before designing a vocational field- or profession-specific learning workshop in order to be able to impart this know-how. The module 2 is dedicated to this analysis and identification.

The objective of the module is:

- to be able to define the individual work processes of a profession,
- be able to describe the materials and resources used in detail,
- to be able to recognize and, if possible, quantify the environmental and climate relevance of these materials and resources,
- to be able to develop possible alternatives.

6.2.3 Module 3 „Work place-/work organization analysis“

In addition to profession-specific work processes, climate and environmental protection aspects can also be found in relation to work places as such and to work organization, i.e. the interaction between different work areas (or work processes). Climate and environmental protection aspects are taken sustained and increased into consideration, particularly when designing the framework in which the work is carried out. Since this is increasingly taking place with the participation of the respective employees/skilled workers, corresponding aspects should be taken into account in the learning workshops. These must be identified and analyzed before designing a vocational field- or profession-specific learning workshop in order to be able to impart this know-how. Module 3 is dedicated to this analysis and identification.

Note: Under certain circumstances, Module 2 and 3 can be combined into one module due to the similarity of the content.

The objective of the module is:

- to be able to analyze the respective workplace of a profession and to identify and evaluate climate and environmental protection aspects,
- to be able to analyze work organizations and connections and to identify where climate and environmental protection comes into play,
- to be able to develop possible suggestions for changes.

6.2.4 Module 4 „Learning workshop - Objectives, possibilities and limits“

Learning workshops as a term are known in all EU countries, but they are still not used enough as a teaching method and are not taught as an independent teaching method in pedagogical training or study programs. In particular, the possibilities that learning workshops open up and their limitations are not sufficiently known. That it is a practical teaching method, know the most specialists, but there is a lack of experience with regard to its planning, implementation and execution. Module 4 is dedicated to all relevant aspects of learning workshops and in particular with a vocational field- or profession-specific orientation with a focus on sustainable climate and environmental protection.

The objective of the module is:

- to introduce the educational specialists the idea, the planning and the implementation of learning workshops,
- to show the possibilities of learning workshops with regard to raising awareness of sustainable climate and environmental protection at the workplace and in the professional world and to do this in close accordance with the real working conditions of the trainees and specialists taking part in the learning workshops,
- to make it clear that learning workshops also have limits when, in particular, theoretical basic know-how about sustainable climate and environmental protection should be imparted.

6.2.5 Module 5 „Evaluations and conclusions for the respective workplace“

The identification of climate and environmental protection that has already been implemented in relation to the working and professional world and here in particular with regard to the questions of where and how this takes place in relation to the vocational field or professions has to be considered in a learning workshop is part of the essential know-how of the educational specialists who are implementing the learning workshop. That is important for the planning and implementation of a learning workshop. The knowledge imparted in Module 2 and 3 needs to be supplemented in Module 5. It is important to evaluate the findings and to know the appropriate evaluation techniques. The trainees/apprentices or skilled workers who take part in the learning workshop and who practically develop their knowledge and learning aims must also be bring in the position to be able to evaluate their learning results and be able to draw conclusions for themselves and their everyday work. Module 5 is dedicated to relevant techniques and the opportunities that a learning workshop offers for that.

The objective of the module is:

- to show and practice evaluation methods for workplace/organizational analysis and work process analysis with regard to their impact on the climate and the environment,
- to be able to draw conclusions regarding sustainable climate and environmental protection for work organization and workplaces as well as work processes,
- to show ways of teaching these skills in and with the help of a learning workshop.

6.2 Duration of the qualification

The time scope of the qualification needs a total of 3-5 qualification days. At least 2 days of this should be dedicated to the creation, organization and implementation of a learning workshop (Module 4).

For the theoretical instruction in the legal principles and requirements as well as framework conditions (Module 1) as well as the introduction to the analysis procedures for identifying vocational field- or profession-specific know-how in relation to the application of sustainable climate and environmental protection (Module 2 and 3) one day can be planned. The imparting knowledge about evaluation and reflection techniques (Module 5) should also be done in one day.

Modules 4 and 5 can easily take place in the form of a learning workshop, so that a double learning effect is achieved. Not only learn how a learning workshop works in its entirety, but also reinforce the knowledge to be learned through the own experience of a “learning workshop”. Learning and applying work organization and work process analyses can, under certain circumstances, be acquired in the form of a learning workshop, but also by using other conventional teaching methods like using examples and work tasks that need to be solved individually, in a team or in a group. The time required ultimately depends on the choice of method and can be extended to 1,5 to 2 days.

Die tatsächliche Ausgestaltung und Länge sollte sich auch nach den jeweiligen Vorkenntnissen der zu Qualifizierenden richten. Dafür sollte ein Raster vorgefertigt sein, so dass verschiedene Längen der Qualifizierung angeboten werden können, die nach dem Grad der Vorkenntnisse 3, 4 oder 5 Tage dauert.

The actual design (structure) and length of the qualification should also depend on the previous knowledge of those being qualified. A grid should be prepared so that different lengths of the qualification can be offered, which takes long 3, 4 or 5 days depending on the level of previous knowledge.

6.3 Equipment of the learning location

The learning location should be equipped so that an exemplary learning workshop can also be held there. This means that a space that is as realistic as possible and corresponds to a workplace or training place should be used. The equipment should be appropriate to the planned content and work tasks, so that materials, tools, work clothing and also research opportunities are available.

6.4 Implementation of the qualification

The implementation can be done in two different ways:

1. The qualification can be implemented as a whole and closed, i.e. all content can be completed one after the other within one week. This has the advantage that all content is available to those being qualified after the qualification has been completed. This also makes it easier to link the content of the various modules and the overall effort for both those being qualified and the organization carrying out the qualification is significantly lower.
2. It may also be advisable to carry out the qualification in individual modules. Then a temporal and spatial separation can take place. The theoretical parts (legal basics, analysis options and types of evaluation) can be taught in classic classrooms, divided into short sections.

This has the advantage that the qualification can take place in several parts, by e.g. 90 minutes units. However, the “learning workshop” module should be carried out practically and the above-mentioned 2 days of practice should be observed. These days can, but do not have to, follow one another directly. This depends on the respective work task.

The following table shows an example of how the qualification is implemented. It should be noted that the implementation depends on various factors such as the prior knowledge of those to be qualified, the context in which they later implement the learning workshops (such as training or further education), the framework conditions of the qualifying institution and other options such as networking with experts who are in the qualification could be included.

Example „ Qualification implementation“

Teaching day	Module and ist content	Method / Didactic
Day 1	<p>Module 1:</p> <p>Introduction to the qualification and presentation of the content and the process</p> <p>Content: Normative basics</p> <ul style="list-style-type: none"> - Legal hierarchy - International right - Contract law - Supranational law, EU Charter - National law, laws and regulations, professional regulations, training regulations 	<p>Presentation</p> <p>Class discussion , Single work, Group work, Presentation</p>
Day 2	<p>Module 4 (Part 1): Learning workshop - Basics</p> <p>Content: Objectives , possibilities and limitations</p> <ul style="list-style-type: none"> - Objective of the learning workshop, participatory approach, “accompanied learning”, role of the teacher/trainer/instructor - Practical learning in contrast to theoretical learning, including the experiences of the participants - Design and organisation of the “learning space” of the learning workshop in order to achieve the above-mentioned objectives - Limitations of a learning workshop and the necessity of learning by using practical examples - Methodology and didactics of the learning workshop 	<p>Class discussion, Group work, Presentation</p>

Day 3	<p>Module 2 und 3: Learnin workshop – Identification and analysis of content</p> <p>Content:</p> <ul style="list-style-type: none"> - Arbeitsorganisation und Arbeitsprozesse - Analysen hinsichtlich der Umwelt- und Klimarelevanz 	<p>Single and group work</p> <p>Presentation</p>
Day 4	<p>Module 4 (Part 2): Learning workshop – Creating a vocational-specific learning workshop</p> <p>Content: Learning workshop implementation</p> <ul style="list-style-type: none"> - Organisation - Realisation - Reflection <p>Evaluation possibilities</p>	<p>Single and group work</p> <p>Class discussion</p>
Day 5	<p>Module 4 (Part 2): Learning workshop – Creating a vocational-specific learning workshop</p> <p>Content: Learning workshop implementation</p> <ul style="list-style-type: none"> - Organisation - Realisation - Reflection <p>Evaluation and overall reflection</p>	<p>Single and group work</p> <p>Class discussion</p>

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