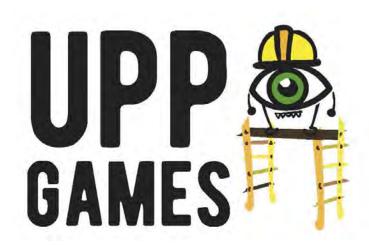
# BASIC HEALTH AND SAFETY SKILLS ON WORKS AT HEIGHT THROUGH SERIOUS GAMES

IO1\_Handy guide: a support tool for trainers in VET training processes

Information on the App and games for works at heights



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# 1.INTRODUCTION

This Handy guide includes information to make easier users to understand how has been the process to get the final Upp\_Games App and to help them in its use. The contents are presented into three main areas to make easier the understanding of the process. Firstly, information regarding the theoretical background as basis of the definition; then, the process to elaborate each mini game; and finally, a list of terms and definitions helping user to comprehend better those concepts related to training-learning process, Health and Safety (H&S) issues, and works at height.

Regarding the theoretical rationale, three different scopes have been investigated:

- Psychological perspective on causality of accidents in construction sector.
- ❖ Main features of gamification and serious games in a learning context.
- ❖ Definition of learning outcome concept.

The process to design and develop the mini games has been the following:

- Specific objectives have been established for each scene bearing in mind the aims pursued on each area in which learning outcomes are structured: knowledge - skills - competences.
- 2. Depending on those objectives, different resources have been chosen to complete each scene development.
- 3. And finally, each resource has been endowed with appropriate content.

A Glossary of terms and definitions is shown in the last part of this Handy guide. It is aimed to facilitate the understanding of some concepts present in the App and other terms linked to H&S issues and works at height.

The Glossary is intended to be an aid to contextualize several terms and concepts used in the documents and products from the project. Different sources have been consulted to complete the definitions, mainly European legislation, professional dictionaries, and documents from entities and organizations concerned with H&S at European and at worldwide level.

# 2.THEORETICAL BASES

As previous work to the concrete definition of the mini-games, a desk research has been carried out to provide the theoretical and methodological bases more adjusted to the objectives pursued by Upp\_Games project.

The theoretical basis to plan and develop the mini games has been done from three different fields.

# 2.1. Psychological perspective on causality of accidents in construction sector

Several studies in this sector have highlighted that the construction accidents occur because there is a combination of unsafe acts and unsafe working conditions on construction sites. In this context, the approach to design the mini games has focused on the Behavioural Based Safety (BBS¹). Basically, BBS is an established method for using positive reinforcement to change unsafe individual behaviours and reinforce the safe ones. This approach is effective in raising the level of workers behaviour and safety and a way to prevent accidents and reduce injuries in the construction sector.

The basic behavioural safety process to get the best result using BBS approach is summarized in these steps:

- Identify unsafe behaviours.
- Develop appropriate observation tools.
- Educate everyone.
- Conduct behavioural observation.
- Provide feedback.

Researches have underlined the high value of the feedback<sup>2</sup>, mainly when the aim is improving the behaviour and allow workers to get better performance in the worksite. Feedback plays a very important role and it is aimed to get the best players' performance and to facilitate users' learning. Because of its key role in the learning, this element has been underlined in the development of the mini games.

 $https://www.hsa.ie/eng/Publications\_and\_Forms/Publications/Safety\_and\_Health\_Management/behaviour\_based\_safety\_guide.html$ 

<sup>&</sup>lt;sup>2</sup> Cameron&Duff, 2007; Grindle et al. 2000.

This will greatly facilitate the internal assimilation of the correct behaviour from health and safety point of view. This process will allow the transfer of this appropriate behaviour to other similar situation, thus ensuring the success of the learning process using the App of Upp\_Games.

# 2.2. Main features of gamification and serious games in learning framework

Gamification and serious games concepts have been set to define the structure of the mini games:

- Gamification is defined as "the use of game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems3".
- Serious games are those that are not designed simply for entertainment or fun, but also for teaching/training, assessing or modifying behaviours.

From this point of view, several mini games have been developed for the App. The objective is to facilitate the acquisition by construction sector workers of safe behaviour in those tasks related to working at height. The use of serious games favours learning by incorporating a recreational component in the training process and placing the learner at the centre of this process.

Some game mechanics have been utilized in their development to enforce its attractiveness and effectiveness: conflict, strategy and chance; aesthetics; theme and story; and rewards.

#### 2.3. Definition of learning outcomes

This Handy guide presents the main learning outcomes collected to be used as basis to develop the mini games in the App.

The first step is to define what a learning outcome is. Cedefop provides two interrelated definitions:

Learning outcomes are defined as "statements of what a learner knows, understands and is able to do on completion of a learning process, which is defined in terms of knowledge, skills and competences". (Cedefop, 2014)

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<sup>&</sup>lt;sup>3</sup> Karl Kapp: "The Gamification of Learning and Instruction: Game-Based Methods and Strategies for Training and Education" (2002)

Learning outcomes are defined as "sets of knowledge, skills and/or competences an individual has acquired and/or is able to demonstrate after completion of a learning process, either formal, non-formal or informal". (Cedefop, 2014)

The first approach puts the focus on the learner as the centre of teaching-learning process. Since one important aim of Upp\_Games project is to highlight the role of the learner as an important factor in the learning process, this option has been applied in designing and developing of the mini games contents.

Besides of general definition, three elements defining learning outcome have been bearded in mind:

- ❖ Knowledge: outcome of assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices related to a field of study or work<sup>4</sup>.
- ❖ Skill: ability to perform tasks and solve problems<sup>5</sup>.
- ❖ Competence: proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations, and in professional and personal development<sup>6</sup>. Besides, it is defined as ability to apply learning outcomes adequately in a defined context (education, work, personal or professional development)<sup>7</sup>.

The content regarding these elements shown in each chosen learning outcome has been the key to establish the different objectives in each mini games and the scenes.

And last, the definition of the levels at which the App will be mainly directed has been established, taking into account the EQF methodology. The selected levels are 2, 3 and 48.

The main definition of descriptors included in the three levels is presented in the chart.

<sup>7</sup> Cedefop, Tissot, 2004; European Commission, 2006a

<sup>&</sup>lt;sup>4</sup> Cedefop, 2008c; European Commission, 2006a

<sup>&</sup>lt;sup>5</sup> Cedefop, 2008c; European Commission, 2008

<sup>&</sup>lt;sup>6</sup> European Commission, 2006a

<sup>&</sup>lt;sup>8</sup> More information in: <a href="https://ec.europa.eu/ploteus/content/descriptors-page">https://ec.europa.eu/ploteus/content/descriptors-page</a>

Level	Knowledge	Skills	Responsibility and autonomy <sup>9</sup>	
2	Basic factual knowledge of a field of work or study.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools.	Work or study under supervision with some autonomy.	
3	Knowledge of facts, principles, processes and general concepts, in a field of work or study.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information.	Take responsibility for completion of tasks in work or study; adapt own behaviour to circumstances in solving problems.	
4	Factual and theoretical knowledge in broad context within a field of work or study.	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study.	Exercise of self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.	

<sup>&</sup>lt;sup>9</sup> Before 2018, it was known as Competence.

# 3.LEARNING OUTCOMES

The mini-games included in the App are aimed to facilitate construction workers to acquire and/or reinforce knowledge, skills and competences in several learning outcomes, selected for their importance in the prevention of occupational risks for those workers in working at heights.

They include a broad list of issues needed to be known by workers to prevent accidents/incidents and/or minimise their consequences, if happen.

The selected ones have been the following:

- 1. Working safely at heights.
- 2. Wear proper personal protective equipment.
- 3. To safely work by collective protection.
- 4. Falling of objects.
- 5. Safety signs.

The content of each learning outcomes is detailed below.

#### 3.1. Working safely at heights

#### 3.1.1. Definition

Prevent hazardous situation when working in any place where a person could fall a distance liable to cause personal injury.

#### 3.1.2. Objective of the learning

To make learners awake of the necessary precautions to be undertaken to avoid risks when working on ladders, roofs, lifting platforms, scaffoldings or any circumstance that exposes workers to a risk of a fall that is reasonably likely to cause injury to himself or other persons around him.

Knowledge	Skills	Competences
*How to access equipment: stepladders, ladders (pole, extension), scaffolding.  *How to work at heights and use work access equipment safely: regular inspection; check for broken, damaged or missing components; responsible use; consideration of adverse weather conditions; and proper training.  *The potential dangers: falling tools, equipment and materials, persons falling from height (injuries to themselves and others).	*Identify legislation relating to working at heights.  *Identify types of access equipment.  *State safe methods of use for access equipment.  *Recognize hazards of working at height: a. List typical accidents and injuries related to work at heights in the workplace. b. Recognize other hazards where workers are exposed to the hazard of falling from heights (i.e. into water, machinery, electrical equipment, hazardous substances or objects).  *Identify situations in which bump lines, barriers, guardrails and safety nets are needed.  *Identify the regulatory requirements for bump lines, barriers, guardrails and safety nets.  *Identify and assess the most suitable equipment (ladder, lifting platform, scaffoldings) to access a given work at heights.  *Identify and assess the most suitable Personal Fall Protection Equipment.  *Determine the fall distance to prevent a worker from striking the ground.	The learner will have the necessary knowledge and skills to:  *Use the hierarchy of controls, identify the different types of equipment that may be available to safely perform a variety of tasks at heights (including Mobile Elevating Work Platforms), scaffolds, ladders and suspended access equipment, with certain level of autonomy.  *Properly and responsible use and maintain the different types of personal fall protection equipment needed to safely work at heights on work access equipment and platforms.  *Be aware that if you are asked to use work access equipment, platforms, or similar equipment in your workplace, you may need additional workplace specific and/or equipment specific information, instruction or training to performance with autonomy and responsibility.

### 3.2. Wear proper personal protective equipment

#### 3.2.1. Definition

To make learners able to identify the need for Personal Protective Equipment (PPE) in construction site, choose the correct equipment and properly maintain it.

# 3.2.2. Objectives of the learning

Players will learn to:

- ❖ Identify the basic potential hazard in building site.
- ❖ Associate the correct PPE according to the specific circumstances / risk assessment.
- ❖ Pay attention to make proper maintaining and storage of PPE.
- ❖ Pay attention to the safety signs on site and to the site managers.

Knowledge	Skills	Competences
The learner will know:  *Different PPE and the most suitable to wear according to the specific circumstances/risk assessment and the legislation covering use of PPE.  *Different characteristic and proper maintenance of the following PPE: head, eye and ear protection, face/dust masks, breathing apparatus, high visibility clothing, safety footwear, gloves, harnesses.	The learner will be able to:  *Identify the different types of PPE used in the specific workplace.  *Select the correct PPE to prevent exposure and personal injury according to the specific hazard.  *Properly wear PPE.  *Properly store and maintain of PPE.	The learner will be able to performance with <b>responsibility</b> and <b>autonomy</b> regarding to:  *PPE legislation.  *Common safety hazards where PPE is required.  *Requirements and limitations for PPE.  *Maintenance and storage of PPE.  *Importance of checking and reporting damaged PPE.  *Safety signs on site and the identification of <b>site managers'</b> instructions.

# 3.3. To safely work by collective protection

#### 3.3.1. Definition

To work on a site and be aware of the main hazards.

Prevent eventualities related to occupational hazards in the surroundings facilities and conditions of the designated work(s) with the help of the collective protections.

#### 3.3.2. Objective of the learning

- ❖ To know the most common collective protection methods, systems and equipment.
- ❖ To be able to visually identify if these protection methods are properly installed.
- ❖ To choose the appropriate action to avoid risks depending on the particular situation.

Knowledge	Skills	Competences	
The learner will know:	The learner will be able to:  *Identify the protection methods,	The learner will acquire certain level of responsibility and autonomy regarding to:	
*Recognising the most common collective protection systems.	based on the characteristics of the work to be done, the working area and the risk related.  *Distinguish the minimum elements and the characteristics of the collective protection equipment, based on the risks to be protected.	*Be responsible of their own safety as well as security of others.	
Describing the most common CPE in the		*Use of CPE and the correct installation of them.	
work site.		*Act and react regarding the risks and the corresponding collective protection equipment, consultation and involvement if needed.	

#### 3.4. Falling of objects

#### 3.4.1. Definition

Prevent eventualities related to occupational hazards in the surroundings, facilities and conditions of the designated work(s) in the areas with potential falling or flying objects.

# 3.4.2. Objective of the learning

- ❖ To know the warning indicator and signs regarding to the falling objects.
- ❖ To be able to visually identify the correct PPE for entrance in the area with potential falling or flying objects.
- ❖ Ability to select the proper fall protection equipment.
- ❖ To choose the appropriate action to avoid the risks that cause objects to drop and potentially injury people (e.g. storage, connection, etc.).

Knowledge	Skills	Competences
The learner will know:  *Recognising the most	The learner will be able to:  *Identify the signification of the	The learner will acquire certain level of responsibility and autonomy regarding to:
common warning indicator and signs, PPEs and risks regarding to the falling objects.	signs and PPEs related to falling objects based on their characteristics visually.	*Be responsible for his/her own safety as well as the security of others on the falling objects.
*Describing the most common fall protection equipment in the work site related to identify risk.	*Distinguish the risks generated by each one, based on the characteristics of the area of work (with potential of falling objects, storage on high level, drop of the tools etc.)	*Act and react in relation to the identified risk.

# 3.5. Safety signs

#### 3.5.1. Definition

To prevent occupational accidents related to the occupational hazards in the surroundings, the facilities and conditions of the building site.

# 3.5.2. Objective of the learning

- ❖ To know the most common safety signs in the working site.
- ❖ To identify and distinguish the nature of the different safety signs.
- ❖ To keep in mind the importance of the signs and their signification to avoid accidents in the work site.

Knowledge	Skills	Competences	
The learner will know:  *Hazards and dangerous situation on the building site.  *Significance of the safety signs on site.  *Specific sign that must be placed on site.  *Sign to warn concerning the present hazards.  *Signification of the signs: their indicative nature.	*Identify the basic potential hazard in building site.  *Pay attention and respect the significance of the safety signs on site.  *Associate the correct risk/interdiction according to the specific safety signs.  *Identify the specific sign that must be placed on site to warn concerning the present hazards.  *Identify the places on the building site according to the sign signification.	The learner will acquire certain level of responsibility and autonomy regarding to:  *Be aware about the dangerous situation on the building sites.  *Be aware about significance of the safety signs on site.  *Respect the signification of interdiction signs according to the specific safety ones.  *Avoid to work in the area or workplace where the access is restricted by the signs.  *Be aware about significance of the safety signs on site to warn concerning the present risks.  *Respect the indication of the signs, its indicative nature.	

# 4.GLOSSARY



**Accident** = it is an accident arising out of, or in the course of employment which, in the case of a person carrying out work, results in personal injury. (*Source*: Workplace Safety and Health Management. *Practical Guidelines on the Implementation and Maintenance of an Occupational Safety, Health and Welfare Management System. Health and Safety Authority.* 2006)

**Anti-slip ladder** = a ladder with rubber studs on its legs, serving two purposes: that of anti-slippage, and that of electric insulation. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Apprenticeship** = systematic, long-term training alternating periods at the workplace and in an educational institution or training centre. The apprentice is contractually linked to the employer and receives a remuneration (wage or allowance). The employer assumes the responsibility for providing the trainee with training leading to a specific occupation. (Source: Cedefop, 2004).

**Assessment of learning outcomes** = Process of appraising knowledge, know-how, skills and/or competences of an individual against predefined criteria (learning expectations, measurement of learning outcomes). Assessment is typically followed by certification. (*Source: Cedefop, 2004*).



**Beaconing** = operation consisting in the positioning of fixed or mobile signs that indicate dangerous places. Some example of beaconing devices are: road humps, guides, cones, cylindrical bollards, site netting, etc. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Body harness** = a fall arrest harness is a body gripping device intended to stop falls, and is a component of a fall arrest system. It may consist of: textile ribbons (intended to support the user's body once it has been dropped); coupling elements connecting the components or subsystems; setting items (allow to adapt the length of the strips to the user); loops (for hanging out material for example). (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Building contractor** = the physical or legal person who assumes the responsibility by contract with the property developer, to commission all or part of the work subject to the project and the contract, and who has his/her own or other's human and material resources. (Art. 3 Law 32/2006, of 18<sup>th</sup> October, Regulating the subcontracting in the

construction sector). (Source: Construction dictionary. Fundación Laboral de la Construcción. www.diccionariodelaconstruccion.com)



**CE approval mark** = it is a symbol indicating that the manufacturer shall take responsibility for the conformity of his product with the declared performance, and the fulfilment of applicable requirements within Regulation and relevant legislation. Regulation 305/2011 of the European Parliament and the Council lays down harmonized conditions for the marketing of construction products. The CE marking must be visible, legible and indelible. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Chinstrap** = a belt or strap that supports the helmet under the chin. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Collective protection measures** = protection measures aim to simultaneously protect a group of workers exposed to a significant risk, eliminating the risky situation. For example, rails, shelters, differential switches, nets, general ventilation, housing for noisy machinery, etc. (Source: Construction dictionary. Fundación Laboral de la Construcción. www.diccionariodelaconstruccion.com)

**Competence** = Ability to use knowledge, skills and personal, social and /or methodological abilities, in work or study situations and in professional and personal development. (Source: Cedefop; European Parliament and Council of the European Union, 2008).

**Continuous improvement** = the process of enhancing the safety and health management system to achieve improvements in H&S performance in line with the organization's safety and health policy. (Source: Workplace Safety and Health Management. Practical Guidelines on the Implementation and Maintenance of an Occupational Safety, Health and Welfare Management System. Health and Safety Authority. 2006)

**Contractor** = any individual, employer or organization whose employees undertake work for a fixed or other sum and who supplier the materials and labour (whether their own labour or that of another) to carry out such work, or supplier the labour only. (*Source: Workplace Safety and Health Management. Practical Guidelines on the Implementation and Maintenance of an Occupational Safety, Health and Welfare Management System. Health and Safety Authority. 2006*)

**Construction work** = the carrying out of any building, civil engineering or engineering construction work, as may be prescribed. (*Source*: *Definition of construction work*. *Health and Safety Authority* www.hsa.ie).



**Danger zone** = any zone within or around work equipment in which an exposed worker is subject to a risk to his health of safety. (Source: Directive 2009/104/EC of the European Parliament and of the Council of  $16^{th}$  of September, 2009, concerning the minimum safety and health requirements for the use of work equipment by workers at work).



**Employee** = any person who works for an employer under a contract of employment. This contract maybe expressed or implied, and be oral or in writing. An employee may be employed full-time or part-time, or in a temporary capacity. (*Source: Workplace Safety and Health Management. Practical Guidelines on the Implementation and Maintenance of an Occupational Safety, Health and Welfare Management System. Health and Safety Authority. 2006*)

**Employer** = any person or organization by which an employee is employed under a contract of employment and includes a person under whose direction and control and employee works. (*Source: Workplace Safety and Health Management. Practical Guidelines on the Implementation and Maintenance of an Occupational Safety, Health and Welfare Management System. Health and Safety Authority. 2006)* 

**European qualifications framework for lifelong learning (EQF)** = reference tool for describing and comparing qualifications levels in qualifications systems developed at national, international and sectorial levels. (*Source: Cedefop; European Parliament and Council of the European Union, 2008*).

**Exposed worker** = any worker wholly or partially in a danger zone. (Source: Directive 2009/104/EC of the European Parliament and of the Council of  $16^{th}$  of September, 2009, concerning the minimum safety and health requirements for the use of work equipment by workers at work).



**Fall arrest lifeline** = a safety belt used to brake and stop a falling person. It has a harness with or without a support belt and a securing element that can be equipped with a cushioning device to break the fall. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Fatal occupational injury** = occupational accident or injury leading to the death of a worker.

**Fragile surface** = a surface, including fittings that would be liable to fail if a person's weight were to be applied to, it in reasonably foreseeable circumstances. (*Source*: *Code of practice of access and working scaffolds. Health and Safety Authority.* www.hsa.ie).





**Handrail** = collective protection made from vertical and horizontal resistant elements whose purpose is to stop workers from falling to a different level. They must be made by rigid materials, with a minimum height of 90 cm, and having safeguards to prevent crossing and slipping beneath them, or objects falling on people. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Hazard** = it is something that can cause adverse effects. E.g. an object, a property of a substance, a phenomenon or an activity. A physical or psychosocial condition, object or agent that has the potential to cause harm to a worker and/or to cause damage to property or environment. Examples: water on a staircase; loud noise; breathing in asbestos dust.

**Hazard evaluation** = this is a process which acquires the information needed by the organization, to be in conditions to make an appropriate decision on the opportunity of introducing preventive actions and if necessary, on the type of actions that should be introduced. At the organizational level of the company, the hazard evaluation is reflected in the Occupational Risk Prevention Plan. In the context of a site, risk assessment related to its execution is integrated into the Health and Safety Plan. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Hazard factor** = hazards factors are when the work conditions, that are susceptible of contributing to produce undesired incidents, damage the health of the people working. Hazard factor is defined as any object, substance, form of energy or organizational characteristic of work that could contribute to an accident at work, aggravate its consequences or damage workers' health over a long period of time. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Health** = a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. (Source: Word Health Organization, WHO, 1948)

**Health and safety at work sign** = it is a complementary preventive means which refers to a determined object, activity or situation that shows an indication or obligation regarding safety or health at work by means of a panel shaped sign, a colour, a luminous or acoustic sign, verbal communication or a gesturing signal according to procedures. (Source: Construction dictionary. Fundación Laboral de la Construcción. <a href="https://www.diccionariodelaconstruccion.com">www.diccionariodelaconstruccion.com</a>)

**Helmet** = it is a garment to cover user's head, which essentially destined to protect the upper part of the head against injuries caused by items falling on it. The most used helmet

in construction sector is the one with a visor and surrounding rim. It has the following elements: cap, visor, and rim, head harness band, neck band and chinstrap. (Source: Construction dictionary. Fundación Laboral de la Construcción. www.diccionariodelaconstruccion.com)



**Incident** = any unexpected and undesired occurrence that although it does not cause loss of health or injuries to people, can cause damage to property, equipment, products or the environment, loss of production or increase in legal responsibilities. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)





**Knowledge** = outcome of assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices related to a field of study or work. (*Source:* 2008, European Parliament and Council of the European Union, 2008).



**Labor inspectorate** = a government authority with the task of advising and giving directions on issues concerning the protection of workers and the work environment, as well as checking that the protection is sufficient. (*Source: ILO, 2001*).

**Ladder** = any fixed ladder- timber or metal. (Source: Code of practice of access and working scaffolds. Health and Safety Authority. www.hsa.ie).

**Learning** = process by which an individual assimilates information, ideas and values and thus acquires knowledge, know-how, skills and/or competences. Learning occurs through personal reflection, reconstruction and social interaction. It may take place in formal, nonformal and informal settings. (*Source: Cedefop, 2008*).

**Learning content** = topics and activities which make up is learned by an individual or group of learners during a learning process. (Source: adapted from European Training Foundation, 1997).

**Learning outcomes / learning attainments** = set of knowledge, skills and/or competences an individual has acquired and /or is able to demonstrate after completion of a learning process, either formal, non-formal or informal. (*Source: Cedefop, 2008, European Parliament and Council of the European Union, 2008*).

**Learning outcomes** = statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence. (*Source: Cedefop, 2008, European Parliament and Council of the European Union, 2008*).

**Line** = rope, chain or webbing. (*Source*: Code of practice of access and working scaffolds. *Health and Safety Authority.* www.hsa.ie).



**Material Safety Data Sheet (MSDS)** = a form that contains detailed information about the possible health and safety hazards of a product and how to safely store, use and handle the product. In most countries, suppliers are required to provide MSDSs for all hazardous materials as a condition of sale.



**Noise** = sound that can lead to so called noise-induced hearing loss, tinnitus or stress, or interfere with the ability to hear other sounds, to concentrate, to relax or to communicate.



**Occupational accident** = an accident related to work.

**Occupational hazard** = the possibility that a worker suffers a set type of damage deriving from the work. To grade the seriousness of a hazard, the probability of happening and its severity are judged together. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Occupational health surveillance** = it is the ongoing systematic collection, analysis, interpretation and dissemination of data for the purpose of prevention. Surveillance is essential to the planning, implementation and evaluation of occupational health programs and to the control of work-related ill, health and injuries, as well as the protection and promotion of workers' health. Occupational health surveillance includes workers' health surveillance and working environment surveillance. (*Source: ILO, 1998*).

**Operator** = the worker or workers given the task of using work equipment. (*Source:* Directive 2009/104/EC of the European Parliament and of the Council of 16<sup>th</sup> of September, 2009, concerning the minimum safety and health requirements for the use of work equipment by workers at work).



**Personal fall protective system** = a fall prevention, work restraint, work positioning, fall arrest or rescue system, other than a system in which the only safeguards are collective safeguards or rope access and positioning techniques. (*Source*: Code of practice of access and working scaffolds. *Health and Safety Authority*. www.hsa.ie).

**Personal protective equipment (PPE)** = any advice or appliance designed to be worn or held by individual for protection against one or more health and safety hazards. (*Source: Council Directive of 21 of December, 1989, on the approximation of the laws of the Member States related to personal protective equipment. 89/686/EEC)* 

**Prevention** = group of activities or, adapted or foreseen measures in all phases of the company's activities to avoid or reduce the possibility that a worker suffers an injury resulting from the performance of his/her work. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Preventive activity** = the group of activities or adopted or planned measures, to avoid or reduce work derived hazards throughout the company's activity phases. This action is based on the following general principles (Act 31/1995): avoid hazards; assess hazards that cannot be avoided; combat hazards at their source; adapt the job to the person; bear in mind the techniques' development; substitute what is dangerous for something that entails little or no danger; contingency planning; adopt measures that give preference to an individual's collective protection; give proper instructions to the workers. (Source: Construction dictionary. Fundación Laboral de la Construcción. www.diccionariodelaconstruccion.com)

**Preventive maintenance** = a system for preventing machinery and equipment failure through scheduled regular maintenance, knowledge of reliability of parts, maintenance of service records, scheduled replacement of parts, and maintenance of inventories of the least reliable parts and parts scheduled for replacements.

**Professional footwear** = it is understood any type of footwear destined to offer a certain protection against hazards to the feet that come from carrying out a working activity. In the construction sector it is recommendable to use professional footwear that wherever possible avoids damages to the workers' feet by knocks or squeezes. (Source: Construction dictionary. Fundación Laboral de la Construcción. www.diccionariodelaconstruccion.com)

**Professional hazard** = work situation that can affect workers' physical, mental and social stability. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Programme of education or training** = inventory of activities, content and/or methods implemented to achieve education or training objectives (acquiring knowledge, skills and/or competences), organized in a logical sequence over a specified period of time. The

term programme of education of training refers to the implementation of learning activities whereas curriculum refers to the design, organization and planning of these activities. (*Source: Cedefop, 2008*)

**Protection** = a preventive technique that acts on the consequences of the hazard by reducing and even eliminating them. They are measures that avoid damage to workers should an accident be triggered off. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Psychosocial work environment** = the content of work and work demands, the social relationships at work, the organization of work and the work culture, which each can affect the mental and physical well-being of workers including management. All these work aspects are sometimes referred to as workplace stressors, which may have cognitive, emotional or motivational effects on workers.



**Risk** = the likelihood that a specified undesired event will occur due to the realization of a hazard by, or during work activities, or by the products and services created by work activities. A risk always has two elements: the likelihood that a hazard may occur and the consequences of the hazardous event. Risk is also determined by the number of people exposed as well as how often. (Source: Workplace Safety and Health Management. Practical Guidelines on the Implementation and Maintenance of an Occupational Safety, Health and Welfare Management System. Health and Safety Authority. 2006)

**Risk assessment =** it consists in carefully examining the situation in which workers are exposed to different risks at their workstation or during their work. It must lead to the definition of measures to prevent the risks to health and safety. (*Source: No-binding guide to good practice for implementing Directive 2001/45/EC. Work at height.* http://ec.europa.eu/employment\_social/index\_en.html 2006)

**Risk management** = all action taken to achieve, maintain or improve work and working conditions so that harmful effect to individuals or populations related to exposure or activities at work will be prevented.



**Safety and health** = occupational health, safety, and welfare in the context of preventing accidents and ill-health to employees while at work. (*Source: Workplace Safety and Health Management. Practical Guidelines on the Implementation and Maintenance of an Occupational Safety, Health and Welfare Management System. Health and Safety Authority. 2006)* 

**Safety at work** = a group of non-medical preventive techniques that try to prevent and avoid accidents at work. They are applied to the productive processes and to the machines and installations intervening in the processes. They control the consequences of the

accidents and use a rational identification methodology to discover their causes. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Scaffold** = it is an auxiliary equipment used as a safe working platform in the work at height. They must meet the requirements related to materials, stability, resistance, general safety and at work, and the specific ones linked to each specific scaffold as the legislation shows. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Skill** = ability to apply knowledge and use know-how to complete tasks and solve problems. (*Source: Cedefop. European Parliament and Council of the European Union, 2008*).

**Stress at work** = subjective feelings and physiological responses that result from the psychosocial work environment and put an individual in a position of being unable to cope or respond appropriately to demands being made upon him or her. Physiological responses that characterize stress can also arise to the physical environment. (*Source: the World Health Organization, WHO, 2010*)

**Stressor at work** = a condition or circumstance in a workplace (or other setting) that elicits a stress response from workers. (*Source: the World Health Organization, WHO, 2010*)



**Task** = a set of related steps that make up a discrete part of a job. Every job is made up of a collection of tasks.

**Teacher** = person whose function is to impart knowledge, know-how or skills to learners in an education or training institution. A teacher may fulfil several tasks such as organizing and carrying out training programmes/courses and transmitting knowledge, whether generic or specific, theoretical or practical. A teacher in a vocationally-oriented institution may be referred to as a trainer. (*Source: Cedefop, 2004; AFPA 1992*).

**Trainer** = anyone who fulfills one or more activities linked to the (theoretical or practical) training function, either in an institution for education or training, or at the workplace. Trainers may carry out various tasks: design training activities; organize and implement these activities; provide the actual training (transfer knowledge, know-how and skills), help apprentices to develop their skills by providing advice, instructions and comments throughout the apprenticeship. (*Source: Cedefop, 2004; AFPA 1992*).



**Unsafe conditions** = they are circumstances that could cause an accident: inadequate protection and shelters; lack of protection and/or safety devices, inadequate or insufficient protection equipment; faulty tools; deficient order and cleanliness at the workplace; exposure to noise, vibrations or radiations; lack of signage or incorrect signage, etc. (Source: Construction dictionary. Fundación Laboral de la Construcción. www.diccionariodelaconstruccion.com)

**Use of work equipment** = any activity involving work equipment such as starting or stopping the equipment, its use, transport, repair, modification, maintenance and servicing, including, in particular, cleaning. (Source: Directive 2009/104/EC of the European Parliament and of the Council of  $16^{th}$  of September, 2009, concerning the minimum safety and health requirements for the use of work equipment by workers at work).



**Vocational education and training (VET)** = education and training which aims to equip people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly on the labour market. (Source: adapted from European Training Foundation, 1997).



**Work at height** = work in any place, including a place to obtain access to or egress from any place, except by a staircase in a permanent place of work or, at or below ground level, from which, if measures required were not taken, and employee could fall a distance liable to cause personal injury. Any reference to carrying out work at height includes obtaining access to or egress from such place while at work. (*Source: Code of practice of access and working scaffolds*).

**Work-based learning** = acquisition of knowledge and skills through carrying out, and reflecting on, tasks in a vocational context, either at the workplace (such as work-linked training) or in a VET institution. (Source: Cedefop, 2011)

**Work damages** = these are defined as all illnesses, pathologies or injuries suffered because of or caused by the work. The presence of hazards sometimes causes accidents to happen. After the accident, professional damages appear that can be classified as follows: accident at work, professional illness, and other damages to health like fatigue, stress, etc. (*Source: Construction dictionary. Fundación Laboral de la Construcción.* www.diccionariodelaconstruccion.com)

**Work equipment** = any machine, apparatus, tool or installations used at work. (*Source:* Directive 2009/104/EC of the European Parliament and of the Council of 16<sup>th</sup> of September, 2009, concerning the minimum safety and health requirements for the use of work equipment by workers at work).

**Working area (scaffolds)** = the sum of the platforms in one level, which provides and elevated safe place for people to work on and to have access to their work. (Source: Code of practice of access and working scaffolds. Health and Safety Authority. www.hsa.ie).

**Worked-related injuries** = an accident at work is defined as a discrete occurrence in the course of work which leads to physical or mental harm. This includes cases of acute poisoning and wilful acts of other persons, as well as accidents occurring during work but off the company's premises, even those caused by third parties. It excludes deliberate self-inflicted injuries, accidents on the way to and from work (commuting accidents), accidents having only a medical origin and occupational diseases. (*Source: European Agency for Safety and Health at Work*).

**Workplace** = any place where physical and/or mental labor occurs, whether paid or unpaid. This includes formal worksites, private homes, vehicles, or outdoor locations on public or private property. (*Source: the World Health Organization, WHO, 2010*).





**Years of live lost (YLL)** = YLL correspond to the number of deaths multiplied by the standard life expectancy at the age at which death occurs. (*Source: European Agency for Safety and Health at Work*).





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