GRINSCO

Green Insulation Skills for Construction Workers

R4 GRINSCO WBL Toolkit

R4-T1 Trainer handbook with WBL guidelines for VET providers and trainers

ERASMUS+ Programme

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Foreword

This handbook serves as a guide for trainers in vocational education to teach the GRINSCO training materials. The training materials contain didactic templates to convey three important learning contents in particular to the training participants: the ecological footprint of building and insulation materials, the sustainable use of such products with a focus on maintenance and the circular economy processes of building products in order to improve them. The training materials are an input and should also serve as a basis for the development of new didactic material, but also as a guideline as to whether and how a trainer should undergo further training in this area.

Introduction

Fight against climate change

The impact of the existing building stock on the environment is significant, with buildings being responsible for a large CO2 emission share in the EU (36%) and heating and cooling accounting for 50% of the EU final energy consumption. The European Green Deal sets a climate neutral EU as a target to be achieved by 2050. Reaching this goal requires investing in environmentally friendly construction technologies and ensuring that new and existing buildings become more energy efficient. To cut greenhouse gas emissions and address environmental changes, the construction sector also requires construction skilled workers in insulation with knowledge of green insulation techniques. GRINSCO aims to develop a modular curriculum for vocational training in the field of

green insulation, which includes a strong WBL component and is based on the results of labour market and skills survey activities in the construction sector and in conjunction with European labour market and skills survey activities in the construction sector. GRINSCO LEARNING PROGRAMM directly contributes to the “green” transformation of the construction sector by setting forward a sectorial skills strategy to address green insulation skills needs and gaps. The awareness to be raised by the project as well as the increased availability of training resources are expected to facilitate the use of green insulation methods and materials and guarantee energy savings and efficiency.

Use Green insulation materials as a solution for CO2 savings in the construction sector

Green insulation is an environmentally responsible and resource-efficient process that has become increasingly relevant for the building sector, the mainstream construction sector has not been applying such materials extensively, due to several barriers including the associated up-front costs, the lack of consumer information, and most importantly deficiencies in the supply of available skills and training, leading to skills gaps and labour shortages. These skills deficits are exacerbated by the rapid greening of the construction sector and the advances in techniques and methods, changing skill requirements faster than the education and training systems have been able to respond.

More workers who know and use green insulation materials

The shortage of construction skilled workers in insulation (i.e. bricklayers, roofers, insulation installers, pianters, dry wall installers and plasterers) with knowledge of green insulation techniques is a major obstacle in implementing EU and national strategies to cut greenhouse gas emissions and to address environmental changes. The VET sector needs to catch up in providing quality and innovative training resources and services in order to support the economic and environmental transformation of the European Green Deal. A swift VET response as a result will enhance the employability, pay and productivity of construction workers.

Approach

The development of GRINSCO toolkit for VET providers and mentors within the construction sector will facilitate the integration of learning units into existing formal and non-formal trainings for related occupations. In particular, the toolkit will be addressed to

1) **VET providers and trainers** who provide formal education & training toconstruction workers and

2) **mentors** within the construction sector (e.g. construction companies) who provide non-formal training and transfer knowledge based on professional experience.

Moreover, a Certificate Supplement will be created to pave the way for the integration of construction sector green insulation skills into EU certification schemes, to ensure that construction sector occupations' qualifications are better understood and recognised by employers and educational institutions across Europe. Last, a position paper will be addressed to EU authorities to be used as an advocacy tool for the stimulation of green growth within the construction industry

Methodology

The developement of a handbook that will allow VET providers and trainers to design and run WBL programmes based on GRINSCO educational resources. It will also provide guidelines on how to merge theory with design and practice, enhancing WBL settings to foster learners' skill development. Moreover, a guide will be developed for mentors to provide them with information on how to benefit from GRINSCO education resources and boost transfer of knowledge to

employees interested in enhancing their insulation skills. The main differentiating point between the two is that the handbook will assist VET providers and trainers who provide formal training to integrate GRINSCO WBL in their trainings whereas the guide will assist mentors to incorporate GRINSCO WBL elements in non-formal trainings that usually take place in company settings.

Overall, this approach is expected to: a) make learning meaningful, thus satisfying learning principles by triggering learners' interest and intuitive understanding, and b) adapt work-based learning to current developments.

Description of the GRINSCO worker - Specifics of the future job.

Ideally, the candidate already has experience in the construction sector or is in the training phase to become a construction worker. If the candidate is a so-called career changer, they should have a minimum of technical understanding and skills. In this case, general basic training as an assistant bricklayer or assistant painter should be a prerequisite. The

relevant courses are not part of the GRINSCO project course modules.

Ideally, he should have completed training as a painter, tiler and plasterer. He can do this in a construction company or as a self-employed person.

He should have experience and knowledge of working conditions in construction; in particular, indoor and outdoor work in buildings with materials, working at height. The working environment can be dusty, dirty and weather dependent. Due to the nature of the work, the worker must be aware that special clothing is required. Thus, workers are guided by the principles of occupational health and safety, ergonomics, industrial hygiene, fire safety, electrical safety, environmental protection and sustainable construction.

Personal qualities are also important in order to promote the use of green insulation materials in the sector: A sense of responsibility, diligence, physical coordination and fitness.

Qualification of the trainers/mentors:

he quality of the training depends very much on the skills and experience of the trainer or mentor, as the construction sector reacts very slowly to innovations and there are very strong prejudices in this area of sustainable construction. The basic technical knowledge should then include building physics, in particular heat and moisture, very good knowledge of materials in the construction sector, again with a focus on materials, and also technical knowledge of the individual trades (brickwork, window installation, sealing work, painting) as well as basic knowledge of electrical and heating installations. Another important characteristic is a sound knowledge of environmental protection and sustainability, again with a focus on the construction sector. It is certainly an advantage if the trainer or mentor has also gained experience in the use of sustainable building materials and knowledge of circular economy processes, recyclability and recycling processes in the building sector. The trainer (or mentor) should not only have very good technical knowledge, but also the communication skills to overcome such hurdles.

To test the trainer's knowledge, the VET provider can use the multiple-choice questions of the GRINSCO learning units as a basis. A colloquium, if the VET provider has internal staff to test technical knowledge, can also be a method to find potential trainers.

In the case of on-the-job training via an in-house mentor, the multiple choice questions are a good self-test where the trainer can assess their strengths and weaknesses and whether they are suitable for such a task, or whether they should first undertake specific further training.

The trainer/mentor must/should be able to answer at least 80/90% of the multiple choice questions of the GRINSCO learning units.

STRUCTURE OF THE GRINSCO LEARNING PROGRAMME

The GRINSCO learning programme has a modular structure to ensure a chronological sequence of learning content based on the previous topics. GRINSCO's modular learning programme is intended for the training or further training of:

- Construction workers or prospective construction workers who are able to carry out general tasks on a construction site under the guidance and supervision of a more highly qualified worker.
- Career changers in the construction sector who have general technical skills and knowledge and are looking for new training.
- Skilled and experienced labour used in the sustainable construction sector.

With regard to the duration of the training program, the modules have been designed to enable the application of ECVET points.

Specifically, for this course, the following hours have been defined for each learning unit as follows:

Consequently, one ECVET credit point corresponds to learning outcomes achieved in an average of 25 learning hours. Thus, the recommended total time required for this course of 100 learning hours corresponds to 4 ECTS credits. Thus, the recommended total time required for this course of 100 learning hours is equivalent to 4 ECTS credits. Specifically, the following hours for each learning unit have been defined for this course as follows as follows:

- Learning Unit 1: 8 contact hours, 6 hands-on hours, 9 self-study hours, 2 assessment hours (assignment);
- Learning Unit 2: 8 contact hours, 8 hands-on hours, 7 self-study hours, 2 assessment hours (assignment);

- Learning Unit 3: 8 contact hours, 8 hands-on hours, 7 self-study hours, 2 assessment hours (assignment);
- Learning Unit 4: 9 contact hours, 8 hands-on hours, 6 self-study hours, 2 assessment hours (assignment).

The modules are structured as follows:

Module 1:

General parameters of building materials

Environmental assesment of building materials

Construction and environmental parameter of insulation materials

Module 2:

Health and safety requirements in the building sector

Waste management

Thermal insulation systems and requirements

Installation of green insulation materials

Module 3:

Building renovation and energy efficiency performance of buildings

Tecnical parameter of insulation materials for refurbishment

Insulation systems and insulation techniques

Assessment of deterioration, ageing and maintenance strategies

Module 4:

Introduction of circular economy

Definition and comuncation of green materials and ecological products an

Etics in the construction sector

Personell developement for GRINSCO workers

GRINSCO LEARNING OUTCOMES

General description of Learning Outcomes

The GRINSCO Learning outcomes are based on the European Qualifications Framework (EQF) and is the common European reference framework, which connects countries' qualifications systems increasing the transparency of qualifications throughout Europe. It acts as a translation device to make national qualifications more readable and comparable across Europe, aiming to promote workers' and learners' mobility between countries and facilitate their lifelong learning.

In particular, the EQF relates different countries' national qualifications systems and frameworks together around a common European reference – its eight reference levels based on "learning outcomes" (defined in terms of knowledge, skills and competences). This approach shifts the emphasis from input (type and duration of learning experience) to actual learning i.e. to what a person is able to do upon the completion of a learning process. By shifting the focus to learning outcomes, the EQF manages to:

- Match the needs of the labour market with education and training offerings;
- Facilitate the transfer and use of qualifications across different countries and education and training systems;
- Enable the validation of non-formal and informal education;
- Transfer units of learning outcome, based on a credit system (ECVET).

The development of national qualifications frameworks with descriptors based on learning outcomes is a step towards making qualifications and levels of learning explicit for all users. According to the EQF, "learning outcome" is defined as a statement of what a learner knows, understands and is able to do upon the completion of a learning process. Furthermore, learning outcomes are used as a basis for credit transfer and accumulation (ECVET) and are specified in three categories dimensions (descriptors) – as knowledge, skills and competence, which can be described as follows:

- Knowledge: The outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices related to a field of work or study. According to the EQF, knowledge is described as theoretical and/or factual.

- Skill: The ability to apply knowledge and use know-how to accomplish tasks and resolve problems. According to the EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical skills (involving manual dexterity and the use of methods, material tools and instruments).
- Competence: The proven ability to use knowledge, skills and attitudes, in work in study situations and in professional and personal development. According to the EQF, competence is described in terms of responsibility and autonomy.

Learning Outcomes LU1

The learning unit LU1 relates to the basic knowledge of building materials with a focus on green materials and their technical properties. In this learning unit, students will learn to analyse and classify different insulation materials and understand the necessity of using green materials. In addition, they will be able to independently assess the product (selection of green insulation materials) and have basic knowledge of the physical properties of construction elements.

In relation to building materials, a fundamental learning objective is that the technical properties relevant to energy efficiency and sustainable construction are learnt by the student and can also be reproduced. Specifically, the student should know the difference between thermal conductivity, thermal resistance and U-value. They should also know some values of the conductivity of some building materials, especially insulation materials, and be able to read data sheets or product labelling.

A further learning outcome is knowledge of some construction methods, such as the application of a thermal insulation composite system. The focus is on the student knowing and being able to use green insulation materials in external thermal insulation composite systems.

A further learning objective is airtight construction, which the student can apply to timber constructions for roof extensions. The student can understand the technical properties of windows and their installation and has knowledge of thermal bridges.

The learning outcomes of LU 1 also includes basic knowledge of sustainability and life cycles in the construction sector. The student knows the individual stages of production, transport, maintenance, demolition and recycling of building materials and can apply these in their work in the construction and renovation of buildings. The focus is on the CO2 footprint indicator, which is defined as a basic indicator. Here, the student can also

classify the sustainability of building materials and show and explain individual insulation materials to future customers. The practical examples show some applications of green materials in refurbishments that are a focus of the learning content. The student should be able to apply green materials in the renovation sector. This also applies to buildings worthy of protection. The student can also apply these refurbishment strategies to the refurbishment of residential units, including reading and understanding detailed drawings and installation plans. Thanks to the detailed photos, they can recognise the areas of applications and can also carry out difficult installations well.

Module name	**Competences**	**Learning outcomes illustrating achievement of the competences**
Learning Unit 1 **Materials and Constructions**	Learn about the Builing materials and construction of green buildings	Basic knowledgs of building physics , building materials in general. Demostrate the existence of green insulation materiales and how to use it.
Module contents (x learning credits in total)		
1.1 Parameters for definition of materials properties	Know are the energetically relevant properties of materials	Describe the diffenrent properties of building and insulation materials. Focus on knowing properties for thermal behaviour of materials, what are insulation materials and classify insulation materials by other material properties.
1.2 CE marking	Know how read CE marking and Eu regulation for building materials	Applicate the EU regulation to ensure structural , fire safety , soundproofing , energy saving a nd environmental protection.
1.3 Classification of insulation materials	Classify insulation materials for form, origin and tecnical properties	Knowing the tecnical properties , such us , fire safety , soundproofing , energy saving, most behavior and environmental protection, identify pros and cons of different insualtion materials to promote green insulation materials

1.4 Construction tiplogies	Apply insulation on different construction tipologies	Know hor to insulate a wall outside (ETICS) and inside Know how to insulate a roof Know how to insulate ceilings Know how install windows without thermal brigdes Know what is air tightness and how to improve air tightness in buildings
1.5 Concepts of sustainability in buildings	Reduce environmentals impacts in buildings	Know the dimensions of sustainibilty Know how and apply reducing , recycling and use low impact materiaels Read and apply LCA and EPD for building materials

Table 1: Learning Outcomes LU1

The following table lists the learning outcomes as characteristics of skills, knowledge and competences:

LEARNING OUTCOME 1	**KNOWLEDGE OF THE QUALITIES OF GREEN INSULATION MATERIALS IN CONSTRUCTION**		
EQF LEVEL 4	**EXPECTED LEARNING OUTCOMES**		
	KNOWLEDGE	**SKILLS**	**COMPETENCES**
	Knows / Aware of: • **ecological relevance and technical properties of materials and systems** • **how to classify insulations**	Be able to: • **to perform a product assessment** • **perform works properly using green insulation materials** • **identify proper insulation**	Be able to: • **account for own and others' actions in ensuring that the application is correctly integrated within a complex environment and complies**

	• **the necessity of using green materials** • **basic concepts of building physics** • **most important ecological labels**	**material for the given work**	**with user/customer needs in terms of selecting proper green insulation materials**

Table 2: Overviev learning outcomes LU1 (knowledge, skills and competences)

Learning Outcomes LU2

Workplace safety is of primary importance on construction sites, especially during building renovation. Here, old structures are demolished, materials are moved and new elements are installed, which carries numerous potential hazards. It is therefore essential that all employees are properly trained and strictly adhere to safety measures.

Key measures include the use of personal protective equipment (PPE) such as helmets, safety shoes and safety goggles to prevent injuries from falling objects or dust. In addition, all machines and tools must be regularly maintained and used safely to prevent accidents.

Thorough planning and risk assessment prior to starting remediation work is crucial to identify potential hazards and take appropriate precautions. This includes setting up barriers and warning signs to identify areas where work is underway or potential hazards exist.

Overall, safety on construction sites during building refurbishment is a collaborative and continuous process that requires constant vigilance and commitment to ensure the wellbeing of all workers.

The learning outcomes of LU2 refers to a set of practices, policies, and regulations designed to protect the well-being of workers, visitors, and the general public involved in or near construction sites. The primary goals of health and safety in construction are to prevent accidents, injuries, illnesses, and fatalities. The GRINSCO student can analyse his working environment for health and safety risk and know who to avoid accidents for himself and minimize the environmental hazards.Health and safety in construction are essential for safeguarding workers, complying with legal requirements, reducing accidents and costs, enhancing productivity and reputation, and ensuring ethical responsibility. Prioritizing health and safety ultimately leads to more successful and sustainable construction projects.

He has to be aware that primary goals of health and safety in construction are to prevent accidents, injuries, illnesses, and fatalities, as well as to minimize the environmental impact of construction activities.

The other main outcome is to recognise construction and demolition (C&D) waste generated during the construction, renovation, demolition, or deconstruction of buildings and infrastructure and reduce the impact of construction activities.

Module name	Competences	Learning outcomes illustrating achievement of the competences
LU2 Application of green insulation materials in different construction structures	Learn about the the application of builing materials and construction of green buildings	Basic knowledge of reqirements for the workplace, construction plans and blueprint, waste management, thermal insulations systems and regulation in EU countries, calculation, preparation and apllication of insulation materials
Module contents (x learning credits in total)		
2.1 Health and safety	Know how of the safety requirements during insatlling insulation materials	Describe the requirements of workplace safety. Applicate satefy reqirements for the workplace during the construction phase Able to read and understand safety instruction on the construction side Know about personal protective equipment Basic knowledge of fire safety requirements
2.2 Construction plans and blueprints	Know how read constructions plans	Able to read , understand desgn proposals, tecnical project and work projekt Basic knowledge of EN 128

2.3 Waste management	Know how of basic requirements of waste management	Knowing the basics of the waste frame directive of the EU Able to read , understand the simbols of hazardous waste Basic Knowledge of safity instructriones for building materials
2.4 Thermal insulation systems and regulations in EU countries	Know how of insulations systems and energy requirements of buildings in EU	Know how to insulate a wall outside (ETICS) Know how about the different reqirements of insulation in the EU

Table 3 Learning Outcomes LU2

The following table lists the learning outcomes as characteristics of skills, knowledge and competences:

LEARNING OUTCOME 2	**APPLICATION OF GREEN INSULATION MATERIALS IN DIFFERENT CONSTRUCTION STRUCTURES**		
EQF LEVEL 4	**EXPECTED LEARNING OUTCOMES**		
	KNOWLEDGE	**SKILLS**	**COMPETENCES**
	Knows / Aware of: • **how to apply thermal insulation composite systems or other systems** • **health and safety requirements** • **differences of construction**	Be able to: • **read and comprehend construction plans/ blueprints** • **determine amounts and types of insulation needed, based on factors such as location,**	Be able to: • **measure and cut insulation materials to adhere to specifications** • **perform quality assurance on site after**

	structures and climate differences in various regions of the EU • **differences of availability of green insulation materials in various countries**	**surface shape and equipment use, energy efficiency etc.**	**finalized installation** • **execute installation of green insulation materials** • **manage construction waste created during insulation works (hazardous materials, sorting, utilization etc.)**

Table 4: Overview learning outcomes LU2 (knowledge, skills and competences)

Learning Outcomes LU3

The third learning unit covers such learning outcomes that are intended to provide knowledge and skills for the maintenance of already installed green insulation or its systems. Learners will learn the basic differences between routine and non-routine care and be able to perform this care. Will be able to perform an assessment of installed insulation systems. Will have knowledge of various surface textures and renovation techniques and will be able to prepare material and cost calculations.

As the learning units can also be carried out separately, the learning objectives of LU1 are also included. This concerns the knowledge of insulation materials and their application as an external thermal insulation composite system (ETICS). The student also recognises other applications such as internal insulation, which are used in renovation projects where the external facade cannot be changed. He knows the problem of condensation and its solutions where green insulation materials are used.

The student acquires the knowledge that the maintenance of buildings correlates very strongly with the building pathologies. Therefore, an outcome of LU3 is the classification of damages, as well as the organised planning and working of maintenance and renovation works. The focus is also that the GRINSCO worker can calculate labour costs and thus also compensate for possible additional costs for the use of green materials through accurate cost calculation.

Module name	Competences	Learning outcomes illustrating achievement of the competences
Learning Unit 3	perform an assessment and diagnosis of the installed system. perform a proper maintenance of green insulation materials.	Basic knowledge of weather and climate conditions Basic knowledge building construction typologies and material in general (review) Application of ordinary and extraordinary maintenance strategies and renovation techniques on different surface textures Application of cost calculations for maintenance for building components Make use of knowledge about life-cycle of systems and buildings to prepare calculations of materials, work, equipment and facades perform regular works, like cleaning or fixing green insulation elements in buildings and structures.
3.1 Weather and climate	Know how of influence of whether and climate conditions of green insulation materials	Influence of the weather conditions and generally for the climate change conditions in order to possible damage or aging of energy relevant components of the building
3.2 Insulation materials, insulation systems and insulation techniques	Know are the relevant properties of green insulation materials, techniques, and systems	Specific knowledge thermophysical properties and configurations of energy relevant components (wall, roof, soil) insulated with green materials. Recognising damage and hazard potentials through the use of green insulation materials in the various construction typologies: when using green materials for roof insulation when using green materials for the insulation of exterior walls (ETICS)

		when using green materials for insulating ceilings when using green materials for interior insulation
3.3. LCA insulation materials	Apply LCA in order of the maintenance of green insulation materials	Applicate LCA of insulation materials Use and selection of insulation materials with regard to low LCA parameters and taking into account the maintenance phases of the insulation systems
3.4 Assessment of deterioration and aging	Know-how and classify building pathologies of insulated building	Understand damage and aging of an insulation materials as pathologies with a diagnosis phase. Analise the building pathologies in relation to consult an expert Apply durability assessment of building components (especially for ETICS)
3.5 Maintenance strategies	Perform and apply maintenance strategies for building with (green) insulation materials	Apply maintenance as a process of care/therapy of building pathology and aging. Define maintenance strategies in relation of: different aging of the building component dimension, type, value and use of the construction building regulation, heritage protection and safety requirements
3.6 Planning and cost calculation	Apply planning and cost calculations of maintenance works	Apply and scheduling maintenance work interventions. Create and apply check list of control procedures. Assess degradation diagnosis and intervention criteria. Apply cost calculation for maintenance work (especially for ETICS)

Table 5 Learning Outcomes LU3

The following table lists the learning outcomes as characteristics of skills, knowledge and competences:

LEARNING OUTCOME 3	MAINTENANCE OF GREEN INSULATION MATERIALS		
EQF LEVEL 4	EXPECTED LEARNING OUTCOMES		
	KNOWLEDGE	SKILLS	COMPETENCES
	Knows / Aware of: • **influence of weather conditions on insulations** • **difference between ordinary and extraordinary maintenance** • **about different surface textures and renovation techniques** • **about ordinary and extraordinary maintenance – how to do it** • **how to prepare cost calculation**	Be able to: • **make use of knowledge about life-cycle of systems and buildings** • **to prepare calculations of materials, work, equipment**	Be able to: • **perform an assessment and diagnosis of the installed system** • **perform a proper maintenance of green insulation materials and facades** • **perform regular works, like cleaning or fixing green insulation elements in buildings and structures.**

Table 6 Overview learning outcomes LU3 (knowledge, skills and competences)

Learning Outcomes LU4

Green insulation materials not only offer energy benefits, but also help to reduce the ecological footprint. A holistic strategy is required to effectively communicate and promote these benefits to customers and fabricators.

Firstly, it is important to clearly communicate the environmental benefits of sustainable insulation materials. This includes aspects such as the reduction of energy consumption, the reduction of CO2 emissions and the use of environmentally friendly materials.

Furthermore, the economic benefits should be emphasised, such as long-term cost savings through improved energy efficiency and possible government subsidies for sustainable building projects.

Another important aspect is the certification of sustainable insulation materials by independent organisations such as the Natureplus label. These certifications can boost customer confidence and help them to make informed decisions.

Another approach is to present case studies and success stories of projects where sustainable insulation materials have been used. This illustrates the practical applications and shows concrete results that can convince potential customers and fabricators.

Overall, transparent and informative communication is key to raising awareness of the benefits of sustainable insulation materials and promoting their acceptance among customers and installers.

The final learning unit is designed to develop soft skills in a wider context and to provide basic knowledge about the circular economy. The learner will learn to communicate effectively with other participants in the construction/insulation process and to present/promote the advantages of the green insulation materials used. Also, this learning unit will focus on professional development and its importance.

Module name	Competences	Learning outcomes illustrating achievement of the competences
Learning Unit 4	Sustainability goals and considerations, transversal skills, communication, employment opportunities, professional	Develop soft skills to promote green insulation and sustainable materials Know the basics of the circular economy Be able to talk about the advantages and disadvantages of different insulation materials and techniques. Understand the importance of lifelong learning Know the different training options
4.1 Know the concept of circular economy	Know the concept Explain the concept Share the concept through a scenario.	Knowledge of the principles of the circular economy. Knowledge of the beginnings of the circular economy to current regulations Knowing how to explain the difference between the "disposable everything" model and the "circular economy" model

4.2 Highlight the benefits of ecological products, communicate effectively with the owner, the master builder and other professionals involved in the implementation of green insulation	Know the language specific to the profession. Know the general information about the techniques and requirements of a building. Know how to justify an insulation choice.	Know how to define what an eco-friendly product is Identify available resources and properties for insulation Know the sources of a building's losses. Know the different insulation techniques, their advantages and disadvantages Know the qualities of an insulating wall
4.3 Understand the ethics of a construction professional and act accordingly on a daily basis in the workplace	Know the laws, labels and obligations of a professionalKnow the rules of the trade.	Knowing how to define the ethics of a construction professional Know how to define the three types of ethics Knowing how to offer an ethical choice of insulation
4.4 Highlight the benefits of green materials	Know the criteria of the materials. Know how to compare materials and argue a choice	Knowing how to define what a green material is Know the different criteria and main criteria for categorizing green insulation
4.5 Recognizing the benefits of personal development	Know the principles of personal development. Know the tools for personal and professional development.	Be able to express yourself on the importance of training throughout your career Know the different practical and theoretical training possibilities

Table 7 Learning Outcomes LU4

The following table lists the learning outcomes as characteristics of skills, knowledge and competences:

LEARNING OUTCOME 4	SUSTAINABILITY OBJECTIVES AND CONSIDERATIONS, SOFT SKILLS, COMMUNICATION, JOB OPPORTUNITIES, PROFESSIONAL DEVELOPMENT		
EQF LEVEL 4	EXPECTED LEARNING OUTCOMES		
	KNOWLEDGE	**SKILLS**	**COMPETENCES**
	Knows / Aware of: • **importance of professional development and motivation for upskilling and improving competence to keep people competitive on job market** • **importance of soft skills meaning at work and how they influence communication and overall performance of work**	Be able to: • **recognize benefits of personal development** • **understand ethos of being a construction professional and act according in on a day-to-day basis at work** • **put in practice the circular economy concept at work**	Be able to: • **to interact and communicate with owner about eco-friendly products being installed and discuss benefits** • **communicate effectively with construction manager/ engineer/ site managers/ foreman/ owner** • **highlight the advantages of green materials**

Table 8: Overview learning outcomes LU4 (knowledge, skills and competences)

LEARNING GUIDELINES AND SCENARIOS

The GRINSCO consortium defined several parcours /scenarios of learning content configuration in order to be able to train or educate people specifically in relation to their education and experience, including the simulation games. In relation to the target groups defined in the description of the GRINSCO project real case scenarios were created.

Scenario 1: A specific project week for sustainable construction and renovation is to be organised for a part-time school for prospective specialist planners in the construction sector (EQF3). The main learning objectives are the application of green insulation materials in the project planning phase for new buildings and refurbishments. The specialist teachers organise the lessons, which should also include practical exercises.

Scenario 2: A medium-sized company working in the construction sector in the field of new buildings and renovations for smaller residential buildings in a rural environment has hired 2 new employees. After basic training in painting, drywall construction and masonry construction, the owner, who also carries out the practical training on site, would like to provide them with further training in sustainable construction. This should be incorporated during the practical work. The content therefore does not have to be module-related, but topic-related (if a certain work assignment has to be carried out).

I. Receipt and storage of building materials in the company

II. Transport and delivery of materials to the construction site

III. Travelling to and inspecting the building to be renovated

IV. Setting up the construction site

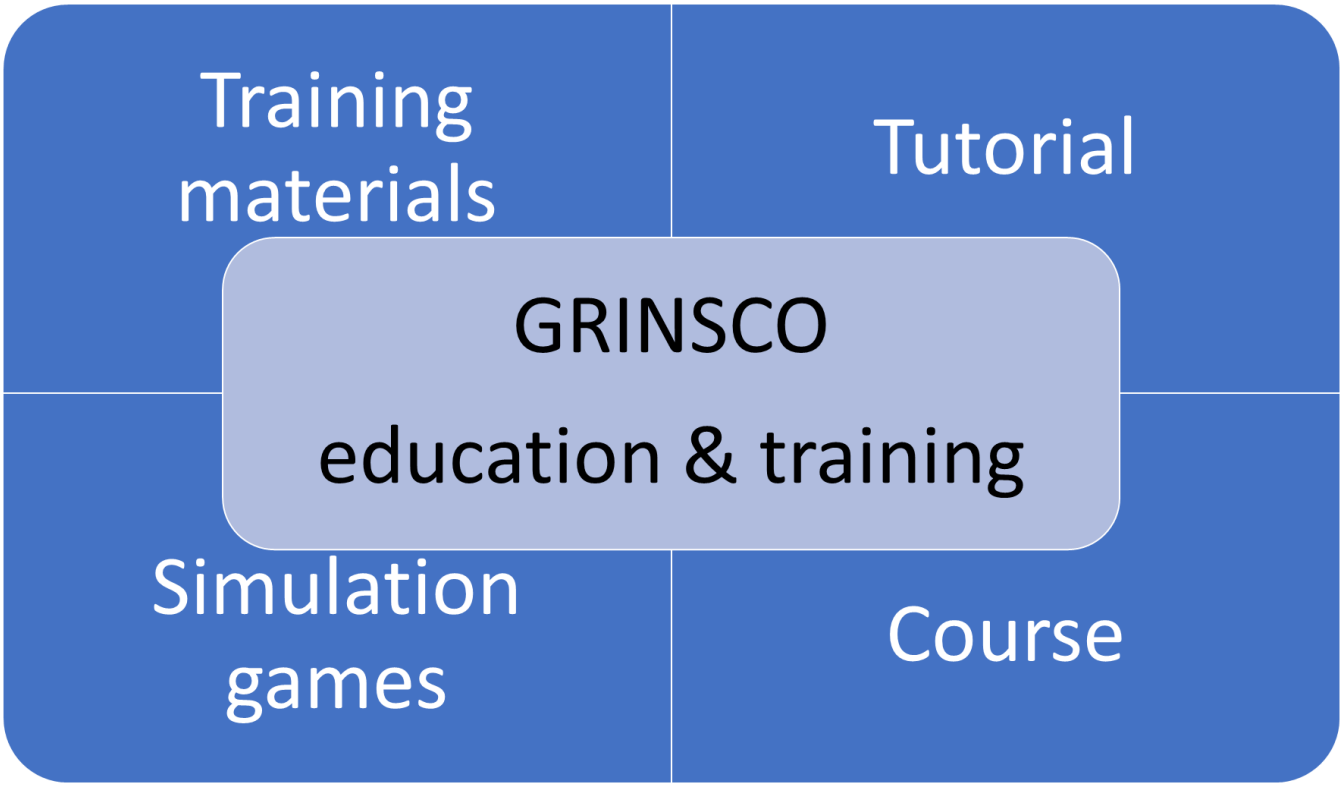
V. Installation of the insulation materials

VI. Disposal of the building materials

Scenario 3: A further education institution would like to organise a specific course for sustainable building via an ESF fund. The participants are unemployed and come from socially disadvantaged backgrounds. The main aim is to convey the concepts of sustainability (with a special focus on the construction sector). The course will be organised online.

Instructions on how to develop extra training and assessment materials

How to create training materials that promote the success of your employees



The training of employees, as well as the training of new employees in the company, is of fundamental importance for the sustainable development of companies, especially for SMEs that depend on the specialization and skills of their employees. Without effective training, the organization suffers from skills gaps, low employee engagement and underperformance. On the other hand, training hours reduce the current productivity of the business because the employee is often absent from the workplace during training. Mentoring is also important, i.e. employee training in the workplace, where an expert inside or outside the company supervises the trainee. On the other hand, regular and effective staff development can create a competitive advantage. When creating new

training methods, it is important to create training methods and tools that are customized to the company and the employee, and to develop professional training documents in a very timely manner. This is not easy in a very changed working world with very differently trained employees. The right tools and preparations can make this much easier.

In this article, a trainer will learn everything that is important for the development of training materials.

1. Training documents explained.
2. A step-by-step guide to creating training materials.
3. Examples of training documents
4. Frequently asked questions about creating e-learning content.

Creation of training materials

The creation of training documents is the core of any training program planning. Essentially, they represent the content of the program.

The first step is to choose the format of the training materials, which can be very different, including digital or printed elements. Each content has a specific learning objective or desired outcome. The creation of the documents defines the learning path, how learning objectives and learning content are integrated in such a way that a uniform learning structure can be created.

When creating training content, it is important to ensure that it is engaging and effective, and also keeps pace with the needs and goals of the organization. The creation of training materials should, if possible, be able to be done internally to adapt to economic and operational changes and keep training up to date. The learning content should be planned as follows:

Here you will find a step-by-step guide to the content development process.

Step 1: Definition of goals

The first step is to define clear learning objectives and outcomes. Setting objectives for all training materials ensures that the desired learning outcome is achieved. It also makes it easier to remove irrelevant content, streamlining the creation process.

Consider the following questions when setting an objective for your training materials:

Who is your target group?

What objective (operational, economic, technical) does the training material relate to?

What skills gap are you trying to close?

What is the desired learning outcome?

It is important to find concrete answers to these questions before the new learning content is created. The answers will guide the entire training material development process and ensure that the learning objectives are kept in mind.

Step 2: Review of existing training documents.

The learning content currently available should be examined and analyzed. An up-to-date inventory of all existing content provides the opportunity to reuse, repurpose or revise training material. This saves valuable time and resources and allows you to localize training gaps.

Outdated material creates the risk that inaccuracies or knowledge that is no longer used or outdated will be incorporated into the newly created training content.

The best way to determine the effectiveness of the material is to gather feedback on its impact. This information helps to create more effective content in less time.

The following questions are useful for correctly evaluating current training content:

- How are the training courses currently organized?
- What (if any) training materials do we currently have on this topic?
- What type of training resources are involved (videos, training manuals, etc.)?
- Is all relevant information included in the current materials?
- Is the training content outdated?
- Are there any errors or are major changes required?
- Are the training materials appealing and didactic?
- How successful was the previous training? What needs to be improved?

Step 3: Creating a training plan

First of all, a general overview of the training content should be formulated. At this stage, the learning content should simply be enumerated and then the sequence of content should be adjusted to create a kind of "script" to see the big picture. This can be a table documenting all training programmes for employees and the corresponding training materials for each programme. Here is an example training plan (as spreadsheet) for new employees (painters).

Learning content	Training materials	Training typology	Details
Purchasing software for painting materials		Video tutorial	Video 10 minutes how to use the program tricks and skills

Sample sales training plan for new employees.

Step 4: Tool / learning platform (online or installed program)

The next step is the development of training materials. For most types of e-learning materials, you will need a tool. The platform/software / tool such as Openlearning or Moodle, helps you to professionally create digital training materials and convert them into a learning format (also as e-learning format). This could be in the form of online courses, assessments, video lectures, dialogue simulations, etc.

Step 5: Training materials.

Once the outline tool has been selected, the individual elements of the training material can be analyzed. At this stage, details are important, such as creating scripts for videos and developing outlines for quizzes and training manuals. Here it is also possible to assess trainers in the creation of the materials but also to include learning checks to test the knowledge acquired by learners.

Step 6: Field test

Feedback is the best way to ensure that your training materials are ready to be shared. Ideally, ask a group of testers (stakeholders, also including industry represenatives, practioners and learners) from different areas of the organization for their feedback. This will give you valuable insights from different perspectives and backgrounds.

On-site testing of training content will highlight issues in the content, such as unclear language or information overload. To streamline the feedback process, ask testers the following questions:

Is the learning material interesting and appealing?

Is the content clear and easy to understand?

Were there any points where you felt confused? Please answer in detail.

Did you find the training content relevant to your daily work?

Did the training give you the opportunity to apply what you learnt?

How can the training material be improved?

How can learning materials be adapted according to the feedback received?

Step 7: Providing training materials.

If the creation of training materials is planned, it must be defined how the content is to be provided. This is where a learning management system (LMS) comes into play.

An LMS is an important e-learning tool that can be used to deliver, manage and track employee training. Training materials can be uploaded, organised into a course or learning path and can be assigned to the right target group. In addition, training professionals can automate all training management tasks via the LMS to save valuable time and resources.

Examples of training materials:

1. Online courses

An online course is a self-paced training program delivered via digital resources. It usually consists of different training materials that are all linked together to train learners on a topic. These training modules can include slides with text, multimedia and interactions.

2. Quizzes - simulation games

Quizzes (assessments) are the key to e-learning. Not only do they allow learners to test their knowledge, they are also interactive and show learners their progress. This breaks the monotony of training and encourages learners to actively participate.

Examples of use

Quizzes and assessments can be used in a variety of ways. They can be interspersed in an online course to regularly check learners' knowledge, or incorporate a large quiz as a formal final assessment.

3. Training videos

Training videos engage learners more than any other type of content. They are short videos that educate employees on a variety of topics.

Application examples:

Videos can be used as stand-alone learning content or embedded in online courses, making them a flexible option for employee training. There are also various types of video content to choose from, including

Lecture recordings - recordings of live training courses or presentations

Software tutorials - capturing the instructor's computer screen while showing how to use software

Talking head videos - usually webcam recordings of a trainer explaining a training topic

4. Conversation simulations - simulation games

Conversation simulations put trainees in real-life scenarios and give them the opportunity to practice in a risk-free environment. This allows them to build their confidence and develop their skills without jeopardizing customer relationships. Most call simulations use branching scenarios to show the consequences of each decision. This teaches employees the results of their actions in a safe space and drives the learning curve.

5. Flipbooks

Flipbooks are an excellent and underutilized training tool. They are essentially e-learning longreads that are created by converting training materials in PDF, Word or PowerPoint files into e-learning courses. These can be uploaded to the LMS. They are a good way of converting existing training material into digital training content and making underutilized company documents accessible to employees.

Application examples

Flipbooks are a way to move training manuals online and train employees:

Standard operating procedures

Step-by-step processes

FAQ

Here are the most frequently asked questions about creating training materials for e-learning:

1. What tools do I need to develop digital training content and share it with employees?

You will need two tools:

A content creation tool to professionally create online courses, interactive units, quizzes, conversation simulations and other training materials with software.

A learning management system (LMS) for storing, providing and managing training materials. This also allows you to track learner progress through detailed analyses and reports

2. What are some common types of training materials?

Training materials can include anything from paper handouts to AI-powered work simulations. In the context of e-learning, the most common types of training content include:

- Online courses
- Videos

- Valuations
- Conversation simulations
- Digital work aids

3. Are there best practices for writing training materials?

Yes, there are some golden rules when developing training materials. Here are some tips for making content as engaging as possible:

- Write for your target audience, their professional role and their expertise!
- Use examples and storytelling to clarify complex topics!
- Use scenario-based learning to train in real work situations!
- Write in short, simple sentences; avoid jargon!
- Break the training material into small, digestible pieces!
- Use visual aids to make content more appealing!