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Bildungszentren des Baugewerbes e.V.

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WinAPP

Work process oriented, interactively enhanced and APP supported learning and training in construction VET in Europe

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REPORT of Intellectual Output (IO) no. 1

Work process orientation in Europe - a survey

1. **IO 1, activity 1 (O1A1)**
   Desk research and analysis
2. **IO 1, activity 2 (O1A2)**
   Structured interviews

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Intellectual Output 1, activity 1 (O1A1) - *Desk research and analysis*

Introduction

Desk analysis concerning work process orientation methods and models in vocational education and training in the construction sector in the partner countries.

Work process orientation (WPO) is one of the key factors in German construction VET, which among others decides upon the success of an individual in the labour market. Action-oriented teaching/training usually proceeds from a concrete situation to an exercise (step 1), in order to derive a general principle from this (step 2) or to explain a general principle (inductive procedure). The opposite concept is the “instruction learning”: it first explains the principle, the law or the context, and then treats individual cases in the form of exercises or examples (deductive approach).

Intellectual Output 1, activity 1 (O1A1) - *Desk research and analysis*

GERMANY

Work process oriented teaching and learning in vocational education and training in Germany – a brief overview

1. History

Starting in the mid 80´s the principle of work process orientation "WPO" (German: "Handlungsorientiertes Lernen - HOL") has taken root in Germany and has constantly evolved since then. The scientific-pedagogic dedication of WPO originates from several major reform-pedagogic approaches like works by Diesterweg, Kerschenreuter, Kilpatrick or Montessori. In 1991 the WPO was formally defined as an educational target in vocational education and training by the ministers for education of the 16 German states ("Bundesländer"), who frequently gather in the Conference of Ministers of Education ("Kultusministerkonferenz"). Manifested goals have been:

- Promoting capability to self-relying planning, operating and controlling
- Promoting development of personality and professional experience
- Promoting social responsibility
- Qualification to enable individuals for integrally practicing complex jobs, which are really demanded by the labour market and thus necessary for society (process competence)

WPO basically orients itself at the constructivist learning theory: this means, that there are often several ways to solve a problem or to deal with a task. The results / solutions can differ in this sense. Apart from the orientation for solutions, the orientation for processes is crucial part of the learning.

Frequently WPO starts from the next principles:

- self-operated and mentally comprehended actions (sustainable actions)
- from the well-known towards the unknown
- from the concrete to the abstract

In this way it is intended to design a solution, which is based on a case study for a given or constructed situation. The abstinence of full information is intended here; the learner is asked to complete all necessary information in order to fulfill the tasks. He/she should make use of various proper sources of information like literature, computers or smart devices (he/she can also ask the trainer).

In the next step the learner has to assess the information along appropriateness and then has to develop a process/action strategy.

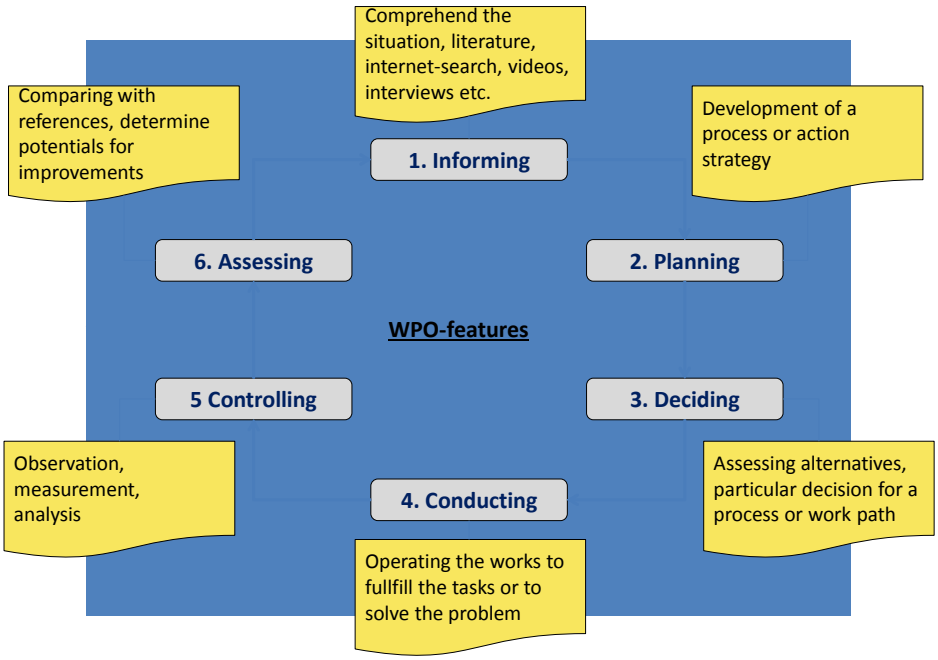
Furthermore he/she has the opportunity to compare his/her strategy with the ones of other learners, to change and also to modify it. Eventually there is a decision for solving the initial task/problem.

The fourth step means the putting into practice of the chosen measures, i.e. the operation of necessary works, which lead to fulfilling the job. This can be craft works (motoric learning - skills), but also the gaining of new knowledge (cognitive learning) by web-search, editing of documents, programming of a software, a communication with customers etc.

In the fifth step the learner has to control his/her work. This orientates at the initial self-given or external references.

The sixth and thus final step covers the reflection of the planning and operational processes. Comprehending these processes of other learners could be taking into account for comparison reasons. With this there will be visible potentials for improvement, which can influence the dealing with future tasks.

The following scheme illustrates the before mentioned aspects:



3. Current situation in Germany

Within the range of the Conference of Ministers of Education of the 16 German states (education is regulated by all 16 German states and not by the federal government!) WPO was and is not only regarded as the central way of teaching and training in initial VET, but also in the advanced training for becoming higher skilled worker and crafts master and in

particular also as the method for final tests followed by formal and non-formal certifications. These demands for WPO on all stages are nevertheless put into practice quite hesitant, because the change in paradigm from knowledge based training towards work-process based training is still not implemented overall. This is caused by multiple personal, organizational, tangible, spacial and / or target-group oriented reasons, what is often brought forward by stakeholders. Sometimes it is not quite clear, from which moment onwards and with which projects WPO should or can be realized. Consequently there have been developed several standard catalogues with exemplary tasks and projects, which are edited and published by a German publishing house. As a compromise in the VET-process there is often a pragmatic approach: all known and proved learning and teaching methods will be combined in the sense of a process logic or action logic; i.e. case studies, communication between trainer and learner, discussions, guiding text method, group work, trial and error etc.

In the VET-institutions WPO is shaped in different ways. In VET-schools the diffusion of WPO is certainly the widest, in the VET-centers slightly less, although the pre-conditions are supposed even better there (very close integration of theory and practice). Within the crafts master courses WPO develops slowly. Until now it has not been achieved to work out a WPO-based curriculum as well as a proper WPO-based final exam. (note: the regulations already exist and hence demand WPO-based exams, but there do not exist binding rules how to conduct these exams WBO-based. Each Chamber of Crafts holds exams in its own manner, often still just getting learners recalling their knowledge. Only in recent years there evolves a spirit to think in terms of customer and process orientation; didactical basis for this might be WPO). Exemptions are the courses for becoming *TeleCoach* and *TeleTutor*; their courses contain a high degree of WPO in planning, realization as well as in the exam.

4. Perspectives and need for action

The WPO path has been pursued for some 25 years now in times when computers and internet were hardly common. The current tasks catalogues are still paper editions in big volumes. The state of the art of documents and scripts has not proceeded in the same speed like the technical developments. This might be one of the various reasons for a hesitant acceptance and realization of WPO in VET.

The demand, now, is bigger than ever to develop WPO-based tasks and learn-projects as well as making use of social media elements, probably also integrating “Crafts 4.0” requests. The realization should be done – as a matter of being up to date – with learn apps in order to attract young people and young adults for WPO. The fun factor is decisive for motivation in using WPO. WinAPP opens a door for this by:

- presence of plenty of already existing relevant contents
- presence of a demanded pedagogic competence at all partners
- presence of experiences of developing inter-active learn applications

Intellectual Output 1, activity 1 (O1A1) - *Desk research and analysis*

LITHUANIA

In Lithuania VET programmes are designed for learners of different ages and educational backgrounds. In IVET, learners have an opportunity to acquire their first vocational qualification and complete general lower or upper secondary education. CVET enables a person to improve an existing qualification, acquire a new qualification or gain a competence needed to perform a specific job (function) as regulated by legislation.

Most VET learners (47%) participate in ISCED level 3 VET programmes, carried out together with the general upper secondary programme which lead to a vocational qualification at EQF level 4 and the upper secondary leaving exam which allows access to higher education. The least popular programmes are those at ISCED 2 that only offer a vocational qualification at EQF level 2. Around 500 to 600 students (7%) participate in these programmes annually. Popularity of post-secondary non-tertiary programmes (ISCED level 4) leading to EQF level 4 is increasing, especially among adults who enter VET with education or work experience (43%).

VET legislation of Lithuania provides a legal basis for apprenticeship. However, apprenticeship has still not gained its position as a clear VET pathway and receives little attention from VET providers and companies. The reasons for this are the lack of apprenticeship traditions in the country, upturns and downturns of economic development and their impact on investments in VET. Another important obstacle for apprenticeship is the absence of support mechanisms (both financial and non-financial) for companies employing apprentices or offering other forms of work-based learning.

VET providers in Lithuania are not familiar with “Work process orientation” methods.

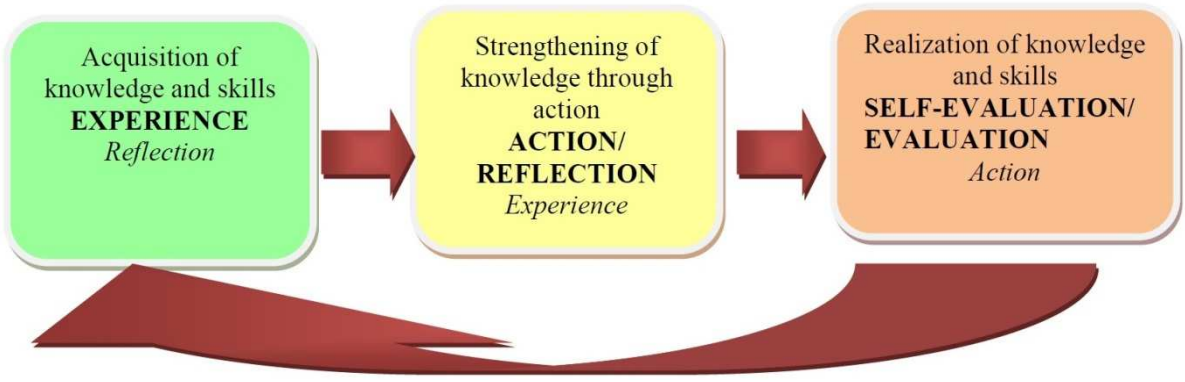
Since 2000, VET programmes in Lithuania have been developed by VET providers, in cooperation with employer representatives. When developing programmes, providers follow VET standards and general requirements approved by the Minister for education and science. A programme may include additional competences to satisfy local needs. VET programme development is also informed by research on skilled labour force needs at local level. A newly-drafted VET programme is subject to approval by a competent employer organisation (such as a chamber of commerce, industry and crafts).

Recently the reform of VET curricula has been implemented, aiming at the replacement of traditional VET programmes by modular ones. It means that the training process is organized in cycles called modules.

The module is a part of vocational training programme that combines some subjects that are related thematically. Modular programme structure consists of common modules which are the same in all vocational training programmes and modules which are characteristic to specific vocational programmes. Common modules include: Introduction to profession; Collecting and Presentation of Data; Introduction to Labour Market. Each module ends with evaluation. Common modules are evaluated with differential credit test, profession specific modules – with intermediate qualifying module exam.

For the most part, VET trainers are free to choose the didactical methods as long as they are in line with the Sectoral qualifications standards set at a national level. „Instruction learning“ can still be seen as the prevailing approach in Lithuanian VET.

In Vilnius Builders Training Centre any training programme is realized by the 3-step principle:



- The first part of programme content (50 percent) - ACQUISITION OF EXPERIENCE – is designed to acquire knowledge and capacities, to fulfill teaching programme requirements and to render the core of teaching content by traditional training methods.

- The second part of content (about 30 percent) - ACTION/ REFLECTION – is designed to strengthen the capacities through action.

- The third part of training programme (about 20 percent) – EVALUATION/ SELF-EVALUATION – is directed to *put into practice the knowledge and capacities* of students, which is realized by carrying out different projects.

Intellectual Output 1, activity 1 (O1A1) - *Desk research and analysis*

SPAIN 

1. What kind of individuals mainly attend vocational training in your country (students, apprentices, workers, etc.)?

In Spain, there are two issues in Education and Professional Training:

- **Professional training of the Education System**, linked to the Ministry of Education and regulated by the Organic Law of 3rd of May, Education (LOE 2/2006), and the Organic Law of 9th of December, to improve the quality of education (LOMCE 8/2013). It comprises the set of training actions that enable the qualified performance of the various professions, access to employment and active participation in social, cultural and economic life.

  It aims to prepare **mainly young students/trainees** for activity in a professional field and facilitate their adaptation to the labor changes that may occur throughout their life, as well as contribute to their personal development and the exercise of democratic citizenship.

  The teaching is organized in 170 training cycles in the public and private centers of the Autonomous Communities (regions), which can be taught in person or at a distance. The qualifications have academic and professional value, with official character and validity throughout the country and the subjects are organized by professional families and levels (grades):

  - Basic vocational education
  - Mid-Grade Vocational Education
  - High-Grade Vocational Education

- **Vocational training for employment**, depending on the Ministry of Labor and regulated by Law 30/2015, of 9th of September, which regulates the Vocational Training System for employment in the workplace. Its mission is to train and qualify people to work and update their skills and knowledge throughout their professional life.
  Several initiatives ruled by this system, specially aim at **workers**:

- Training programmed by companies, for their workers.

- Training offer for employed workers, with sectorial training programs and transversal training programs, qualification programs and professional recognition.

- Training offer for unemployed workers, with programs aimed at covering detected training needs, specific training programs, and training programs with hiring commitments.

- Other initiatives: individual training permits; Training in alternation with employment; Training of public employees; Training not financed with public funds developed by centers and entities of private initiative destined to obtain certificates of professional qualification.

Here it is worth to mention, the **certificate of professional qualification** that is the instrument for official accreditation of the professional qualifications of the National Catalogue of Professional Qualifications in the field of Labour Administration that accredits the training for the development of a work activity with significance for employment.

A certificate of professional qualification configures **a professional profile** understood as a set of professional competences identifiable in the productive system, and recognized and valued in the labor market.

Certificates of professional qualification will have official character and professional validity throughout the national territory, accredit the corresponding professional qualifications to those who have obtained them, and are issued by *Servicio Público de Empleo* (Public Employment Service) (SEPE) or, as the case may be, by the Autonomous Communities (regions).

Two ways to get a certificate of professional qualification:

- Passing the modules that make up the certificate of professional qualification.

- Following established procedures for the evaluation and accreditation of professional skills acquired through work experience or non-formal training.

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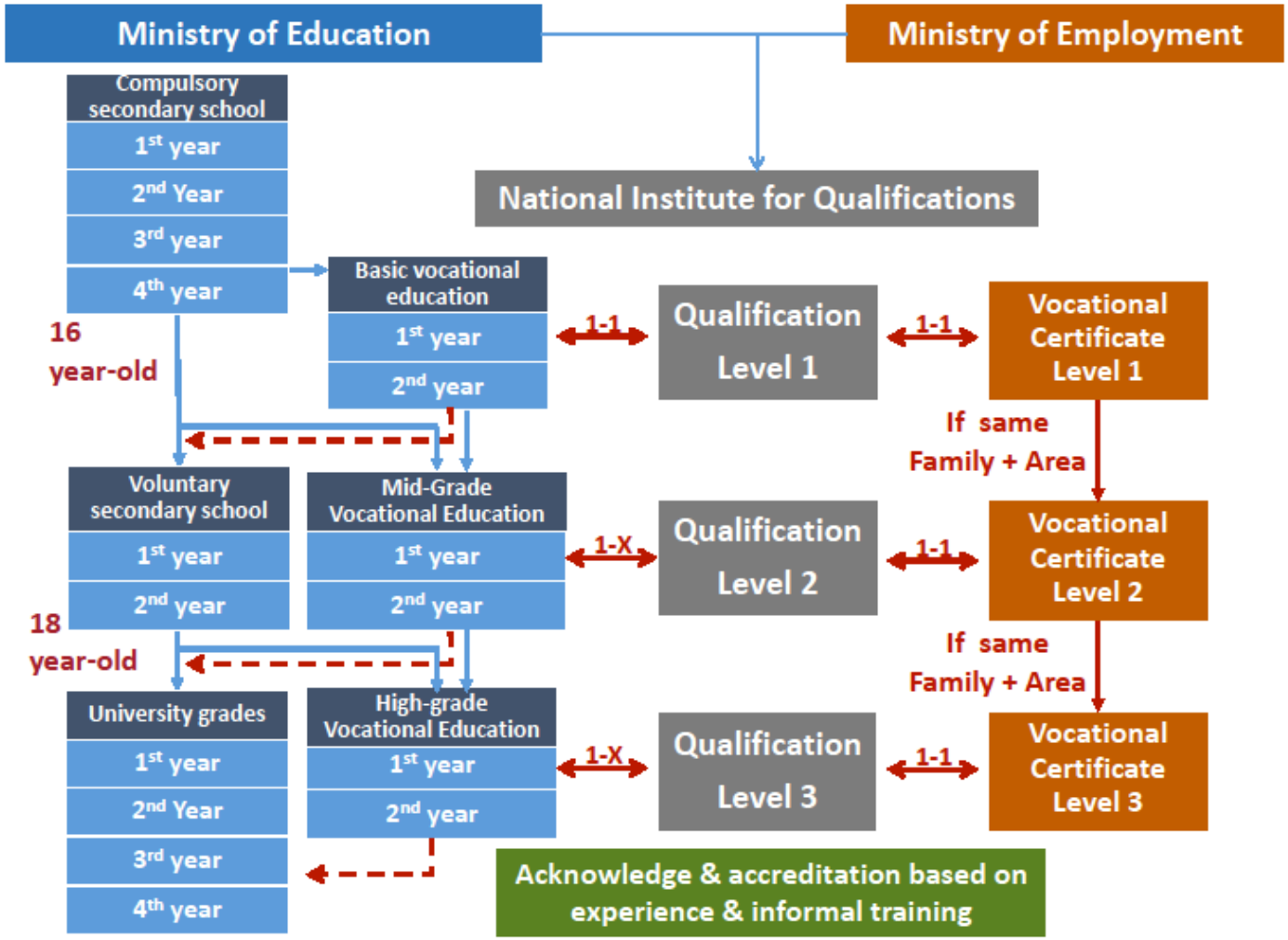

2. Are VET providers in your country familiar with "Work process orientation" methods?

It is not compulsory to apply a concrete didactic and pedagogic method, either in Professional training (depended on the Education System) or in Vocational Training in Spain. The dominant pedagogical methodology is the traditional teaching model.

The traditional teaching model is characterized by:

- An **asymmetric relation between teacher/ trainer and student / apprentice**, where teacher/trainer is seen as the owner of knowledge and student/apprentice has "White brain", and the teacher must fill it with the knowledge.

- Use a model of transmission → teaching-learning is conceived as the **transfer of knowledge in a unidirectional sense**, starting with the teacher and targeting the student.

- Assume that the information given is correct, unquestionable, that all students must be able to identify and reproduce uniformly. In principle, **no discussion is generated**, there is no doubt about the logical or empirical support of concepts (absence of critical thinking), nor is there an exchange of points of view (there is a single and correct answer to problems).

- **Do not encourage much interaction among students** because they "don't know anything which is being said in the classroom". The one who knows is the teacher /trainer, and the attendees are focused on what he/she says and does.

- **Teaching / training "out of context"** → education / training is based on theoretical concepts, formulas and concepts that the student must learn, but that do not always apply to real problems and situations of everyday life and the world of work, especially in the theoretical part.

- To evaluate the learning on the basis that **students /apprentices repeat concepts** and identify them without reproducing what they have learned in real contexts and situations.

The speeches directed by teacher / trainer are the central element. It is an economic method and with an easy organization of the several participant elements. It continues to be rooted in the customs and expectations of students / trainees, but step by step innovation is taking hold. In addition, it fits very well to the transmitter function that has traditionally had the training center.

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How the methodology is arranged

Tasks and goals of learning: they are defined by teacher / trainer following the standard curricula and in accordance with training center, and their knowledge on the group of students.

Competences of the traditional method: it allows to grasp information and concepts, but it is limited to develop competencies. These competencies are only transmitted when, in addition to the orientation and reception phases, trainees are able to practice through the interaction, fixation and implementation phases.

Phases for application of the model:

- **Orientation phase** (connection): to create a link between knowledge and previous experiences of students / trainees and the subjects.
- **Reception phase** (presentation): teacher / trainer presents the training subject in a tidy way.
- **Interaction phase** (work): teacher / trainer gives guidelines to students / trainees to work the important knowledge.
- **Fixation phase** (assurance): Students exercise the knowledge, skills and abilities until they reproduce them in a safe and agile way.
- **Application phase**: the acquired knowledge and skills are transmitted to new cases and scopes, and they are related to new perspectives of use.

Roles

- Student / trainee → receiver or passive observer, especially in the orientation and reception phases, since it only reacts occasionally before the teacher's questions. He has little room for thinking and developing knowledge, with a passive role in the process.
- Trainer / teacher → he / she dictates the class to a constant group of students for a time, and is usually an expert in the subject. It is usually the center of the teaching and education process.

Output 1, activity 1 (O1A1) - *Desk research and analysis*

SLOVENIA

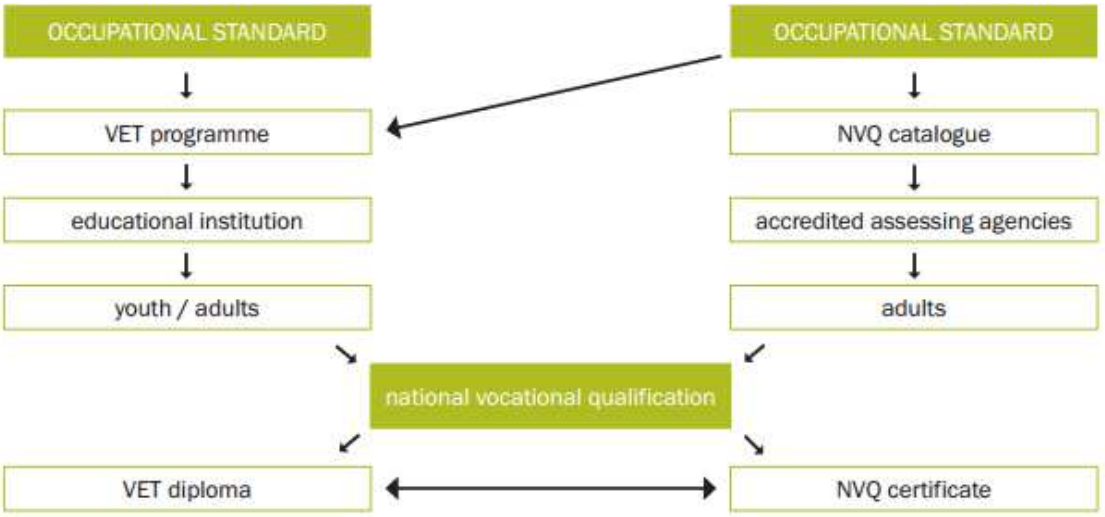
Brief Excursion into Contemporary History of Slovene VET

The VET system in Slovenia was conducted exclusively at schools (school-based) during socialist times in the former Yugoslavia and was linked to the centrally-planned economy. The system was financed entirety by the state, which also planned its scope, determined the programme and provided conditions for its implementation. Following Slovenia's independence, our country opted for the market economy, with the education sector launching the reform of the whole education system. Late 70-ies saw the setting up of the so-called career-oriented education at a level of higher secondary education in the state. The model introduced a special model of a common secondary school deriving from two general principles: (1) to enable the entire population to obtain a common basis for further education, personal growth and higher cultural standard, and (2) to direct students towards work or towards appropriate branch of education. (Common …1979). This was an advanced model in terms of its principles; however, its implementation was plagued with many problems giving rise to its abolition. The model was criticised for making the so-called "common basis in career-oriented education" too demanding for the entire population of secondary school students resulting in poor school performance and dropout. The model was also disapproved for not preparing students sufficiently for the entry into the labour market. The reform process did not include employers, while teachers were not trained to take up the work in the new system. Having considered and reflected on the experience accumulated from career-oriented education, a conceptual design for a new VET system in Slovenia came to life in 1992. The concept was published in the Proceedings System Regulation of VET (ed. Medveš, Muršak, 1992). The Proceedings reflected research efforts and debates held at the end of the 80-ies and beginning of 90-ies in which a large number of experts from various fields participated. The concept elaborated in the document modelled on the White Paper on Education in the Republic of Slovenia and also on the Vocational Education and Training Act (1996).

The Slovene system of secondary (initial) VET is characterised by three types of educational programmes. > >> Lower VET programmes lead to the occupation at the level of an assistant or ancillary staff, and take two years to complete. The programme annually receives approximately two percent of the young population, out of which the majority comes from the ranks of those who failed to successfully complete primary school programmes, or from special schools. Consequently, these programmes have a more pronounced orientation towards socialization and general education. A student who successfully finishes the programme is eligible to matriculate into the first year of a secondary vocational programme.

> >> Three-year secondary VET programmes train students to take on occupations at the level of skilled workers, craft and service sector. At the same time, these programmes have a pronounced general education component as the graduates are in the position to register into an additional two-year vocational and technical education programmes. This programme is already at the level of technical/professional education. Therefore it finishes with the vocational *matura* (final examination). The *matura* enables students to be trained in the occupation at the level of a technician, while at the same time also provides for the unlimited matriculation into vocational college and higher education programmes, while the registration to some university programmes is also an option under certain conditions. This is the so-called 3 + 2 system representing the alternative to the technical learning path described in the following paragraph. This system serves an important function as it strengthens vertical and horizontal transferability. > >> Four-year secondary technical or professional education programmes conclude with the vocational *matura*. Contrary to VET programmes, professional contents are at the heart of the programme, while there is less emphasis on professional practice. Despite this difference, education obtained in a 3 + 2 system and technical or professional programmes is equal in status. > >> The *matura* course is a one-year training programme accepting applicants who successfully finished a secondary vocational or professional programme, or a third year of the grammar school and interrupted education for at least a year, or successfully finished a primary school programme and passed the examination equal to the level of a third year of the grammar school. The *matura* course provides for planned and systematic preparation for the general *matura*.

The principle of transparency is the guiding force in the methodology for the development of occupational standards which lay down simple records and transparency of documents. The methodology for the development of occupational standards is published in the brochure and in this way made available to all interested partners participating in the development of occupational standards. Comparable documents from EU Member States are also considered in the development of occupational standards, which also contributes to mobility and employability at national and European labour market. The procedures for the development of occupational standards systematically involve all key partners at national level as the contents of occupations and qualifications are defined, their levels of complexity are determined and labour market needs in the following years are set. The participation of most advanced actors in industry, craft and services is of particular relevance in order to identify the need for new qualifications at an early stage. In the period from 2001 to 2006, the National Institute for Vocational Education and Training cooperated with social partners and developed 351 occupational standards in different professional fields.



The National Institute for Vocational Education and Training (www.cpi.si) is the central development and advisory institution for VET in Slovenia. The basic tasks of the Institute include creation of professional bases and methodology platforms, competence-based occupational standards, development of contemporary modular educational programmes and other activities leading to increased quality of VET and integration of education and work sphere

Between 2016 and 2021 vocational education and training will be modernised. The emphasis will be on developing models of practical training adapted to Slovenia's circumstances and needs. These will be implemented in close cooperation with social partners. In 2016, the platform for developing educational programmes of short vocational education, upper secondary vocational education, upper secondary technical education and short higher education study programmes was adopted. The new Apprenticeship Act entered into public consultation and measures in the field of vocational education will be co-financed by the European Social Fund. The act will establish the role of support institutions at the national level, require the adaptation of curricula, define the conditions for selecting and training employers and selecting schools, and set standards for mid-term and final examinations. In January 2016, the Slovenian Qualifications Framework Act (ZSOK) entered into force. The act places academic and vocation qualifications in a common system of classification and references them against the European Qualifications Framework.

In VET schools (we do not have in our national educational system special VET training centres) of course students are their main group. VET training centres of course offer some special sectoral (ca. 40- 80 hours long) trainings for unemployed (mostly adults) to be upskilled for construction tasks, or they offer special VET training for workers (adults) who want achieve national vocational qualification certificate (for some of the competences (9) on level EQF 3 and 4) and want to start work abroad or change work sector.

1. Are VET providers in your country familiar with “Work process orientation” methods?
   - IF YOUR ANSWER IS ‘YES’:
     COMMENT: we call in our country this WBL-WORK BASED LEARNING (we assume the meaning is the same: WPO=WBL)
     a. Is it a mandatory method for VET training? NO, THIS YEAR (2017) WE START AGAIN DUAL SYSTEM WITH SOME OF THE PROFFESSIONS only (for construction sector only 2 ones)
     b. In case it’s not mandatory, what is the relevance of this method in your country (widespread, not very common)? NOT VERY COMMON, we will sart as pilot dial system this autumn (2017)
     c. Is action-oriented teaching/training applied only to practical training or also to theoretical subjects? ONLY PRACTICAL
     d. How many of the 6 steps (1. inform, 2. plan, 3. decide, 4. conduct, 5. control and 6. assess) are used in your country to implement this method? We do not use this method in this way
     e. Is there an age limit for starting using this didactical method? We do not use this method in this way
     f. Are there products / materials available for the implementation of WPO methods? NOT YET
     g. Is WPO used as indicator to assess whether a student / apprentice acquired a specific competence / skill? ? We do not use this method in this way

Didactical methods

VET public schools (for 3 AND 4 LEVEL EQF) and private and public (for 5 EQF) VET Schools have a lot of freedom in developing didactical methods, priorities and orientation and TOOLS AND EQUIPMENT OF SCHOOL for different occupations. Therefore, the aforementioned aspects will vary from VET school to VET SCHOOL. There is Eramsus+1 activities in VET schools also, school accept foreign pupisl and send Slovenian out, but the last not so often.

Other sources:

- Overview of all proffesions in Slovenina on all qualification level (NQF, EQF) has just been prepared by us - CCIS CCBMIS: https://www.gzs.si/Portals/Panoga-Gradbenistvo/info%20gradbena%20mapa_2017_v13.pdf
- http://www.ukom.gov.si/en/media_room/background_information/education/educational_system_in_slovenia/
- More on VET system in Slovenia: http://www.cpi.si/files/cpi/userfiles/Publikacije/ESF_eng.pdf
- Education and Training Monitor 2016 Slovenia https://ec.europa.eu/education/sites/education/files/monitor2016-sl_en.pdf

Output 1, activity 1 (O1A1) - *Desk research and analysis*

NETHERLANDS

An introduction to the Dutch VET

By combining theoretical instruction with hands-on, practical experience, the Dutch system of secondary vocational education and training (MBO) prepares it's students for a wide range of occupations. While it typically targets young adults (16 years and older), adults are also welcome to enrol. Currently, 630,000 students are enrolled in the VET sector - 485,000 are enrolled in regular VET courses and the rest are enrolled in contract basis programs for adult education/education courses.

There are 2 pathways students enrolled in the secondary vocational education (or MBO) programme can choose to take - but both pathways are equal in terms of qualifications and opportunities. The first pathway is known as the work-based pathway (bbl). Students who opt for this pathway will spend at least 60% of the course time in work-placement to get hands-on, practical experience. The second pathway is known as the school-based pathway (bol). This pathway dedicates more time to theoretical education, with anywhere between 20%-60% of the course spent in work-placement.

There are five types of courses offered under the senior secondary vocational education programme:

1. Entry training - This is a 1 year long course, qualification level 1.
2. Basic vocational training - This is a 2 year long course, qualification level 2.
3. Professional training - This is a 3 year long course, qualification level 3.
4. Middle management training - This is a 3-4 year long course, qualification level 4.
5. Specialist training - This is a 1 year long course, but can only be enrolled in after a relevant professional training course is completed. Qualification level 4.

For a student to obtain a higher qualification level, they must first obtain the next lowest qualification level. For example, to be admitted in a professional training course (qualification level 3), students must first pass a basic vocational training course (qualification level 2).

Competence-based qualifications

In 2005, the competence-based qualification structure was introduced in the Netherlands. This structure accurately reflected the skills required for each occupational practice.

The 2005 competence-based qualification structure highlights and explains:

- core tasks and processes that are relevant to and necessary for the occupation or trade;
- the competence required to complete these tasks and processes;
- the theoretical knowledge and skills needed to understand the mechanisms of the

occupation or trade;
- performance indicators to accurately assess whether competences have been acquired.

The qualifications for each sector is developed by the Centers of Expertise, along with the companies in the sector. A standardized list of 25 competences is used, and the relevant ones are applied to each sector. These competences comprise of active behavior such as cooperation skills, initiative, application skills etc. Using a standardized set of competences makes the process of identifying whether a student is qualified or not much easier.

Vocational training centers can operate training programs of their own, as long as they follow the requirements of the qualifications. This includes the Learning and Citizenship profile as well as general education rules. Supervision by the Educational Inspectorate is mandatory.

The qualifications, training programs and examinations should be attuned to one another to ensure the examinations are relevant and useful. The vocational training centers can be developed by the training centers themselves, or bought from an external source such as a Center of Expertise or a sector organization or an educational agency.

Qualification structure concepts

Qualification file

Qualification files describe various qualifications. Essentially, it identifies and explains the competences of a *beginner* worker as well as the activities of the occupational context a beginner-worker is ready for.

Specializations in qualifications are known as “exits” or “differentiations”. There is a similar set of core tasks and work processes across all exits.

Example: Qualification file carpenter contains 4 specializations

- Carpenter (level 2)
- Allround Carpenter New construction (level 3)
- Allround Carpenter Construction and workshop (level 3)
- Allround Carpenter Restoration (level 3)

Core task

Core tasks refer to the “core” of the work. It is essentially a set of activities (related by purpose/time) grouped together. A core task usually includes multiple work processes and describes a situation which any worker should be able to handle. Core tasks and work processes create the occupational context competences are applied to.

Example A: Qualification file carpenter contains 3 core tasks

- *Core task 1: Setting and dimensioning*
- *Core task 2: Processing and handling materials and*
- *(Prefab) elements*
- *Core task 3: Organizes daily work of colleagues*

Example B: Qualification file masonry contains 5 core tasks

- *Core task 1: Performs masonry tasks*
- *Core task 2: Performs glue tasks*
- *Core task 3: Carries out repair work*
- *Core task 4: Performs concrete tasks*
- *Core task 5: Organizes daily work of colleagues*

Work process

Work processes describe the typical activities belonging to a core task.

Example: Core task 3 and work processes for a carpenter

Core task	**Organizes daily work of colleagues**
Work processes	Distributes tasks and assists colleagues
	Monitors quality and compliance with regulations
	Consults and coordinates with third parties
	Monitors progress
	Reports to supervisor

Performance indicators

Performance indicators help show how far the student has developed their competence for various situations. They are descriptions of visible behaviors shown by the student that correspond to a level of competence. They could be about the process (procedure, method) or the result (service, product) of an action or behavior, or both.

Didactical methods

VET colleges have a lot of freedom in developing didactical methods, priorities and orientation. Therefore, the aforementioned aspects will vary from college to college. For example, some VET colleges focus on finding foreign work placements for their students as they are more international.

Sources:

Dutch competence-based qualification system: Background, structure, procedure, concepts, and formats

https://www.s-bb.nl/onderwijs/kwalificeren-en-examineren/kwalificatiedossiers

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http://www.ecabo.nl/international/vocational-education-netherlands/

Output 1, activity 1 (O1A1) - *Desk research and analysis*

ITALY 

In Italy the main target groups attending VET are:

1. Students, for performing a 3 years learning path from 15 to 18 old, still in compulsory education. These kinds of learning paths are characterized by a highlighted attention to the future job (i.e. construction worker, mechanics, hairdresser, etc.). This means that most of the subjects are oriented to the profession and have a strong practical orientation (minimum 50% of practical activities in workshops and companies). Students do not have a contract with the company. They perform internships.
2. Workers, for retraining and refresher courses. The main types of courses attended by construction workers are health and safety courses (first aid, fire risk, use of scaffoldings, use of machinery, etc.) which are mandatory by law.

There are other categories attending VET but less relevant:

- Apprentices according to traditional Italian system: who attend mainly theoretical lessons about right/duties connected to their job, citizenship, maths, English, H&S. The duration is around 200 hours in total.
- Apprentices according to dual system: this system started as pilot experience in 2015 only in 2 Regions (Veneto and Lombardia) so numbers are low.

Legislation on Vocational Education in Italy is delegated to each of the 20 Regions; this means that there is a lack of homogeneous and coordinated systems throughout the country. Each Region (or group of Regions) has its competences standards catalogue generally structured in learning outcomes.

VET providers are normally not very used to apply WPO as the most used system is traditional “instruction learning”. Moreover, the Italian concept of WPO (or “action-oriented teaching/training”) is not exactly the same of the German conception of “Handlungsorientierung” process.

The widespread concept of action-oriented teaching/training is mainly divided into 3 different methodologies:

• Learning by doing: learning through practical experience, usually performed with groups of students who learn through reflection and action by realizing real projects.

• Problem based learning: teaching method in which, starting from a problem, the students shall identify the procedure to fix it. The problem is the starting point of the learning process.

• Project work: the simulation of a real project work, performed by students usually after a series of introductory and explanatory lessons.

For the above mentioned reason, the 6 steps of the German model of WPO as defined by Prof. Uhe & Meyser (1. inform, 2. plan, 3. decide, 4. conduct, 5. control and 6. Assess) are not a “must” when applying action-oriented teaching/training.

For several years the Ministry of Education and relevant Institutions have been “speaking” about the advantages of applying action-oriented teaching/training in terms of competences achievement, self-esteem and social skills but this methodology had a good spread in kindergarten and in primary schools, while it is still rather limited in secondary schools.

The main obstacles for applying WPO are:

- Time: the main concern of many teachers (above all in state school) is the completion of their teaching program. Less emphasis is instead placed on how significant and stable in students’ memory competences/skills are. Time needed for WPO is longer than that required for Instruction Learning.
- Organization: as holistic learning, the different disciplines involved need to be coordinated and complementary to one another (different teachers / trainers have to follow a common program/project)
- Motivation: teachers / trainers have to rethink their methods. The system used for years (and which was taught to them for years) has to be revised ➔ exit from the comfort zone
- Cost: WPO system is not cost-effective (you need more hours and you need smaller groups of students than a traditional lesson).

CEAP’s experience:

The main teaching method for most of theoretical lessons of general culture (like History, Italian, Religion, etc.) is the instruction learning, which provides the following steps:

1. Explanation of the task by teacher

2. Execution of the task by student under supervision of teacher

3. Assessment done by teacher

CEAP is performing action-oriented teaching/training, starting from the second year, for practical training and for work oriented subjects like work planning, applied math, technology by applying 4 main steps:

1. Informing + planning: task is given to trainee and strategy/strategies to work out the task are developed together with the teacher

2. Deciding: students assess alternatives and take decision

3. Conducting: perform the task

4. Controlling + Assessing: the work carried out is assessed together with the teacher/trainer

In many cases, when applying action-oriented teaching/training, the different above-mentioned subjects, are coordinated to work on the same project together, for instance:

Project: realization of a wall according to a given blueprint

Subject technology: choosing the most appropriate materials according to the blueprint

Applied math: calculate the quantities of different materials needed

Subject work planning: defining the different phases of the process (take measures, buy materials, prepare the work site, execute the work, etc.)

Practice in workshop: realize the give task in practical

DESK ANALYSIS COMPARISON TABLE

GERMANY	SPAIN	NETHERLANDS	LITHUANIA	SLOVENIA	ITALY
VET system: who attends vocational training?					
Apprentices (dual system)	- Young students -Workers (employed/unemployed)	1) Students (from 16 years old) 2) Adults (from 18 years old) 3) Workers (on a contract basis) refresher courses, in-service, life-long learning	- Students (both initial Vocational training and advanced training) - Workers (for improving existing qualification or perform a specific job)	- Mainly students - Special training for workers (employed/unemployed)	MAIN TARGET GROUPS: - Young students (15-18 years old) - Workers (employed/unemployed) SECONDARY TARGET GROUPS: - Apprentices according dual system (pilot experiences started in 2015 - Apprentice (mainly theoretical lessons)
Governance: Centralized system? who sets the rules?					
Centralized: VET-training centre level Decentralized: regulated by all 16 German States on VET-school level	Centralized system: Ministry of Education for students Ministry of Labour for workers	Centralized system Minister of Education, Culture and Science.	Centralized system: ministry of education and science **HOWEVER** additional modules can be added to satisfy local needs (competent employers' organizations approve new VET programs)	Centralized	Decentralized: each Region (20) has the governance on VET

GERMANY	SPAIN	NETHERLANDS	LITHUANIA	SLOVENIA	ITALY
Level of knowledge and application of WPO in VET system					
THEORETICAL CONCEPT: - Already established method (started in the 80's) - Key teaching/training method APPLICATION: - Different standard catalogues / systems ➔ no WPO-based curriculum or exams - More developed in VET training centres	- NO application of WPO - traditional teaching methods applied	- Freedom in developing training / teaching methods => no standard methodology - Competence based qualifications	- NO real application of WPO - VET trainers free to choose the methods ➔in line with the Sectoral qualifications standards -Instruction learning is still the prevailing approach	VET providers are not familiar with WPO - Freedom in developing training / teaching methods	- WPO is not the main method applied. WPO concept is different from the German one. - Traditional "Instruction Learning" is the common method applied - Freedom in developing training / teaching methods => no standard methodology CEAP: uses this method with young students for practical training and certain theoretical subjects (like work planning) ➔ from the second year on

GERMANY	SPAIN	NETHERLANDS	LITHUANIA	SLOVENIA	ITALY
Background					
WPO is seen as the most effective teaching/training method, also with the purpose of promoting: -self entrepreneurship -social responsibility -enhance connection between market demand and VET education	Instruction learning: - Cheap Method - Easier organization - Traditional (it's what people expects) Limits: - one way direction of knowledge (from teacher to students) - no critical thinking development - out of labour market context	VET maintains close relations with the labour market. Colleges have frequent contact with companies and organisations where students work or do work experience.	Still adopting traditional methods with inclination of using a rough WPO method (VSRC applies 3 steps principle ➔ 3rd step provides self-evaluation)	Work-based learning system is applied (some pilot experience with dual system in 2017) but the WPO system (according to German concept) is not performed	- Due to decentralization of legislative powers of VET training, the Italian scenario is miscellaneous: each Region (or group of Regions) has its own qualification standards framework - Pilot dual system only in 2 regions In common: 1.competence-based and work-related curricola 2.close relationships with companies for internships

GERMANY	SPAIN	NETHERLANDS	LITHUANIA	SLOVENIA	ITALY
Steps: what is done exactly?					
WPO: 1.Informing: task is given to trainee 2.Planning: trainee develops strategy/strategies to work out the task 3.Deciding: assessing alternatives and take decision 4.Conducting: perform the task 5.Controlling: self-assessment, measurement 6.Assessing: benchmarking performance against external criteria	Instruction learning: 1. Orientation: create link between knowledge and previous experiences of students 2.Reception: explanation by teacher 3.Interaction: teacher gives guidelines 4. Fixation: exercise 5.Application: transmitting acquired knowledge to new cases	-Competence based qualifications => 2 main types: 1. work-based pathway: at least 60% of the course in work-placement 2.school-based pathway: between 20%-60% in work-placement - Qualifications are divided into: 1.core tasks (example: Core task 1: Performs masonry tasks, Core task 2: Performs glue tasks). 2. Each core task includes several work processes 3. Performance indicators are associated to each work process	In VSRC: 1. First part (50%) - ACQUISITION OF EXPERIENCE –to acquire knowledge and capacities, with traditional training methods. 2.Second part (30%) - ACTION/ REFLECTION strengthen the capacities through action. 3.The third part (20%) – EVALUATION/ SELF-EVALUATION –put into practice the knowledge and capacities carrying out different projects.	3 types of educational programmes: 1. assistant level: 2 years 2. skilled worker: 3 years 3. Technical occupation: 4 years or 3+2 years	- Instruction learning (common practice): 1.explanation of the task by teacher/trainer 2.execution of the task by student under supervision of teacher/trainer 3.assesment done by teacher/trainer - WPO: 1.Informing + planning: task is given to trainee and strategy/strategies to work out the task are developed together with the teacher 2.Deciding: students assess alternatives and take decision 3.Conducting: perform the task 4.Controlling + Assessing: the work carried out is assessed together with the teacher/trainer

GERMANY	SPAIN	NETHERLANDS	LITHUANIA	SLOVENIA	ITALY
Key words					
Case study Problem solving Entrepreneurship	Trainees are passive observers	No systematized system	Half traditional / half WPO	Vocational system under modernisation	Non-homogeneous system

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Output 1, activity 2 (O1A2) - *Structured interviews*

GERMANY 

Report on the survey results for Germany

TOTAL no. of participants: 40

1. Country of residence : GERMANY

2. Gender:

2.1. Male: **36** (**90 %)**
2.2. Female: **4 (10 %)**

3. Age group:

3.1. 12-17 years old: **0**

3.2. 18-24 years old: **0**

3.3. 25-34 years old: **2** (**5,00 %)**

3.4. 35-44 years old: **12 (30,00 %)**

3.5. 45-54 years old: **13 (32,50 %)**

3.6. 55-67 years old: **12 (30,00 %)**

3.7. 65-74 years old: **1 (2,50 %)**

4. Current status:

4.1. Apprentice: **0**
4.2. Trainee: **0**
4.3. Trainer: **21 (52,50 %)**
4.4. Working in VET: **18 (45,00 %)**
4.5. Trainer's coordination and /or mobility coordinator: **1 (2,50 %)**

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5. Nº of years under above condition:

- 1-5 years: **6**
- 6-10 years: **5**
- Over 10 years: **29**

6. Learning by doing is a holistic pedagogical concept in the vocational training in the construction sector. It is based on the didactical and function-logic sequence: informing – planning – deciding – executing - checking - assessing. Is the concept "Learning by doing" familiar to you?

6.1. Yes: **38 (97,44 %)**
6.2. No: **1 (2,56 %)**

7. In which field will be applied the "learning by doing" concept?

7.1. Apprenticing: **33 (89,19 %)**

7.2. Initial vocational training (students): **18 (48,65 %)**

7.3. Life-long learning (workers): **22 (59,46 %)**

8. To what extend will be implemented the "learning by doing" concept?

8.1. Regularly: **26 (70,27 %)**
8.2. Occasionally: **10 (27,03 %)**
8.3. Rarely: **1 (2,70 %)**
8.4. Never: **0**

9. To what extend do you agree with "learning by doing" concept / didactical method?

8.1. Very much: **14 (37,84 %)**
8.2. Rather agree: **19 (51,35 %)**
8.3. Rather disagree: **4 (10,81 %)**
8.4. Very little: **0**

10. In your opinion, how successful would be the approach "learning by doing" in the vocational training?

9.1. Very successful: **0**
9.2. Successful: **0**
9.3. Less successful: **0**
9.4. Not successful: **0**

11. In your opinion, how would the trainers/teachers receive the approach "learning by doing"?

10.1. Positive: **0**

10.2. Tends to be critical: **0**

10.3. Opposed: **0**

10.4. Indifferent: **0**

12. In your opinion, how would the learners receive the approach "learning by doing"?

11.1. Positive: **0**

11.2. Tends to be critical: **0**

11.3. Opposed: **0**

11.4. Indifferent: **0**

13. In your opinion, which aspects would be important in the approach "learning by doing", (please select)?

Aspect	Very important	Less important	Not important
12.1. All-around approach: learners recognise the value of the job	**31 (86,11%)**	**5 (13,89%)**	**0**
12.2. Different experiences, knowledge and skills could be applied	**32 (88,89%)**	**4 (11,11%)**	**0**
12.3. Social interaction: reciprocal support, overcoming difficulties, supporting the weaker ones	**22 (61,11%)**	**14 (38,89%)**	**1 (7,69%)**
12.4. Independent work: assumption of responsibility	**28 (77,78%)**	**8 (22,22%)**	**0**
12.5. Development opportunities: competences will be further developed	**29 (80,56%)**	**6 (16,67%)**	**1 (2,78%)**
12.6. Importance: added value for society and production	**21 (58,33%)**	**12 (33,33%)**	**3 (8,33%)**

14. Do you basically know about "Building Information Modelling (BIM)-concept?

13.1. Yes: **17 (47,22 %)**

13.2. No: **19 (52,78 %)**

15. In which areas BIM is applied? (→15 responses)

14.1. New buildings: **14 (93,33 %)**

14.2. Old buildings renovation: **3 (20,00 %)**

14.3. Technical modernization: **7 (46,67 %)**

14.4. Facility management: **7 (46,67 %)**

14.5. Others: **2 (13,33 %)**

16. Which target groups mainly work along BIM? (→15 responses)

15.1. Planner/Architect: **14 (93,33 %)**
15.2. Entrepreneur: **4 (26,67 %)**
15.3. Site manager: **10 (66,67%)**
15.4. Site supervisor: **4 (26,67%)**
15.5. Facility operator: **6 (40,00 %)**
15.6. Others: **3 (20,00 %)**

17. Which advantages for the construction branch do you see in BIM? (→16 responses)

16.1. Costs´ advantages: **8 (50,00 %)**
16.2. Interconnectedness: **12 (75,00 %)**
16.3. Higher quality: **11 (68,75 %)**
16.4. Higher output: **4 (25,00 %)**
16.5. Better knowledge base: **10 (62,50 %)**
16.6. Others: **2 (12,50 %)**

18. Do construction staff and stakeholders accept BIM and how do they react on BIM? (→16 responses)

17.1. Positive: **5 (31,25 %)**
17.2. Rather critical: **10 (62,50 %)**
17.3. Refusing: **0**
17.4. Other: **1 (6,25 %)**

19. Explain your option:

….

20. How BIM is taught and diffused by you / in your organization? (→16 responses)

18.1. Initial training: **4 (25,00 %)**
18.2. Further training courses: **8 (50,00 %)**
18.3. Academic studies: **0**
18.4. Others: **4 (25,00 %)**

21. Do you know any plans to mandatory introduce digital and interconnected planning as a working method in your country? (→19 responses)

19.1. Yes: **9 (47,37 %)**
19.2. No: **10 (52,63 %)**

22. How are the management, coordination and interconnectedness of building processes currently assured in your country?

…..

23. How would be the building staff and stakeholders regard digital and interconnected working methods along your point of view? (→19 responses)

21.1. Positive: **4 (21,05 %)**
21.2. Rather critical: **14 (73,68 %)**
21.3. Refusing: **0**
21.4. Explain your option: 1 (5,26 %)

24. Which aspects would be important along your point of view when introducing digital and interconnected working methods (please, set your marks)? (→34 responses)

Aspect	Very important	Less important	Not important
22.1. Work with digital models (see draft further above here)	**24 (70,59%)**	**9 (26,47%)**	**1 (2,94%)**
22.2. Digital calculation of quantities and costs	**26 (76,47%)**	**8 (23,53%)**	**0**
22.3. Digital planning and calls of bids	**21 (61,76%)**	**12 (35,29%)**	**1 (2,94%)**
22.4. Cross-branch cooperation	**27 (79,41%)**	**6 (17,65%)**	**1 (2,94%)**
22.5. Design of contracts and liability	**24 (75,00%)**	**7 (21,88%)**	**1 (2,94%)**
22.6. Organisation for applying BIM	**17 (50,00%)**	**17 (50,00%)**	**0**
22.7. Data management and data safety	**20 (58,82%)**	**13 (38,24%)**	**1 (2,94%)**
22.8. Quality and cost control	**27 (79,41%)**	**6 (17,65%)**	**1 (2,94%)**
22.9. Other:	**0**	**0**	**0**

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Output 1, activity 2 (O1A2) - *Structured interviews*

LITHUANIA 

Report on the survey results for Lithuania

TOTAL no. of participants: 13

1. Country of residence : LITHUANIA

2. Gender:

2.1. Male: **5** (**38,46%)**
2.2. Female: **8 (61,54%)**

3. Age group:

3.1. 12-17 years old: **0**

3.2. 18-24 years old: **3 (23,08%)**

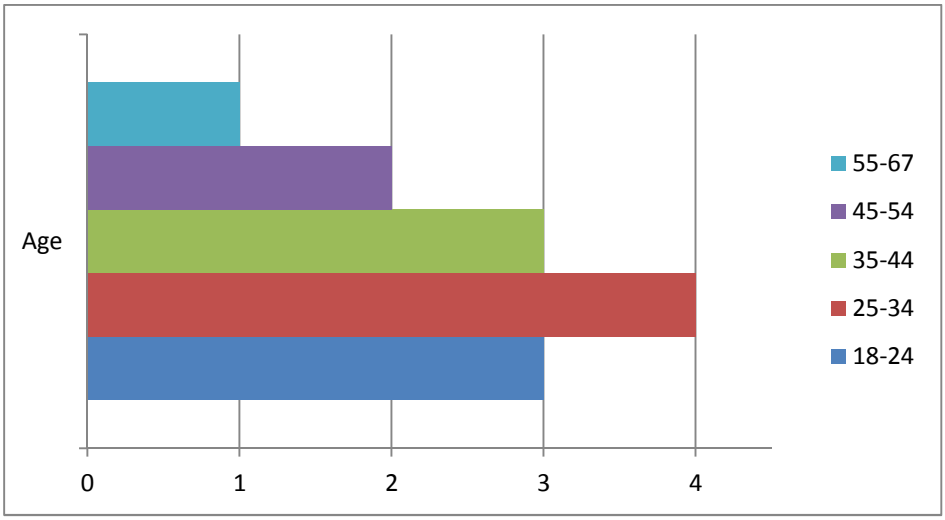
3.3. 25-34 years old: **4** (**30,77%)**

3.4. 35-44 years old: **3 (23,08%)**

3.5. 45-54 years old: **2 (15,38%)**

3.6. 55-67 years old: **1 (7,69%)**

3.7. 65-74 years old: **0**



4. Current status:

4.1. Apprentice: **1 (7,69%)**
4.2. Trainee: **3 (23,08%)**
4.3. Trainer: **6 (46,15%)**
4.4. Working in VET: **1 (7,69%)**
4.5. Trainer's coordination and /or mobility coordinator: **2 (15,38%)**

4.6. № of years under above condition:

- 1-5 years: **5**
- 6-10 years: **3**
- Over 10 years: **4**

5. Learning by doing is a holistic pedagogical concept in the vocational training in the construction sector. It is based on the didactical and function-logic sequence: informing – planning – deciding – executing - checking - assessing. Is the concept "Learning by doing" familiar to you?

5.1. Yes: **11 (84,62%)**

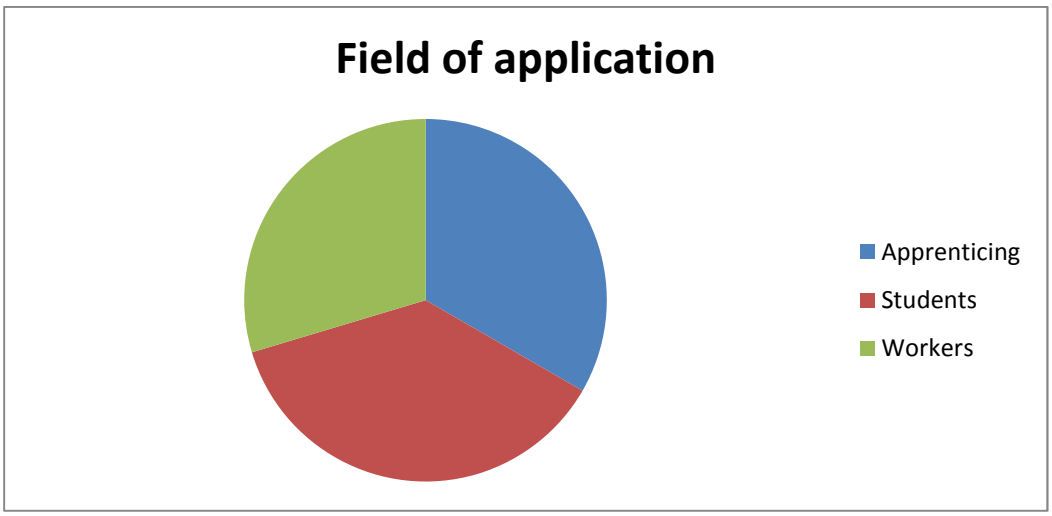
5.2. No: **2 (15,38%)**

6. *In which field will be applied the "learning by doing" concept?*

6.1. Apprenticing: **9 (81,82%)**

6.2. Initial vocational training (students): **10 (90,91%)**

6.3. Life-long learning (workers): **8 (72,73%)**



7. ***To what extend will be implemented the "learning by doing" concept?***

7.1. Regularly: **10 (90,91%)**
7.2. Occasionally: **1 (9,09%)**
7.3. Rarely: **0**
7.4. Never: **0**

8. ***To what extend do you agree with "learning by doing" concept / didactical method?***

8.1. Very much: **10 (90,91%)**
8.2. Rather agree: **1 (9,09%)**
8.3. Rather disagree: **0**
8.4. Very little: **0**

9. ***In your opinion, how successful would be the approach "learning by doing" in the vocational training?***

9.1. Very successful: **0**
9.2. Successful: **1 (100,00%)**
9.3. Less successful: **0**
9.4. Not successful: **0**

10. ***In your opinion, how would the trainers/teachers receive the approach "learning by doing"?***

10.1. Positive: **2 (100,00%)**
10.2. Tends to be critical: **0**
10.3. Opposed: **0**
10.4. Indifferent: **0**

11. ***In your opinion, how would the learners receive the approach "learning by doing"?***

11.1. Positive: **2 (100,00%)**
11.2. Tends to be critical: **0**
11.3. Opposed: **0**
11.4. Indifferent: **0**

12. ***In your opinion, which aspects would be important in the approach "learning by doing", (please select)?***

Aspect	Very important	Less important	Not important
12.1. All-around approach: learners recognise the value of the job	**13 (100,00%)**	**0**	**0**
12.2. Different experiences, knowledge and skills could be applied	**13 (100,00%)**	**0**	**0**
12.3. Social interaction: reciprocal support, overcoming difficulties, supporting the weaker ones	**8 (61,54%)**	**4 (30,77%)**	**1 (7,69%)**
12.4. Independent work: assumption of responsibility	**13 (100,00%)**	**0**	**0**
12.5. Development opportunities: competences will be further developed	**13 (100,00%)**	**0**	**0**
12.6. Importance: added value for society and production	**8 (61,54%)**	**5 (38,46%)**	**0**

13. Do you basically know about "Building Information Modelling (BIM)-concept?

13.1. Yes: **12 (92,31%)**
13.2. No: **1 (7,69%)**

14. ***In which areas BIM is applied?***

14.1. New buildings: **12 (100,00%)**
14.2. Old buildings renovation: **11 (91,67%)**
14.3. Technical modernization: **10 (83,33%)**
14.4. Facility management: **9 (75,00%)**
14.5. Others: **0**

15. ***Which target groups mainly work along BIM?***

15.1. Planner/Architect: **12 (100,00%)**
15.2. Entrepreneur: **7 (58,33%)**
15.3. Site manager: **11 (91,67%)**

15.4. Site supervisor: **5 (41,67%)**
15.5. Facility operator: **4 (33,33%)**
15.6. Others: **0**

16. ***Which advantages for the construction branch do you see in BIM?***

16.1. Costs´ advantages: **10 (83,33%)**
16.2. Interconnectedness: **10 (83,33%)**
16.3. Higher quality: **9 (75,00%)**
16.4. Higher output: **10 (83,33%)**
16.5. Better knowledge base: **10 (83,33%)**
16.6. Others: **0**

17. ***Do construction staff and stakeholders accept BIM and how do they react on BIM?***

17.1. Positive: **9 (75,00%)**
17.2. Rather critical: **3 (25,00%)**
17.3. Refusing: **0**
17.4. Other: **0**
17.5. Explain your option: -

18. ***How BIM is taught and diffused by you / in your organization?***

18.1. Initial training: **6 (50,00%)**
18.2. Further training courses: **4 (33,33%)**
18.3. Academic studies: **1 (8,33%)**
18.4. Others: **1 (8,33%)**

19. ***Do you know any plans to mandatory introduce digital and interconnected planning as a working method in your country?***

19.1. Yes: **0**
19.2. No: **1 (100,00%)**

20. ***How are the management, coordination and interconnectedness of building processes currently assured in your country?*** **-**

21. ***How would be the building staff and stakeholders regard digital and interconnected working methods along your point of view?***

21.1. Positive: **1 (100,00%)**
21.2. Rather critical: **0**
21.3. Refusing: **0**
21.4. Explain your option: -

22. ***Which aspects would be important along your point of view when introducing digital and interconnected working methods (please, set your marks)?***

Aspect	Very important	Less important	Not important
22.1. Work with digital models (see draft further above here)	**12 (92,31%)**	**1 (7,69%)**	**0**
22.2. Digital calculation of quantities and costs	**12 (92,31%)**	**1 (7,69%)**	**0**
22.3. Digital planning and calls of bids	**9 (69,23%)**	**4 (30,77%)**	**0**
22.4. Cross-branch cooperation	**10 (76,92%)**	**3 (23,08%)**	**0**
22.5. Design of contracts and liability	**10 (76,92%)**	**3 (23,08%)**	**0**
22.6. Organisation for applying BIM	**12 (92,31%)**	**1 (7,69%)**	**0**
22.7. Data management and data safety	**13 (100,00%)**	**0**	**0**
22.8. Quality and cost control	**13 (100,00%)**	**0**	**0**
22.9. Other:	**0**	**0**	**0**

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Output 1, activity 2 (O1A2) - *Structured interviews*

SPAIN 

Report on the survey results for Spain

1. **Country of residence :** SPAIN

2. **Gender**:

	Nº Answers	%
Male	44	61,11
Female	28	38,89
Total	**72**	**100**

3. **Age group**:

	Nº Answers	%
12-17 years	0	-
18-24 years	0	-
25-34 years	8	11,11
35-44 years	26	36,11
45-54 years	31	43,06
55-67 years	7	9,72
65-74 years	0	-

4. **Current status**:

	Nº Answers	%
Apprentice	0	-
Trainee	0	-
Trainer	52	72,22
Working in VET	9	12,50
Trainer's coordinator and/or mobility coordinator	11	15,28
Total	72	100

Nº of years under above condition

	Nº Answers
< 1 years	1
1-5 years	23
5-10 years	16
10-15 years	16
15-20 years	8
> 20 years	8

Questionnaire action-oriented learning

5. Learning by doing is a holistic pedagogical concept in the vocational training in the construction sector. It is based on the didactical and function-logic sequence: informing – planning – deciding – executing - checking - assessing. Is the concept "Learning by doing" familiar to you?

	Nº Answers	%
Yes	63	88,73
No	8	11,27
Total	**71**	**100**

If the concept is familiar to you

6. *In which field will be applied the "learning by doing" concept?*

	Nº Answers	%
Apprenticing	39	65
Initial vocational training (students)	26	43,33
Longlife learning (workers)	31	51,67
Total	**60**	**100**

7. To what extend will be implemented the "learning by doing" concept?

	Nº Answers	%
Regularly	42	70
Occasionally	14	23,33
Rarely	4	6,67
Never	0	-
Total	**60**	**100**

8. *To what extend do you agree with "learning by doing" concept / didactical method?*

	Nº Answers	%
Very much	48	78,69
Rather agree	13	21,31
Rather disagree	0	-
Very little	0	-
Total	**61**	**100**

If the concept is not familiar to you

9. *In your opinion, how successful would be the approach "learning by doing" in the vocational training?*

	Nº Answers	%
Very successful	6	66,67
Successful	3	33,33
Less successful	0	-
Not successful	0	-
Total	**9**	**100**

10. *In your opinion, how would the trainers/teachers receive the approach "learning by doing"?*

	Nº Answers	%
Positive	8	88,89
Tends to be critical	1	11,11
Opposed	0	-
Indifferent	0	-
Total	**9**	**100**

11. *In your opinion, how would the learners receive the approach "learning by doing"?*

	Nº Answers	%
Positive	7	87,50
Tends to be critical	1	12,50
Opposed	0	-
Indifferent	0	-
Total	**8**	**100**

12. *In your opinion, which aspects would be important in the approach "learning by doing", (please select)?*

Aspect	Very important		Less important		Not important	
All-around approach: learners recognise the value of the job	58	87,88	8	12,12	0	-
Different experiences, knowledge and skills could be applied	63	95,45	3	4,55	0	-
Social interaction: reciprocal support, overcoming difficulties, supporting the weaker ones	52	78,79	14	21,21	0	-
Independent work: assumption of responsibility	50	75,76	16	24,24	0	-
Development opportunities: competences will be further developed	41	62,12	23	34,85	2	3,03
Importance: added value for society and production	49	74,24	16	24,24	1	1,52
		%		%		%

13. Do you basically know about "Building Information Modelling (BIM)-concept?

	Nº Answers	%
Yes	40	59,70
No	27	40,30
Total	**66**	**100**

In case you know about the BIM-concept

14. *In which areas BIM is applied?*

	Nº Answers	%
New buildings	37	97,37
Old buildings renovation	26	68,42
Technical modernization	23	60,53
Facility management	26	68,42
Others	2	5,26
In architecture and civil engineering All of them		
Total	**37**	**100**

15. *Which target groups mainly work along BIM?*

	Nº Answers	%
Planner /Achitect	39	100
Entrepreneur	18	46,15
Site manager	26	66,67
Site supervisor	18	46,15
Facility supervisor	13	33,33
Others	2	5,13
*Geologists, topographers, and engineers. *Engineers.		
Total	**39**	**100**

16. *Which advantages for the construction branch do you see in BIM?*

	Nº Answers	%
Costs‘ advantages	24	61,54
Interconnectedness	33	84,62
Higher quality	28	71,79
Higher output	31	79,49
Better knowledge base	24	61,54
Others	2	5,13
*More coordination among steps (and staff) regarding construction, which means less mistakes and /or their detection early. This saves costs both in time and materials. *It allows to simulate with reality and with possible difficulties.		
Total	**38**	**100**

17. *Do construction staff and stakeholders accept BIM and how do they react on BIM?*

	Nº Answers	%
Positive	18	47,37
Rather critical	11	28,95
Refusing	1	2,63
Others	8	21,08
*The technical staff of the Project consider the model positively. *Many staff and stakeholders don’t know about BIM, some of them are reticent to change and refuse it. *It is soon to evaluate the impact of the model in the sector because the model is being implemented.		

*It is not known among some groups in the construction industry. *In general the evaluation is positive although some of the stakeholders refuse it and cling to the tradition.		
Total	**38**	**100**

Explain your option:

- BIM is in process of implementation and it is necessary it improves to be considered in a positive way. The learning curve and the initial decrease in productivity may be a barrier to its full implementation in the sector. The technical staff considers BIM very positive, but the rest of the stakeholders don't know it or they are indifferent.

- There is still insufficient culture or training on the model and there is much ignorance about the BIM model. The unknown is usually rejected and, in some cases BIM modeling is seen as a "fashion".

- In many cases, the rejection of BIM is due to the reluctance to apply new concepts and methodologies. Those who know the methodology and tools that BIM gives are aware that it is an advantage to work using the model and that they have to update to new methods if they don't want to become obsolete.

- The stakeholders in the sector don't apply BIM model in an effective way.

18. *How BIM is taught and diffused by you / in your organization?*

	Nº Answers	**%**
Initial training	3	7,39
Futher training courses	35	89,74
Academic studies	0	-
Others	1	2,56
Projects and courses		
Total	**39**	**100**

In case you do not know about BIM

19. *Do you know any plans to mandatory introduce digital and interconnected planning as a working method in your country?*

	Nº Answers	**%**
Yes	1	4,17
No	23	95,83
Total	**24**	**100**

20. *How are the management, coordination and interconnectedness of building processes currently assured in your country?*

* Technicians.
* Work inspection
* Coordination meetings.
*FLC and collective bargaining agreement of construction industry.
* Usually the company that assumes the building is responsible of whole process.

21. *How would be the building staff and stakeholders regard digital and interconnected working methods along your point of view?*

	Nº Answers	%
Positive	10	45,45
Rather critical	6	27,27
Refusing	0	-
Explain your option	6	27,27
*A lot of stakeholders would be rather critical because it is hard to change the way of working and it is like this in the case to have to use digital and interconnected methods. This implicates to learn and modify the "traditional and effective use" for knowing different methodologies, methods and tools. *It would be helpful to increase knowledge and perspectives in their jobs. *The most part of the workers in the construction industry are employees with large experience, and it is difficult for them to use new technologies. *Many workers in the sector lack the needed digital skills to use digital and interconnected working methods.		
Total	**22**	**100**

22. *Which aspects would be important along your point of view when introducing digital and interconnected working methods (please, set your marks)?*

Aspect	Very important		Less important		Not important	
Work with digital models	51	82,26	11	17,74	0	-
Digital calculation of quantities and costs	57	91,94	5	8,06	0	-
Digital planning and calls of bids	41	67,21	20	32,79	0	-
Cross-branch cooperation	53	85,48	9	14,52	0	-
Design of contracts and liability	35	57,38	25	40,98	1	1,64
Organisation for applying BIM	53	88,33	7	11,67	0	-

Data management and data safety	45	73,77	15	24,59	1	1,64
Quality and cost control	54	88,52	7	11,48	0	-
		%		%		%

Other aspects:

- Continuous digital training of all stakeholders working in the construction industry.

- Security in the data protection and in the productive process.

- Coordination between the involved actors in the productive process and the work to carry out.

- Good previous organization of the tasks to be carried out and appropriate distribution of tasks and responsibilities.

- Importance of security in works in the construction industry.

- Transparency in the management of the building site data and the changes carried out, and improvement of productivity.

- Feedback.

- Easy and quick communication, updated information.

- Minimization of errors and incoordination

- Try not to forget the craft and creative part of each specialty in construction industry

Output 1, activity 2 (O1A2) - *Structured interviews*

SLOVENIA 

Report on the survey results for Slovenia

1. **Country of residence :** Slovenia

2. **Gender:**

	Nº Answers	%
Male	5	27,8
Female	13	72,2
Total	**18**	100,0

3. Age group:

	Nº Answers	%
12-17 years	0	
18-24 years	0	
25-34 years	1	5,6
35-44 years	1	5,6
45-54 years	8	44,4
55-67 years	8	44,4
65-74 years	0	

4. Current status:

	Nº Answers	%
Apprentice		
Trainee		
Trainer	3	16,7
Working in VET	9	50,0
Trainer's coordinator and/or mobility coordinator	6	33,3
Total	18	100,0

Nº of years under above condition

	Nº Answers
< 1 years	0
1-5 years	2
5-10 years	3
10-15 years	3
15-20 years	3
> 20 years	7

Questionnaire action-oriented learning

5. Learning by doing is a holistic pedagogical concept in the vocational training in the construction sector. It is based on the didactical and function-logic sequence: informing – planning – deciding – executing - checking - assessing. Is the concept "Learning by doing" familiar to you?

	Nº Answers	%
Yes	18	100,00
No	0	0
Total	**100**	**100**

If the concept is familiar to you

6. *In which field will be applied the "learning by doing" concept?*

	Nº Answers	%
Apprenticing	10	55,5
Initial vocational training (students)	11	61,1
Longlife learning (workers)	5	28,0
Total	**18**	**100**

7. To what extend will be implemented the "learning by doing" concept?

	Nº Answers	%
Regularly	10	55,6
Occasionally	5	27,8
Rarely	1	5,6
Never	2	11,1
Total	**18**	**100**

8. *To what extend do you agree with "learning by doing" concept / didactical method?*

	Nº Answers	%
Very much	6	33,3
Rather agree	7	38,9
Rather disagree	3	16,7
Very little	2	11,1
Total	**18**	**100**

If the concept is not familiar to you

9. *In your opinion, how successful would be the approach "learning by doing" in the vocational training?*

Nobody answered this!

	Nº Answers	%
Very successful		
Successful		
Less successful		
Not successful		
Total		

10. *In your opinion, how would the trainers/teachers receive the approach "learning by doing"?*

Nobody answered this!

	Nº Answers	%
Positive		
Tends to be critical		
Opposed		
Indifferent		
Total		

11. *In your opinion, how would the learners receive the approach "learning by doing"?*

Nobody answered this!

	Nº Answers	%
Positive		
Tends to be critical		
Opposed		
Indifferent		
Total		

12. *In your opinion, which aspects would be important in the approach "learning by doing", (please select)?*

Aspect	Very important		Less important		Not important	
All-around approach: learners recognise the value of the job	14	77,8	2	11,1		
Different experiences, knowledge and skills could be applied	12	66,7	4	22,2		
Social interaction: reciprocal support, overcoming difficulties, supporting the weaker ones	12	66,7	4	22,2		
Independent work: assumption of responsibility	14	77,8	2	11,1		
Development opportunities: competences will be further developed	13	72,2	3	16,7		
Importance: added value for society and production	12	66,7	4	22,2		
		%		%		%

13. Do you basically know about "Building Information Modelling (BIM)-concept?

	Nº Answers	%
Yes	7	43,75
No	9	56,25
Total	**16**	**100**

In case you know about the BIM-concept

14. *In which areas BIM is applied?*

	Nº Answers	%
New buildings	6	42,86
Old buildings renovation	1	7,14
Technical modernization	3	21,43
Facility management	3	21,43
Others	1	7,14
• According to information from the BIM technology companies in Slovenia it does not operate in full		
Total	**14**	

15. *Which target groups mainly work along BIM?*

	Nº Answers	%
Planner /Achitect	6	33,3
Entrepreneur	1	5,6
Site manager	5	27,8
Site supervisor	5	27,8
Facility supervisor	2	11,1
Others	1	5,6
• All of the above should be and in the future can be worked for new buildings in the future.		
Total	**20**	

16. *Which advantages for the construction branch do you see in BIM?*

	Nº Answers	%
Costs‘ advantages	2	11,1
Interconnectedness	6	33,3
Higher quality	2	1,4
Higher output	1	5,6
Better knowledge base	2	11,1
Others	1	2,6
• Raising the quality of the technical documentation, a more accurate definition of content		
Total	**14**	

17. *Do construction staff and stakeholders accept BIM and how do they react on BIM?*

	Nº Answers	%
Positive	2	11,1
Rather critical	4	22,2
Refusing		
Others	12	66,7
Total	**18**	**100**

Explain your option:

• BIM is a good thing, and coming in the construction of the engineering industry, where requirements regarding quality and accurate documentation are much higher than in construction. We note as many times with new IT applications promote excessive expectations. BIM is not called and does not solve the problem performance, selection of optimal technologies to achieve the best possible approximation of planned building
• They do not know enough
• Learn about the importance of end-use facility

• Technology respectively. Computer programs are too expensive for small design bureau in computer processing projects is still a lot of errors in each building additional annexes due to unforeseen part - Annexes

18. *How BIM is taught and diffused by you / in your organization?*

	Nº Answers	%
Initial training	2	11,1
Futher training courses	3	16,7
Academic studies	1	5,6
Others	12	66,7
• We support the work of associated institutions and associations for BIM. • Bad.		
Total	**18**	**100**

In case you do not know about BIM

19. *Do you know any plans to mandatory introduce digital and interconnected planning as a working method in your country?*

	Nº Answers	%
Yes	1	5,6
No	6	33,33
Total	**7**	

20. *How are the management, coordination and interconnectedness of building processes currently assured in your country?*

- I do not know
- Only on limited fields of work
- bad
- probably bad

21. *How would be the building staff and stakeholders regard digital and interconnected working methods along your point of view?*

	Nº Answers	%
Positive	3	16,7
Rather critical	3	16,7
Refusing	1	5,6
Explain your option		
***no opinion**		
Total	**7**	**38,9**

22. *Which aspects would be important along your point of view when introducing digital and interconnected working methods (please, set your marks)?*

Aspect	Very important		Less important		Not important	
Work with digital models	7	38,9	4	22,2	1	5,6
Digital calculation of quantities and costs	10	55,6	2	11,1		
Digital planning and calls of bids	10	55,6	2	11,1		
Cross-branch cooperation	7	38,9	5	27,8		
Design of contracts and liability	8		4			
Organisation for applying BIM	7	38,9	4	22,2		
Data management and data safety	8	44,4	4	22,4		
Quality and cost control	9	50	3	16,7		
		%		%		%

Other aspects:

- The problem of the high cost of equipment, staff training, limited access for SMEs, to identify areas where the effects of the use of high and areas where little or no data.

Output 1, activity 2 (O1A2) - *Structured interviews*

NETHERLANDS

Report on the survey results for the Netherlands

1. Country of residence : NETHERLANDS

2. Gender:

	Nº Answers	%
Male	16	94,1
Female	1	5,9
Total	**17**	**100**

3. Age group:

	Nº Answers	%
12-17 years	4	23,5
18-24 years	7	41,2
25-34 years	4	23,5
35-44 years	1	5,9
45-54 years	0	-
55-67 years	1	5,9
65-74 years	0	-

4. Current status:

	Nº Answers	%
Apprentice	5	29,4
Trainee	7	41,2
Trainer	4	23,5
Working in VET	1	5,9
Trainer's coordinator and/or mobility coordinator	0	-
Total	17	100

Nº of years under above condition

	Nº Answers
< 1 years	1
1-5 years	11
5-10 years	4
10-15 years	1
15-20 years	0
> 20 years	0

Questionnaire action-oriented learning

5. Learning by doing is a holistic pedagogical concept in the vocational training in the construction sector. It is based on the didactical and function-logic sequence: informing – planning – deciding – executing - checking - assessing. Is the concept "Learning by doing" familiar to you?

	Nº Answers	%
Yes	17	100
No	0	-
Total	**17**	**100**

If the concept is familiar to you

6. *In which field will be applied the "learning by doing" concept?*

	Nº Answers	%
Apprenticing	13	76,5
Initial vocational training (students)	4	23,5
Longlife learning (workers)	0	-
Total	**17**	**100**

7. To what extend will be implemented the "learning by doing" concept?

	Nº Answers	%
Regularly	14	82,4
Occasionally	2	11,8
Rarely	1	5,9
Never	0	-
Total	**17**	**100**

8. *To what extend do you agree with "learning by doing" concept / didactical method?*

	Nº Answers	%
Very much	11	64,7
Rather agree	13	35,3
Rather disagree	0	-
Very little	0	-
Total	**17**	**100**

If the concept is not familiar to you

9. *In your opinion, how successful would be the approach "learning by doing" in the vocational training?*

	Nº Answers	%
Very successful	17	100
Successful	0	0
Less successful	0	-
Not successful	0	-
Total	**17**	**100**

10. *In your opinion, how would the trainers/teachers receive the approach "learning by doing"?*

	Nº Answers	%
Positive	17	100
Tends to be critical	0	-
Opposed	0	-
Indifferent	0	-
Total	**17**	**100**

11. *In your opinion, how would the learners receive the approach "learning by doing"?*

	Nº Answers	%
Positive	17	100
Tends to be critical	o	-
Opposed	0	-
Indifferent	0	-
Total	**17**	**100**

12. *In your opinion, which aspects would be important in the approach "learning by doing", (please select)?*

Aspect	Very important		Less important		Not important	
All-around approach: learners recognise the value of the job	13	76,5	2	11,8	2	11,8
Different experiences, knowledge and skills could be applied	12	70,6	3	17,6	2	11,8
Social interaction: reciprocal support, overcoming difficulties, supporting the weaker ones	13	76,5	2	11,8	2	11,8
Independent work: assumption of responsibility	10	58,8	5	29,4	2	11,8
Development opportunities: competences will be further developed	13	76,5	2	11,8	2	11,8
Importance: added value for society and production	6	52,9	9	35,3	2	11,8
		%		%		%

13. Do you basically know about "Building Information Modelling (BIM)-concept?

	Nº Answers	%
Yes	6	35,3
No	10	58,8
No answer	1	5,9
Total	**17**	**100**

In case you know about the BIM-concept

14. *In which areas BIM is applied?*

	Nº Answers	%
New buildings	5	100
Old buildings renovation	2	40
Technical modernization	1	20
Facility management	1	20
Others	0	0
In architecture and civil engineering All of them		
Total	**9**	**100**

15. *Which target groups mainly work along BIM?*

	Nº Answers	%
Planner /Achitect	5	100
Entrepreneur	4	80
Site manager	1	20
Site supervisor	1	20
Facility supervisor	2	40
Others	0	0
*Geologists, topographers, and engineers. *Engineers.		
Total	**13**	**100**

16. *Which advantages for the construction branch do you see in BIM?*

	Nº Answers	%
Costs‘ advantages	5	100
Interconnectedness	3	60
Higher quality	5	100
Higher output	5	100
Better knowledge base	1	20
Others	0	0
*More coordination among steps (and staff) regarding construction, which means less mistakes and /or their detection early. This saves costs both in time and materials. *It allows to simulate with reality and with possible difficulties.		
Total	**19**	**100**

17. *Do construction staff and stakeholders accept BIM and how do they react on BIM?*

	Nº Answers	%
Positive	3	75
Rather critical	1	25
Refusing	0	-
Others	0	0
*Reduce costs of failing *They find it useful.		
Total	**4**	**100**

Explain your option:

- BIM is in process of implementation and it is necessary it improves to be considered in a positive way. The learning curve and the initial decrease in productivity may be a barrier to its full implementation in the sector. The technical staff considers BIM very positive, but the rest of the stakeholders don't know it or they are indifferent.

- There is still insufficient culture or training on the model and there is much ignorance about the BIM model. The unknown is usually rejected and, in some cases BIM modeling is seen as a "fashion".

- In many cases, the rejection of BIM is due to the reluctance to apply new concepts and methodologies. Those who know the methodology and tools that BIM gives are aware that it is an advantage to work using the model and that they have to update to new methods if they don't want to become obsolete.

- The stakeholders in the sector don't apply BIM model in an effective way.

18. *How BIM is taught and diffused by you / in your organization?*

	Nº Answers	%
Initial training	3	60
Futher training courses	0	-
Academic studies	0	-
Others	2	40
Projects and courses		
Total	**5**	**100**

In case you do not know about BIM

19. *Do you know any plans to mandatory introduce digital and interconnected planning as a working method in your country?*

	Nº Answers	%
Yes	0	-
No	7	100
Total	**7**	**100**

20. *How are the management, coordination and interconnectedness of building processes currently assured in your country?*

* Pen and paper
* Technical drawing

Note: most of them have no idea.

21. ***How would be the building staff and stakeholders regard digital and interconnected working methods along your point of view?***

	Nº Answers	%
Positive	2	28,57
Rather critical	1	14,29
Refusing	1	14,29
Explain your option	3	42,86
*Positive and negative. Will be difficult for the older generation.		
Total	**7**	**100**

22. ***Which aspects would be important along your point of view when introducing digital and interconnected working methods (please, set your marks)?***

Aspect	Very important		Less important		Not important	
Work with digital models	9	75	2	16,67	1	8,33
11	11	91,67	1	8,33	0	-
Digital planning and calls of bids	6	50	6	50	0	-
Cross-branch cooperation	7	58,33	5	41,67	0	-
Design of contracts and liability	4	33,33	8	66,67	0	-
Organisation for applying BIM	10	83,33	1	8,33	1	8,33
Data management and data safety	7	58,33	5	41,67	0	-
Quality and cost control	10	83,33	2	16,67	0	-
		%		%		%

Other aspects:

- Reduce cost of failure.

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Output 1, activity 2 (O1A2) - *Structured interviews*

ITALY

Report on the survey results for Italy

1. **Country of residence :** ITALY

2. **Gender**:

	Nº Answers	%
Male	49	96,07
Female	2	3,92
Total	**51**	**100**

3. **Age group**:

	Nº Answers	%
12-17 years	27	52,94
18-24 years	9	17,64
25-34 years	3	5,88
35-44 years	2	3,92
45-54 years	9	17,64
55-67 years	1	1,96
65-74 years	0	0,000
Total	**51**	**100**

4. Current status:

	Nº Answers	%
Apprentice	0	0,00
Trainee	36	70,58
Trainer	11	21,56
Working in VET	4	7,84
Trainer's coordinator and/or mobility coordinator	0	0,00
Total	**51**	**100**

Nº of years under above condition

	Nº Answers
< 1 years	0
1-5 years	1
5-10 years	10
11-15 years	23
16-20 years	1
> 20 years	2
NO ANSWER	14

Questionnaire action-oriented learning

5. Learning by doing is a holistic pedagogical concept in the vocational training in the construction sector. It is based on the didactical and function-logic sequence: informing – planning – deciding – executing - checking - assessing. Is the concept "Learning by doing" familiar to you?

	Nº Answers	%
Yes	49	96,08
No	2	3,92
Total	**51**	**100**

If the concept is familiar to you

6. *In which field will be applied the "learning by doing" concept?*

	Nº Answers	%
Apprenticing	6	12,50
Initial vocational training (students)	42	87,50
Longlife learning (workers)	8	16,67
Total	**56**	**100**

7. *To what extend will be implemented the "learning by doing" concept?*

	Nº Answers	%
Regularly	24	48,98
Occasionally	23	46,94
Rarely	2	4,08
Never	0	0
Total	**49**	**100**

8. *To what extend do you agree with "learning by doing" concept / didactical method?*

	Nº Answers	%
Very much	33	67,35
Rather agree	16	32,65
Rather disagree	0	0
Very little	0	0
Total	**49**	**100**

If the concept is not familiar to you

9. *In your opinion, how successful would be the approach "learning by doing" in the vocational training?*

	Nº Answers	%
Very successful	0	0
Successful	2	100
Less successful	0	0
Not successful	0	0
Total	**2**	**100**

10. *In your opinion, how would the trainers/teachers receive the approach "learning by doing"?*

	Nº Answers	%
Positive	2	100
Tends to be critical	0	0
Opposed	0	0
Indifferent	0	0
Total	**2**	**100**

11. *In your opinion, how would the learners receive the approach "learning by doing"?*

	Nº Answers	%
Positive	1	50
Tends to be critical	0	0
Opposed	0	0
Indifferent	1	50
Total	**2**	**100**

12. ***In your opinion, which aspects would be important in the approach "learning by doing", (please select)?***

Aspect	Very important		Less important		Not important	
All-around approach: learners recognise the value of the job	44	89,90	4	8,16	1	2,04
Different experiences, knowledge and skills could be applied	47	95,92	2	4,08	0	0
Social interaction: reciprocal support, overcoming difficulties, supporting the weaker ones	43	91,49	4	8,51	0	0
Independent work: assumption of responsibility	43	91,49	4	8,51	0	0
Development opportunities: competences will be further developed	45	95,74	2	4,26	0	0
Importance: added value for society and production	42	89,36	5	10,64	0	0
		%		%		%

13. Do you basically know about "Building Information Modelling (BIM)-concept?

	Nº Answers	%
Yes	26	53,06
No	23	46,94
Total	**49**	**100**

In case you know about the BIM-concept

14. ***In which areas BIM is applied?***

	Nº Answers	%
New buildings	18	81,82
Old buildings renovation	9	40,91
Technical modernization	11	50
Facility management	8	36,36
Others	0	0
Total	**22**	**100**

15. *Which target groups mainly work along BIM?*

	Nº Answers	%
Planner /Achitect	22	95.65
Entrepreneur	10	43,48
Site manager	9	39,13
Site supervisor	7	30,43
Facility supervisor	12	52,17
Others	0	0
Total	**23**	**100**

16. *Which advantages for the construction branch do you see in BIM?*

	Nº Answers	%
Costs‘ advantages	10	43,48
Interconnectedness	20	86,96
Higher quality	13	56,52
Higher output	9	39,13
Better knowledge base	11	47,83
Others	0	0
Total	**23**	**100**

17. *Do construction staff and stakeholders accept BIM and how do they react on BIM?*

	Nº Answers	%
Positive	17	73,91
Rather critical	5	21,74
Refusing	0	0
Others (I don’t know)	1	4,35
Total	**23**	**100**

Explain your option:

RATHER CRITICAL:

- Workers are sceptical towards new systems
- BIM requires several multidisciplinary competences

POSITIVE

- Optimizes workload and quality of final result
- Helpful for coordinating the different work phases

18. *How BIM is taught and diffused by you / in your organization?*

	Nº Answers	%
Initial training	9	39,13
Futher training courses	11	47,83
Academic studies	2	8,70
Others	1	4,35
Projects		
Total	**23**	**100**

In case you do not know about BIM

19. *Do you know any plans to mandatory introduce digital and interconnected planning as a working method in your country?*

	Nº Answers	%
Yes	16	80
No	4	20
Total	**20**	**100**

20. *How are the management, coordination and interconnectedness of building processes currently assured in your country?*

- architect/engineer + project manager

21. *How would be the building staff and stakeholders regard digital and interconnected working methods along your point of view?*

	Nº Answers	%
Positive	7	38,99
Rather critical	11	61,11
Refusing	0	0
Total	**18**	**100**

22. *Which aspects would be important along your point of view when introducing digital and interconnected working methods (please, set your marks)?*

Aspect	Very important		Less important		Not important	
Work with digital models	29	70,73	12	29.275	0	
Digital calculation of quantities and costs	38	95	2	0	0	
Digital planning and calls of bids	40	100	0	0	0	
Cross-branch cooperation	40	100	0	0	0	
Design of contracts and liability	31	79,49	8	20.51	0	
Organisation for applying BIM	36	90	4	10	0	
Data management and data safety	34	87,18	5	12.82	0	
Quality and cost control	37	92,5	3	7.5	0	

		%		%		%

Other aspects:

- Useful for information exchange
- It's important to train people properly