



**„Work-based training approach in the field of Industry 4.0 for
competitive European Industry”**

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

**State-of-the-art analysis on the knowledge &
skills gaps on the topic of Industry 4.0 and the
requirements for WBL (Output 1)**



This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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I. Introduction

This document is created as part of Intellectual output 1 which is aimed to set the basis for elaboration of the INDUCE 4.0 training course (O2) and the INDUCE 4.0 Practical methodology for WBL (O3) in accordance with the target groups' needs as well as to provide basis for forming recommendations for evidence-based policy in the field of WBL.

The purpose of this report is to describe and analyse the findings of the target group survey and review of legislation framework in the field of WBL, conducted in 6 European countries including: RO, PL, PT, DE, BG and CY.

The State-of-the-art analysis on the knowledge & skills gaps on the topic of Industry 4.0 and the requirements for WBL consists of the following:

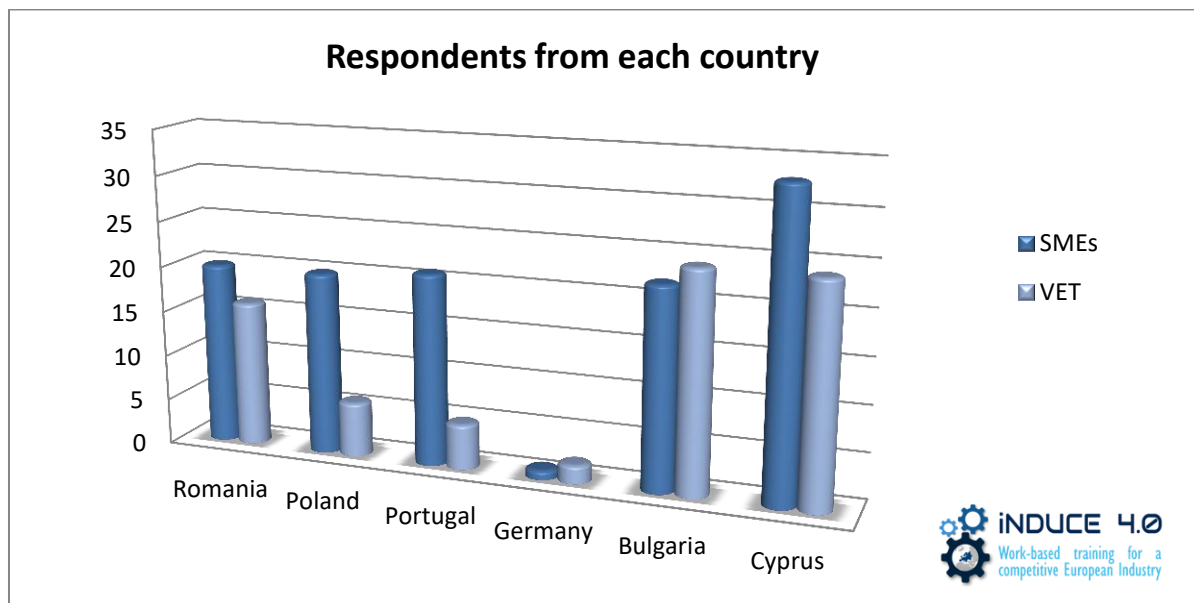
- 1) Results from a large-scale survey conducted among two target groups - manufacturing SMEs and VET providers/trainers/consultants from 6 countries
- 2) Cross-sectional analysis of the viewpoints of manufacturing SMEs representatives vs. VET providers
- 3) Review of legislation framework in the field of WBL, apprenticeship in partner countries and comparative analysis between formal regulations
- 4) Policy recommendations section for performing of evidence-based policy in the field of WBL
- 5) Annexed individual country reports.

II. Results from a large-scale survey conducted among two target groups - manufacturing SMEs and VET providers/trainers/consultants from 6 countries

The target group survey is focused in 2 main directions: defining the knowledge and skills gaps in the field of Industry 4.0 and defining the main hardships in organizing work-based trainings according to manufacturing SMEs and VET providers. The surveys among the two target groups – manufacturing SMEs and VET providers/ trainers/ consultants were conducted in the 6 partner countries (Romania, Poland, Portugal, Germany, Bulgaria, Cyprus) in the period November 2017 – January 2018.

Each partner performed the surveys via chosen communication means – via email, phone, electronic software (e.g Google docs, SurveyMonkey, LimeSurvey, etc) or face-to-face meetings. The targeted types of respondents from SMEs were Managers of manufacturing SMEs; Heads of departments (production, logistics, etc.) in manufacturing SMEs; employees from human resource departments, other relevant staff and for VETs they were trainers, consultants, Training developers; Mentors; other relevant staff of VET organisations. The total numbers of respondents reached are **117 SMEs** and **77 VET providers** as shown in figure 1. After conducting the survey Partners prepared country analysis reports outlining the main findings and conclusions of both surveys on national level which are annexed to this report.

Fig.1



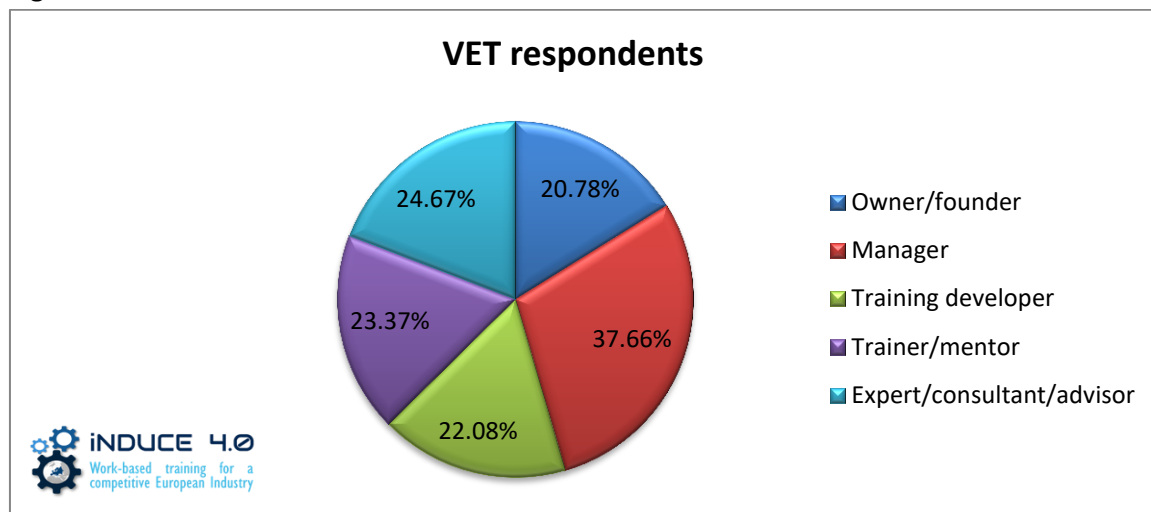
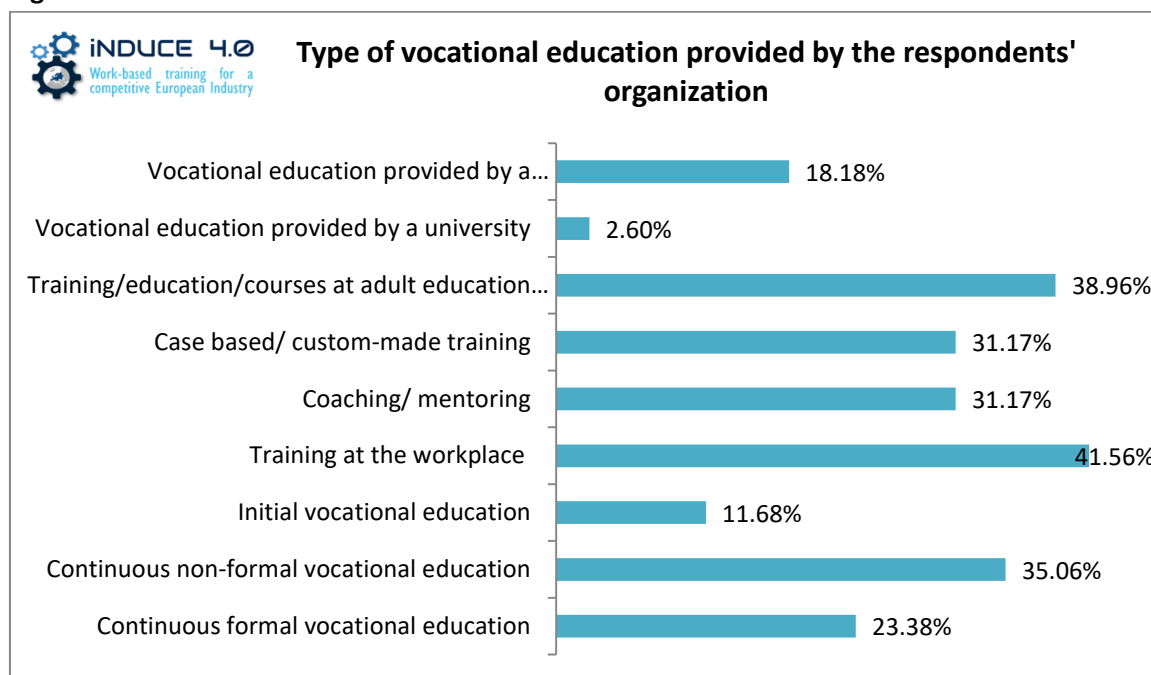
As it is visible from Fig.1 the representatives from SMEs were more responsive to the survey than the VETs except for Bulgaria where VETs responses are more. This might be due to the fact that SMEs are more interested by the project topic. Responses received in Germany are less compared to other countries however they come from big umbrella organisations representing Those two enterprises (VET and social service institutions) operating in more than 1.150 locations all over Germany with numerous VET centres and employing 23.500 people.

III. Cross-sectional analysis of the viewpoints of manufacturing SMEs representatives vs. VET providers

1. SECTION I: Identification of respondents

A. VET providers

As it is visible on Figure 2. the majority of the respondents from VET providing organisations are managers (37,66%) , followed by expert/consultant/advisor (24,67%), and trainers and mentor (23,37%).

Fig.2

Fig.3


According to Fig. 3 the vast majority of the VET respondent provide training at the workplace (41,56%), followed by VET providing training at adult education centers (38,96%) or continuous non-formal education (35,06%). These results indicate that the majority of VET respondents deal with WBL and therefore their feedback could be very useful.

B. SMEs

The vast majority of respondents from SMEs are managers, office-workers and department managers. Respondents were representatives from different industries mainly Machinery; Metalworking; Electronics; Electrical engineering, which are all industries on which Industry 4.0 will have significant impact.

Fig 4.

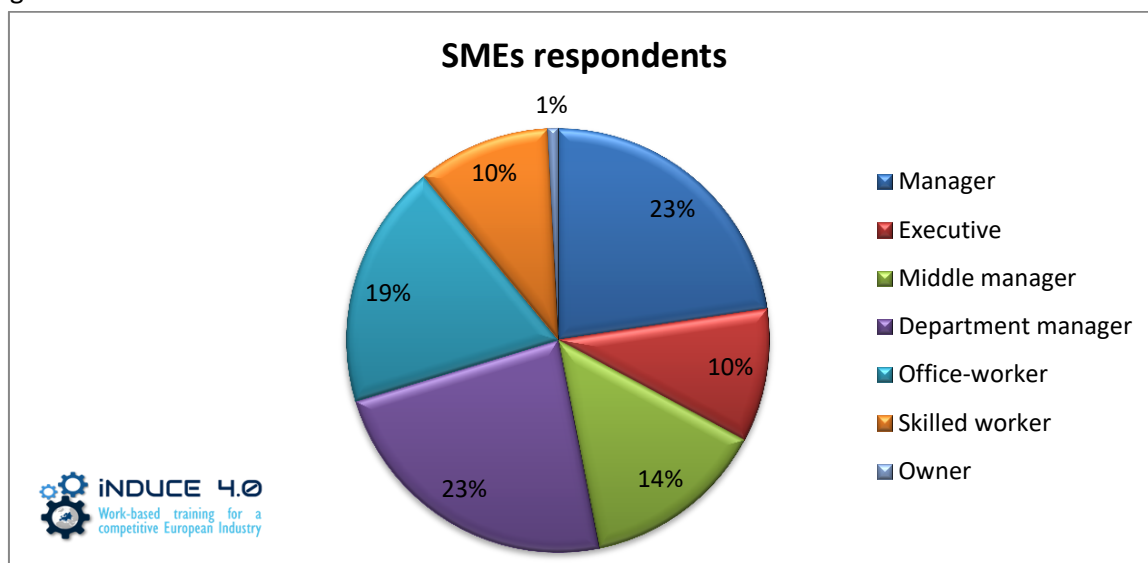
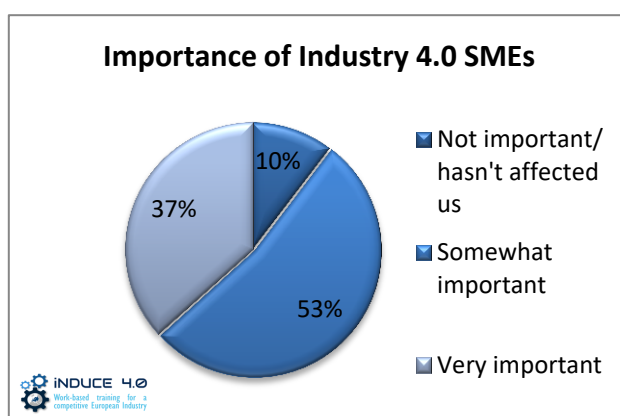


Fig.5.



More than half of SMEs surveyed in partner countries realize the importance of changes arising from Industry 4.0 as they have pointed it is somewhat important. More than 1/3 say it's very important to their operations and only 10% (11 out of 117 SMEs) deem it unimportant. These results indicate interest towards the topic and awareness on the fact that it is important to be in line with the changes arising from Industry 4.0.

2. SECTION II: Industry 4.0 skills and knowledge gaps

For most of the participants in the survey from both representative groups, the concept of industry 4.0 is well known, as in Bulgaria alone the majority of respondents from SMEs and VET declare that they are not familiar with the concept and in Germany neither consider their staff to be familiar with the concept of Industry 4.0 (VETs/SMEs) nor see themselves acquainted with it (SMEs).

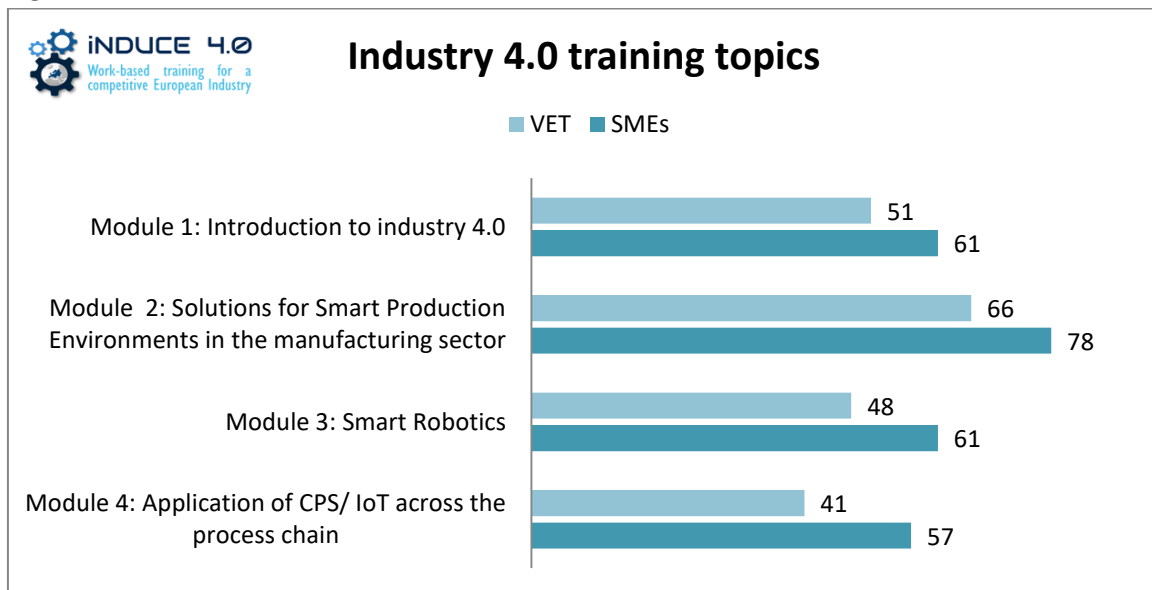
Also it is noteworthy that representatives of **SMEs are more familiar with the idea of Industry 4.0 in comparison with the VET** providers which may be due to the fact that they are directly affected. This indicates that partners should disseminate the project objectives and results more to VET providing organisations in order to raise their awareness on the topic and its importance.

From the results of the research of all partners, it is clear that the majority of respondents consider staff in their enterprise isn't familiar with the concept of *Industry 4.0*. Meanwhile for the majority of SMEs representatives Industry 4.0 and changes arising from it are important to them (see fig. 5).

Taking into account the above mentioned and the fact that most of the participants are in managerial positions and fewer are employees or administrative personnel it indicates that since the trend is still new so far Industry 4.0 has affected only partially the organizations, mainly the management sector. Furthermore we can presume that available knowledge of the industry is due to self-interest and self-awareness rather than corporate organization and management who are acquainted with the concept of the Industry understand its importance but doesn't take action to introduce it to its employees which presumably could be due to lack of resources or of access to proper education.

Following the logic of the above-presented results, which show a low level of awareness of the subject at company level, it is not surprising that all suggested modules prove to be of high interest for both target groups which indicates that a **comprehensive package of training materials will be highly appreciated**. Though, as visible on Fig.6, Module 1 “Introduction to Industry 4.0” and Module 2 “Solutions for smart production environments in the manufacturing sector” are seen to be the most necessary ones.

Fig. 6



The interest in the subject of Industry 4.0 is additionally proven by some relevant suggestions for additional topics to be addressed by the INDUCE 4.0 training course which might be integrated as part of the listed modules or to be developed as additional modules.

Suggested modules from VETs are:

- Digitization of the training and training of the personnel in the industry;
- Organization of processes in digital environment;
- Security and protection of cyber-physical systems, including legal base;
- Encoding language.

Suggested modules from SMEs are:

- Applied cooperation between clusters and scientific thought;
- Competitiveness, Trade and Development of SMEs.

With regard to the necessary skills for successful implementation of Industry 4.0 it is difficult to identify common to all participating countries ones, most likely because the skills required depend to a large extent on the industry in which a company operates. However, we may point out some skills that stand out among the responses of SMEs representatives like **Technical skills, Complex problem solving, Cognitive analytics and System skills.**

On the other hand, VET providers mainly have chosen **Complex Problem Solving Skills and Technical skills**, which prove to be the crossing point between the two target groups. Some of the other more chosen answers are **Content skills, Systems skills and Resource management.**

It is interesting that SMEs and VET providers have different view on the importance of skills. Only in Cyprus for example respondents point out System Skills' with percentage of 51.52% for SMEs and 70.83% for VETs, but in the meantime both groups claim that everyone lack this skill. **This data confirms the need for this study in order to align the needs of companies and training offered.**

As regard to the skills people lack most of them coincide with those listed as the most important. What makes impression is that in both questions the answers are quite varied and the choice of participants is numerous which indicates that **only one or two skills are not enough when it comes to Industry 4.0 but a set of skills is needed.** Partnership should take this into account when developing the Induce 4.0 project training materials and try to target as many skills as possible.

In order to acquire the missing skills, the participants in the study had to indicate their preferred way of learning. As the question was open-ended, the respondents gave a variety of answers, some focusing on the course theme, others on methods of teaching and learning.

However, it can be concluded that SMEs representatives prefer **practical training connected with the workplace and the profession, on the job training based on real-time examples and case-studies on the workplace including in-house training, onsite learning online courses, work-based learning.**

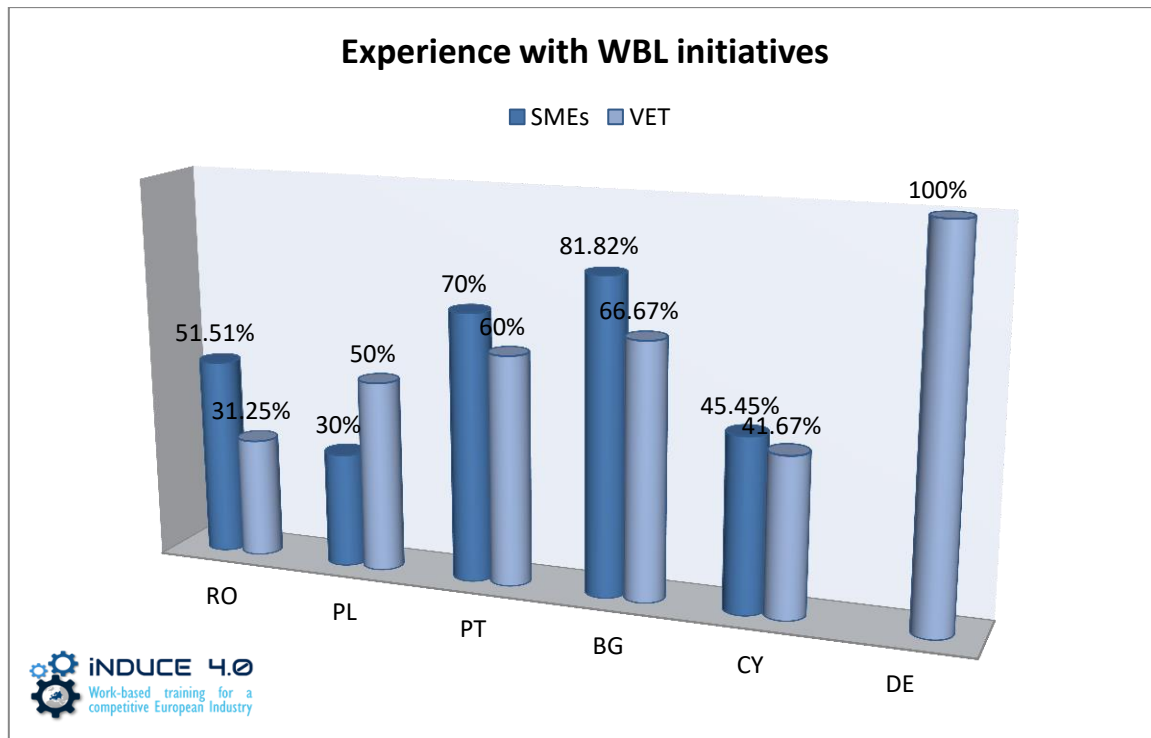
Regarding VET providers, they unite around idea of practical training and onsite training. Referring to the results one may conclude, that **practice-focused training is preferred with the option to be tailored to a different ways of teaching such as on the workplace training, blended learning, online courses.**

3. SECTION III: Experience with Work-based learning

In almost all countries (except for Poland and Germany) participating in the survey SMEs are more experienced in WBL initiatives than VETs and only in half of countries the experienced respondents are more than the unexperienced ones. The most common kind of experience in both target groups

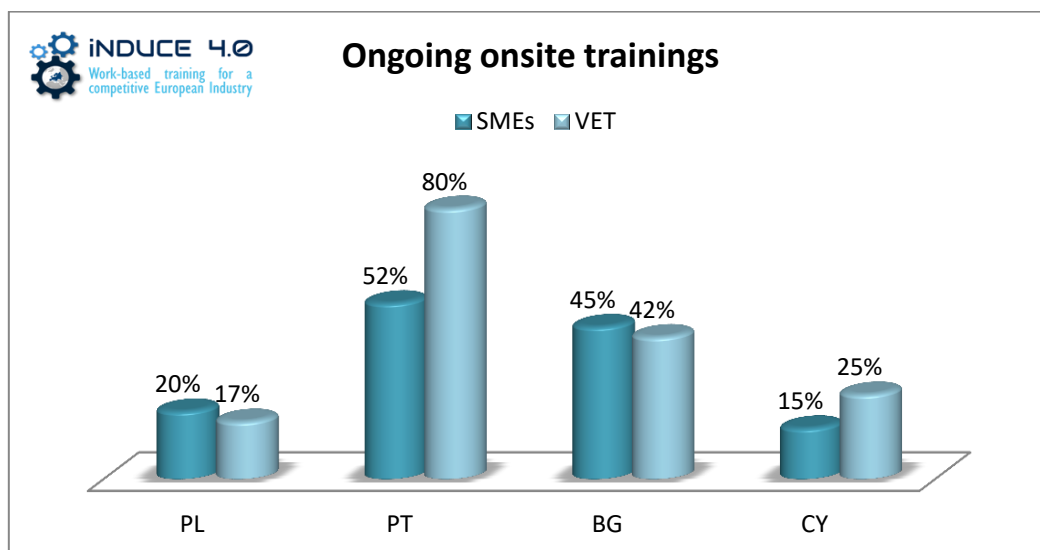
are internships followed by apprenticeships for SMEs and training and consulting services for VET providers.

Fig.7



In fact, it is noticeable that in each country the rates between SMEs and VET providers with experience with WBL activities are almost the same which indicates that there might be a correlation between activities of VET and SMEs. The same is valid for VET providers offering on the workplace /onsite training programmes to business and SMEs having onsite training programmes implemented within their organization. For example in Bulgaria “10 out of 24 VET providers have stated that they offer on the workplace /onsite training programmes to business and 10 out of 22 SMEs have confirmed they have onsite training programmes implemented within their organization”.

Fig.8



Only few of the participating VET organisations that provide onsite training programmes to companies offer any training related to Industry 4.0. One reason for this might be the fact that the topic is still new and VETs haven't managed to develop courses already and they themselves are not familiar enough with the matter. Other reasons for the lack of offering stated by VETs are lack of information resources, low demand / interest in educational service, reluctance of employers and employees.

In comparison, SMEs stated out as obstacles in applying WBL programmes for new employees/ students lack of time and resources, lack of theoretical materials to combine with practical elements, legal regulations.

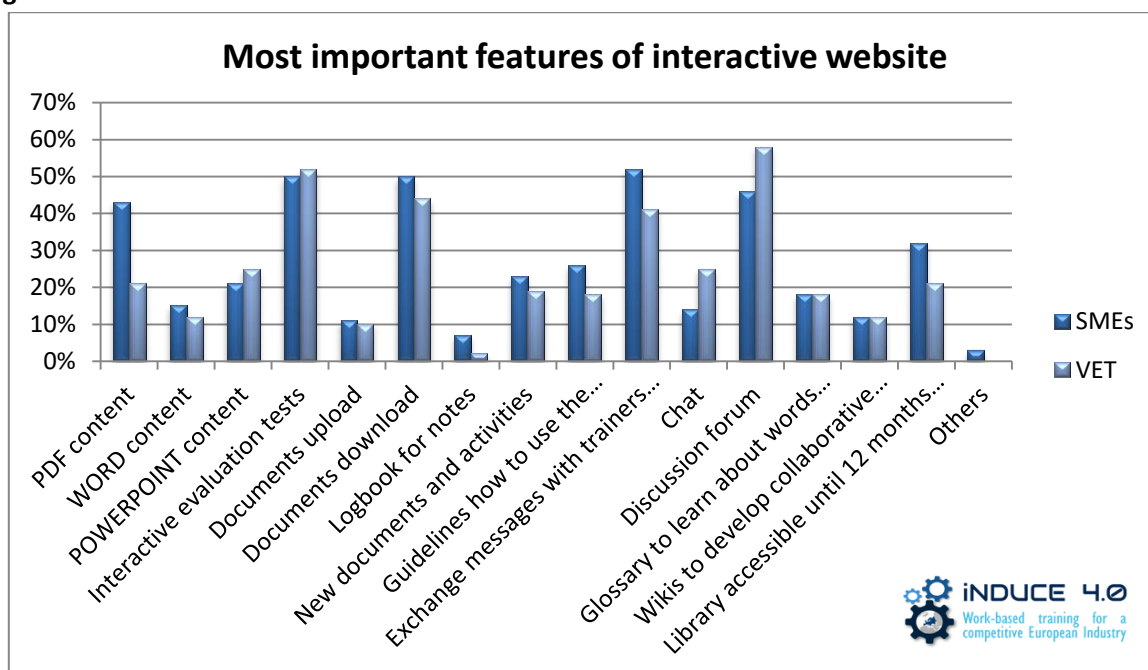
The level of awareness on the topic combined with the lack of information resources and theoretical and practical materials pointed by SMEs and VETs as obstacle towards organizing WBL confirms the importance of the project and the need of such training materials and courses as intended to be developed.

4. SECTION IV: Preferences and training needs

As visible from fig. 9 SMEs and VET providers have similar preferences according to the technological solutions/functions in an interactive educational website. **The most valuable ones for both target groups are: interactive evaluation tests, possibility to download files and exchange messages with trainers and colleague trainees, discussion forum.** For SMEs the PDF content is also somewhat important as well as library accessible until 12 months after concluding the training course. VETs will also value to have PowerPoint content, chat and library.

Therefore, these functionalities should be taken into account when planning the educational portal where the INDUCE 4.0 training course will be available to users. Partners should discuss the feasibility of implementing the most favoured features.

Fig.9



As regards the best proportion of theory and practical on the job training when organizing WBL in the field of Industry 4.0 results prove that **both SMEs and VET providers consider that practice should be more than theory** with the majority of answers stating 30/70 theory against practice. Still there are also a significant number of responses that state equal proportions are preferred. In order to satisfy the needs and expectations of target groups INDUCE 4.0 deliverables should be both practical and theoretically orientated in order to allow trainees to choose the best option for them and thus be usable by more people.

5. Conclusion

Based on the results from the researches carried out in all partners' countries, the following key points concerning the elaboration of the INDUCE 4.0 training course (O2) and the INDUCE 4.0 Practical methodology for WBL (O3) could be defined:

- The topic of Industry 4.0 is considered important but there is a low level of awareness of the subject at company level. What is more SMEs are better acquainted with the industry concept than VET providers' representatives.
- A comprehensive package of training materials will be highly appreciated with focus put on Module 1 "Introduction to Industry 4.0" and Module 2 "Solutions for smart production environments in the manufacturing sector". During development of the course it should be taken into account the additional modules suggested by participants in the survey.
- Only one or two skills are not enough when it comes to Industry 4.0 but a set of skills is needed. Induce 4.0 Methodology should address as many skills as possible with focus on Complex Problem Solving Skills , Technical skills and Systems skills.
- Induce 4.0 training course should be more practice-focused with the option to be tailored to a different ways of teaching such as on the workplace training, blended learning, online courses.
- Both SMEs and VET providers consider that practice should be more than theory (70%/30%). Although in order to be usable by more people the needs and satisfy expectations of all representatives of the target groups INDUCE 4.0 deliverables should be both practical and theoretically orientated in order to allow trainees to choose the best option for them and thus be usable by more people.
- The educational portal on which the INDUCE 4.0 course and methodology will be available should have interactive evaluation tests, option to download files and exchange messages with trainers and colleague trainees, discussion forum.

IV. Review of legislation framework in the field of WBL, apprenticeship in partner countries and comparative analysis between formal regulations

The review of legislation on national level seeks to identify the policies and the legal framework set (or lack of such) in the field of WBL in partner countries and thus define policy recommendations in the field of WBL. Subject of the research were the following topics:

- ***How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject?***
- ***Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)?***
- ***Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc....)? If yes, how does it differ from the standard labour legislation?***
- ***Are there specific tax laws in favor of companies engaged in WBL initiatives, dual education? If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?***

Results from the legislation review show that situations in all partner countries are very similar. It turns out that WBL is regulated mainly as a cross-section subject and specific legislation in that field is rare. Romania proves to be the only country with a special law on apprenticeship and in Bulgaria dual training/ WBL is regulated both by specific legislation and as a cross-section subject.

In most partner countries there are no public registers for companies authorized to participate in WBL initiatives which comes as a normal consequence of the fact that every company can participate in WBL initiatives and no specific requirements should be met. In Germany as the most experienced country in the consortium in dual education all companies (VETs, SMEs or large enterprises) which would like to participate in the dual vocational training programme have to meet the legal requirements and have to be registered at either of the chambers or at the Regional Administrative Authority. And in Bulgaria alone a special permission is needed for companies to employ individuals under 18 though there is no register where such companies are listed.

Country results show that there is no practice such as to imply specific tax laws in favor of companies engaged in WBL initiatives and no special tax reductions. The incentives that employers receive to provide practical learning to students include tax-deduction or reimbursement of costs such as fees, equipment, materials, travel, accommodation, meals. Other funding options are available under European funds or other programmes.

As a result of the Review of the legislation framework, the following country specific typologies were identified:

	WBL in Romania
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In Romania, WBL is embedded in the national legislation as a cross-section subject. The general legal framework is set at a national level provided by The Law of National Education no.1/2011 with its further amendments and completions for this is the same for the whole country.

Given that no mention is made, we can conclude that in Romania there are no specific legal requirements for companies to participate in WBL initiatives. All enterprises can engage into

apprenticeship contracts provided that they have the necessary facilities and they provide the local Labour Directorates of the Ministry of Labour and Social Justice with proof that they have a specifically designed training programme for the occupation for which they wish to organize apprenticeship.

In Romania there is a different legislation regulating apprenticeship and internship.

Apprenticeship is organised for persons that want to work and to obtain a qualification (young that dropped out from school, NEETs, unemployed, long-term unemployed, adults). It is not considered as part of IVET and there is a special law on apprenticeship. According to the Apprenticeship Law, work-based apprenticeship is regarded as a special and distinct form of vocational training combining employment with vocational training provided by the employer. The apprenticeship conditions are settled through apprenticeship contracts, which have been defined as a special type of labour contracts with determined duration involving both work as well as vocational training at the workplace. The contract as such cannot be longer than three years or shorter than six months, in accordance with the level of qualification to be provided.

According to the Apprenticeship Law and to its application norms, those entitled to apprenticeship are the individuals over 16 year old, provided that they had no prior qualification in the trade for which they demand entering into an apprenticeship contract. The apprentice is considered a full time employee and is entitled to all associated rights (minimum salary, working time regulations). The apprentice also has to benefit from theoretical training which is to be provided inside the working hours.

The work-based apprenticeship programme is organised only for qualifications for which there are occupational standards / professional training standards and occupations included in the Romanian Classification of Occupations (*Codul Ocupatiilor din Romania - COR*) .

The minimum duration of the apprenticeship training is equal to the duration provided by regulations on the adult training qualification courses. The necessary time for the theoretical training of the apprentice is included in the regular working hours. The monthly salary provided by the apprenticeship contract is at least equal to the national gross minimum salary. The working programme is 8 working hours/day, 40 hours/week. For people younger than 18, the working programme is 6 working hours/day, 30 hours/week.

The Ministry of Labour and Social Justice, through the local Employment Agencies is monitoring and controlling the activity of the authorised training providers delivering work-based apprenticeship programmes.

Internship in Romania is understood as a practice within companies of pupils and/or students, according to the present legislation (Law 258/2007). According to the law, practice of pupils/students is organised by the training provider (educational institution) based on a contract concluded with a practice partner which is a company or any other legal person that carries out an activity in correlation with the specialization for which pupils/students are trained. Practical work can be done weekly or cumulatively at the end of a certain period of theory, as provided by the curriculum for the training course. Internship in this form is usually not remunerated except for the situation provided by the law, when during the practice period, the practice partner decides to hire the practitioner

based on a fixed-term individual labour contract, according to the Labour Code, and negotiating the remuneration.

In Romania there are no specific tax laws in favour of companies engaged in WBL initiatives and no special tax reductions, however all costs for the companies involved in the work-based learning of IVET learners such as fees, equipment, materials, travel, accommodation, meals, etc. are tax-deductible (deductible expenses for determining the tax result) according to the relevant legislation on education and the Fiscal Code.

WBL in Poland

In Poland WBL is regulated as part of the vocational education which is regulated by the Act on the Education System as well as the Regulation of the Minister of National Education of 23 December 2011 on the classification of professions for vocational education and the Regulation of the Minister of National Education of 7 February 2012 on the core curriculum of vocational education (as amended). VET is based on two types of school: basic vocational schools (BVS) and technical upper secondary schools. The practical part of vocational education can be performed as **work-based learning** (in school workshops, continuing education centres and practical training centres or with an employer) or as an **on-the-job training** (which is mandatory for vocational upper secondary and post-secondary programmes and lasts from 4 to 12 weeks, depending on the type of job performed).

Based on the country report it is not understood that there is specific labour legislation dealing with the apprenticeship, internships or other WBL initiatives. Under current legislation practical classes can be held with employers on the principles of the dual education system, based on two types of contracts:

- Employment contract for vocational training, concluded between the juvenile and the employer;
- A contract of apprenticeship concluded between the school principal and the host employer of students on apprenticeship.

In the dual system in Poland during their practical training students attending vocational schools have the status of a juvenile worker. Therefore there is a special type of practical training which is **juvenile employment** for the purpose of vocational training for young people between 16-17 years of age with lower secondary education.

In Poland, just like in Romania, there is lack of financial incentives for companies or VET providers to accept students for practical classes. Though employers who provide practical training to students from vocational schools can receive some support like refund of trainers' salaries, refund of the extra salary paid to instructors, refund of the cost of work clothes and necessary protection measures, training allowance, and refund of the bonus for work placement supervisors.

Since 2014, employers are given also the opportunity to use the National Training Fund, which is part of the Labor Fund to finance training for their employees and in some cases funding can cover up to 100 % of the costs.



WBL in Germany

The Dual Vocational Training is laid down on German federal level in the Vocational Training Act (BBiG) and implemented on all levels by the individual federal state.

All companies (VETs, SMEs or large enterprises) which would like to participate in the dual vocational training programme have to meet the legal requirements and have to be registered at either of the chambers or at the Regional Administrative Authority.

All companies participating in the vocational training programme are monitored by the different chambers representing the companies field of work or the responsible Regional Administrative Authority.

There are no specific tax laws in favour of companies engaged in WBL initiatives, dual education.



WBL in Portugal

In Portugal there is no specific legislation single-handedly regulating WBL. WBL is regulated as cross-section subject as part of other legislations. For example in 2007 alongside the creation of the National Qualifications System (SNQ) six VET – dual education programmes were established and each of them have its own legislation/regulation, where WBL is addressed.

Other WBL initiatives that are not under the SNQ scope, including state-funded and non-state-funded internships, are also regulated independently.

The responsible institution for setting all aforementioned legislation is The Constitutional Government and the legislation is the same in the whole country.

In Portugal for state-funded initiatives companies should be law-abiding and meet the legal requirements linked to their activity and in terms to registration, accounting, taxes. In this case the Institute for Employment and Vocational Training has the responsibility to ensure the company is in compliance with the law. Otherwise no specific legal requirements have to be met and there is no public register for companies authorized to participate in WBL initiatives.

Nevertheless, it should be noted that for the VET – dual education programmes it is, typically, up to the VET provider to form a partnership with companies which host learners during WBL. The VET providers also need to maintain its certification and are, thus, audited frequently. During the audit, it is assessed the criteria used to select the companies as well as the pedagogic methods that feature mechanisms for monitoring and evaluation of the WBL activities. But there is no evidence that companies who participate in WBL initiatives are subject to more regular audits from labour monitoring institutions.

There is no specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives. Common rules for WBL initiatives is that a contract between all parties involved must always be signed, where it should be acknowledged that learners have the right to receive meal and transport subsidies, and work insurance afforded by the company. The remaining contract aspects, including maximum working time and working schedule, are the same as the applicable for the generality of the company's employees, which are regulated by the standard labour legislation. The internship contract, generally, has a term of 9 months, except for companies of national economic strategic interest and for trainees' in certain social situations (refugees, ex-convicts, etc).

In Portugal also there are no specific tax laws in favour of companies engaged in WBL – dual education initiatives. Both the company and the trainee are subject to the applicable tax law, as if the trainee was a regular employee.

There is funding and grant legislation under the European Social Fund (ESF) which directly address WBL initiatives. Companies involved in internships programmes are also entitled to a financial contribution from IEFP. 65% of the trainee's monthly allowance is funded, which can be increased to 80% if it is a non-profit organization, a company with national economic strategic interest status or a company with less than 10 employees that's applying for the first time. If the trainee belongs to certain social groups (refugees, ex-convicts, etc), another 15% is added to the former value. Companies that hire trainees within 20 days after the internship is over, will be awarded a grant of twice as much the monthly allowance agreed on the contract.



WBL in Bulgaria

Training through work (dual education in Bulgaria) is a relatively new opportunity that has been formally introduced into the VET system in Bulgaria in 2015 and is regulated as a cross-section subject by the VET act and the Labour Code and by specific legislation - Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training).

Dual education (WBL) as part of VET in Bulgaria is governed by the same institutions that are responsible for VET. There are different responsible institutions at all levels – national, regional and local.

Companies who want to participate in WBL initiatives in cooperation with VET schools need to have special permission from the General Labour Inspectorate Executive Agency to employ individuals below 18 years old. The permission is given after the General Labour Inspectorate Executive Agency inspects the working facilities and grants permission only if the work environment is deemed in compliance with all OSH standards.

There is no specific legislation dealing with the apprenticeship, internships, other WBL initiatives. Relations between the employer and the student are formalized in a contract that should be in accordance with the Labor Code (LC). A specific requirement for the dual training is that the employment contract shall be concluded at the latest two weeks before the start of the school year

in which the training will be commenced. Last amendments in the Labor Code intend to support the work-based form of learning (dual) as a type of apprenticeship where:

- (a) labour contracts for training during work define the forms, place and duration of the training, the compensation which the parties owe when failing to fulfil their obligations and other issues related to training provision;
- (b) dual training lasts 1-3 years for regular VET learners;
- (c) work-based learning for employees that is not regulated by the VET act lasts six months or less;
- (d) after a successful completion of an employee's training, an employer has to offer and an employee has to accept a permanent job; this is not the case for VET learners in dual training.

In Bulgaria there is no specific public register where companies participating in dual training are signed.

There are no tax incentives for employers participating in WBL initiatives, projects, etc. What is more, a paradox turns out to be the fact that since employers have to conclude a labour contract with students from VET schools they need to pay mandatory health insurance for each of the students in the company and at the same time the state pays health insurance for the same student, which results in double taxation.

There is no specific grant legislation addressing WBL/ dual training. Companies in Bulgaria can count on various initiatives aimed at promoting WBL in Bulgaria such as project DOMINO - “Swiss support for the introduction of dual track principles in the Bulgarian vocational education system” and Erasmus+ programme.



WBL in Cyprus

In Cyprus there is no specific legislation in the field of WBL. All the activities regarding the provision of continuing vocational education and training are legalized by the Council of Ministers or by legislation adopted by the House of Representatives. The main bodies responsible for formulating and implementing policy for the initial vocational education and training are the Ministry of Education and Culture (MoEC), the Ministry of Labor and Social Insurance (MLWSI), the Human Resource Development Authority (HRDA) and public higher education institutions. Additionally work based learning is partially governed by the Law on Equal Treatment of Men and Women in Employment and Vocational Education Law of 2002 (Law 205 (I) / 2002), along with its amendments.

Every organisation in Cyprus has the right to participate in WBL training programs, with no limitation on participation, type of business or type of training. Every employer has the ability to organize and implement, at his / her own cost, any training he / she considers to contribute to the development of his / her workforce.

The Human Resource Development Authority of Cyprus (HRDA), every six months, approves a number of training programs exclusively for employees and also internships for new entrants to the labor market which are supported by the Government of Cyprus through financing employers. Interns may or may not be salaried, depending on the organisation that is sponsoring the placement. Usually, interns receive a nominal payment, which vary depending on the employer.

If the training is an initiative of a company and is organized and implemented exclusively by the company, then there is no additional audit of the specified audits that are or would be carried out in this company.

If a company participates in vocational training programs through Human Resource Development Authority of Cyprus (HRDA) and collaborating VETs, then the Human Resource Development Authority of Cyprus is responsible for quality assurance within the implementation of the programs it adopts.








In Cyprus, in order to give companies incentives to participate in WBL initiatives, all human resource development expenditure is deducted from taxation, just like other production costs. In this way, it is estimated that the state accounts for about 20-25% of the total cost of human resources development, while the remainder is covered by private funds. On the other hand, employers must contribute every month the percentage of 1% on the salary of each employee in the Human Resource Development Fund.

V. Policy recommendations section for performing of evidence-based policy in the field of WBL

Based on the findings of the legislation review the following recommendations for performing of evidence-based policy in the field of WBL can be made:

- 1) To introduce specific legislation concerning WBL initiatives defining terms and conditions for organizing and participating in WBL initiatives. This will increase
- 2) To set specific requirements for companies wishing to participate in WBL initiatives in order to assure quality of dual training – for instance to have a specific program that should be approved, to have an appointed employee to take care of the trainees and support them, etc.
- 3) To establish public registers for companies that are entitled to provide dual training. This way the process of finding a company and forming partnership between the VET provider and companies which host learners during WBL will be facilitated.
- 4) To implement a quality assurance system including monitoring and evaluation mechanisms for assuring and improving the quality of the WBL programmes.
- 5) To introduce some formal incentives for employers participating in WBL initiatives in order to additionally motivate them and encourage increasing participation rates in these programmes.

VI. Annexes

	Annex 1: Country report Romania
	Annex 2: Country report Poland
	Annex 3: Country report Germany
	Annex 4: Country report Portugal
	Annex 5: Country report Bulgaria
	Annex 6: Country report Cyprus
	Annex 7: Methodology for development of Output 1: State-of-the-art analysis on the knowledge & skills gaps on the topic of Industry 4.0 and the requirements for WBL



**„Work-based training approach in the field of Industry 4.0 for
competitive European Industry”**

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

Country Analysis Report ROMANIA



This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1. Introduction

- Have been collected 16 surveys from EFP providers and 20 surveys from SMEs
- The surveys were carried out in the period November 2017- January 2018
- Means of distribution: emails -15, by phone 9, face-to-face meeting 12
- Number of responses upon which the conclusions in the next sections are based is 36

2. Analysis of results from surveys

2.1. Identification of respondents

• For VET

The groups to whom the interviewed person belong to:

Manager - 5
Training developer - 5
Trainer/Mentor - 1
Expert/ consultant / advisor - 4
Project manager - 1

The type of vocational education provided by the organisation:

Continuous formal vocational education - 6
Continuous non-formal vocational education - 6
Coaching/ mentoring - 1
Case based/ custom-made training - 2
Training/education/courses at adult education centres - 4
Vocational education provided by a university - 1
Development and extension of competences in education - 1

• For SMEs

The groups to whom the interviewed person belong to:

Manager - 4
Executive - 6
Middle manager - 3
Department manager -3
Office-worker -4

The industry in which the enterprise is currently operating:

Machinery - 5
Automotive (OEM, supplier) -1
Furniture - 1
Glass, ceramics, stones, earths, building materials - 1
Clothing apparel - 2
Wood - 1
Metalworking, metal machining - 1
Textiles - 2
Gas extraction/installations – 2
Manufacture of musical instruments – 1
Energy – 1
Design and consultancy in engineering – 1

Manufacture of cosmetics – 1

Thermal installations – 1

2.2. Industry 4.0 skills and knowledge gaps

• For VET

-Interviewed person from EFP provider institution acquainted with the concept of Industry 4.0 –

Yes – 2; No – 14

-Teachers/trainers in EFP provider institution to be familiar with the concept of Industry 4.0 -

Yes – 2; No – 14

-Topics related to Industry 4.0 training is the needed the most by companies:

Module1: Introduction to Industry 4.0 – 14

Module 2: Solutions for Smart Production Environments in the manufacturing sector - 11

Module 3: Smart Robotics - 12

Module 4: Application of CPS/IoT across the process chain - 12

-The skills illustrated on figure 1 deem most important for successful implementation of Industry 4.0 in companies:

Basic skills and transversal functionalities are the most important;

Cognitive analysis. Skills to solve complex problems;

System skills. Skills for solving complex problems, technical skills;

Social skills: coordination with others, emotional intelligence. Resource Management skills: resource management, people management;

Transversal functional skills;

Logical reasoning, manual dexterity, systems analysis, ICT knowledge, critical thinking, quality control;

Cognitive analysis, content skills, technical skills;

Content, management, technical skills

Cognitive analysis, content skills, resource management skills, skills to solve complex problems,

Creativity, logical reasoning, mathematical reasoning, manual dexterity, ICT knowledge, critical thinking, complex problem solving, coordination with others, people management,

Creativity, logical reasoning, mathematical reasoning, manual dexterity, system analysis, active learning, ICT knowledge, critical thinking, financial and material resources management, programming, time management, people management,

Cognitive flexibility, management of financial resources and material resources, people management, time management, logical reasoning, system analysis, ICT knowledge, complex problem solving, training and teaching of others, technical skills.

Cognitive analysis, content skills, technical skills.

-Which the skills people lack:

Basic and functional transversal skills are the ones that are lacking in employees;

Skills for solving complex problems;

System skills;

Emotional intelligence, coordination with others, people management;
People management, time management, technical skills, resource management skills.
Resource and technical management skills;
creativity;
management;
Skills to solve complex problems, ICT knowledge;
Emotional Intelligence, Time Management, Creativity, Complex Problem Solving;
Creativity, knowledge in ICT, time management, people management;
Cognitive flexibility, complex problem solving, time management, training and teaching others.

-What kind of training is the best solution for nurturing the pointed skills:

Training focused on specific topics, solving certain problems and deepening specific notions;
Training / education / courses at adult education centers;
Training based on practical activities;
Training;
Dual training, the combination of theory and practice at work;
Learning in the workplace;
Continuous vocational training, on-the-job training;
Practical training courses based on practical activities and interactive training methods;
continuous training;
Case study, visual methods;
Out-of-organization training with applicative exercises at other organizations implementing industry 4.0;
Trainings organized outside the company;
Training includes;
On-the-job training.

• **For SMEs**

-Interviewed person from SME acquainted with the concept of Industry 4.0 –

Yes – 10; No - 10

-Staff in the SME acquainted with the concept of Industry 4.0 –

Yes – 6; No - 14

-How important is Industry 4.0 for the company

Not important/ hasn't affected us - 0

Somewhat important - 14

Very important - 6

Topics related to Industry 4.0 training is the needed the most by companies:

Module1: Introduction to Industry 4.0 – 15

Module 2: Solutions for Smart Production Environments in the manufacturing sector - 14

Module 3: Smart Robotics - 10

Module 4: Application of CPS/IoT across the process chain – 8

Other: Professionalization on trades, Design and construction of infrastructures

-The skills illustrated on figure 1 deem most important for successful implementation of

Industry 4.0 in companies

Complex problem solving, cognitive flexibility, critical thinking, technology and design of user experience;

Cognitive analysis, process skills, system skills, technical skills;

Social skills, technical skills;

Transversal functional skills;

Analysis, content skills, system management and processes;

All would be important because, unfortunately, none of the above abilities are formed in schools in Romania. Learn about anything but work, no.

Technical skills;

Physical abilities, technical skills, complex problem solving skills;

Technical skills;

All;

Absolutely everything;

ICT knowledge, critical thinking, judgment and decision-making, complex problem solving;

Maintenance, repair, operation and control of equipment, mathematical reasoning, ICT knowledge;

All competencies are important for the successful implementation of 4.0 industry in our company;

Basic skills, transversal functional skills;

Physical abilities, technical skills, content skills;

Cognitive Analysis, Process Skills, Management Skills, System Skills, Skills for Complex Problems, Technical Skills;

All technical skills, resource management skills, complex problem solving skills, system skills;

Process Skills, Social Skills, Resource Management Skills;

Technical skills, complex problem solving.

-Which the skills people lack:

Technology and design of user experience;

Technical skills;

Resource management skills;

Time management, coordination with others, service orientation, scheduling;

System and process skills;

All;

Technical skills;

Solving complex problems;

Quality control;

Social skills, system skills, technical skills;

Critical thinking, judgment and decision-making, debugging;

Skills for complex problem solving;

Transversal functional skills;

creativity;

Process skills, skills to solve complex problems;

Active learning, judgment and decision-making;
Social skills;
Technical skills.

-What kind of training is the best solution for nurturing the pointed skills:

Technical skills;
Social communication skills;
Specialized courses and workplace learning - in English WBL - work-based learning;
The education, still small child, in the spirit shown by the "family of competences" in
Fig. 1. Watching at the given stages: ABILITIES (starting a small child); BASIC
SKILLS (up to about 16 years of age); TRANSVERSAL FUNCTIONAL SKILLS (in
vocational schools, lyceums and faculties, masters, doctorates);
Training for work purposes;
Continuous, regular training in which employees understand what quality is;
Theoretical training approx. 40-50% but especially practice (practice) of activities at
the workplace;
Skills that can be cultivated can be developed through training;
Long-term and practical training at the workplace;
Training of technical skills;
Social skills, cordoning with others, emotional intelligence;
Non-formal education;
On-the-job training;
Courses and workshops;
Courses at work.

2.3.Experience with Work-based learning

• For VET

-The organisation ever participated/ organized joint WBL initiatives in cooperation with companies

5 VET providers have participated/organized such initiatives: By means of the Moodle software offers training courses in quality management; For trades demanded on the labor market; For various trades; Data Entry Operator, Validation And Data Processing, WEB Designer; Training for the use of numerical control machines.

-The main obstacles/ hardships/ challenges that you have faced or you think you will face in case of organizing joint WBL programmes with companies:

Lack of time for resources, reluctance on the part of companies;
Lack of logistics of partner enterprises for organizing such programs (resources mentioned above). Lack of time (employers' availability);
Site maintenance and administration;
lack of information on this subject and lack of awareness of the labor market;
Lack of time, staff reluctance to train new employees;
Lack of technical materials combined with practice
lack of resources, lack of theoretical materials to be combined with practical elements;
lack of confidence in the method, reluctance of higher staff to train new employees / apprentices;
Company reluctance;

Employee reluctance due to predominantly bureaucratic management;
Managers' reluctance;
Legal regulations, lack of resources, including information;
Lack of information resources.

• **For SMEs**

-The company ever participated/ organized joint WBL initiatives in cooperation with companies

17 respondents have indicated the following participations:

Internships, mentoring, job shadowing;
Professional courses;
Training courses in trades (we have a license and we have authorized trainers),
introductory courses and Practice for pupils and students, mentoring
programs, diploma papers, etc .;
Participating in the Baden-Württemberg Land Exchange, in terms of dual and
professional education, strikingly similar to what Romania had before 1990,
but at the current technical level;
Face to face without internet training;
Practice and mentoring (on a voluntary basis);
Apprenticeship mentoring programs;
Apprenticeships, internships;
Apprenticeship;
Internships;
Internships, apprenticeship, workplace qualification;
Internships for engineering students;
Workplace training on a new job;
Internships, mentoring (volunteering), training with an old employee;
Apprenticeship;
Practice at work, apprenticeship.

*-The main obstacles/ hardships/ challenges that you have faced or you think you will face in case of
organizing joint WBL programmes for new employees/ students*

The lack of time;
Lack of information resources;
Lack of theoretical materials to be combined with practical elements;
Legal regulations, lack of information resources, lack of theoretical materials to be
combined with practical elements;
The lack of legislation on education and the education system, with the aim of
forming the "Family of Competencies" presented above. Lack of educational
resources that should provide us with the "juvenile" to specialize in
factories: teachers with practical training, pedagogical sense, etc .; teaching
materials and technical equipment (laboratories, machines, devices, etc);
Lack of interest in the work of young people as well as their parents to see
their children in office or office, in the budget system, not at any factories.
Lack of trust in the social system that discourages LUNCA, encouraging the
escape from social benefits, unemployment, the budget system (where you
do not have to find solutions, you are not tied to competition, if wages are
not enough, taxes increase, do not bankrupt, you are protected labor code,

etc.). Given that BASE (the above = education, education) is NOT provided by the system, factories have nothing to implement. The certified school has no way to do in the factory; diplomas / attestations There is no way to release. The solution would be for the factories to support professional classes or technical faculties;

Lack of time and adequate internet tools - employees do not have the level of training that allows them to use these technologies;

Experienced employees do not want to learn other employees because they have a lot of work that would greatly crowd their work schedules;

Lack of confidence in the method and lack of time;

Lack of time, lack of resources;

Lack of resources, limited time (working on a regular basis);

Lack of theoretical materials to be combined with practical elements;

Lack of resources;

Lack of seriousness of the students;

The lack of time.

2.4. Preferences and training needs

• For VET

-The technological solutions/functions considered most important for interactive educational website:

PDF contents availability - 3

WORD contents availability - 5

POWERPOINT contents availability - 10

Interactive evaluation tests - 11

Documents upload - 6

Documents download - 11

Logbook for notes - 1

New documents and activities - 2

Guidelines how to use the interactive elements - 4

Exchange messages with trainers and colleague trainees – 10

Chat - 3

Discussion forum - 13

Glossary to learn about words and expressions - 5

Wikis to develop collaborative contents - 3

Library accessible until 12 months after concluding the training course - 7

Others - 0

-The best proportion of theory and practical on the job training when organizing WBL in the field of Industry 4.0:

40-60, 33-66, 40-60, 30-70, 40-60, 50-50, 30-70, 25-75, 33-66, 33-66, 25-75, 33-66, 33-66, 25-75, 30-70.

• For SMEs

-The technological solutions/functions considered most important for interactive educational website:

PDF contents availability - 8

WORD contents availability - 3

POWERPOINT contents availability - 8

Interactive evaluation tests - 8

Documents upload - 4

Documents download - 8
Logbook for notes - 0
New documents and activities - 4
Guidelines how to use the interactive elements - 8
Exchange messages with trainers and colleague trainees - 13
Chat - 1
Discussion forum - 6
Glossary to learn about words and expressions - 3
Wikis to develop collaborative contents - 2
Library accessible until 12 months after concluding the training course - 6
Others - simplicity of use - 1, examples of good practice – 1.

-The best proportion of theory and practical on the job training when organizing WBL in the field of Industry 4.0:

40-60, 50-50, 50-50, 40-60, 30-70, 25-75, 20-80, 50-50, 50-50, 30-70, 50-50, 60-40, 40-60, 50-50, 40-60, 30-70, 50-50, 40-60.

2.5.Conclusion

(1)–Respondents of the surveys have a wide distribution from managers to trainers or workers so it was interviewed different positions from strategic management to operational management. The type of VET providers interviewed is mainly from continuous formal and non-formal vocational education. The industry in which enterprises are operating is mainly from machinery, than textiles.

(2)–People from EFP provider institutions are less familiar with the concept of Industry 4.0, in comparison with people from SMEs which are more familiar, for whom the topic is somewhat important. Module 1 should be the most preferred as it is introductory, than Module 2 but also the others are needed. People from VET appreciate as important skills creativity, cognitive flexibility, basic skills, social skills, while people from SMEs appreciate complex problem solving, cognitive flexibility, critical thinking, technology and design of user experience. The skills people lack are the complex problems solving, system skills, creativity for EFP people and technical skills, time management, coordination with others, service orientation, scheduling in SMEs. Training focused on specific topics and practical activities, dual training and on-the-job training are preferred by EFP people, while training of technical skills is most preferred in companies.

(3)–Aprox. 1/3 of EFP providers have participated/organized WBL initiatives in cooperation with companies, the main obstacles being the lack of time for resources, reluctance on the part of companies, logistics, adequate training materials, reluctance of companies and people. Most of the companies have participated/organized WBL initiatives, the main obstacles being the lack of time, resources, confidence in the method, information resources, theoretical materials to be combined with practical elements.

(4)–Preferences of training needs for EFP are: Documents download, Exchange messages with trainers and colleague trainees, Powerpoint contents availability, etc. Preferences of training needs for SMEs are: Exchange messages with trainers and colleague trainees, Documents download, PDF contents availability, Powerpoint contents availability, etc.

2.6.Recommendation

- (1)-Development of training materials should be focused more on Module1: Introduction to Industry 4.0 and Module 2: Solutions for Smart Production Environments in the manufacturing sector;
- (2)-Technological solutions are Documents download, PDF contents availability, Powerpoint contents availability
- (3)- When organizing WBL in the field of Industry 4.0 proportion is theory 40% and practical on the job training 60%.

3. Conclusions from legislation review and policy recommendations

4. Conclusion

5. Annexes

- Annex 1: Legislation review

Annex 1: Legislation review

Legislation and WBL (work based learning)	
Please describe the legislation in the field of WBL in your country regarding the topics listed below. The questions should give you a reference point for what is needed. If you think, you should add something not targeted by the questions, please write it down.	
General overview of WBL in the national legislation How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject? Who is responsible for setting legislation in regard to WBL in your country (National, regional or local level)? Is the legislation the same in the whole country?	<p>In Romania, WBL is embedded in the national legislation as a cross-section subject at all the relevant levels of the education system: initial vocational training (IVET) at upper secondary and post-secondary level, internships in higher education, work-based apprenticeship and continuing vocational education and training (CVET). The legislation is set at a national level and is the same for the whole country.</p> <p>The Law of National Education no.1/2011 with its further amendments and completions provides the general legal framework and describes the general objectives, aims, principles, structure, organization and functioning of the education system in Romania. The National Law of Education is complemented by a set of subsequent specific laws, government decisions and regulations, as well as by strategic documents in the context of the National Reform Programme, elaborated in line with the European recommendations, such as:</p> <ul style="list-style-type: none"> • The VET Strategy for 2016-2020 (adopted by Government decision no. 317/2016) • The National Strategy for Lifelong Learning for 2015-2020 (adopted by Government decision no. 418/2015) <p>Since it joined the European Union, Romania has reformed its education and training system developing streams leading to higher education and horizontal mobility with mainstream pathways, but also vocational and technical pathways with a strong WBL component. To meet the demands of the working world, Romania has called on social partners to define training and qualifications standards, WBL regulations and to cooperate with examination committees.</p> <p>According to the Law of National Education no.1/2011 with its further amendments and completions, the general mandatory education has 11 grades and includes the primary education (ISCED 1, 6-11 years, including a preparatory grade and grades 1—4), the lower secondary education (ISCED 2, which includes grades 5—8) and the first 2 years of the upper secondary education (ISCED 3, grades 9 and 10). The access from the lower secondary education (grade 8) to the upper level (grade 9) is achieved by a national evaluation examination and distribution in upper secondary education units. The secondary upper education (ISCED 3) can be:</p> <ul style="list-style-type: none"> • high school education (grades 9-12/13), leading to an A-level type diploma (<i>Diploma de bacalaureat</i>) granting access to higher education, which includes the high school grades 9-12/13, with the following pathways: <ul style="list-style-type: none"> ○ mainstream pathway (<i>liceu filiera teoretica</i>) with general programmes in sciences and humanities; ○ vocational pathway (<i>liceu filiera vocationala</i>) leading to specific careers (fine arts, music, sports, military, theological, pedagogic qualifications). These programmes with a work-based learning (WBL) component of 10-20% are referred to as “vocational” in the national context, but they are not actually considered to be part of IVET; ○ technological pathway (<i>liceu filiera tehnologica</i>) leading to qualifications in three areas: technical professions, services, natural resources and environment protection. With a WBL component of 16-30%, these programmes are considered as part of IVET and lead to both A-levels (Level 3 ISCED) and a level III vocational qualification (Level 4 EQF). • school- and work-based VET programmes (<i>invatamant profesional</i>) which are

available after the completion of the 8th or 9th grade and last for two or three years. Upon successful completion graduates can acquire a qualification certificate of skilled worker at level II (Level 3 EQF). These programmes have a WBL share varying between 20 and 70%

- a more specifically vocational pathway called the “progressive pathway” (*ruta progresiva*), with studies lasting for 2 years in arts and crafts schools (*Scoli de arte si meserii*), leading to a level I qualification (Level 2 EQF), followed by a post-compulsory “finishing year”, leading to a level II qualification (Level 3 EQF). Graduates that are successful in the professional qualification certification exam, also receive a compulsory education certificate and can attend the higher cycle of upper secondary education (grades 11th and 12th) of school-based programmes. Students from this stream can then study for a level III qualification (Level 4 EQF) by following a 2-year upper secondary education course. At the end of the cycle, pupils receive “dual qualifications”, i.e. a level III vocational qualification (Level 4 EQF) and their A-levels (Level 3 ISCED). Vocational programmes are organised in modules. A number of credits are applied to each module according to specific criteria.

Graduates of any upper secondary education programmes, including VET graduates from technological schools or graduates of school- and work-based VET programmes (only after graduating from the higher cycle of school-based programmes), can enrol in:

- tertiary non-university education, which includes post-secondary IVET programmes (*postliceale*) and foremen schools (ISCED 4)
- higher education provided they pass the national examination and receive a baccalaureate diploma (*diploma de bacalaureat*), which entitles them to access higher education (ISCED 5-8)

Post-secondary VET and foremen education through tertiary non-university programmes (ISCED 4) last for one to three years according to the complexity of the qualification and the number the VET credits. Upon successful completion graduates can acquire a qualification certificate at level 5 of the EQF (*technician*). Curricula may be offered on a regular basis or be especially arranged to meet the needs of specific employers. Post-secondary VET programmes provide an opportunity for advanced vocational training for the graduates of upper secondary schools (including those who do not hold the baccalaureate diploma).

Most of key decisions in pre-university education, including VET are taken centrally. The Ministry of National Education retains many decision-making powers applied by the 42 county school inspectorates. A line of accountability between schools, the county school inspectorates and the Ministry of Education governance represents a key vertical dimension of VET governance. Schools elaborate yearly the schooling planning with the necessary number of classes (*profiles*) and send them to the county schools inspectorates and the Ministry for approval. Financing is ensured based on the number of pupils/students enrolled and is allocated to each school by the Ministry through the local authorities. School inspectorates work closely with the advisory consultative bodies at county and regional level (Local Committees for the Development of Social Partnerships - LCDSP – and Regional consortia) to propose the number of students to be enrolled based on strategic planning documents and labour market information.

The internal dimension in VET governance refers to the organisation of internal management and control within each specific school unit. There is also internal monitoring and control performed in each school with the support of specific boards (the administration board, the quality assurance committee).

External monitoring is made regularly by a committee of external evaluators from the Romanian Agency for Quality Assurance in Pre-university Education (Agentia Romana de Asigurare a Calitatii in Invatamantul Preuniversitar - ARACIP: <http://aracip.edu.ro/>) and a representative of the school inspectorate checking if statutory provisions are met and quality assurance mechanisms are in place.

Finally, a horizontal dimension is reflected by the (accountability) relations between a school and its local stakeholders: employers, local authorities, parents, etc.

The higher education system in Romania (ISCED 5-8) has a three-cycle structure, following the Bologna system: Bachelor, Master and PhD (Doctorate), at levels 6, 7 and 8 of the EQF. WBL is embedded in the national legislation for organizing reduced frequency programs or distance learning programs at university level. There are specific standards for such programs, as set by the Romanian Agency for Quality Assurance in Higher Education (<http://www.aracis.ro/>). Moreover, the Law of National Education no.1/2011 with its further amendments and completions foresees post-university continuing training and personal development studies leading to the certification of specific vocational competencies acquired during the respective study programme.

The financing mechanism and budget for education, including VET are approved yearly by the State Budget Law and are distributed nationally (at village, town and municipality levels) by the general directions of public financing within each of county and with specific support from county school inspectorates. The principle of financing is based on standard costs per pupil/student enrolled, depending on specific indicators such as area (rural/urban) or level of education (early, primary, secondary, post-secondary and higher education) and is generally financing per capita, according to the methodology set by the Ministry of National Education.

Education in Romania, at all levels, is free of charge. The state also provides basic finance for all accredited public, private and religious education, as well as for public post-secondary education. Private education is also supported through annual tuition fees paid by pupils/students, set by internal institution rules.

Adult vocational training (CVET - continuing VET) education is regulated by the Government Ordinance no. 129/2000 (modified and completed by Law 167/2013), according to which vocational competences can be acquired through formal, non-formal and informal learning as follows:

- formal learning is provided within a programme organized by an accredited (authorised) public or private vocational training provider or employer;
- non-formal learning refers to the acquisition of competences either via regular performance of specific work activities or through self-training;
- informal learning refers to the process of acquiring competences through training methods that are unstructured, unintended and non-institutionalised (non-systematic contacts within the family, society and professional environment leading however to learning outcomes and to acquiring competences).

Adult vocational training is provided by legal persons/entities (private or public) as well as, in certain cases, by individuals acting as vocational training providers. Authorization of training providers is coordinated by the National Authority for Qualifications (ANC - Autoritatea Nationala pentru Calificari <http://www.anc.edu.ro/>) through the authorization commissions. Individuals providing teaching and training activities within the system of continuing education and training for adults are specifically classified in the Romanian Classification of Occupations (COR) as certified adult trainers (*formatori de adulti*). Thus they classify as a specific specialization inside the system, with their own procedure for certification. In most cases, training courses for adult trainers are organized by private training providers, which are certified for the organization of specialised train-the-trainer courses. Certificates are provided by the National Authority for Qualifications.

Adult vocational training programmes are organised based on the training/qualification needs of the adult participants, as follows:

- initiation training programmes, focused on the acquisition of one or more competences specific for a qualification in accordance with the occupational standard or the training standard;
- improvement/upgrading skills and specialisation programmes.
- qualification, and re-qualification programmes (at levels I-III, equivalent

	<p>levels 2-4 of EQF);</p> <ul style="list-style-type: none"> • training programmes leading to the acquisition of a set of competences that will allow a person to carry out activities specific to one or more occupations (entrepreneurship, foreign languages, other soft skills); <p>The WBL share for the qualification, and re-qualification programmes represents 2/3 of the total duration of a training course: 240 hours out of 360 hours for level I (Level 2 EQF), 480 hours out of 720 hours for level II (Level 3 EQF) and 920 hours out of 1080 hours for level III (Level 4 EQF). For other training programmes the WBL component may vary according to the complexity and is set by the training provider when authorising the training course.</p> <p>According to the Ordinance no. 76/2004 (updating the Government Ordinance no. 129/2000), vocational training programmes enable participants to acquire professional competences in accordance with occupational standards (<i>standarde ocupationale</i>) or, if the case, professional training standards (<i>standarde de pregatire profesionala</i>) recognized at national level. The credit transfer system and accumulation of transferrable training credits certify the acquisition of new competences. CVET programmes are organized for occupations included in the Romanian Classification of Occupations (<i>Clasificarea ocupatiilor din Romania</i> - COR) or for vocational competences which are common for a set of occupations.</p> <p>Adult vocational training activities are offered through:</p> <ul style="list-style-type: none"> • courses organised by training providers, • courses organised by employers inside their institutions, • internships and specialisation, • other forms of training. <p>The Government Decision no. 481/2015 amends the Government Ordinance no. 129/2000, through improving coordination, efficiency and relevance of adult training with emphasis on:</p> <ul style="list-style-type: none"> • Monitoring adults' lifelong learning participation - employers send data regarding the number of employees who received training to the technical secretariat of the authorization commission on a quarterly basis; • Linking training and retraining programmes for adults with qualifications listed in the National Register of Qualifications in Romania; • Increasing active involvement of sectoral committees, the National Authority for Qualifications and the Ministry of Labour in order to review the methodology for development, validation, approval and management of occupational standards so that they meet the needs of the labour market; • Increasing the role of the National Authority for Qualifications on matters relating to coordination of the accreditation process of training providers. <p>Based on the Government Ordinance no. 129/2000, adult vocational training may be financed from:</p> <ul style="list-style-type: none"> • employers/enterprise own funds; • unemployment insurance fund; • sponsorship, donations, and external sources; • co-financing from the EU's structural and cohesion instruments
<p>Please indicate the source</p>	<ul style="list-style-type: none"> • Ministerul Educatiei Nationale (Ministry of National Education) MEN: https://www.edu.ro/ • Centrul National de Dezvoltare a Invatamantului Profesional si Tehnic (National Centre for Vocational Education and Training Development) CNDIPT: www.tvet.ro • Agentia Romana de Asigurare a Calitatii in Invatamantul Preuniversitar (Romanian Agency for Quality Assurance in Pre-university Education) ARACIP: http://aracip.edu.ro/ • Agentia Romana de Asigurare a Calitatii in Invatamantul Superior (Romanian Agency for Quality Assurance in Higher Education) ARACIS: http://www.aracis.ro/ • Autoritatea Nationala pentru Calificari (National Authority for Qualification) ANC

	http://www.anc.edu.ro/
Legislation for participating in WBL Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)? • If yes, what are the requirements? • Is there a specific public register where interested parties can check authorized companies to participate WBL?	<p>In 2014, new updates of the National Law on Education introduced the three-year school- and work-based VET programme, (approved by Minister Order no.3136/20.02.2014), which was organised since the school year 2014-15, for graduates of the 8th grade. The programme is also open to graduates of 9th grades from previous generations if students are willing to re-enter education. Its duration is from 9th to 11th grade.</p> <p>In 2016 the National Centre for Technical Vocational Education and Training Development (Centrul National de Dezvoltare a Invatamantului Profesional si Tehnic - CNDIPT) and the Ministry of National Education launched a public debate referring to the opportunity of introducing <i>dual initial VET</i> in the present context, as an answer to employers' demands by increasing their participation and the work-based training share.</p> <p>Currently, the three-year school- and work-based VET programme (<i>scoala profesionala</i>) is the pathway providing IVET in close cooperation with companies (referred to as <i>dual initial VET</i>).</p> <p>To ensure alignment of state-funded VET provision with labour market needs, prior to the approval of the number of students funded by governmental funds, every school is required to submit to the School inspectorates' framework contracts with companies that will provide workplace to students (based on the Order of the Ministry of Education no. 3539/14.03.2012). These framework contracts establish clear responsibilities for both school representatives and their partner companies concerning students' training during the workplace learning component (practical training) and technical and human resources to be provided by the company, that are necessary for students' training and their certification exams</p> <p>The share of WBL (practical training in the schools' laboratories or in companies) for the 3-year school- and work-based VET programme (dual IVET starting after the 8th grade) is significant:</p> <ul style="list-style-type: none"> • in the 1st year, WBL represents 20% of the total number of hours, including 5 weeks in the company; • In the 2nd year, WBL represents 60% of the total number of hours, including 9 weeks in the company; • In the 3d year, WBL represents 72% of the total number of hours, including 10 weeks in the company. <p>After completing their studies, learners undertake a qualification certification exam which is organized by their school that allows them to acquire a professional qualification at level II (Level 3 EQF). After completing the programme, students also acquire a compulsory education certificate, which allows them to continue their studies in high school if they wish to obtain the baccalaureate diploma and continue in higher education.</p> <p>The list of school units, the employers that have established partnership agreements for the available qualifications in dual VET system is published by the National Centre for TVET Development (www.tvet.ro) on the platform „Choose your path!” („Alege-ti drumul!”) http://www.alegetidrumul.ro/</p>
Please indicate the source	<ul style="list-style-type: none"> • Centrul National de Dezvoltare a Invatamantului Profesional si Tehnic (National Centre for Technical Vocational Education and Training Development) CNDIPT: www.tvet.ro • The platform „Choose your path!” („Alege-ti drumul!”) http://www.alegetidrumul.ro/
Labour legislation and WBL	Within the national context, apprenticeship is not considered as part of IVET. A

<p>How does the labour legislation look like in your country? Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc....)? If yes, how does it differ from the standard labour legislation?</p>	<p>special law on apprenticeship has been mandated by the Labour Code since 2003. The Apprenticeship Law was adopted in 2005, in order to diversify the training provisions, to encourage work-based learning and to support workforce adaptation to the ever changing labour market requirements (Law no 279/2005 with its further amendments and completions).</p> <p>Apprenticeship is organised for persons that want to work and to obtain a qualification (young that dropped out from school, NEETs, unemployed, long-term unemployed, adults). There is no upper age limit for enrolment, but there is a minimum age limit of 16 years old, the legal working age.</p>
<p>Are companies who participate in WBL initiatives subject of more regular audits from labour monitoring institutions?</p>	<p>According to the Apprenticeship Law, Work-based apprenticeship is regarded as a special and distinct form of vocational training combining employment, in the form of a closed-end, determined duration contract, with vocational training, to be provided by the employer - both practical and theoretical (apprenticeship contracts, which have been defined as a special type of labour contracts involving both work as well as vocational training at the workplace).</p> <p>According to the Apprenticeship Law and to its application norms, those entitled to apprenticeship are the individuals over 16 year old, provided that they had no prior qualification in the trade for which they demand entering into an apprenticeship contract. The contract as such cannot be longer than three years or shorter than six months, in accordance with the level of qualification to be provided (level I-III, equivalent to levels 2-4 of NQF/EQF). Presently, the Norms for the application of the Law clearly state that the contract cannot exceed 24 months so as to be in full compliance with the provisions of the Labour Code for determined-duration contracts. All enterprises can engage into apprenticeship contracts provided that they have the necessary facilities and they provide the local Labour Directorates of the Ministry of Labour and Social Justice with proof that they have a specifically designed training programme for the occupation for which they wish to organize apprenticeship.</p> <p>Apprentices benefit from the legal provisions applicable to all other employees, insofar as they are not contrary to the apprentice status. The apprentice is considered a full time employee and is entitled to all associated rights (minimum salary, working time regulations). The apprentice also has to benefit from theoretical training which is to be provided inside the working hours.</p> <p>The work-based apprenticeship programme includes theoretical and work-based training, according to the Government Ordinance no 129/2000 on adult training, with its further amendments and completions, resulting in qualifications at levels I-III, equivalent to levels 2-4 of NQF/EQF. Training periods alternate with working time allocated for the tasks specified in the job description; the work-based training of the apprentice is performed under the guidance and supervision of a certified trainer. The assessment and certification is made according to the legal provisions on adult training and the apprentice gets a nationally recognized formal certificate.</p> <p>The work-based apprenticeship programme is organised only for qualifications for which there are occupational standards / professional training standards and occupations included in the Romanian Classification of Occupations (<i>Codul Ocupatiilor din Romania - COR</i>) .</p> <p>The <i>minimum</i> duration of the apprenticeship training is equal to the duration provided by regulations on the adult training qualification courses: 360 hours for qualifications level I (EQF level 2), 720 hours for qualifications level 2 (EQF level 3), and 1080 hours for qualifications level III (NQF level 4), out of which WBL represents a share of 2/3. The necessary time for the theoretical training of the apprentice is included in the regular working hours. The monthly salary provided by the apprenticeship contract is at least equal to the national gross minimum salary. The working programme is 8 working hours/day, 40 hours/week. For people younger than 18, the working programme is 6 working hours/day, 30 hours/week.</p> <p>The Ministry of Labour and Social Justice, through the local Employment Agencies is</p>

monitoring and controlling the activity of the authorised training providers delivering work-based apprenticeship programmes. In 2013, the Ministry of Labour introduced some changes to the Apprenticeship Law, in order to encourage employers' engagement, aiming at increasing available funding for employers engaging in apprenticeship – apart from funds available from the unemployment insurance fund, ESF funds may be now accessed so as to complement funding and ensuring that training for the apprentices is provided by certified training providers at least for the theoretical part of the training and that all apprentices receive nationally recognized qualification certificates.

Internship in Romania is understood as a practice within companies of pupils and/or students, according to the present legislation (Law 258/2007). The aim of practice is to verify the practical applicability of the theoretical knowledge acquired by them in the training program, according to the curriculum established by the training provider. According to the law, practice of pupils/students is organised by the training provider (educational institution) based on a contract concluded with a practice partner (company or any other legal person that carries out an activity in correlation with the specialization for which pupils/students are trained). Practical work can be done weekly or cumulatively at the end of a certain period of theory, as provided by the curriculum for the training course. The curriculum also includes the duration of practice and the forms of assessment of the practitioner's knowledge by the training provider together in cooperation with the practice partner. Internship in this form is usually not remunerated except for the situation provided by the law, when during the practice period, the practice partner decides to hire the practitioner based on a fixed-term individual labour contract, according to the Labour Code, by negotiating the remuneration.

In the recent years, internship programs were used by many employers to attract fresh talent by hiring students for a limited period of time. Internship programs can be part-time or full-time, depending on the job requirements and can be paid or unpaid, depending on the employer's size and resources. As such internship are not yet legally regulated in Romania, most of the time, interns are paid much lower and are not given the same benefits or rights of the employees of the same company, even if they do the same work. In order to avoid situations where internship is used as a method of exploiting students to cover the need for staff in a certain period, in 2017 the Government of Romania has initiated consultations with educational institutions and social partners to develop a draft law regulating internship programs and the relationship between interns and the host organization through a new type of contract, the internship contract. The draft on Internship Law is currently in the procedure of being adopted by the Parliament. The law aims to eliminate the confusion between internship and work, so that internships don't turn into a masked form of employment without proper benefits and payment for the intern.

Traineeships for higher education graduates are foreseen by the Labour Code (Law no.52/2003 with subsequent changes) for the first six months after graduation, with the exception of professions for which special legislation provides differently (e.g. doctors and other medical personnel, lawyers, notaries). Conditions for this form of training are set by Law no.335/2013. The traineeship of graduates must not be confused with the probation period provided by the Labour Code. Law no. 335/2013 stipulates that traineeships for higher education graduates are meant to ensure the transition of graduates from the education system to the labour market, by strengthening professional skills and abilities to adapt to the job requirements.

In order to carry out a traineeship, companies need to enter into labour contracts with the graduates, just as they do with regular employees with a salary negotiated by the parties, for a program of 8 hours per day and 40 hours per week on average. Additionally the parties must conclude a traineeship agreement that becomes an annex to the labour contract and is concluded for a six-month period (the duration of

	<p>the traineeship imposed by the Traineeship Law), except for cases when a special time period is set forth by a particular piece of legislation. The trainee receives the monthly salary, as well as all the other typical employee protections under the labour contract and performs work, carrying out his or her activity based on a plan reflecting the trainee's objectives and performance targets, that is approved by the company. Each participating company must appoint a traineeship mentor who is allowed to coordinate and supervise not more than three (3) trainees simultaneously.</p> <p>Before the traineeship is completed, an appraisal committee, also appointed by the company, drafts a report about the trainee (highlighting the activities, objectives achieved, performance indicators, competencies and skills, behaviour, degree of involvement, etc.). At the same time, the trainee must also draft a self-appraisal report regarding the activities carried out during the traineeship period. Both reports must be considered by the company before a decision is taken as to the completion of the traineeship and the termination or the continuation of the labour contract. In any case, if the appraisal is unsatisfactory, the labour contract may be terminated without notice and the company may employ another higher education graduate for the same position, based on a traineeship agreement, only one more time. The trainee may challenge the company's decision, first internally, by filing a complaint with the company and, subsequently, in court if the company's is unsatisfactory. The company may contractually impose a retention period during which the trainee may not initiate the termination of the labour contract for a given duration if, during the traineeship period, the trainee has benefitted from professional training, under the sanction of incurring relevant costs, as demonstrated by the company.</p>
Please indicate the source	<ul style="list-style-type: none"> Ministerul Muncii si Justitiei Sociale (Ministry of Labour and Social Justice) MMJS: http://www.mmuncii.ro/j33/index.php/ro/ Agentia Nationala de Ocupare a Fortei de Munca (National Agency of Employment/NAE): http://www.anofm.ro
Tax legislation and WBL Are there specific tax laws in favor of companies engaged in WBL initiatives, dual education? If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?	<p>There are no specific tax laws in favour of companies engaged in WBL initiatives and no special tax reductions, however all costs for the companies involved in the work-based learning of IVET learners are tax-deductible (deductible expenses for determining the tax result) according to the relevant legislation on education and the Fiscal Code.</p> <p>This financial incentive comes out of the general public expenditure, that is from all taxpayers, as a reduction in the tax base of the company. There is no maximum amount of deduction defined and the eligible costs include all the expenses incurred by the economic operators for engaging in WBL initiatives in IVET, according to the legal regulations in the field of national education (fees, equipment, materials, travel, accommodation, meals etc.)</p> <p>Expenses related to the acquisition, production, construction of depreciable fixed assets, held and used for organizing and carrying out WBL initiatives in IVET (as well as the investments made to them) are recovered from the tax point of view by deducting the depreciation according to the provisions of the Fiscal Code.</p> <p>The following incomes are not taxable: scholarships, prizes and other rights in the form of accommodation, transport, meals, work and protection equipment, compulsory medical investigations and other such incentives received by students during initial vocational and technical education (according to the legal regulations in the field of national education).</p>
Please indicate the source	<ul style="list-style-type: none"> Ministerul Educatiei Nationale (Ministry of National Education) MEN: https://www.edu.ro/ Centrul National de Dezvoltare a Invatamantului Profesional si Tehnic (National Centre for Vocational Education and Training Development) CNDIPT: www.tvet.ro Ministerul Finantelor Publice (Ministry of Public Finances) MFP: http://www.mfinante.ro/pagina.html?pagina=acasa
Subsidies and grant legislation with regard to WBL	<ul style="list-style-type: none"> Several measures for young people are taken by the Ministry of National

<p>Does the funding and grant legislation directly address WBL/dual education initiatives? If yes, how (e.g. special funds or grants for certification, investments in education and trainings of head or staff to be mentors/trainers?)</p>	<p>Education in cooperation with other national authorities, which also apply for learners in IVET:</p> <ul style="list-style-type: none"> the <i>Professional Scholarship</i> is a national social programme open to all learners enrolled in school- and work-based VET programmes consisting of a monthly financial support of 200 lei (about 45 €). Pupils enrolled in school- and work-based VET programmes cannot benefit simultaneously of the professional scholarship and the financial support granted to pupils within other general, vocational or technology programmes. However participating companies may offer additional scholarships, transport from school to the place where practical training takes places or meals, based on their internal procedures and resources. Many of the prominent companies engaged in WBL initiatives offer such scholarships and benefits. the <i>high school money programme</i> is a national social protection programme providing monthly financial support for pupils enrolled in upper secondary education including VET (grades 9-12th) of 180 lei (about 40 €); other types of scholarships for foreign pupils and students; <i>Euro200</i> is a national programme that supports students, including VET ones and students with limited financial means to purchase computers and develop ICT skills. The <i>Euro 200</i> has been implemented since 2004, under Law no. 269/2004, granting financial aid based on social criteria; The <i>state allowance</i> for children going to school (including VET ones) is doubled since June 2015 (Law no.61/1993 updated in 2015); 50% discount for national local transportation by bus for pupils and students and free national transportation by train for students (till the age of 26). <p>A pilot project on the impact assessment of the Apprenticeship Law, conducted by the Ministry of Labour between in 2015, revealed that flexible minimum duration of apprenticeship training and increased subsidies for employers are needed. Increase in the subsidy refers to the amount which is granted to the employer who enters into a contract of apprenticeship. The subsidy comes from the unemployment insurance budget (funded by all employers through a levy on a percentage of the payroll). Until 2017, the amount of the grant, given throughout the course of the apprenticeship contract, was of 300 lei/month (about 70 €) for each apprentice, that is 60% from the value of the reference social indicator for unemployment benefits and fostering employment (with the current value of 500 lei). Beginning with 2017, the employer is entitled to sign a contract with the Public Employment Service to receive from the unemployment insurance budget a monthly subsidy of 1125 lei/month (about 250 €) for each apprentice, for the entire duration of the apprenticeship contract. Grants to employers are foreseen if the employer wishes to offer the apprentice a contract of indefinite duration upon graduation, thus enabling small and medium size companies to retain skilled workers.</p> <p>Companies entering into a traineeship agreement with higher education graduates may also receive a monthly monetary incentive. Until 2017, the amount of the targeted subsidy was of 750 lei/month (about 170 €), that is 150% from the value of the reference social indicator for unemployment benefits and fostering employment (with the current value of 500 lei). Beginning with 2017, the employer is entitled to sign a contract with the Public Employment Service to receive from the unemployment insurance budget a monthly subsidy of 1350 lei/month (about 300 €) for each high school graduate, for the entire duration of the traineeship contract.</p> <p>In the context of high youth unemployment, in 2015 funding of apprenticeship programmes was included in actions financed from the ESF under the Operational Programme for Human Capital 2014-2020. To reduce youth unemployment, especially of NEETs, based on the EU Council Recommendation of 22 April 2013, the Ministry of Labour developed and implemented the Youth Guarantee Implementation Plan 2014-15. This plan introduced key reforms and initiatives designed to create the appropriate framework for youth employment including through apprenticeship</p>
<p>Are there any positive or negative incentives in the legislation promoting participation in WBL initiatives? If yes, which one?</p>	

	<p>schemes. Young people who have benefited of apprenticeships have also benefited of guidance and career counselling services. The new Youth Guarantee Implementation Plan for 2016-2020 again includes measures to promote apprenticeship. The Ministry of Labour and Social Justice also implements a set of measures designed to promote and better support the labour market access:</p> <ul style="list-style-type: none"> • services of professional information and counselling are delivered free of charge to the job-seekers; • measures for the transition from unemployment or inactivity to employment, focused on improving employability of individuals (personalised career information and counselling programmes, free of charge continuing vocational training programmes for adult learners and individual entrepreneurship stimulation) as well as stimulating mobility by offering mobility incentive packages that are tied to the social reference indicator (about 110 €); • reform of the employment legal framework. Modification and completion of the Law no. 76/2002 on the unemployment insurance system addresses the development of new employment stimulation measures and the adaptation to the current needs of the labour market. The law introduces the following elements: providing free services to assess the skills acquired through informal and non-formal learning, grading the financial support to unemployed persons during their participation in CVET programmes, allowing more flexible conditions for subsidizing CVET programmes organised by employers, improving the access to mobility bonuses for unemployed persons and reducing taxation for companies that hire unemployed persons and persons belonging to vulnerable groups. • active employment measures implemented by the National Agency for Employment with ESF support through the SOPHRD, which proposed tailored actions to facilitate the transition from school or inactivity to the labour market, such as vocational guidance and counselling, increase of professional competences, validation of competences gained in non-formal and informal learning, stimulation of entrepreneurship, job placements. <p>IVET, CVET, adult training, internships and other WBL initiatives may also benefit from European Funds, mainly coming from the ESF under the Operational Programme for Human Capital 2014-2020 or the Erasmus+ Programme. Public and/or private education and training providers may apply for European Funds within specific calls of proposals, according to the provisions of the relevant applicant guides.</p>
<p>Please indicate the source</p>	<ul style="list-style-type: none"> • Ministerul Educatiei Nationale (Ministry of National Education) MEN: https://www.edu.ro/ • Centrul National de Dezvoltare a Invatamantului Profesional si Tehnic (National Centre for Vocational Education and Training Development) CNDIPT: www.tvet.ro • Ministerul Muncii si Justitiei Sociale (Ministry of Labour and Social Justice) MMJS: http://www.mmuncii.ro/j33/index.php/ro/ • Ministerul Fondurilor Europene (Ministry of European Funds) MFE: http://www.fonduri-ue.ro/ • Agenția Națională pentru Programe Comunitare în Domeniul Educației și Formării Profesionale (National Agency for Community Programmes in the Field of Education and Vocational Training) www.anpcdefp.ro
<p>Other comments</p>	<p>The blend of school and workplace learning offered by VET, apprenticeships and other WBL initiatives is a powerful method of preparing young people for jobs and careers. They are very effective at securing smooth initial transitions into the labour market.</p> <p>During recent years an increasing number of young people have chosen the higher education path, hoping for better jobs and higher earnings. Many are now stranded in jobs yielding little in terms of both material as well as professional gain. As a result, the VET route, from a less attractive education path, is gradually gaining</p>

attractiveness, as a more suitable alternative to provide a much desired, job-yielding qualification with good employment prospects. Consequently, establishing a professional (vocational) baccalaureate, as an alternative to the classical baccalaureate exam is becoming a necessity. The latter was seen as too focused on theory and thus less appropriate for VET students as well as for those aiming to get a job and not necessarily a university degree.

Starting in the 2012/2013 school year, a vocational/professional alternative sub-route, labelled “*choose your way*”, was introduced for graduates of the 9th grade as a technological route. It offers students an option of a curriculum with strong focus on practical skills, with a qualification certificate upon completion. Subsequently, students may enrol in 11th grade of upper secondary school and thus enter the baccalaureate exam procedure. As a result, after one additional year of study, at age 20, a young person might possess a qualification enabling them either to get a job or go to the university.

The legislation was adopted and work is under way on laying down rules for an effective implementation of a dual VET system involving private companies interested in this type of training. Following an extensive consultation process of the main VET stakeholders, the legal framework to allow for dual VET at levels 3, 4 and 5 of the national qualifications framework was adopted in 2016-2017. Private companies involved in dual VET to provide training, are offered financial incentives that include tax benefits and direct subsidies, but the effectiveness of measures aimed at aligning qualifications with the labour market requirements still needs to be improved.

Adult participation in learning remains low despite the widespread need for upskilling (1.2 % participation in 2016, well below the EU average of 10.8 %). The unemployed are less likely to engage in learning (2.1 %) as compared with the EU average (9.5 %), as well as older people (0.3 % versus 6.9 %) and low-qualified adults (0.3 % versus 4.3 %). The adult learning system in Romania remains fragmented, and its different components have developed in disparate ways. Access to continuing VET learning programmes is still hampered in some areas by entry requirements linked to the completion of lower secondary education. The validation of prior learning is well developed, but there is no database of possible courses where adults can go to supplement the competences they lack, which would make it possible to match adult learners’ needs and demands with the educational offer. In addition, there is poor data collection and a limited culture of participation in lifelong learning, particularly among the large population living in rural areas and working in subsistence and semi-subsistence agriculture, where there is poor educational infrastructure and limited access to learning opportunities. The legal framework establishing community centres for lifelong learning was adopted in August 2017, but support for capacity building and training of adult learning professionals to ensure quality and diverse education provision have yet to be developed.

The implementation of the national strategy for lifelong learning (adopted in 2015) is expected to solve a lot of these problems, including the adoption of the new national registry of qualifications, as a single reference tool in training, ensuring fair access to national and European labour markets and matching labour market needs.

Romania had a long tradition of apprenticeships and until the end of the communist period, companies and co-operatives played an important role as “*sponsors*” for the VET system. The enterprises helped to define the number of enrolments and the structure of the programmes, supported the school budget and provided training places for apprentices. The practical training period for apprenticeships was also normally between two and three years. Less than 8% of school students were in theoretical (academic) education. Apprenticeships in Romania nearly completely disappeared after the 1990s and despite interest on how to develop an effective model that would work at the postsecondary level – partly to raise its esteem, many uncertainties remain, in particular concerning incentives to companies. One way of developing apprenticeships would be to identify particular sectors to pilot new

programmes. In these sectors there would be a shortage of trained workers, and where therefore employers would be particularly keen to take apprentices. Such pilots would also allow evaluation of initial experiments with apprenticeships.

The message to the economy of the future should be: Romanian enterprises benefit from vocational training and thereby increase considerably their competitiveness in the global economy, so the Romanian economy must partially finance the vocational education. Therefore, the significant aspect is that not only the society and the government has to support VET in vocational schools, industry and the trades are also responsible for the training of technicians and skilled workers.

Measures to improve vocational education and training (VET) are underway, but challenges remain. Reforms in VET continued in the past year, with particular attention to dual VET. Effectiveness of measures aimed at aligning qualifications with labour market requirements still needs to be improved. An integrated and robust system of collecting feedback from employers about the relevance of qualifications is still to be developed, despite the isolated good experiences of some education institutions. Guidance and counselling services are still under-developed and lack a common methodology to be effective across all educational levels. Further efforts are needed to improve the attractiveness of VET as a career choice and not only as a “second choice” option.

Meanwhile, the country is trying to reassess its development perspectives in an unstable economic climate, while keeping in line with its Europe 2020 commitments. Establishing a permanent entity to provide decision-makers, including VET ones, with a much-needed forecasting mechanism, is a challenge for the near future.

In accordance with the Europe 2020 flagship initiative “*An Agenda for New Skills and Jobs*”, the Government is committed to undertake the necessary steps for the implementation of the flexicurity concept and of measures increasing chances of integrating persons of disadvantaged groups, women and young people in the labour market. The measures of facilitating young people’s entry in the labour market (guidance, counselling, apprenticeship, internship, company set-up) will also contribute to the implementation of the “*Youth on the move*” flagship initiative. Romania plans to set up the appropriate framework to facilitate the access and participation in the labour market of persons belonging to vulnerable groups. The goal is to develop specific programmes for (re)integration on the labour market of such persons and training programmes dedicated to acquire basic skills and qualifications.

Moreover, the NQF (National Qualification Framework) needs to be completed, the Romanian Classification of Occupations (COR) needs to be revised and the development of partnerships between the education system and the labour market to be further supported, especially by involving social partners in planning education and training offer.

Private companies involved in WBL initiatives, are offered financial incentives that include tax benefits and direct subsidies, but the effectiveness of measures aimed at aligning qualifications with the labour market requirements still needs to be improved. In this respect there is still a need for non-financial incentives that could include measures, such as a redesign of the WBL programmes, effective training of in-company trainers and other measures to improve the training capacity of employers. These measures increase the benefits or diminish the costs of offering WBL programmes, meaning that the overall benefits are at least equal to the costs. Other non-financial incentives could include regulatory measures that require employers to take on apprentices (or penalise them if they do not) and implement some enhancement measures designed to attract employers and learners to WBL initiatives.



„Work-based training approach in the field of Industry 4.0 for competitive European Industry”

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

Country Analysis Report Poland



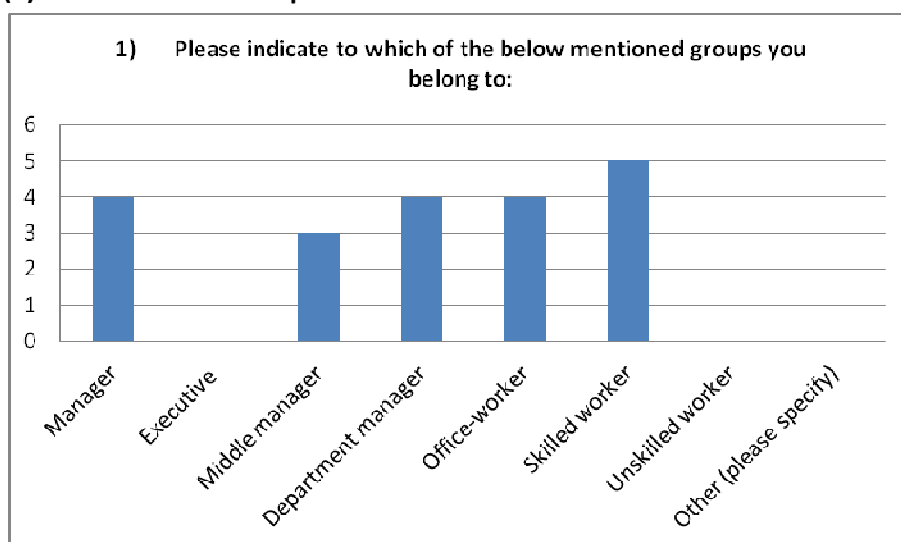
This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1. Introduction

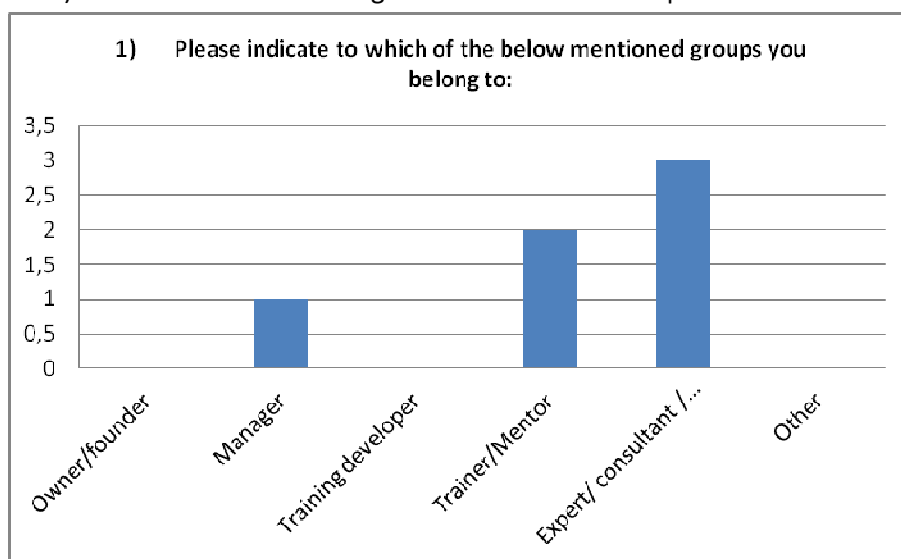
In Poland surveys were collected during the period from December 2017 to January 2018. They were distributed to the target group (companies) by various means including face to face meetings (during event organized in PIAP and company visits) and phone calls. Overall 20 questionnaires from various types of SMEs and 6 from VET related responders were collected. The questionnaires were translated into Polish language and analysis carried out in the following section is based on translated responses.

2. Analysis of results from surveys

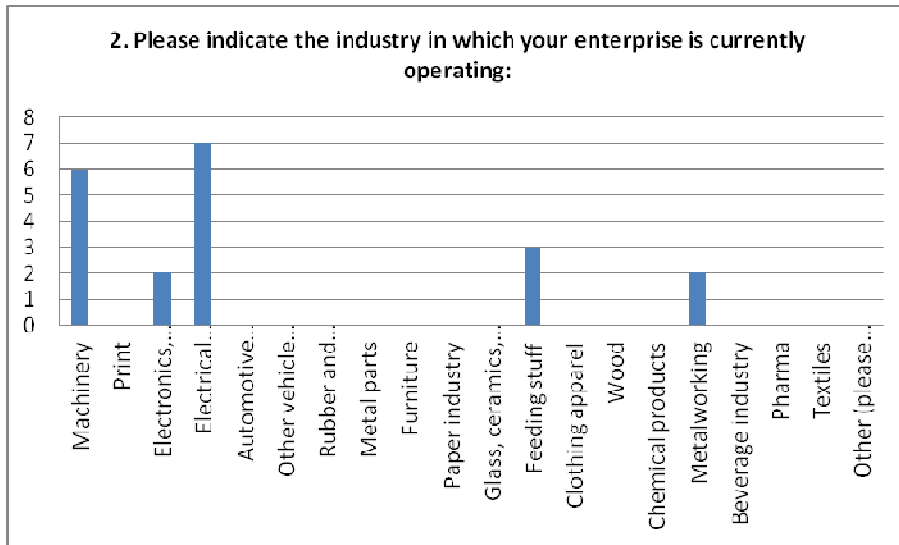
(1) Identification of responders



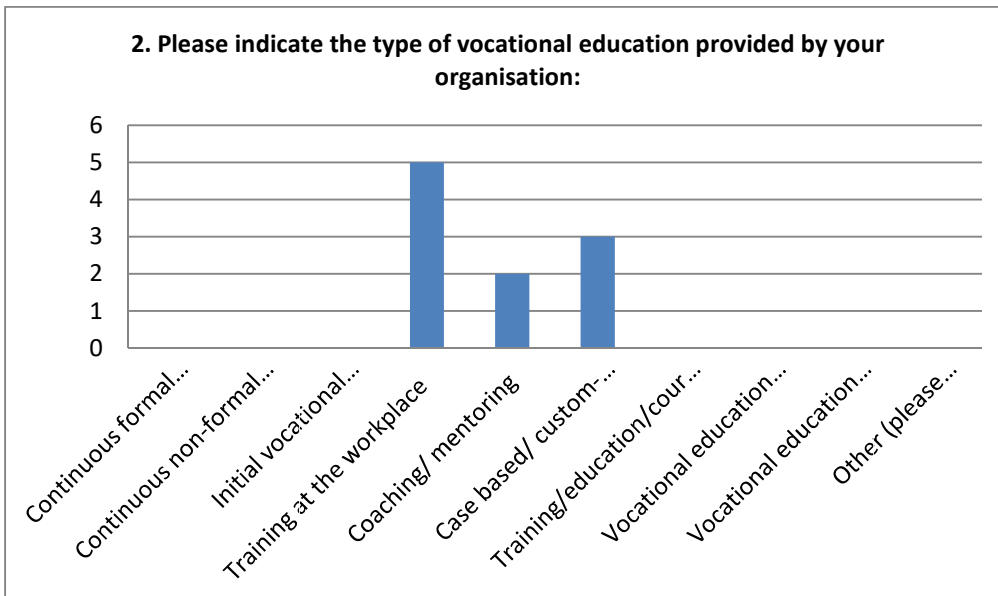
The responses received from SMEs represent various kind of employees in SMEs. Majority (11 of 20) were from various managerial levels while rest represent office and skilled workers.



From the VET providers questionnaire was answered by Manager, Trainers and Expert representatives of target groups.

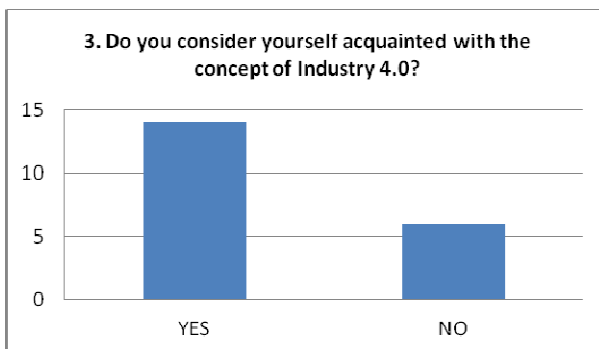


The responses received were from five different branches of industry: Machinery, Electronics, Electrical engineering, Feeding stuff and Metalworking.

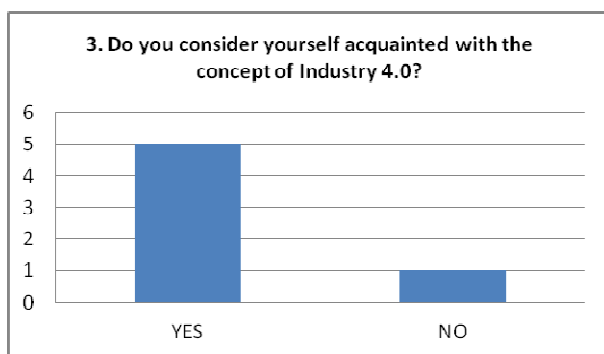


Some of the responders from VET organizations picked more than one answer here.

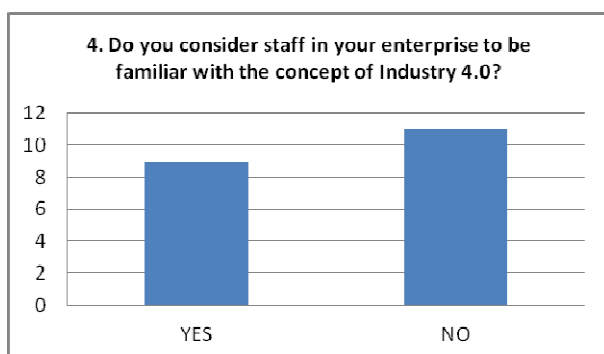
(2) Industry 4.0 skills and knowledge gaps



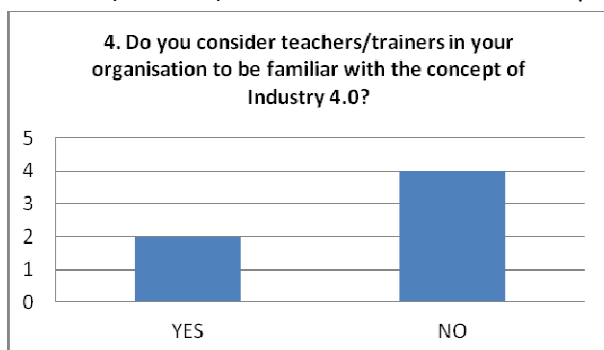
Regarding the awareness of responders from SMEs it seems that the majority of them (14 of 20) is claiming that acquainted with the idea/concept of Industry 4.0.



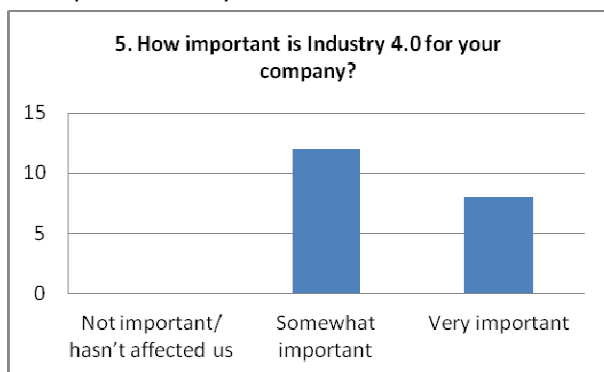
Again from the VET providers majority of responders claimed that the concept of Industry 4.0 is known to them.



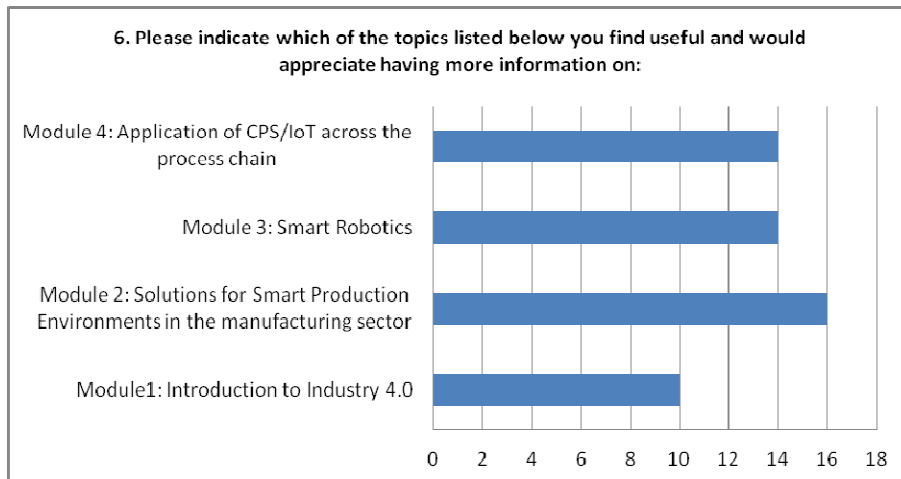
Regarding the awareness of staff in the enterprises of responders they state that majority of the staff (11 of 20) is not familiar with the concept of Industry 4.0



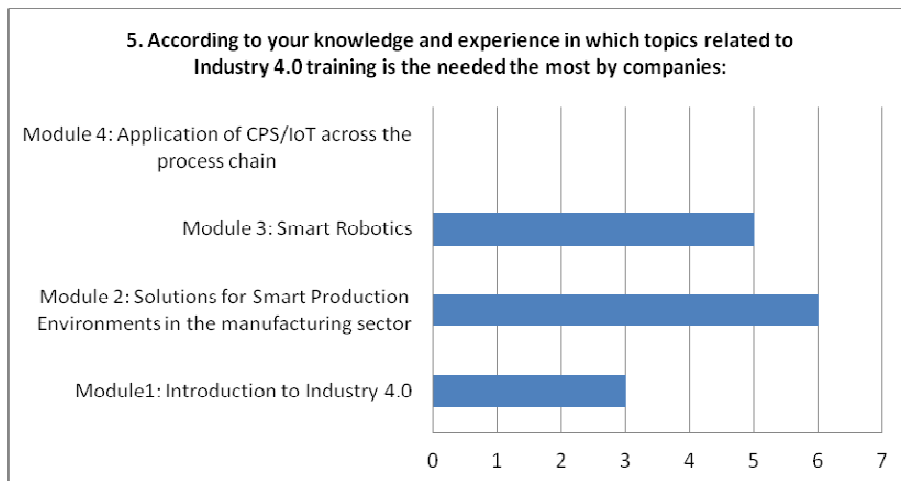
Regarding the fellow teachers only 2 of 6 responders from VET claimed that they know the concept of Industry 4.0.



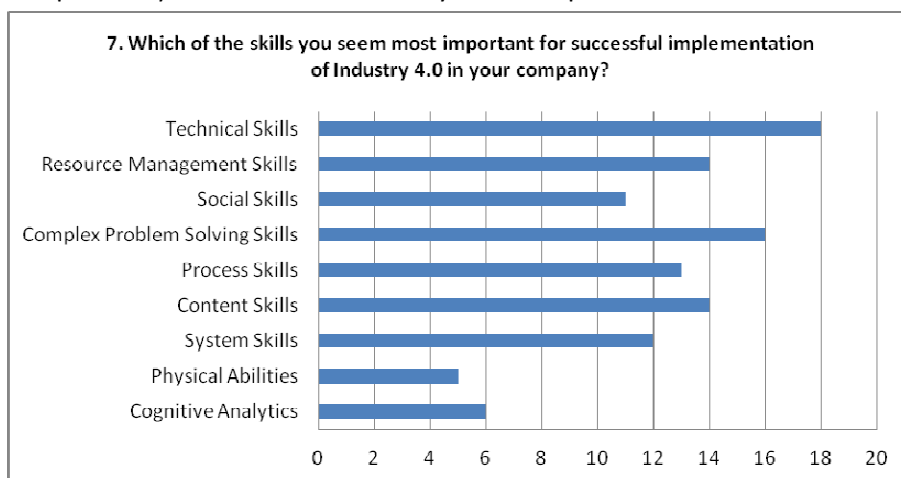
All of the responders answered that the Industry 4.0 is important for their company. From them majority (12 of 20) stated that it is “somewhat important” and the rest that the idea is “very important”.



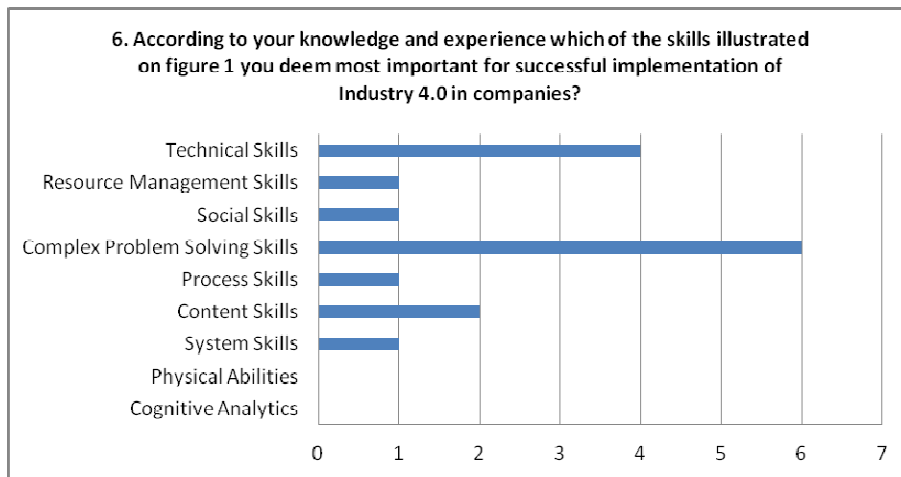
When asked about training topics most responders (16 of 20) chosen Module 2 as most useful and interesting for them while Modules 3 and 4 were chosen by only a slightly less number of responders (14 of 20) each. The least chosen option was Module 1.



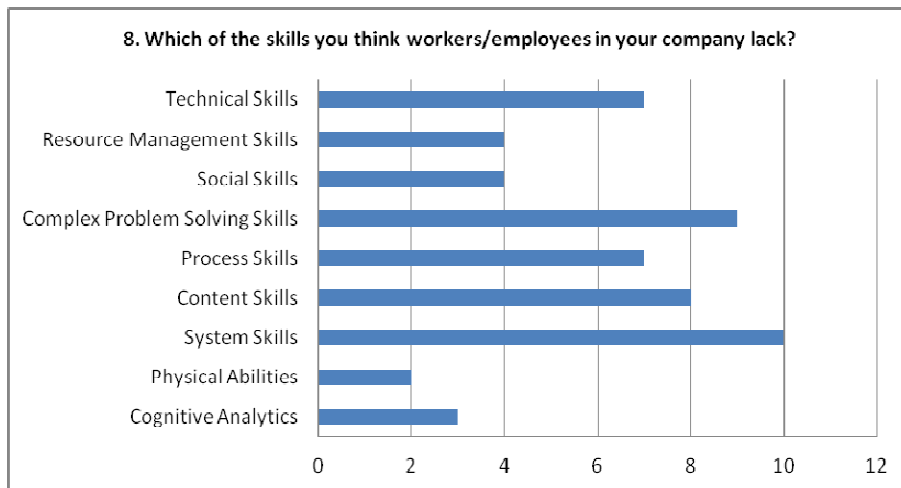
Responders from VET organizations picked Module 2 as most needed by companies, Module 3 was picked by 5 of 6 and Module 1 by 3 of 6 responders.



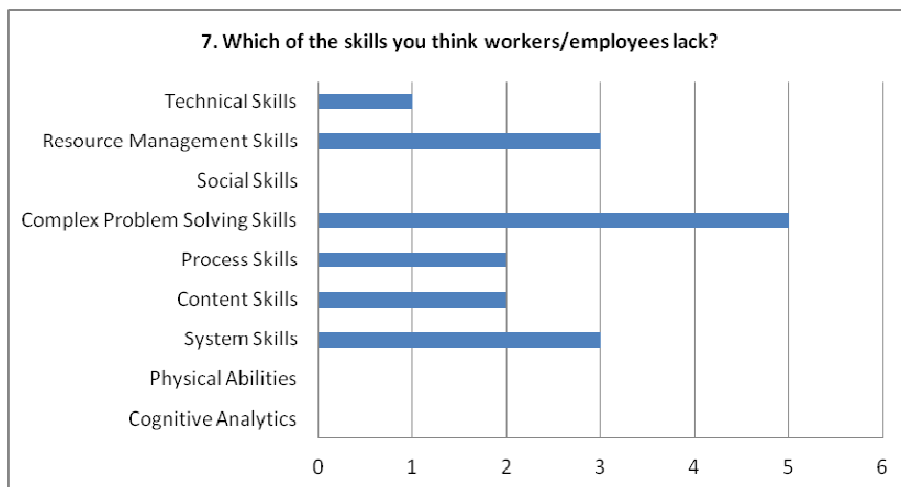
Responders chosen Technical Skills (18 of 20), Complex Problem Solving Skills (16 of 20), Resource Management Skills (14 of 20) and Content Skills (14 of 20) as most important for successful implementation of Industry 4.0 in their companies. The least chosen answers were Physical Abilities (5 of 20) and Cognitive Analytics (6 of 20).



Responders from VET area picked up Complex Problem Solving Skills (6 of 6) and Technical Skills (4 of 6) as most important for successful implementation of Industry 4.0 in companies.



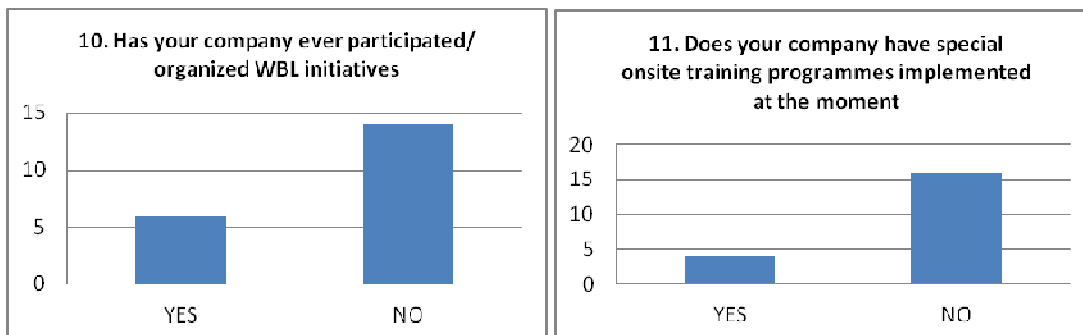
Responders pointed lack of System Skills (10 of 20), Complex Problem Solving Skills (9 of 20) and Content Skills (8 of 20) in their companies.



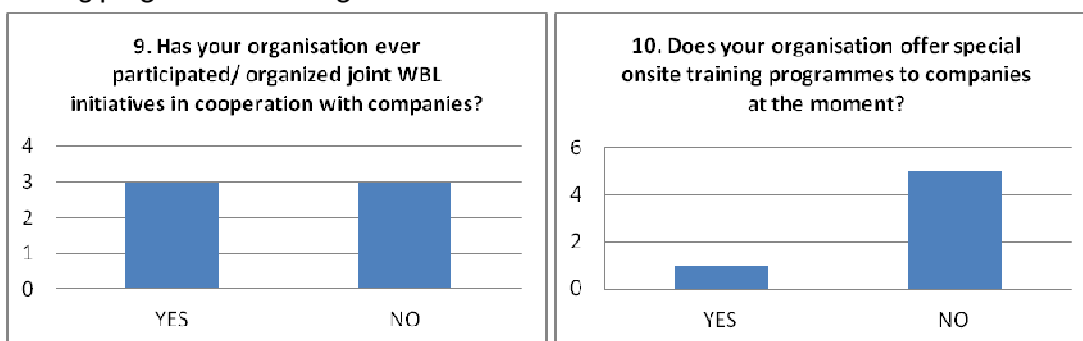
Responders from VET pointed lack of Complex Problem Solving Skills (5 of 6), Resource Management Skills (3 of 6) and System Skills (3 of 6) at companies.

For the organization of the training responders from companies picked up practical training or blended approach (practice with some sort of distance learning) as a preferred solution, while VET responders opted for more emphasis to be put on distance learning.

(3) Experience with Work-based learning

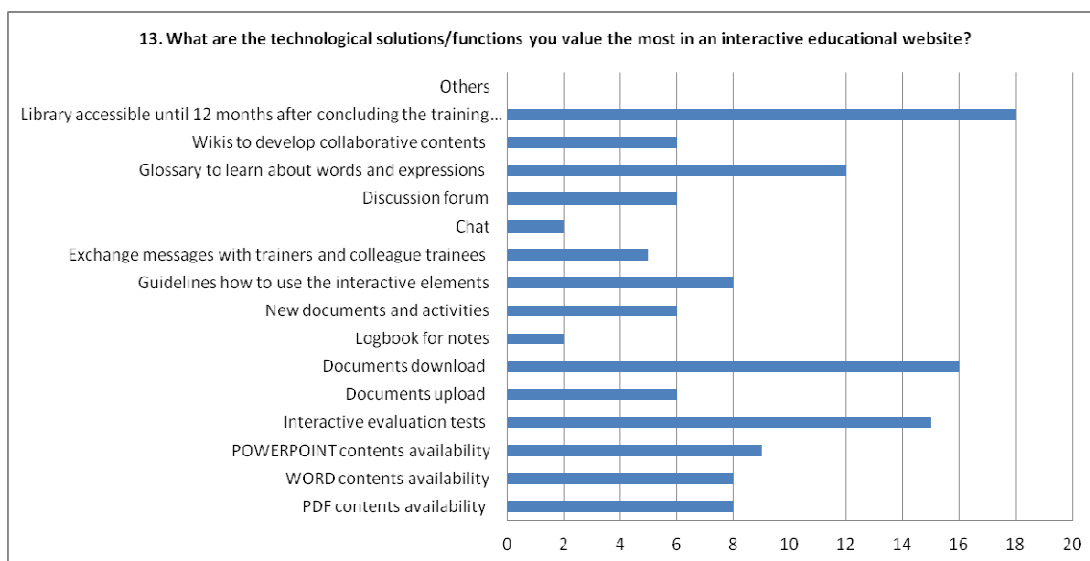


Only 6 of 20 responders from companies stated that their company had any experience with any WBL initiatives and only 4 of 20 responders admitted that their company have onsite training programmes running at the moment.

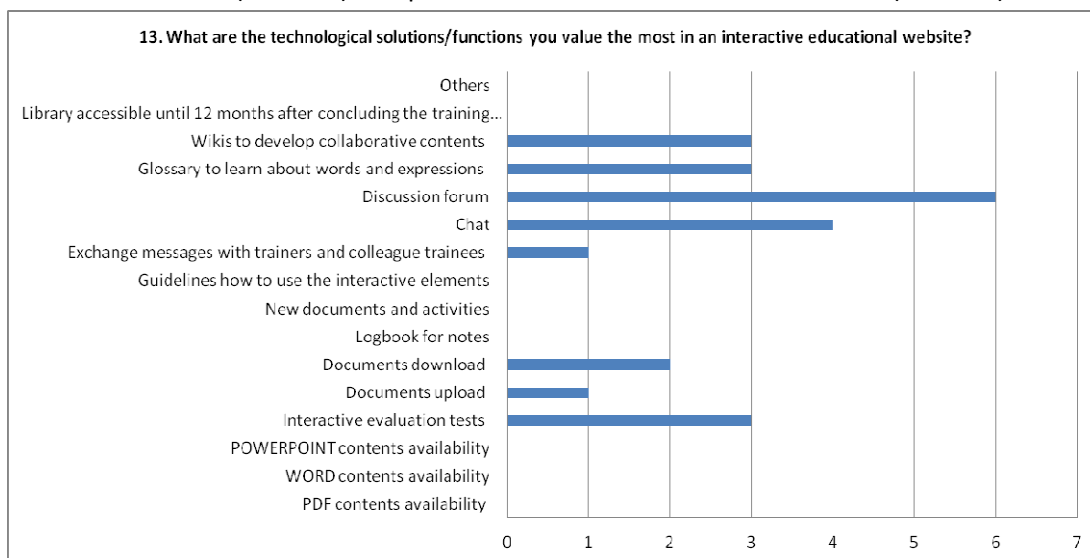


3 VET responders stated that they participated/organized WBL training while only one stated that they offer such training programme at the moment. None of the responders offers any kind of courses connected to the changes arising by Industry 4.0 because topic is quite new and needs to be researched further before offering it to the trainees.

Main obstacles and hardships reported were connected with the lack of resources, low demand/interest in the educational service and reluctance on the part of employers to organize such initiatives.



Preferred functions of the training environment were online library (18 of 20), documents download function (16 of 20) and presence of interactive evaluation tests (15 of 20).



From VET responders preferred functions of the training environment were Discussion forum (6 of 6), Chat (5 of 6), Interactive Evaluation tests (3 of 6), Wikis (3 of 6) and Glossary (3 of 6).

Regarding the proportion of practice and theory majority of responders from companies stated that not least that 50% of the time shall be devoted to practice assignments, while VET responders opted for more time for on-line learning.

Based on the survey results it can be stated that:

- although majority of responders are acquainted with the Industry 4.0 concept, there is a general lack of knowledge in the area,
- the most important for the responders was Module 2: Solutions for Smart Production Environments in the manufacturing sector while Module 3: Smart Robotics and Module 4: Application of CPS/IoT across the process chain are only a fraction less interesting for the audience. Those 3 modules should be emphasized on,
- the training should incorporate documents repository, interactive tests, practical assignments and some possibilities of synchronous (chat) and asynchronous (discussion forum) communication between teachers and trainees.

3. Conclusions from legislation review and policy recommendations

Main finding and conclusions from legislation review relevant to situation in Poland point that not adequate incentives (on national and regional level) and lack of cooperation between VET providers and companies are the most important problems in WBL training approach in Poland.

Main findings for incentives and capacity of vet providers:

- VET providers lack the technical capacity, tools, and human resources to engage in effective WBL implementation.
- VET providers have concerns about the quality of training that can, at this stage, be provided through WBL.
- Schools have incentives to provide practical training through Centers for Practical Training, rather than in firms.
- Reform resistance is exacerbated by concerns about the impact of increased WBL on the demand for teaching staff and teachers' skills.
- Main findings for incentives and capacity of companies:
- Costs associated with engaging in WBL tend to be high, and actual and perceived benefits tend to be low.
- Costs are relatively high, since firms tend to lack the capacity and tools to efficiently engage in WBL.
- Functional mechanisms to provide financial compensation to firms are largely absent.
- Firms do not reap direct benefits from WBL, since students tend not to contribute to production processes.
- Employers do not take into account all potential medium and long-term benefits of WBL.
- WBL engagement tends to be insufficiently marketed to have a notable impact on a firm's image.
- Enterprises do not necessarily consider VET providers as sound partners.

Quality assurance mechanisms for WBL in Poland:

- The current QA system for VET does not yet incorporate key recognized good practices to ensure demand-responsiveness of training provision, and is not specifically geared toward assuring the quality of WBL provision.
- No regulations or clear guidance is made available to firms and schools to guide them in carrying out sound quality assurance of WBL.

To strengthen the WBL initiatives it is necessary to adapt the VET regulatory framework to clarify regulations, increase incentives, and introduce quality assurance mechanisms.

In particular there is a need to clarify definitions and provisions that currently lead to ambiguities and

misinterpretations, such as the difference between practical training and vocational practice, which may be superfluous, increase incentives for VET providers and their managing bodies to engage in

WBL, by increasing the minimum requirements for the share of learning that is to take place in firms and to introduce clear mechanisms and procedures to assure the quality and relevance of WBL including, among others, related to identifying and assessing learning

outcomes. The above regulatory changes may need to be accompanied, at least in their initial stages, by support measures to VET schools and other stakeholders, to ensure their awareness of the changes as well as their ability to comply with them. The other thing is to adapt the accountability and governance framework to increase incentives for engagement in WBL. In addition to adapting the regulatory framework, further national-level interventions could be considered to strengthen WBL implementation. These could, for example, include introducing performance-based elements in accountability and financing mechanisms, which may need to be preceded by activities to strengthen monitoring and evaluation mechanisms that accurately keep track of performance. Similar to revising the regulatory framework, such reforms may potentially need to be accompanied by support measures to VET providers and other stakeholders, to ensure that they have the desired impact. After all, increased accountability and results-based financing will only have the desired impact when providers are able to meet performance requirements.

4. Conclusion

There are some important elements that facilitate the process of VET and WBL learning in Poland. These elements relate to all stakeholders involved in promoting and implementing WBL, they are particularly relevant for effectively engaging VET providers. They include, among others, the need to involve all key stakeholders and ensure that they share the same vision; avoiding competition between the new approach and existing approaches to WBL or other forms of practical learning (such as, in the case of Poland, practical training provision in CPTs); starting with pilot programmes and ensuring that lessons learned can be incorporated in subsequent activities; investing substantial efforts in developing tools and building stakeholder capacity; and actively marketing and communicating the new approach to all key stakeholders.

5. Annexes

- Chłoń-Domińczak, A. et al.(2016). *Vocational education and training in Europe – Poland. Cedefop ReferNet VET in Europe reports.*
http://libserver.cedefop.europa.eu/vetelib/2016/2016_CR_PL.pdf
- *The System of Education in Poland in Brief, Polish Eurydice Unit, 2015*
- *Education and Training Monitor 2016 Poland*
- *Rozwój kształcenia w miejscu pracy jako instrumentu doskonalenia szkolnictwa zawodowego w województwie Świętokrzyskim, 2017*
- *Apprenticeship-type schemes and structured work-based learning programmes Poland, Cedefop's ReferNet 2014*

Annex 1: Legislation review

Legislation and WBL (work based learning)	
Please describe the legislation in the field of WBL in your country regarding the topics listed below. The questions should give you a reference point for what is needed. If you think, you should add something not targeted by the questions, please write it down.	
General overview of WBL in the national legislation	
How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject?	
Who is responsible for setting legislation in regard to WBL in your country (National, regional or local level)? Is the legislation the same in the whole country?	<p>Vocational education in Poland is based on two types of school: basic vocational schools (BVS) and technical upper secondary schools. Both of these entities exist in the education system pursuant to the Act on the Education System. Recent changes were implemented to it on 20th May 2015. Important documents are also the Regulation of the Minister of National Education of 23 December 2011 on the classification of professions for vocational education and the Regulation of the Minister of National Education of 7 February 2012 on the core curriculum of vocational education (as amended). The amendment of the Act of 2012, assumed the reform of vocational education, among others, introduced the concept of the so-called qualifications in the profession. Qualifications are carried out during the vocational training. After passing the examination, student obtains a qualification certificate and after passing all the qualifications required in a given profession (and graduation) receives a diploma and professional title. A new core curriculum for vocational education has been implemented as well. It is consistent with the National Qualifications Framework - an EU project aiming to facilitate getting a job in the EU.</p> <p>Students go to vocational school or technical upper secondary school after graduating from lower secondary school (at the age of approx. 15 years). The BVS is 3 years, technical upper secondary school - 4 years. Completion of technical upper secondary school allows students to obtain the technician title and high-school certificate. The BVS students who want to get a high school diploma must complete the so-called "complementary high-school". Before starting vocational school students are directed by the school for the compulsory medical examination and after the test, they receive a certificate which confirms the lack of contraindications as to starting the education. Adult education is carried out in school and extracurricular in schools for adults, centres of continuing education, practical and vocational training centres, as well as postgraduate studies. At the same time, within the limits of the system of training of the unemployed and looking for work, vocational courses are organized e.g. in labour offices. The basic vocational school does not provide the education of adults.</p> <p>Activities taken, also by the Ministry of Education aim to restore the splendour of vocational schools and the introduction of solutions to practical training professions.</p> <p>In the current state of the law in the Polish education system practical classes can be held with employers on the principles of the dual education system, based on:</p> <ol style="list-style-type: none"> 1) The employment contract for vocational training, concluded between the juvenile and the employer; 2) A contract of apprenticeship concluded between the school principal and the host employer of students on apprenticeship <p>In practice, the dual school system is used in the training of young workers attending vocational schools who have the status of a juvenile worker. Classes in the technical upper secondary schools are held by employers almost exclusively in the form of monthly practical</p>

	<p>classes, with the detachment from the school classes. According to the Ministry, only 60 percent of students of vocational schools have the status of juvenile worker, and only every fifth student of vocational education receives the vocational training in the dual education system, receiving On-the-job Training with an employer (only 20% of the students are juvenile workers). Today, the problem of vocational education in Poland is that the professional experience is not gained in practice, only in schools. Students of technical upper secondary schools benefit from dual education system only in a limited way. After all, they should be specialists in their own branches, trained in the best conditions.</p> <p>In the current economic and social realities of Poland, abilities to cover all vocational schools students with the dual education system are limited. This is mainly due to the vocational training system, which is still mismatched to the labor market: the need to implement the core curriculum developed centrally, high qualification requirements for teachers and staff shortages in vocational training. Furthermore, there is also insufficient interest on the part of employers in cooperation with schools, the reluctance of employers to contribute to the curriculum, lack of financial incentives to accept students for practical classes. Moreover, despite the ongoing campaign to advertise vocational education, these schools are selected by the still students whose aspirations are limited only to obtain a secondary education. Professions' selections are made non-reflective, and often the most important motivation for the choice of a profession is a close distance from home to school, which educates him. Students are not so convinced that the school, which they chose will provide solid vocational training and the profession, they want to learn provide them in future work.</p> <p>The number of students opting for vocational training, and selections of lower secondary school graduates in the school year 2014/2015 shows that vocational education starts to recover, and the choice of a vocational school may be a chance for students' personal development and therefore success in the labor market.</p> <p>Vocational education still needs many changes at the system level, among others, supplementary trainings for teachers (in schools often teach theorists), high-end workshop equipment, cooperation of school with the entrepreneurs and real dual system giving students access to real knowledge required in the labour market. Our legislature is aware of changes in the global economy, hence the emphasis on the development of apprenticeships, but it seems to have too little knowledge in particular for the quickly progressing fourth industrial revolution.</p>
<p>Please indicate the source</p>	<ul style="list-style-type: none"> - Chłóń-Domińczak, A. et al.(2016). <i>Vocational education and training in Europe – Poland. Cedefop ReferNet VET in Europe reports.</i> http://libserver.cedefop.europa.eu/vetelib/2016/2016_CR_PL.pdf - <i>The System of Education in Poland in Brief, Polish Eurydice Unit, 2015</i> - <i>Rozwój kształcenia w miejscu pracy jako instrumentu doskonalenia szkolnictwa zawodowego w województwie Świętokrzyskim, 2017</i> -

Legislation for participating in WBL	
<p>Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)? If yes, what are the requirements?</p>	<p>The mismatch between qualifications required by the labour market and those provided by VET schools is significant. The funding method for VET means that powiat authorities fund VET programmes even if qualifications are not in demand, while it discourages them from funding vocational qualifications that are costlier to provide and often more in demand (Cedefop 2015a). However, within the framework of the current reform of vocational education it is planned to strengthen actions aimed at closer linking education with the labour market. From September 2015 the new form of dual education has been introduced in vocational schools. It combines education at a vocational school with practical training. The practical training is based on agreement between a young employee and an employer or between a school and an employer. A minimum number of vocational practice classes is set and employers can influence the content of vocational training programmes carried out as part of practical training within the company.</p> <p>In December 2015 the Law on an integrated qualifications system was adopted. The Act came into force in January 2016. It introduced the Polish Qualifications Framework (PQF), which means that qualifications in formal and non-formal education will be assigned to designated PQF levels. The integrated qualifications register was launched in July 2016 and is coordinated by the Minister for National Education. By extending the possibility to accumulate and transfer learning outcomes achieved in various contexts, these tools allow for greater flexibility in obtaining further qualifications and make it learning pathways more flexible.</p>
<p>Please indicate the source</p>	<ul style="list-style-type: none"> - Chłoń-Domińczak, A. et al.(2016). <i>Vocational education and training in Europe – Poland. Cedefop ReferNet VET in Europe reports.</i> http://libserver.cedefop.europa.eu/vetelib/2016/2016_CR_PL.pdf - <i>Education and Training Monitor 2016 Poland</i>
Labour legislation and WBL	
<p>How does the labour legislation look like in your country? Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc....)? If yes, how does it differ from the standard labour legislation?</p>	<p>The practical part of vocational education can be performed as work-based learning (in school workshops, continuing education centres and practical training centres or with an employer) or as an on-the-job training (which is mandatory for of vocational upper secondary and post-secondary programmes and lasts from 4 to 12 weeks, depending on the type of job performed). Practical vocational education is equal to 60% of the total hours of classes in basic vocational programmes and 50% in vocational upper secondary and post-secondary programmes.</p> <p>A special type of practical training is juvenile employment for the purpose of vocational training (<i>przygotowanie zawodowe młodocianych pracowników</i>) for young people between 16-17 years of age with lower secondary education. Around 60% of basic vocational programme pupils participate in this form of practical training.</p> <p>In order to update the training offer, VET schools cooperate with local employers. According to IVET teachers' survey (Pfeiffer, 2013) the most popular forms of this cooperation are consultations, field trips to learn about occupations, and obtaining training materials. Only around 11% of teachers stated that the cooperation was related to apprenticeships.</p> <p>In regard to the school-enterprise cooperation, employers frequently criticise the lack of financial incentives, bureaucracy, legal frameworks and the necessity to engage employees in supervising trainees.</p>

Are companies who participate in WBL initiatives subject of more regular audits from labour monitoring institutions?	Yes, especially those who accept juvenile Workers.
Tax legislation and WBL	In Poland there is lack of financial incentives for the companies or vet providers to accept students for practical classes.
Are there specific tax laws in favor of companies engaged in WBL initiatives, dual education? If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?	
Please indicate the source	<ul style="list-style-type: none"> - Chłóń-Domińczak, A. et al.(2016). <i>Vocational education and training in Europe – Poland. Cedefop ReferNet VET in Europe reports.</i> http://libserver.cedefop.europa.eu/vetelib/2016/2016_CR_PL.pdf - <i>Apprenticeship-type schemes and structured work-based learning programmes Poland, Cedefop's ReferNet 2014</i>
Subsidies and grant legislation with regard to WBL	Supporting employers in their involvement in VET practical training.
Does the funding and grant legislation directly address WBL/dual education initiatives? If yes, how (e.g. special founds or grants for certification, investments in education and trainings of head or staff to be mentors/trainers?)	Employers who provide VET training to students of vocational schools can receive the following support: refund of trainers' salaries, refund of the extra salary paid to instructors, refund of the cost of work clothes and necessary protection measures, training allowance, and refund of the bonus for work placement supervisors (Pfeiffer, 2013). An assessment of the co-operation between schools and entrepreneurs in the area of work placements (Fila et al., 2014)
Are there any positive or negative incentives in the legislation promoting participation in WBL initiatives? If yes, which one?	indicates that employers believe that the financial support offered is not fully adequate to the resources devoted to such training. The period of vocational practices is seen as being too short, which means that students are not providing added value to the company's performance. Promoting the involvement of local social partners in adapting VET to the needs of the local labour market. The European Social Fund projects in the programming period 2014-20 to further promote the involvement of employers, social partners and support for the VET schools in the development of curricula adapted to labour market needs. Within the project "Partnership for vocational education development" representatives of social partners are involved in working groups that update the VET curricula. National training fund supporting the financing of training organised by employers. Since 2014, employers are able to use the National Training Fund (<i>Krajowy Fundusz Szkoleniowy</i>) to finance training for their employees. The fund is part of the Labour Fund (<i>Fundusz Pracy</i>). It mainly finances courses and post-graduate studies attended by employees at the request of the employer; examinations enabling the attainment of vocational qualifications; medical and psychological examinations required for a job; and personal accident insurance. The application for funding can be submitted to the UP by any employer who employs at least one employee. In the case of microenterprises, the funding can cover 100% of the costs of continuing education, whereas in other types of enterprises, the employer covers 20% of the training cost. The amount for training for one employee cannot exceed 300% of the average salary in the economy in a given year (in 2015, PLN 3 899 PLN per month, an equivalent of about EUR 900). In 2014, 12 236 employers

	received support from the National Training Fund, resulting in training or other forms of assistance for 73 287 employees (MRPiPS, 2016).
Please indicate the source	<ul style="list-style-type: none"> - Chłoń-Domińczak, A. et al.(2016). <i>Vocational education and training in Europe – Poland. Cedefop ReferNet VET in Europe reports.</i> http://libserver.cedefop.europa.eu/vetelib/2016/2016_CR_PL.pdf - <i>Apprenticeship-type schemes and structured work-based learning programmes Poland, Cedefop’s ReferNet 2014</i> - <i>Rozwój kształcenia w miejscu pracy jako instrumentu doskonalenia szkolnictwa zawodowego w województwie Świętokrzyskim, 2017</i>
Other comments	



„Work-based training approach in the field of Industry 4.0 for competitive European Industry“

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

Country Analysis Report Germany



This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1. Introduction

EVBB being a European network with no grassroots work or work directly conducted in the field of VET, the survey was carried out within the EVBB network among the German members representing the German VET Sector very well. In addition to that, a well-connected SME was identified and contacted in order to get a glimpse inside the industry sector.

The survey was distributed via email to high-ranking representatives or carried out directly in a telephone conference.

The two largest members within EVBB based in Germany active in the field of VET and the well-connected SME responded to the survey.

2. Analysis of results from surveys

(1) Identification of the respondents

Those two enterprises (VET and social service institutions) are active at more than 1.150 locations all over Germany with numerous VET centres, employ 23.500 members of staff and 505.000 cared for people. Those two enterprises represent the VET sector in Germany very well.

Together they cover all indicated types of vocational education, includes:

- Continuous formal vocational education
- Continuous non-formal vocational education
- Initial vocational education
- Training at the workplace
- Coaching/ mentoring
- Case based/ custom-made training
- Training/education/courses at adult education centres
- Vocational education provided by an university

The main focus of their services is on the formal vocational training in the framework of dual vocational training in Germany. Over the period of the last 5 years, that focus shifted from initial vocational training at adult education centres to custom-made training, coaching/mentoring and training at the workplace.

This development is caused by the individualisation and digitalisation of labour market itself and the individual workplaces.

The SME respondent works in the field of coaching/mentoring in the automotive industry. This is a highly specialised and individualised service with only indirect link to industry 4.0.

(2) Industry 4.0 skills and knowledge gaps

Regarding the awareness of Industry 4.0 and the digital revolution, the VET service providers and SME are aware of the dimension and the effect it will have on society and the world of

work. As the VET providers and SMEs in the field of coaching/mentoring are not directly involved in the industry sector, the importance and effects on their actual work within them are still quite limited compared to the industry sector.

Therefore, it doesn't come as a surprise that neither consider their staff to be familiar with the concept of Industry 4.0 (VETs/SMEs) or see themselves acquainted with it (SMEs). This is also shown in the fact of seeing the importance of Industry 4.0 for their company (SMEs).

The choice of topics related to Industry 4.0 corresponds with the gaps identified. Both VETs and SME selected Module 1: Introduction to Industry 4.0 (concept and benefits) as a field where training is definitely needed. In addition to that, VETs chose Module 2 Solutions for Smart Production Environment and Module 4 Application of CPS/IoT across the process chain as an extra field of training depending on their training courses delivered to the SMEs or other customers and staff of the industry sector.

Significant differences between the VETs and SMEs are shown in respect of needed skills. VETs see content, complex problem solving and resource management skills as most important for the successful implementation of Industry 4.0 in companies, whereas SMEs see beside only the resource management skills all cross-functional skills as important.

Beside of complex problem solving and content skills (VETs), social skills (SME's) are seen as those skills members of staff lack the most.

(3) Experience with work-based learning

Germany being one of the countries, where there is Dual Vocational Training in place, it is essential to provide work-based training. Therefore, all VETs participated or organized WBL initiatives in cooperation with companies. There are special onsite training programmes in place in some VET centres, others face obstacles/hardship/challenges to organize and implement those programmes. Beside the lack of understanding the dimension of digitalization, the following obstacles have been identified:

- The lack of trust in those programmes by the companies (VETs)
- Reluctance of employers and employees (generational gap) (VETs)
- The lack of training material (VETs)
- The lack of resources (SMEs)
- The lack of time (SMEs)

Due to the facts above, no courses have been implemented concerning Industry 4.0. Some VET centres addressed the topic and the effects on businesses and society in the frame of courses targeting at Change and Risk Management, quality and ICT training.

(4) Preferences and training needs

The survey shows that the training needs of VETs and SMEs are quite similar. Based on what technological solutions/functions are most valued for an interactive website like:

- PDF contents availability (SMEs)

- Interactive evaluation tests (VETs/SMEs)
- Documents upload (VETs/SMEs)
- Documents download (VETs/SMEs)
- New documents and activities (SMEs)
- Guidelines how to use the interactive elements (SMEs)
- Exchange messages with trainers and colleague trainees (VETs/SMEs)
- Chat (VETs)
- Discussion forum (VETs), SMEs)
- Glossary to learn about words and expressions (VETs/SMEs)
- Wikis to develop collaborative contents (VETs)
- Library accessible until 12 months after concluding the training course (VETs)
- Others (Please specify): e.g. easy-to-use and self-explaining tools (VETs)

Training needs are seen in a combination of overcoming the obstacles/hardships/challenges mentioned above by using those features indicated for an interactive educational website.

3. Conclusions from legislation review and policy recommendations

Germany as a country already has, based on historical developments in the industry and craft sector, fully implemented WBT in the form of dual vocational education as the backbone of the vocational training on all levels. This principle of dual vocational training is embedded in the Vocational Training Act and accompanied by numerous guidelines and legal papers and enforced on federal and regional level.

Policy recommendations:

- Berufsbildungsgesetz (BBiG)
- Curricula for all recognised professions in all sectors
- Aufstiegsfortbildungsförderungsgesetz (AFBG)

4. Conclusion

Based on the CEDEFOP country report and the Survey for VET providing organisations and SMEs, it can be said that Germany is a country where digitalisation has an effect on all levels of the economy, educational systems and society as a whole.

The biggest challenge Germany's economy is facing is securing its competitiveness due to the lack of skilled workers. According to the McKinsey study 2017, 77% of low-skilled work and 46% of medium-skilled work can be automated through digitalisation, but only 18% of the high-skilled work. Therefore, there is a big demand in training courses on all levels for raising more awareness of the importance of the digitalisation and its effects, challenges and also opportunities it creates. This is reflected by the conducted surveys as well.

Furthermore, every employee has the right to continuous vocational training in order to develop their skills and raise opportunities to support their career prospective. This right is covered by the Career Advancement Supporting Act (AFBG) and is important for the individual employee's further qualification of skills required by the labour market.

A good way of achieving those objectives is implementing training courses in theory (schools and educational institutions etc.) and practice (WBT). The German dual vocational education system is very suitable for those objectives covering both sectors.

5. Annexes

- **CEDEFOP (2016). VET in Europe: country report Germany**
(<http://www.cedefop.europa.eu/en/publications-and-resources/country-reports/germany-vet-europe-country-report-2016>)
- **Arbeitsgesetzbuch**
(https://www.bmas.de/SharedDocs/Downloads/DE/PDF-Publikationen/a711-arbeitsrecht.pdf?__blob=publicationFile)
- **Berufsbildungsgesetz (BBiG)**
(<https://www.bmbf.de/de/das-berufsbildungsgesetz-bbig-2617.html>)
- **Aufstiegsfortbildungsförderungsgesetz (AFBG)**
(<https://www.gesetze-im-internet.de/afbg/AFBG.pdf>)
- **Jugendarbeitsschutzgesetz**
(<https://www.gesetze-im-internet.de/jarbschg/>)
- **McKinsey-Study**
(<https://www.mckinsey.de/das-digitale-wirtschaftswunder>)

Annex 1: Legislation review

Legislation and WBL (work-based learning)	
Please describe the legislation in the field of WBL in your country regarding the topics listed below. The questions should give you a reference point for what is needed. If you think you should add something not targeted by the questions, please write it down.	
General overview of WBL in the national legislation How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject? Who is responsible for setting legislation in regard to WBL in your country (national, regional or local level)? Is the legislation the same in the whole country? <i>Please indicate the source</i>	Besides an All School Training, the Dual Vocational Training is laid down on German federal level in the Vocational Training Act (BBiG) and implemented on all levels by the individual federal state as the backbone of the German vocational education system. On the level of higher education, universities are introducing more dual studies every year. https://www.bmbf.de/de/das-berufsbildungsgesetz-bbig-2617.html https://www.kmk.org/themen/berufliche-schulen/duale-berufsausbildung.html
Legislation for participating in WBL Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)? If yes, what are the requirements? Is there a specific public register where interested parties can check authorized companies to participate WBL? <i>Please indicate the source</i>	All companies (VETs, SMEs or large enterprises) wanting to participate in the dual vocational training programme have to meet the legal requirements and have to be registered at either of the chambers or at the Regional Administrative Authority. e.g. http://www.hwk-dresden.de/Ausbildung/Duale-Ausbildung http://www.dresden.ihk.de/servlet/pool?knoten_id=2619&sprache=deu&pk_campaign=ausbildung https://www.lfs.sachsen.de/ausbildung/?ID=12314&art_param=852 Jugendarbeitsschutzgesetz https://www.gesetze-im-internet.de/jarbschg/
Labour legislation and WBL How does the labour legislation look like in your country? Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc...)? If yes, how does it differ from the standard labour legislation? Are companies who participate in WBL initiatives subject of more regular audits from labour monitoring institutions?	Germany has several laws and legal regulations in place dealing with the labour market (Arbeitsgesetzbuch) and regulating labour market. Besides that, there are numerous collective labour agreements in place negotiated by companies/industry representatives and the unions. Yes, all companies participating in the vocational training programme are monitored by the different chambers representing the companies field of work or the responsible Regional Administrative Authority.
Tax legislation and WBL	no

Are there specific tax laws in favour of companies engaged in WBL initiatives, dual education? If yes, which one (e.g. special tax reductions in cases of employing certain numbers of students or other)?	
Please indicate the source	http://www.bmas.de/DE/Startseite/start.html Aufstiegsfortbildungsförderungsgesetz (AFBG) https://www.gesetze-im-internet.de/afbg/AFBG.pdf
Subsidies and grant legislation with regard to WBL	no
Does the funding and grant legislation directly address WBL/dual education initiatives? If yes, how (e.g. special funds or grants for certification, investments in education and trainings of head or staff to be mentors/trainers?)	
Are there any positive or negative incentives in the legislation promoting participation in WBL initiatives? If yes, which one?	
Please indicate the source	
Other comments	no



**„Work-based training approach in the field of Industry 4.0 for
competitive European Industry”**

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

Country Analysis Report Portugal



This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1. Introduction

The surveys were carried out between the 16th and the 26th of January, via emails and phone calls. As expected, phone calls proved to be way more efficient in obtaining companies' answers. For some questions, it also allowed to get some insights that would otherwise be unachievable. Given time limitations, a wider sample spectrum was not reached and the minimum answers goal for VET providers was not reached. The results are based upon answers from 21 SMEs and 5 VET providers.

2. Analysis of results from surveys

a) Identification of respondents

SMEs respondents belong to the following industries: *Metalworking* (4); *Metal Parts* (4); *Machinery* (3); *Industrial Automation* (3); *Rubber and Plastics Parts* (3); *Automotive* (2); *Electrical Engineering* (2); *Chemical Products* (1); *Cables* (1). Notice some companies operate across multiple industries.

Most participating companies operate in the metallurgical industry.

Charts 1 provides information on the SMEs respondents' job categories:

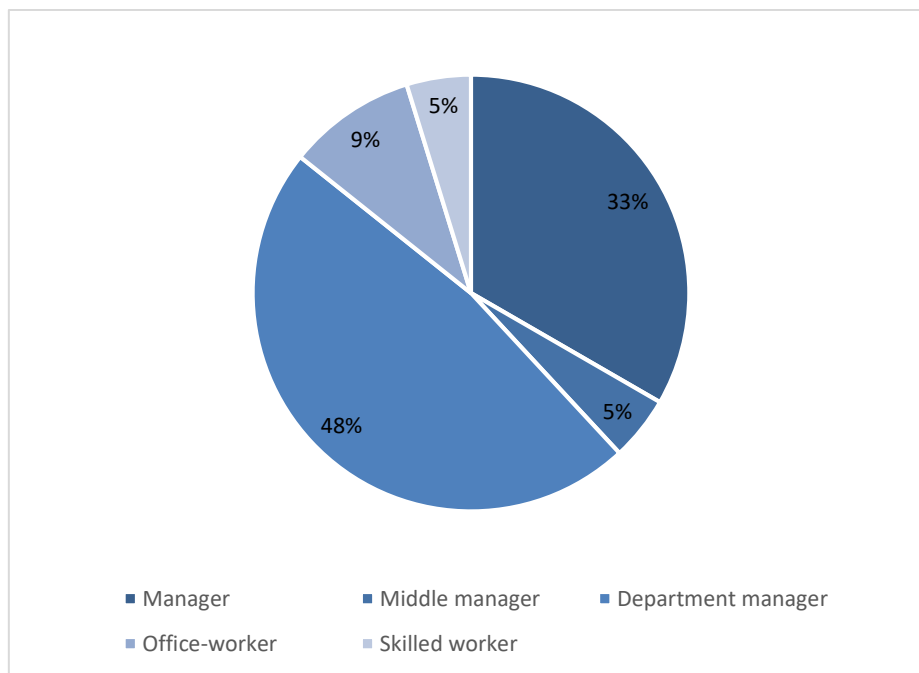


Chart 1 - Job Category (SMEs)

The range of different industries from which answers were obtained is not extremely wide. This results in an inevitable bias. Although it shouldn't be significant, it is present and should be acknowledged, especially if a generic result that fits multiple industries is aimed for this project.

Respondents from VET providers were either managers (3) or training developers (2). *Chart 2* shows which types of vocational education are provided by the VET organizations:

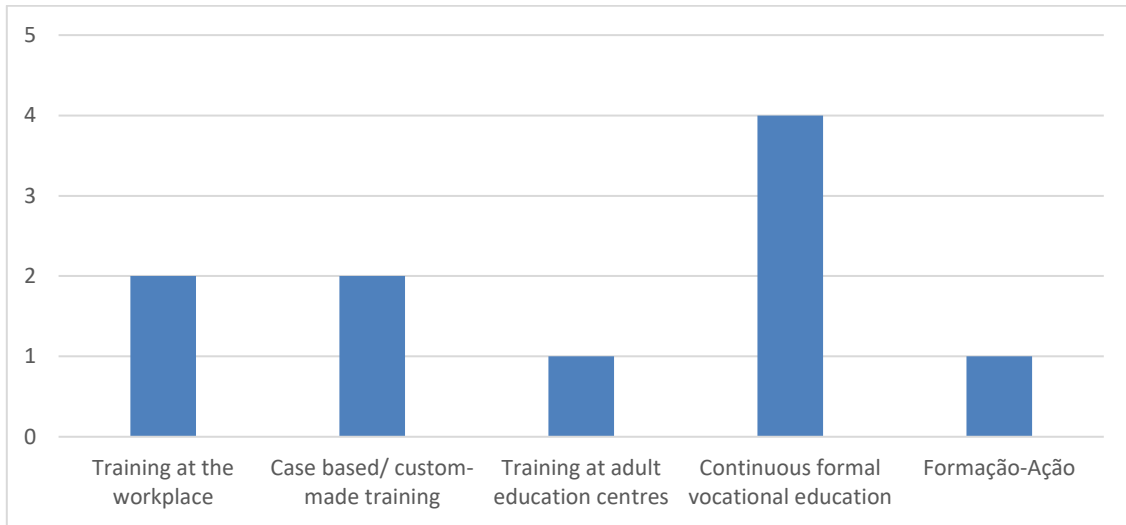


Chart 2 – Types of Vocational Education Provided by Participating VET Organizations

Formação-Ação is an initiative for SMEs that aims to improve the management skills, allowing for a better response to processes of change and innovation, through enhancements in the organization and competitiveness. This 12-month programme could be considered a *custom-made training*, given an individual company diagnosis is performed. The programme encompasses a series of training workshops and consulting initiatives. Different themes are available, including *Internationalization*, *Strategic Management* and *Digital Economy*.

b) Industry 4.0 skills and knowledge gaps

Regarding *Industry 4.0* knowledge gaps, one found that 62% of the SMEs respondents considered themselves to be acquainted with the concept of *Industry 4.0*, but only 48% thought the staff in their enterprise was familiar with such concept.

87.5% of respondents from SMEs that didn't find themselves to be familiar with the concept of *Industry 4.0* also thought staff in their enterprise wasn't. This could indicate that it is an organizational flaw, where the majority of workers are not acquainted with the concept.

Regarding the former group, 37.5% of those respondents said *Industry 4.0* was not important to the company's activity, and only 12.5% said it was very important. One could argue that in some cases, the company might not be aware of the potentially disrupting changes arising by *Industry 4.0*.

Still on the former group, 87.5% of those respondents chose the topic *Module 1: Introduction to Industry 4.0*. Also, 72.7% and 54.5% of respondents that said staff at their enterprise was not familiar with *Industry 4.0* selected the topics *Module 1: Introduction to Industry 4.0* and *Module 2: Solutions for Smart Production Environments in the Manufacturing Sector*, respectively.

When answers were obtained via phone calls, one could tell respondents occasionally found hard to describe their familiarity and of those who worked at their company to *Industry 4.0* with a yes or no question. Often, the reason respondents stuttered is that they considered a part of the staff to be acquainted and the rest not as much, making it difficult to give a yes or no answer. Frequently, it was the case that some department managers (Quality, Production, etc) were familiar and some

workers, especially administrative and some skilled workers were not. Also, sometimes, respondents didn't have knowledge of the acquaintance of other staff.

With regard to VET providers, 80% of the respondents said they were familiar with *Industry 4.0*. While, only 60% thought teachers/trainers in their organization were acquainted with *Industry 4.0*.

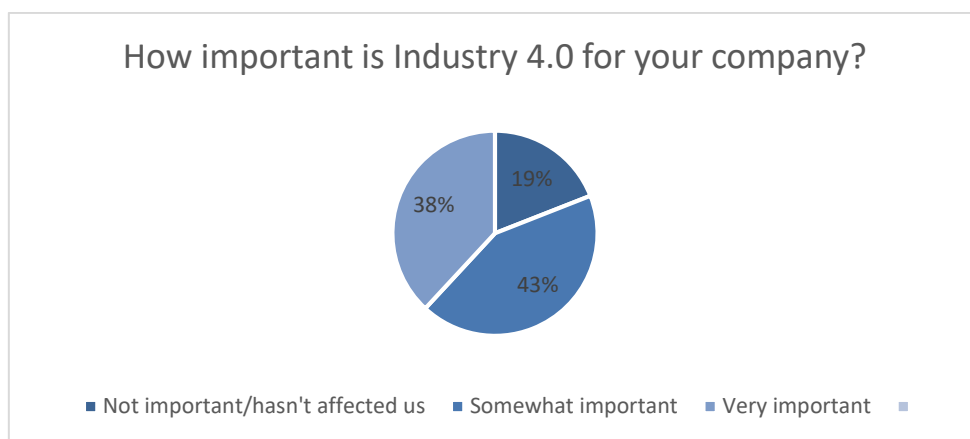


Chart 3 – SMEs' Survey Answers to Question 5

81% of SMEs respondents said *Industry 4.0* was either somewhat important or very important for their enterprise. One can, thus, see the importance *Industry 4.0* may have on the SMEs business sector. Some interviewees thought *Industry 4.0* was not directly significantly important to their activity, but it was to their clients. Acknowledging that *Industry 4.0* is, indeed, very important in some fields.

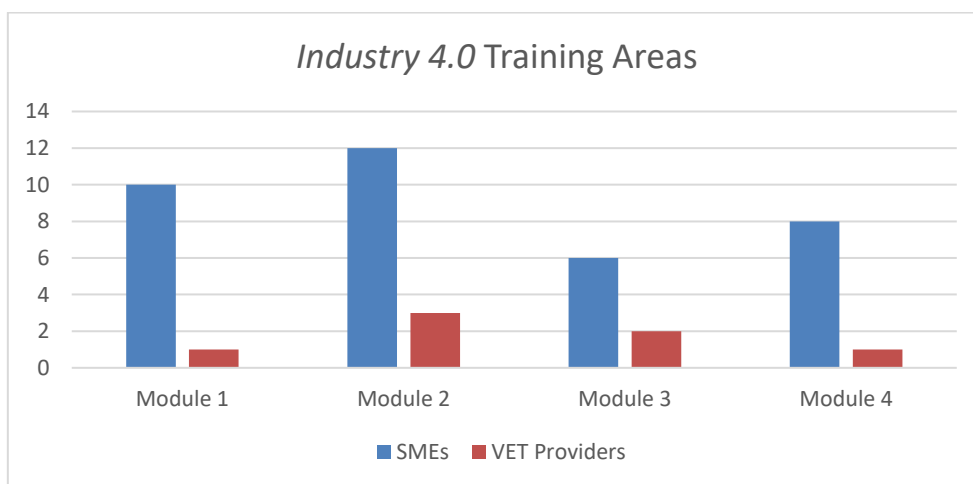


Chart 4 – Industry 4.0 Topic/Training Areas

Many companies feel they are not as instructed in the fields of *Industry 4.0* as they could be. Targeting those companies, a learning package that mostly lectures the topic *Module 1: Introduction to Industry 4.0* should be developed. In this learning package, the training area *Module 2: Solutions for Smart Production Environments in the Manufacturing Sector* could also be included as an introduction to real applications of *Industry 4.0*.

When asked which skills were deemed as most important for a successful implementation of *Industry 4.0* in their respective companies, very different answers were given. Skills, family skills, specific characteristics/tasks within a skill, and even all skills were among the given responses.

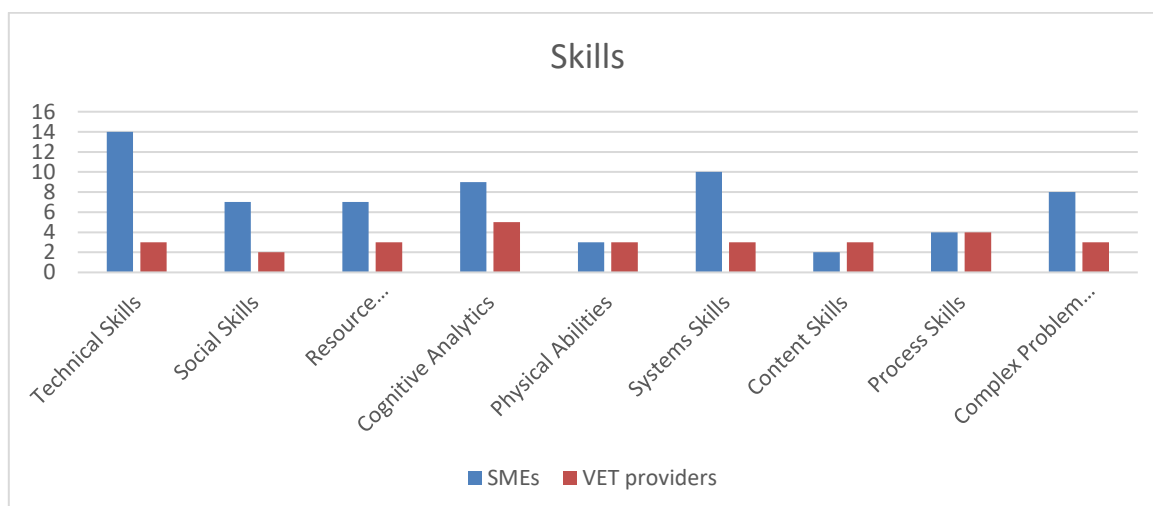


Chart 5 – Skills Deemed Most Important for Successful Implementation of Industry 4.0

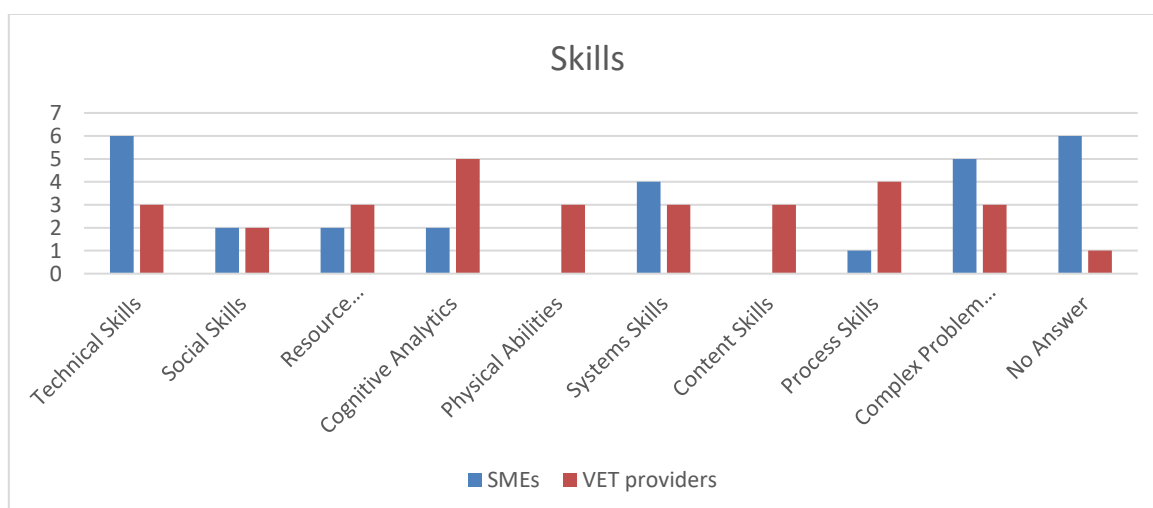


Chart 6 – Skills Workers Lack

For SMEs, *Technical*, *Systems* and *Complex Problem-Solving Skills* as well as *Cognitive Analytics* were deemed most important for a successful implementation of *Industry 4.0*. While for VET providers, *Cognitive Analytics* and *Process Skills* were chosen as the most important ones. VET organizations also seem to agree that not only *Cognitive Analytics* is paramount for a successful implementation of *Industry 4.0*, but it is also a skill that workers generally lack. Highlighting the importance of enhancing this skill set. SMEs respondents, on the other hand, while not disregarding *Cognitive Analytics*, thought it was better to nurture *Technical* and *Complex Problem-Solving Skills*.

Frequently, SMEs respondents could not name skills employees lacked or thought they did not lack one specific skill.

Regarding the recommended training to nurture such skills, a disparity of answers was obtained. Respondents were not exactly sure how to approach this, given the generic character of the question. The wide range of answers include, for instance, whether training was mostly theoretical or practical. Whether it was onsite training, distance learning or a mix of both. Whether training was given during or after working hours, and so on and so forth. Some indicated specific courses, within a certain field or industry.

Concerning SMEs responses, *practical/technical training* (5) was the most chosen training initiative, followed by *onsite training* (4) and *theoretical education* (3). *Theoretical-Practical education* was suggested once, as was a training initiative specifically targeting equipment control and operation. *Soft-Skills workshops* were referred to twice, one regarding *Complex Problem Solving and Decision Making*, and the other a blend with *technical training*. One interviewee highly recommended a theoretical training that would lead to the standardisation of *Industry 4.0*-related practices, referring to *RAMI 4.0*. Another respondent asked for more training initiatives in the *Metal Parts* industry.

It should be noted, that 6 SMEs respondents did not answer this question.

Regarding VET organizations, most respondents also selected *onsite training* (3) and *practical education* (2). *Onsite custom-made training* was proposed once, as was a *neuro-linguistic programming workshop*.

One may conclude, given answers by both employees and trainers, that both practical and theoretical training are needed, and that such training should, mostly, be given on an onsite basis. Soft-skills should also be target of improvement.

c) Experience with WBL

70% of the respondents' companies have participated in WBL initiatives, while 52% have onsite training programmes currently implemented for new employees and/or students. The grand majority of the ongoing training programmes were *internships* (6). *Training for new employees* (1) was also selected. Specific vocational training initiatives (3) were also mentioned, namely *CNC programming*, *additive manufacturing* and *circular economy*.

It should be taken into account, that in Portuguese the translation of internship is often used for both apprenticeship and internship. Thus, it is hard to distinguish when respondents are referring to one or the other.

60% of the interviewees' VET organizations have participated in joint WBL initiatives in cooperation with companies. 80% have special onsite training programmes to companies at the moment, of which only one offers courses connected to the changes arising by Industry 4.0, which is an innovation and development training package. The special onsite training programmes are the following: *internships*, *training and consulting services*, and *strategic management*, *digital economy* and *laser welding workshops*.

Those who do not yet have courses targeting Industry 4.0, have stated the following reasons for the lack of offering:

- The course is under preparation.
- The VET organization is waiting for the results of an ongoing local survey.
- There has not been yet an opportunity to develop such courses.

24% of SMEs respondents said no noteworthy obstacles are found when applying WBL programmes. *Lack of time* (7) is the most mentioned hardship that companies face. *Legal regulations* (2), *lack of theoretical materials to combine with practical elements* (2), *reluctance on the part of senior staff to train new employees/apprentices* (2) were also chosen as challenges faced. *Lack of trust in the*

trainee’s responsibility and *lack of information resources* were also named as significant obstacles. Respondents also stated other challenges:

- Lack of sufficient work volume that allows for a complete integration of the trainee.
- Trainees’ lack of experience.
- Trainees’ expectations based on their theoretical background that do not correspond to the practical on the job training done at the company.

VET providers also point out *lack of information resources* and *legal regulations* as major hardships when organizing joint WBL programmes with companies. One respondent said the main challenge was the knowledge transfer itself. While, another one revealed inexperienced trainers that end up applying the same pedagogical techniques as in a classroom hinder the success of the WBL component. It was also mentioned that the advanced age of many SMEs’ management team members results in lack of trust in the method on the part of companies or inertia to promote change. Lack of financial resources, time and the distance from the company to the VET provider were also selected as main obstacles.

Given some of the motives just mentioned, for instance *lack of time* and *reluctance from senior staff to train new employees*, one may suggest that further incentives should be awarded to companies that participate in WBL initiatives, in order to encourage increasing participation rates in these programmes. Also, more information regarding the benefits of these joint initiatives should be channelled to SMEs’ management teams. Benefits range from the possibility to address skills gaps through tailor made training to improved productivity and performance, specially in apprenticeships where the trainee spends a large amount of time on the workplace. If the management team is aware of the benefits, it will certainly increase participation in cooperative WBL initiatives.

For suggestions that aim to solve issues related to *legal regulations* and *lack of information resources*, please refer to chapter 3. *Conclusions from legislation review and policy recommendations*.

d) Preferences and training needs

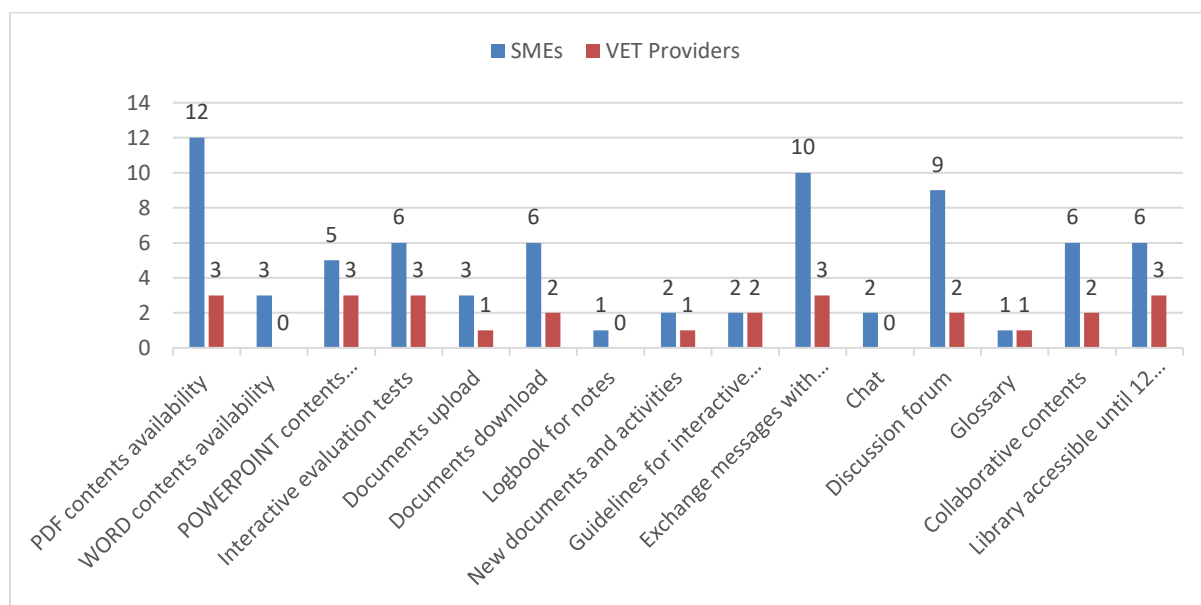


Chart 7 – Technological Solutions Deemed Most Important for Interactive Educational Website

PDFs content availability and the chance to share ideas and ask questions, via *exchange messages with trainers and other fellow trainees* and a *discussion forum*, were the most chosen technological solutions to implement in an interactive educational website. It was often said that it was paramount to be able to ask specific questions on given course contents, even after the course conclusion, where doubts may still appear.

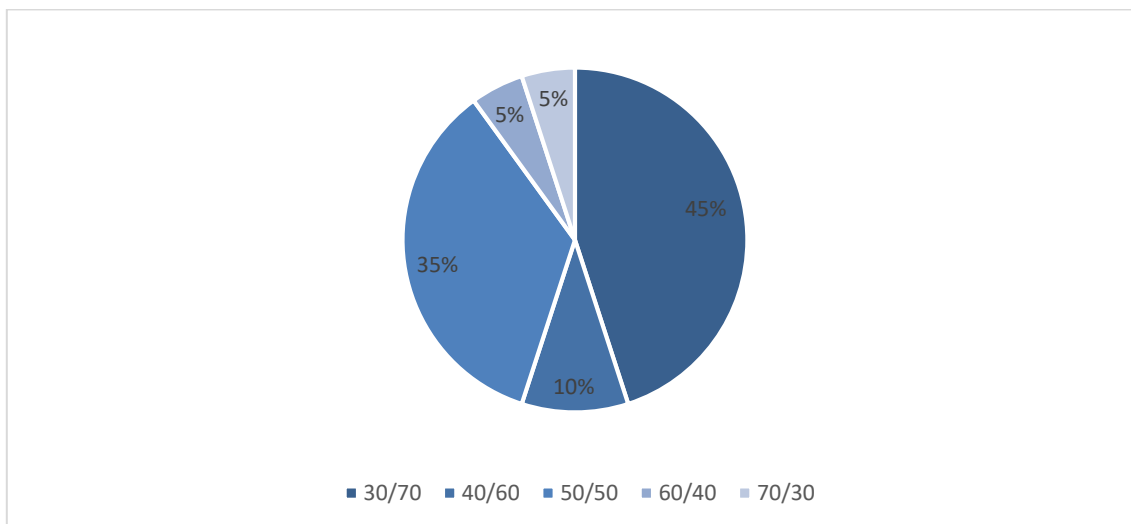


Chart 8 – SMEs respondents’ best proportion of theory and practical training for WBL in the field of Industry 4.0

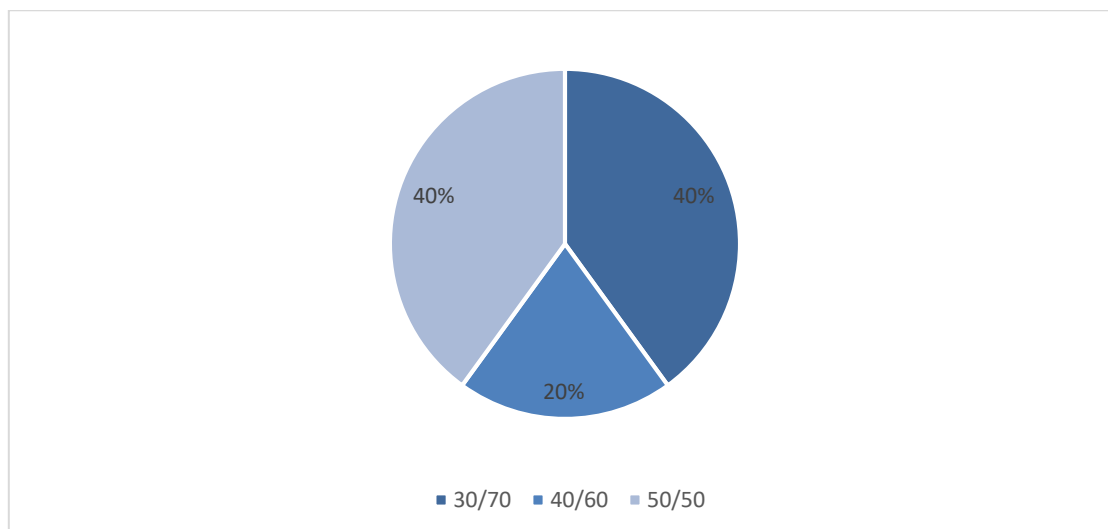


Chart 9 – VET providers respondents’ best proportion of theory and practical training for WBL in the field of Industry 4.0

It is worth noting that most companies selected a higher proportion of practical on the job training (55%) when organizing WBL in the field of *Industry 4.0*. Just as importantly, only 10% of the SMEs respondents chose a higher proportion of theoretical training compared to practical training. While, 35% said an even amount of theory and practical training was the best option.

The proportion of theory and practical on the job training in the field of *Industry 4.0* that a company finds sound is clearly influenced by the company’s perception of its own current status of *Industry 4.0*-related practices and technologies implementation. That is, a company that feels they have not yet adopted such practices to great lengths, will likely refer to a higher proportion of theoretical training.

3. Conclusions from legislation review and policy recommendations

A Legislation review proves there is no specific legislation single-handedly regulating WBL. While WBL is not targeted individually, it is often times well-regulated as a topic in other legislations. That is the case regarding the six VET – dual education programmes that were established alongside the creation of the National Qualifications System (SNQ), in 2007. All of which have their own legislation/regulation, where WBL is addressed.

Other WBL initiatives that are not under the SNQ scope, including state-funded and non-state-funded internships, are also regulated independently.

The Constitutional Government is responsible for setting all aforementioned legislation, and the legislation is, therefore, the same in the whole country.

Whenever a company, participating in a WBL initiative, does not resort to state-funding, no legal requirements have to be met. For state-funded WBL initiatives, companies must comply with certain requirements, see *Annex 1 – Legislation for participating in WBL*.

There is no public register for companies authorized to participate in WBL initiatives. Unless, of course, it is a state-funded programme. Then, IEFP will ensure the company is in compliance with the requirements before posting the offer on its website.

Nevertheless, it should be noted that for the VET – dual education programmes it is, typically, up to the VET provider to form a partnership with companies which host learners during WBL. The VET providers also need to maintain its certification and are, thus, audited frequently. During the audit, it is assessed the criteria used to select the companies as well as the pedagogic methods that feature mechanisms for monitoring and evaluation of the WBL activities. There is a public register of certified VET organizations.

Common rules for WBL initiatives is that a contract between all parties involved must always be signed, where it should be acknowledged that learners have the right to receive meal and transport subsidies, and work insurance afforded by the company. Generally, the remaining contract aspects, including maximum working time and working schedule, are the same as the applicable for the generality of the company’s employees, which in turn are regulated by the standard labour legislation.

There is no evidence that companies who participate in WBL initiatives are subject to more regular audits from labour monitoring institutions.

There are no specific tax laws in favour of companies engaged in WBL – dual education initiatives.

Both the company and the trainee are subject to the applicable tax law, as if the trainee was a regular employee.

The funding and grant legislation does, indeed, directly address WBL initiatives, especially when involving dual education programmes. The funding guidelines regarding the European Social Fund includes a section for education and training. Here, interested organizations may find which costs are eligible and which are not, and other important information, see *Annex 1 – Subsidies and grant legislation with regard to WBL*.

Excessive regulation is occasionally named as a hindering factor by companies that organize WBL initiatives.

The fact that the legislation is the same nation-wide is positive. WBL labour rules tend to be homogeneous, which is also helpful, with some minor adjustments where the government finds fit, depending on the trainee's age, qualification, time of unemployment, etc.

The government should develop measures that keep simplifying and easing on bureaucracy related to processes of certification and others, regarding WBL activities.

The pros and cons of the implementation of legal requirements, in non-state-funded programmes, that companies would need to meet in order to participate in WBL initiatives would have to be object to further analysis. Weighing whether extra bureaucracy is worth the potential quality improvements in WBL activities.

Tax benefits may be a good measure, encouraging companies to increase participation rates in WBL programmes when they do not see other worthy benefits.

4. Conclusion

The number of VET providers' answers came short of the 15 minimum answers goal. Even though conclusions can still be drawn, and comparisons with the SMEs results be made, one should bear in mind the small sample size.

One found a reasonably high percentage of SMEs respondents think that themselves, and their respective staff, are acquainted with *Industry 4.0*, and acknowledge the impact *Industry 4.0* may have on their company.

Many companies feel they are not as instructed in the fields of *Industry 4.0* as they could be. Hence, a learning package that mostly lectures the most chosen topics *Module 1: Introduction to Industry 4.0* and *Module 2: Solutions for Smart Production Environments in the Manufacturing Sector* should be developed. This learning package would feature an introduction to the concept of *Industry 4.0* as well as some examples of real industrial applications of *Industry 4.0*.

One may conclude, given answers by both employees and trainers, that both practical and theoretical training are needed, and that such training should, mostly, be given on an onsite basis. Soft-skills should also be target of improvement.

One interviewee highly recommended a theoretical training that would lead to the standardisation of *Industry 4.0*-related practices. This could be an interesting approach that may facilitate cooperation between different companies in the field of *Industry 4.0*.

It is suggested that a study on further incentives awarded to companies that participate in WBL initiatives should be made. Evaluating the impact that increasing participation rates in these programmes may have on the economy versus the impact on the public administration accounting balance. Incentives may be of the form of, for instance, tax incentives or subsidies.

5. Annexes

Annex 1: Legislation review

Legislation and WBL (work based learning)	
Please describe the legislation in the field of WBL in your country regarding the topics listed below. The questions should give you a reference point for what is needed. If you think you should add something not targeted by the questions, please write it down.	
General overview of WBL in the national legislation	There is no specific legislation that aims to regulate WBL. With the creation of the National Qualifications System (SNQ) in 2007, the different types of VET initiatives were segmented into six different VET – dual education programmes, and two other VET initiatives concerning companies’ employees only, namely continuous formal vocational training and custom-made training for SMEs. Every VET pathway in the scope of the SNQ includes WBL. All these VET programmes have their own legislation/regulation, in which WBL is addressed. WBL rules are not necessarily the same for different VET programmes.
How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject?	Some WBL initiatives that may not be under the SNQ scope, for instance internships, are also legislated individually. Henceforth, these WBL initiatives will be, generically, designated as <i>Internships</i> .
Who is responsible for setting legislation in regard to WBL in your country (National, regional or local level)? Is the legislation the same in the whole country?	The Constitutional Government is responsible for setting all aforementioned legislation, and the legislation is, therefore, the same in the whole country.
Please indicate the source	(SNQ) Decree-Law no. 396/2007, 31 December: http://www.catalogo.anqep.gov.pt/boDocumentos/getDocumentos/155
Legislation for participating in WBL	There are no legal requirements that companies need to meet in order to participate in WBL initiatives, except for state-funded professional internship programmes (EP), through The Institute for Employment and Vocational Training (IEFP). In this case, the companies must comply with the following requirements:
Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)? If yes, what are the requirements?	<ul style="list-style-type: none"> a) To be law-abiding, when it comes to its registration and accounting; b) To fulfil the legal requirements linked to their activity; c) To have its tax and contributory obligations fulfilled, with regard to Social Security and the Fiscal Administration; d) To be compliant in funding affairs with the IEFP and the European Social Fund; e) Not being in a wage arrears situation, special exceptions may be found for this subparagraph; f) Not have been convicted of a crime or an administrative infraction within the last three years.

<p>Is there a specific public register where interested parties can check authorized companies to participate WBL?</p>	<p>There is no public register where one can check authorized companies to participate in WBL initiatives. For the former case of professional internship programmes, the companies apply for funding beforehand and the IEFP ensures the company is in compliance with the requirements. Hence, internship offers under this program, available on IEFP's website, are exclusively from authorized companies.</p> <p>Nonetheless, it should be noted that for the VET – dual education programmes it is, typically, up to the VET provider to form a partnership with companies which host learners during WBL. It should be evaluated whether those companies have the desired workplace practices, processes, equipment and technology, and sufficient human resources, that could lead to an appropriate vocational training.</p> <p>The VET providers also need to maintain its certification and are, thus, audited frequently where all documents requested must be handed, which may include documents related to WBL initiatives. During the audit, it is also assessed the criteria used to select the companies as well as the pedagogic methods that feature mechanisms for monitoring and evaluation of the WBL activities.</p> <p>There is a public register of certified VET organizations.</p>
<p>Please indicate the source</p>	<p>(EP) Ordinance no. 131/2017, 7 April: https://dre.pt/application/file/a/106848681 (Certification of VET Providers) Ordinance no. 851/2010, 6 September: https://dre.pt/application/dir/pdf1sdip/2010/09/17300/0393603944.pdf</p>
<p>Labour legislation and WBL</p> <p>How does the labour legislation look like in your country? Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc....)? If yes, how does it differ from the standard labour legislation?</p>	<p>There is no specific labour legislation dealing with WBL initiatives. However, the general legislation for both <i>Internships</i> and each of the VET dual education programmes addresses labour-related regulations. The common rules for all WBL initiatives is that a contract between all parties involved must always be signed, where it should be acknowledged that learners have the right to receive meal and transport subsidies, and work insurance afforded by the company. Generally, the remaining contract aspects, including maximum working time and working schedule, are the same as the applicable for the generality of the company's employees, which in turn are regulated by the standard labour legislation.</p> <p>For EP, the allowance is calculated depending on the trainee's qualification level, defined by the SNQ. The monthly allowance for the lowest qualification level is equal to the Social Support Index (IAS), while the highest level of qualification is equal to 1.75*IAS. The minimum wage under this programme (1*IAS = 428.90€) is lower than the national minimum wage (580€). The internship contract, generally, has a term of 9 months, except for companies of national economic strategic interest and for trainees' in certain social situations (refugees, ex-convicts, etc).</p> <p>There are other state-funded (through IEFP) internship programmes that target very specific groups of people, which have very similar regulations to EP. For instance, the REATIVAR programme targets people that have been registered as unemployed for at least 12 months and are older than 31 years old. The contract term is, instead, 6 months and the allowance for the three highest qualification levels is 1.65*IAS.</p> <p>For non-state-funded internships, excluding graduate internships, the monthly allowance can not be lower than 1*IAS. The contract term can not be longer than a year.</p>

	<p>Regarding state-funded internships in the Public Administration (PA), the monthly allowance is equal to 2*IAS and the contract term is twelve months, non-extendable.</p> <p>In graduate internships or internships shorter than three months, no remuneration is compulsory.</p> <p>For the VET programmes that include WBL (dual programmes, apprenticeships), remuneration is not mandatory.</p>
Are companies who participate in WBL initiatives subject of more regular audits from labor monitoring institutions?	There is no evidence that companies who participate in WBL initiatives are subject to more regular audits from labor monitoring institutions.
Tax legislation and WBL	There are no specific tax laws in favour of companies engaged in WBL initiatives – dual education.
<p>Are there specific tax laws in favor of companies engaged in WBL initiatives, dual education?</p> <p>If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?</p>	Both the company and the trainee are subject to the applicable tax law, as if the trainee was a regular employee.
Please indicate the source	<p>(Tax Benefits Statute):</p> <p>https://www.pwc.pt/pt/pwcinformisco/codigos/ebf.pdf</p>
Subsidies and grant legislation with regard to WBL	The funding and grant legislation does, indeed, directly address WBL initiatives, specially when involving dual education programmes. The funding guidelines regarding the European Social Fund (ESF) includes a section for education and training. Here, interested organizations may find which costs are eligible and which are not, and other important information. The maximum eligible costs are 2.5€ per hour and per trainee for most dual education programmes considered by the SNQ.
Does the funding and grant legislation directly address WBL/dual education initiatives? If yes, how (e.g. special funds or grants for certification, investments in education and trainings of head or staff to be mentors/ trainers?)	
Are there any positive or negative incentives in the legislation promoting participation in WBL initiatives? If yes, which one?	<p>Companies involved in EPs are also entitled to a financial contribution from IEFP. 65% of the trainee's monthly allowance is funded, which can be increased to 80% if it is a non-profit organization, a company with national economic strategic interest status or a company with less than 10 employees that's applying for the first time. If the trainee belongs to certain social groups (refugees, ex-convicts, etc), another 15% is added to the former value.</p> <p>Companies that hire trainees within 20 days after the internship is over, will be awarded a grant of twice as much the monthly allowance agreed on the contract, up to 5*IAS.</p> <p>The VET – dual education programmes funded by the IEFP, should aim to achieve a rate of employability of at least 50% of its trainees within 6 months of the course closure. Failing to meet this goal, results in a reduction of the awarded funds.</p> <p>VET – dual education programmes fostered by higher education institutions (HEI) are subject to the institutions' funding legislation. Nevertheless, the institution may apply for other funds.</p> <p>The VET providers must also fulfil some targets regarding the minimum number of trainees per class. Not achieving such targets means there will be a reduction in the granted funds.</p>

	The IEFP is responsible for funding other WBL/dual education initiatives. Deciding whether the VET provider is entitled to financial contribution and how much should this value be.
<i>Please indicate the source</i>	(FSE) Ordinance no. 60-A/2015, 2 March: https://dre.pt/application/file/a/66639436 (EP) Ordinance no. 131/2017, 7 April: https://dre.pt/application/file/a/106848681 (HEI Funding) Law no. 37/2003, 22 August: https://dre.pt/application/file/a/656008 (Dual Education Program Funding – Qualification Level 4) Ordinance no. 49/2007, 8 January: https://dre.pt/application/file/a/261993



„Work-based training approach in the field of Industry 4.0 for competitive European Industry“

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

Country Analysis Report BULGARIA



This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1. Introduction

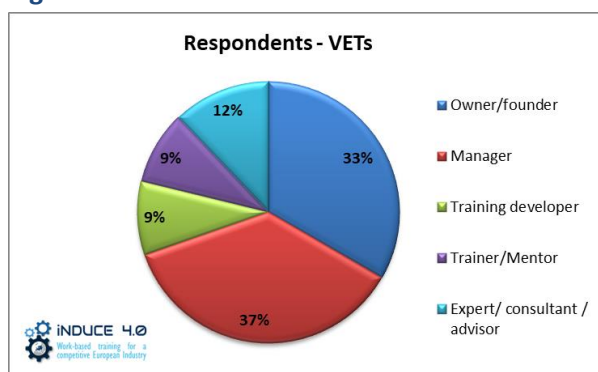
This report is based upon the results from 2 surveys – one aimed at VET providers, and one aimed at SMEs. Both surveys were implemented into Google Forms and distributed electronically via email in the period 01.12 – 22.12.2017. The INDUCE 4.0 survey for VETs was distributed among 700 organisations providing VET and the one aimed at SMEs has been send to a total of 4755 enterprises operating in the following economic sectors: Section C ‘Manufacturing’; Section E ‘Water supply, sewerage, waste management and remediation activities’; Section F ‘Construction’.

The sample on which the results in the next sections are based, consist of 22 responses from SMEs and 24 answers received from VET providers.

2. Analysis of results from survey

SECTION I: Identification of respondents

Fig. 1.



According to Fig. 1 most of the respondents from VET providing organisations are manager or owners of the organisations.

On Fig.3 VET respondents are classified according to the type of courses they provide. Most of the VET providers organize courses for adults and training on the workplace, assuming that they are well acquainted with the WBL mechanisms and their relevance for SMEs.

Fig. 3

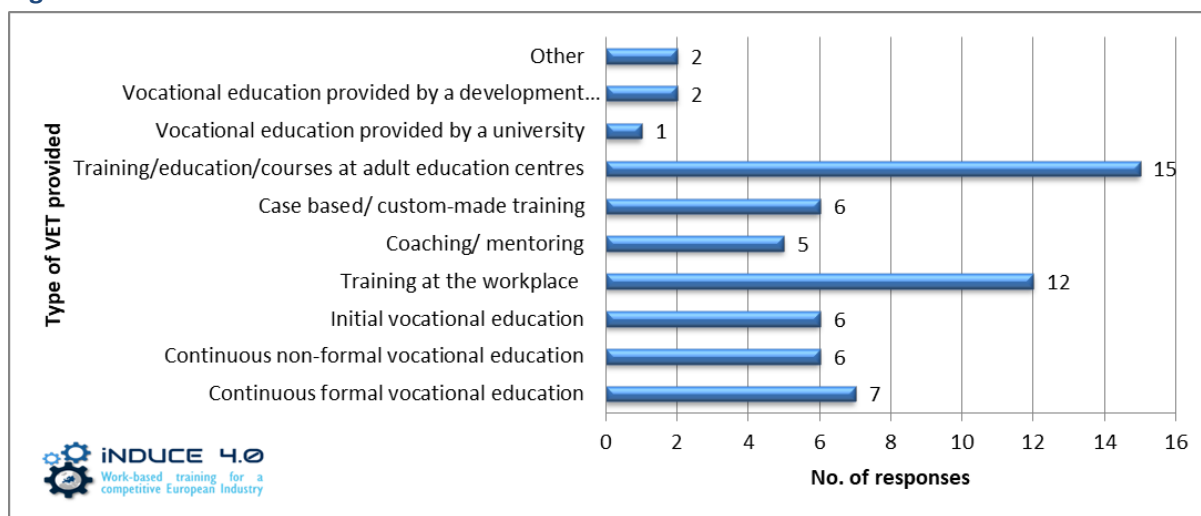
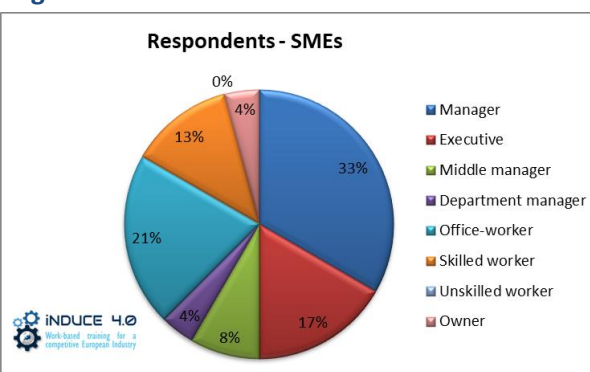


Fig. 2.



As visible from fig. 2, the vast majority of respondents from SMEs are managers, office workers, executives.

The SMEs who have participated in the survey are from the production industry namely: Machinery (6); Metalworking, metal machining (4); Clothing apparel/Textile (4); Printing (2) Rubber and plastics parts (2); Electronics & Optics (1); Food industry (1) and Other (2).

SECTION II: Industry 4.0 skills and knowledge gaps

63% (15 respondents) of VET providers against 55% (12) of SME representatives have pointed that they aren't acquainted with the concept of Industry 4.0, and only 38% (9) of VETs and 45% (10) of SMEs which responded to the survey have good comprehension of the Industry 4.0 idea.

83% (20 respondents) of VET representatives don't think people in their organisations are familiar with the Industry 4.0 concept and 91% (20) of SMEs' representatives share the same opinion. Only 17% (4) of VETs and 9% (2) of SMEs think their colleagues are well informed on the topic, which indicates lack of information and comprehension in the field of Industry 4.0 in both of the surveyed types of organisations.

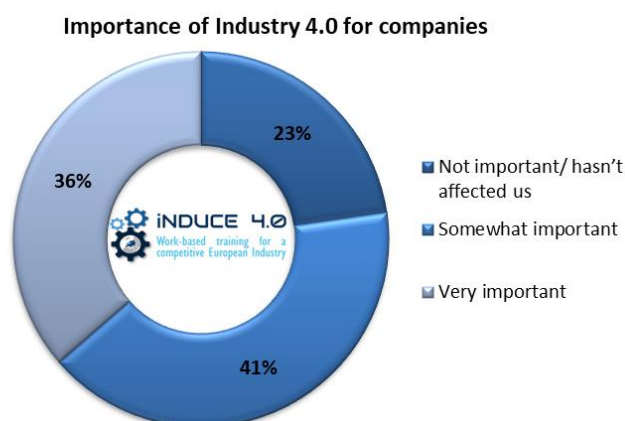
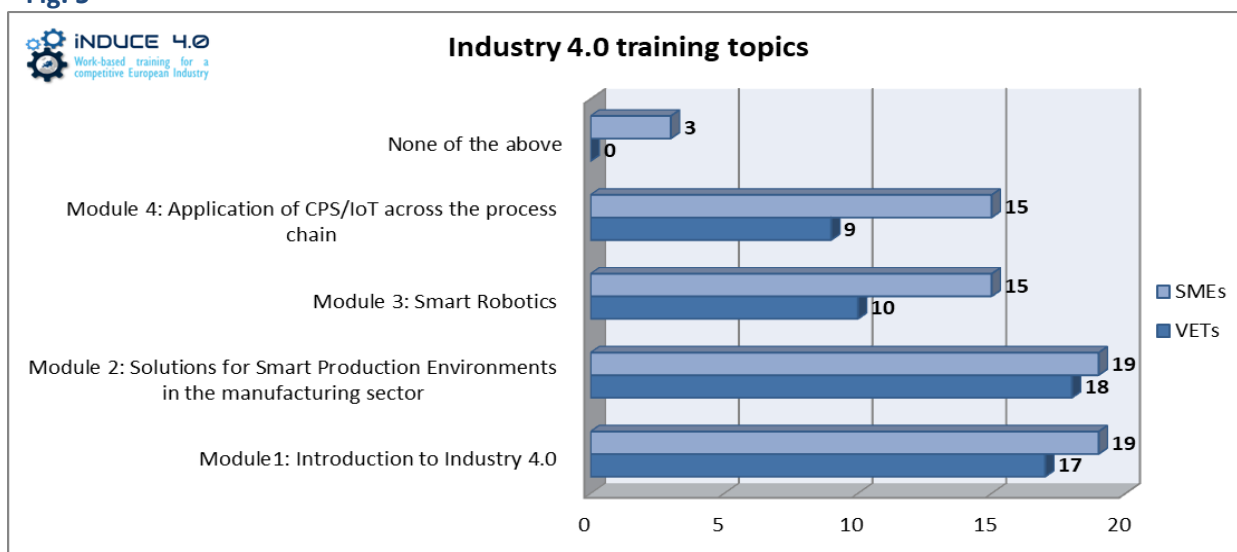


Fig. 4

According to the results shown on Fig. 4 for the majority of enterprises 77% consider Industry 4.0 and changes arising from it are important to them. The surveyed SMEs are operating in various industries (printing, food, textile, metalworking, etc.) which confirms that the awareness on the topic is essential and applicable all across the business value chain.

Fig. 5



As visible on Fig. 5, the **modules of highest interest to both surveyed groups are Module 1: Introduction to Industry 4.0 and Module 2: Solutions for smart production environments in the manufacturing sector**. These results can be correlated with the low level of awareness on the topic in organisations as well as the fact that all SMEs from the manufacturing sector and significant share of VETs provide courses for adults and training on the workplace, meaning that they work with SMEs. In general the interest towards all topics is quite high as only 3 respondents from SMEs have stated they are not interested in the training topics. Respondents have provided some relevant suggestions for additional topics to be addressed by the INDUCE training course. The suggested topics might be integrated as part of the listed modules or additional modules can be developed which will be decided within the partnership.

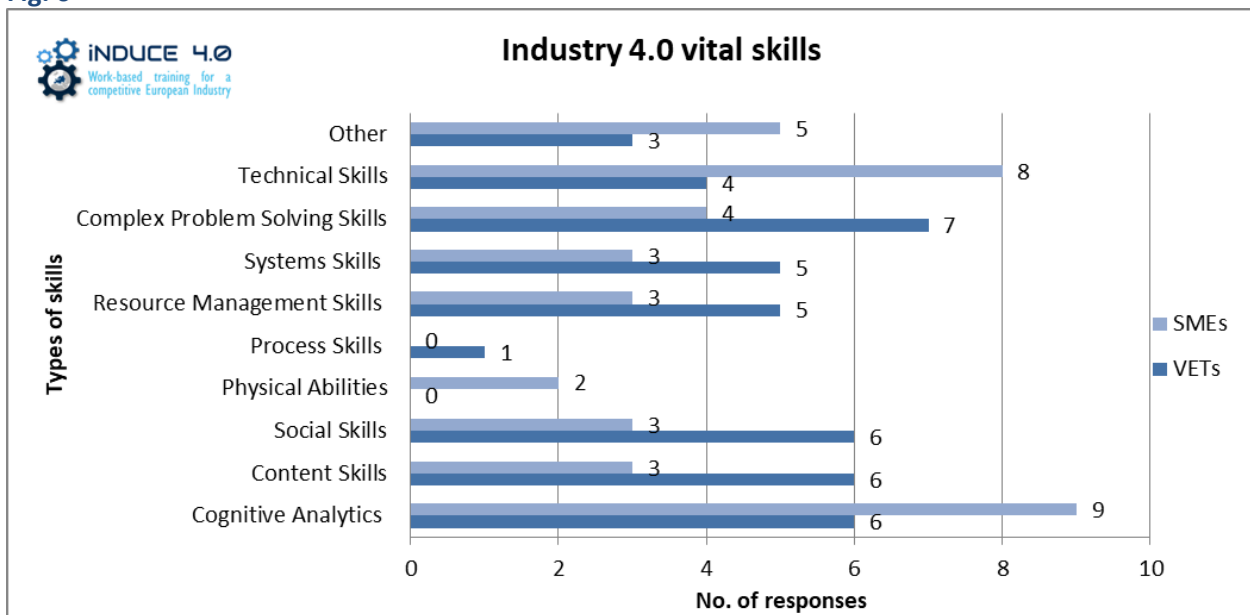
Suggestions & comments provided by VETs:

- Digitization of the training and training of the personnel in the industry
- Organization of processes in digital environment
- Security and protection of cyber-physical systems, including legal base
- Encoding language

Suggestions & comments provided by SMEs:

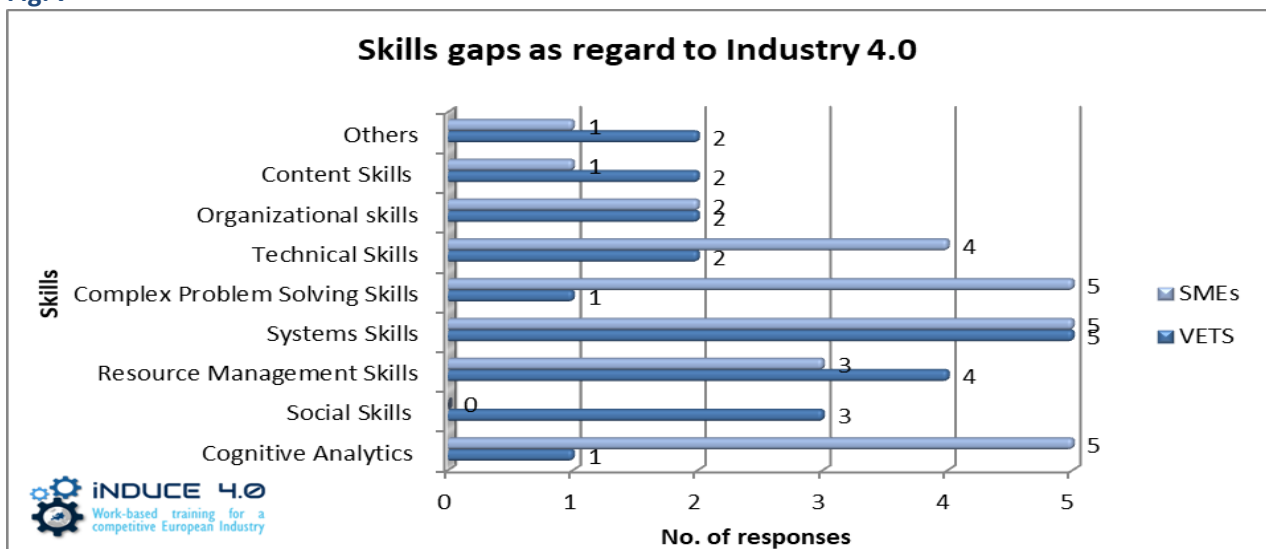
- applied cooperation between clusters and scientific thought
- I do not have
- Competitiveness, Trade and Development of SMEs.
- The list appears to be comprehensive enough

Fig. 6



SMEs' representatives are of the opinion that among the most essential skills with regard to Industry 4.0 are Cognitive analytics, Technical skills, Complex problem solving skills. Under the category of Other SMEs have pointed organisational skills as well and commented that all skills are actually important. The point where VETs and SMEs perceptions meets is that Cognitive analytics and Complex Problem solving skills are among the most relevant for understanding the smart production environments that Industry 4.0 represents. VET representatives consider also Content, Social, System and Resource management skills to be important as well.

Fig. 7



As regard to SMEs the skills they consider people lack when it comes to Industry 4.0 are the same that they consider to be most essential namely: Cognitive analytics; Complex problem solving skills; Technical skills and System skills. According to VET providers the main skill gap when it comes to Industry 4.0 are connected to System skills, Resource management skills and Social skills which corresponds with the skills that VETs have defined as essential for Industry 4.0. Both groups confirm that people lack System skills which are also deemed to be of great importance for Industry 4.0.

To the question what kind of training would be the best solution for acquiring the skills that people lack and are essential for Industry 4.0, the following responses were provided:

SMEs	VET providers
on the workplace - 5 in educational institution - 2 short-term, intensive, cross-subject - 1 remote training - 1 Practical case studies connected with the workplace and the profession - 2 Group training focused on practical case studies -1 Constant training - 1 Remote/ face-to-face training of managing and executive staff - 1 Conflict resolution training - 1	Practical training - 4 on the workplace according to staff specific needs - 1 on the workplace as INDUSTRY 4.0 solutions are very complex - 1 Technical training according to the occupation - 1 Seminars - 1 Face-to-face training - 1 Training on social skills - 1 Training on technical and complex problem-solving skills - 1 training on sustainable and high-tech solutions - 1

Taking into account the aforementioned the INDUCE training course should:

- Be focused on practice
- have case studies focused in the Industry 4.0 application in companies
- have options for on the workplace training/ face-to-face sessions combined with remote training.

SECTION III: Experience with Work-based learning

To the question whether they have participated in joint business-education initiatives 18 out of 22 SMEs have responded positively and have pointed that the initiatives were mainly internships. 4 out of 22 don't have experience in the field. 16 out of 24 VET providers have organized joint WBL initiatives with business and 6 haven't.

10 out of 24 VET providers have stated that they offer on the workplace /onsite training programmes to business and 10 out of 22 SMEs have confirmed they have onsite training programmes implemented within their organisation. 13 out of 24 VET providers and 12 out of 22 SMEs have stated they don't offer or have onsite training programmes. Those who have responded positively have pointed the kind of onsite trainings they have implemented or are offering:

Onsite trainings VET providers offer	Onsite training programmes SMEs have set in place
<ul style="list-style-type: none"> ▪ Safety, Work at heights, work in confined spaces ▪ safe and healthy working conditions ▪ in the area of Gas distribution, Project 	<ul style="list-style-type: none"> ▪ for qualification upgrade and compulsory training (by regulations) ▪ internships, dual education ▪ Production Practices, DOMINO Project, Student

management, etc. <ul style="list-style-type: none"> ▪ By request of the companies themselves ▪ Qualification courses ▪ Occupational Safety and Health at work ▪ German for medical professionals ▪ Surveillance Closed Circuit TeleVision - CCTV- related to specific object monitoring and security - physical, video surveillance. ▪ Practice on a real workplace 	Internships <ul style="list-style-type: none"> ▪ internships and mentoring programs ▪ operators of CNC machines ▪ mentoring programs ▪ apprenticeships, exchange of experience by monitoring the work of colleagues from other companies ▪ medical training ▪ training for sewers
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VET providers were asked whether they offer courses in the field of Industry 4.0 and only 1 out of 23 respondents to the question has responded positively pointing the course “computer designing and designing of machining parts with AutoCAD”. The rest 22 have responded with NO, which combined with the lack of theoretical and practical materials pointed by SMEs as obstacle to organizing WBL on the topic of Industry 4.0 indicates the need of such training materials and courses.

Main obstacles/ hardships in carrying out WBL initiatives	
For SMEs	For VET providers
<ol style="list-style-type: none"> 1. the <u>lack of theoretical materials</u> to be combined with practical elements 2. <u>lack of sufficient theoretical materials</u> and limited time for on-the-job training for new employees. 3. lack of time; <u>lack of theoretical materials</u> combined with practice; <u>unsettled legal situations</u> for dual education 4. Lack of motivated new employees 5. lack of sufficient willingness to participate by staff, <u>lack of information resources</u> 6. reluctance of students and means 7. insufficient basic qualification, after the training the trainees go abroad, <u>insufficient resources for the training</u> 8. lack of education, which is a prerequisite for building competencies 9. disconnection from the production process 10. bureaucracy 11. lack of staff to be responsible for the trainees 12. People's reluctance to make efforts to learn more and the lack of sufficient competencies to adapt to the specific needs of the trainers. 13. <u>legislative</u>, administrative, <u>lack of time</u> 14. Motivation of employees 15. lack of time, unwillingness of senior officials to train others, <u>lack of theoretical materials to be combined with practical ones</u> 16. Lack of qualification 	<ol style="list-style-type: none"> 1. Lack of dynamic practical venues/laboratories 2. Inefficient distribution of working time 3. Differences in terms 4. Achieving mutual usefulness and successful financing of training. 5. Until now, we have not encountered any difficulties. 6. lack of trust 7. lack of resources; <u>low demand / interest in educational service</u>; the <u>lack of information resources</u> 8. financial obstacles; use of licensed software, lack of resources, <u>lack of motivation for employers</u> due to higher pay and impossibility to retain workers who have been trained 9. <u>Poor motivation of employers!</u> 10. not good communication and understanding by companies and <u>lack of legal provisions</u> 11. low educational level 12. low skills and low education 13. <u>reluctance on employers part for joint programs</u> 14. mistrust, lack of resources - financial and lecturers 15. <u>low demand</u> for the educational service 16. selecting the right people 17. <u>the reluctance of employers</u> 18. <u>the reluctance of employers</u> to organize such initiatives

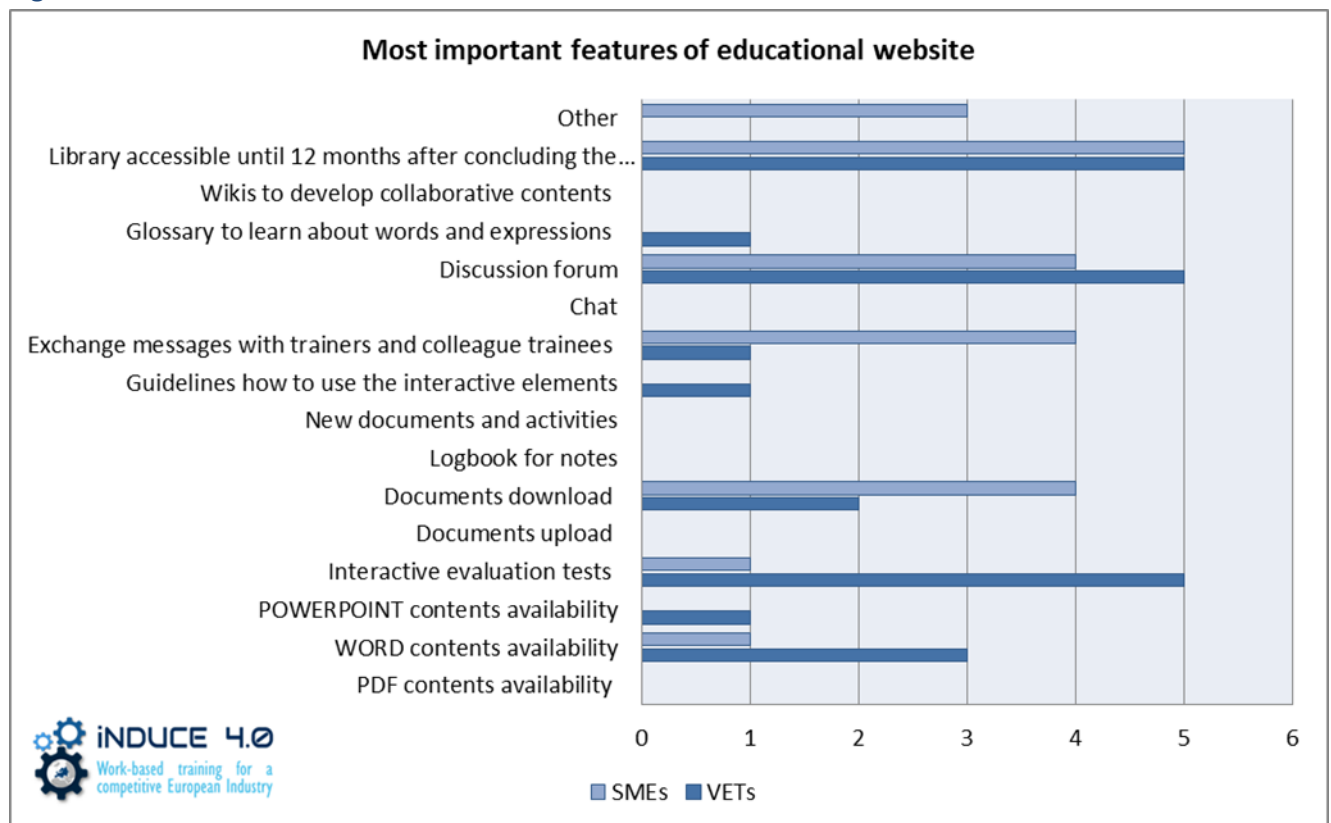
17. Lack of interest in possible training; lack of time and skills by competent staff - to train new workers or trainees.
18. lack of desire to work as well as the legal provisions – bureaucracy connected to hiring and dismissal of employees
19. lack of willingness
20. Insufficient motivation and ambition on the part of new workers and employees

Taking into account the SMEs' comments, the biggest obstacle for them to organize WBL on the topic of Industry 4.0 is lack informational sources – training materials to perform the training; low motivation of employees to be trained and to train others; legal framework; lack of time.

On the other hand, VET providers point as main hardship when organizing WBL in this field, the reluctance on the part of employers, lack of resources, etc. Both groups have pointed out the lack of resources which is a need the INDUCE 4.0 project directly addresses as it will provide informational and educational resources.

SECTION IV: Preferences and training needs

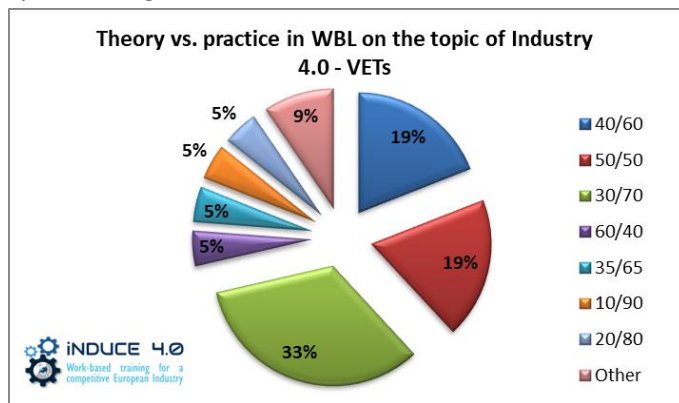
Fig. 8



The most favoured features of an interactive learning environment according to both groups surveyed are:

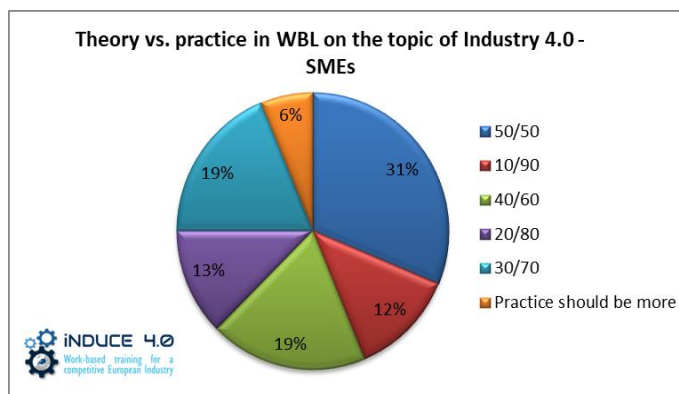
- discussion forum
- option to exchange messages with trainer and fellow trainees
- documents download
- interactive evaluation tests
- Library accessible until 12 months after concluding the training course

Therefore, these functionalities should be taken into account when planning the educational portal where the INDUCE 4.0 training course will be available to users. Partners will discuss the feasibility of implementing the most favoured features.



33% (7 respondents) of the VET providing organisations have pointed that the optimal combination of theory and practice is 30% to 70%. The vast majority of VET providers support the thesis that practice should be more than theory and 4 respondents (19%) have pointed that they should have equal shares. Only 1 respondent is of the opinion that theory should be slightly more than the practice – 60 to 40.

Taking into account the aforementioned, according to VET representatives a WBL course in the field of Industry 4.0 should have emphasis on practice and the theory to be no more than 30 to 40% of the course.



Interesting result is that opposing to the VETs perceptions, SMEs have pointed that such a course should consist of 50% theory and 50% practice which pointed by 5 respondents (31%). The rest of the respondents – 17 totally support the idea that practice should be more and answers vary between 10 to 40% of theory.

Therefore, the SMEs' perception matches the one of the VET providers that practice should be more than theory.

3. Conclusions from legislation review and policy recommendations

The dual training has been formally introduced into the VET system in Bulgaria in 2015. Since then a considerable progress has been made thanks to various privately-funded and stately funded programmes. The biggest initiative supporting dual training is called DOMINO project - "Swiss support for the introduction of dual track principles in the Bulgarian vocational education system" and it's funded by the Bulgarian-Swiss Cooperation Programme. The project has a total budget of CHF 3'530'000, including 15% co-funding from the Bulgarian Ministry of Education and Science. During the school year over 1000 students and 160 employers all across the country are engaged in dual training under DOMINO.

Dual training/ WBL is regulated both by:

- specific legislation like Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training) which sets the responsibilities of all parties involved in the process.
- as a cross-section subject within the VET act and the Labour Code. Paragraph 230 of the Labour code regulates the type of contract the employers should conclude with students

engaged in dual education. However, there are some gaps in the labour legislation when it comes to dual training that need to be addressed.

Taking into account the information presented in Annex 1 of this report, the following policy recommendations could be made:

- (a) establishment of a public register for companies that are entitled to provide and are providing dual training. Setting criteria which the companies should cover in order to enter the register a part from the permission under Ordinance No. 6 of 2006 on the conditions and procedure for granting a work permit to persons under 18 years of age (SG, issue 64 of 2006).
- (b) to better address gaps in law legislation concerning dual training – for instance the fact that the employer and the state are obliged to pay health insurance for one the same individuals engaged in formal dual training.
- (c) to introduce some tax or other formal incentives for employers participating in WBL initiatives. Thus, employers will be additionally motivated to participated in dual training.

4. Conclusion

In the light of the results from the research carried out in Bulgaria, the following could be highlighted:

- The concept of Industry 4.0 is deemed important, however the level of acquaintance with it within organisations – both SMEs and VET providers is rather low, which indicates the lack of awareness in the field.
- Modules of highest interest to both surveyed groups are Module 1: Introduction to Industry 4.0 and Module 2: Solutions for smart production environments in the manufacturing sector, therefore modules 1 and 2 should be more detailed and informative.
- The skills that are essential for Industry 4.0 according to both surveyed groups are cognitive analytics and complex problem solving skills.
- The crossing point between the 2 groups as regard to the skills that people lack is: System skills. The groups have pointed also: Cognitive analytics; Complex problem solving skills; Technical skills, System skills and Resource management skills. Therefore, the INDUCE 4.0 Methodology should be designed to address the improvement of these skills when applying the knowledge from the INDUCE 4.0 training course on the workplace.
- The educational portal on which the INDUCE 4.0 course and methodology will be available should have discussion forum; option to exchange messages with trainer and fellow trainees; documents download; interactive evaluation tests; Library accessible until 12 months after concluding the training course. The feasibility of technical implementation should be discussed by partners.
- SMEs’ perception matches the one of the VET providers that practice should be more than theory. Matching the opinion of both groups, the share of theory in an WBL course on the topic of Industry 4.0 should be between 20 and 40% and share of practice between 80 and 60%.

5. Annexes

- *Annex 1: Legislation review - Bulgaria*
- *NAVET (2016). Vocational education and training in Europe – Bulgaria. Cedefop ReferNet VET in Europe reports; 2016;*
- *Vocational Education and Training Act, effective 1.08.2016*
- *Labour code of Bulgaria, SG No. 96/1.12.2017, effective 1.01.2018*
- *Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training)*

Annex 1: Legislation review

Legislation and WBL (work based learning)	
Please describe the legislation in the field of WBL in your country regarding the topics listed below. The questions should give you a reference point for what is needed. If you think, you should add something not targeted by the questions, please write it down.	
General overview of WBL in the national legislation	Training through work (dual education in Bulgaria) shall be organised and carried out in compliance with the VET act, the Labour Code and Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training). Specific legislation focused only dual training is Ordinance № 1 of 8 September 2015. In the VET act and the Labour code, dual training is a cross-section subject.
How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject?	Training through work or the dual education in Bulgaria is regulated by the Vocational Education and Training Act. The VET Act regulates VET in all its forms in Bulgaria. In 2015 the act was amended and the dual education was officially introduced in the Bulgarian VET system.
Who is responsible for setting legislation in regard to WBL in your country (National, regional or local level)? Is the legislation the same in the whole country?	Dual education (WBL) as part of VET in Bulgaria is governed by the same institutions that are responsible for VET. At national level they are: <ul style="list-style-type: none"> (a) the National Assembly of the Republic of Bulgaria – implements the legislative activity in the field of VET and respectively WBL; (b) the Council of Ministers sets out the government policy in the field of VET and respectively WBL; (c) the education ministry manages, coordinates and implements the VET policy; (d) the labour ministry participates in the implementation of the national VET policy; (e) the culture ministry implements the VET policy in art schools; (f) the sports ministry implements the VET policy in sports schools; (g) the health ministry participates in the coordination of the list of professions; (h) the sectoral ministries are involved in the development, coordination and updating of the State educational standards for the acquisition of qualifications; in the development, coordination and updating of the list of professions; in coordinating the admission plan for schools, funded by them; (i) the employers’ representatives participate in the development, coordination and updating of the State educational standards for the acquisition of qualifications, the legislative framework and policy documents, as well as in the updating of the list of professions and in organising and conducting qualification examinations; (j) the Economic and Social Council discusses and makes proposals with regard to issues, related to education, including VET in the context of lifelong learning; (k) the National Council for Tripartite Cooperation discusses and gives opinions on draft legislation regarding employment and vocational qualification and thus participates in the formulation of VET policy. The Council is composed on the tripartite principle. It is a body for consultations and cooperation at a national level for labour, social insurance and living standard issues, consisting of two representatives of the Government (of whom one is the Vice Prime Minister), two

	<p>representatives of trade unions and two representatives of employers' organisations;</p> <p>(l) the National Council for Vocational Qualifications at the labour ministry coordinates the development of national policies and strategies for training for unemployed and employees, leading to the acquisition of professional qualifications;</p> <p>(m) the National Council for the Promotion of Employment at the Ministry of Labour and Social Policy is also constituted on the tripartite principle. Its functions are to discuss and give opinions regarding the development and implementation of the employment policy and the National action plan for employment;</p> <p>(n) the National VET agency is a specialised body within the Council of Ministers. The Agency develops the State educational standards for the acquisition of VET qualifications; it maintains the list of professions according to the needs of the labour market; it licenses and exercises further control over the activities of VET institutions for people over 16 years of age and over the activities of vocational guidance providers;</p> <p>(o) the Employment Agency implements the state policy on promoting employment and provides career information, counselling and training for employees and unemployed;</p> <p>(p) the Human Resource Development Centre is a National Agency, which coordinates the management and administration of the EU Erasmus+ Programme.</p> <p><u>At regional level:</u></p> <p>VET governance comprises the following institutions at regional level:</p> <p>(a) the Regional administration participates in the implementation of the Government policy for employment and acquisition of VET qualifications;</p> <p>(b) the Regional Employment Service Departments implement the Government policy for training of unemployed and employed adults for acquiring a vocational qualification; they offer training measures and projects; provide coordination and support in the field of vocational training, consultancy of and guidance for the local employment offices;</p> <p>(c) the Regional Inspectorates of Education (territorial administrative units of the education ministry, situated in the 28 district centres) implement the state policy in the field of VET at a regional level through projects, programmes and strategies for development, functioning and improvement of VET at a district level;</p> <p>(d) the permanent and temporary employment committees to the Regional Councils for regional development identify, organise and control the implementation of the state policy on the promotion of employment and training for acquiring a vocational qualification at a regional level.</p> <p><u>At local level</u></p> <p>VET governance comprises the following institutions at local level:</p> <p>(a) the municipalities participate in the development of a VET policy within their territories regarding: the employment needs for vocational guidance and training of students, unemployed and other groups; the necessary equipment of schools, vocational training providers and centres for information and guidance through funds from the municipal budget;</p> <p>(b) the Labour offices of the Employment Agency provide career services: career information; advice and guidance for inclusion in the appropriate program/measure for employment and training;</p> <p>(c) the Cooperation Councils at the Labour office Directorates monitor the implementation of programmes and measures included in the National action plan for employment.</p>
<p><i>Please indicate the source</i></p>	<p>▪ Vocational Education and Training Act, effective 1.08.2016, Available at: http://III.mon.bg/uploaded_files/zakon_profesionalnoto_obrazovanie_2015_E_N.pdf ; [Accessed: 10.01.2018]</p>

	<ul style="list-style-type: none"> NAVET (2016). Vocational education and training in Europe – Bulgaria. Cedefop ReferNet VET in Europe reports; 2016; Available at: http://libserver.cedefop.europa.eu/vetelib/2016/2016_CR_BG.pdf ; [Accessed: 10.01.2018]
Legislation for participating in WBL	Companies who want to participate in WBL initiatives in cooperation with VET schools need to have special permission from the General Labour Inspectorate Executive Agency to employ individuals below 18 years old. The permission is given after the General Labour Inspectorate Executive Agency inspects the working facilities and grants permission only if the work environment is deemed in compliance with all OSH standards.
Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)? If yes, what are the requirements?	According to Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training) the employer must filed an application for permission under Ordinance No. 6 of 2006 on the conditions and procedure for granting a work permit to persons under 18 years of age (SG, issue 64 of 2006). The employer concludes a contract with the students for the whole period of the training in the profession and specialty the employment contract under Art. 230, para. 1 of the Labor Code (LC). The employment contract shall be concluded at the latest two weeks before the start of the school year in which the training will be commenced (dual training).
Is there a specific public register where interested parties can check authorized companies to participate WBL?	<p><u>There is no specific public register where companies participating in dual training are signed.</u></p> <p>The companies that perform such initiatives in cooperation with VET secondary schools which participate in the DOMINO* project are listed on the website: http://dominoproject.bg/en/business. Currently there are 68 companies in the project cooperating with 17 VET schools all across the country.</p> <p><i>*DOMINO is he acronym for “Swiss support for the introduction of dual track principles in the Bulgarian vocational education system”, financed by Switzerland under the Bulgarian-Swiss Cooperation Programme.</i></p>
Please indicate the source	<ul style="list-style-type: none"> DOMINO project website, available at: http://dominoproject.bg/en/; [Accessed: 10.01.2018] Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training); Available at: https://www.lex.bg/en/laws/ldoc/2136610831 ; [Accessed: 10.01.2018]
Labour legislation and WBL	Following the amendments in the VET act, the Labour Code (1986) has also been amended in 2014 to support the work-based form of learning (dual) as a type of apprenticeship:
How does the labour legislation look like in your country? Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc....)? If yes, how does it differ from the standard labour legislation?	<p>(a) labour contracts for training during work define the forms, place and duration of the training, the compensation which the parties owe when failing to fulfil their obligations and other issues related to training provision;</p> <p>(b) dual training lasts 1-3 years for regular VET learners;</p> <p>(c) <u>work-based learning for employees that is not regulated by the VET act lasts six months or less;</u></p> <p>(d) after a successful completion of an employee’s training, an employer has to offer and an employee has to accept a permanent job; <u>this is not the case for VET learners in dual training.</u></p>
Are companies who participate in WBL initiatives subject of more regular audits from labour monitoring institutions?	According to Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training) the employer must filed an application for permission under Ordinance No. 6 of 2006 on the conditions and procedure for granting a work permit to persons under 18 years of age (SG, issue 64 of 2006). This permission is issued by the General Labour Inspectorate Executive Agency of Bulgaria and is connected to more regular audits from the agency and more documentation concerning the employed students.
Please indicate the source	<ul style="list-style-type: none"> Labour code of Bulgaria, SG No. 96/1.12.2017, effective 1.01.2018; Available at: https://www.mlsp.government.bg/index.php?section=CONTENT&l=226&lang= [Accessed: 10.01.2018] NAVET (2016). Vocational education and training in Europe – Bulgaria. Cedefop ReferNet VET in Europe reports; 2016. Available at:

	http://libserver.cedefop.europa.eu/vetelib/2016/2016_CR_BG.pdf ; [Accessed: 10.01.2018] <ul style="list-style-type: none"> Ordinance № 1 of 8 September 2015 on the terms and conditions of conducting training through work (dual training); Available at: https://www.lex.bg/en/laws/ldoc/2136610831 ; [Accessed: 10.01.2018]
Tax legislation and WBL	There are no tax incentives for employers participating in WBL initiatives, projects, etc. What is more, currently the employers need to conclude a labour contract with students from VET schools under para. 230 of the Labour code and they need to pay mandatory health insurance for each of the students in the company and at the same time the state pays health insurance for the same student, which results in double taxation. This issue indicates one of the gaps in legislation addressing dual training in Bulgaria.
Are there specific tax laws in favour of companies engaged in WBL initiatives, dual education? If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?	
Please indicate the source	<ul style="list-style-type: none"> Dual learning in Bulgaria is stumbling over gaps in the laws; Available at: https://www.investor.bg/ikonomika-i-politika/332/a/dualnoto-obuchenie-v-bylgariia-buksuva-zaradi-propuski-v-zakonite-255380/ ; [Accessed: 07.02.2108]
Subsidies and grant legislation with regard to WBL	There is no specific grant legislation addressing WBL/ dual training. However, there are various initiatives aimed at promoting WBL in Bulgaria. The biggest project supporting dual training in Bulgaria is called DOMINO - “Swiss support for the introduction of dual track principles in the Bulgarian vocational education system” and it’s funded by the Bulgarian-Swiss Cooperation Programme. The project has a total budget of CHF 3`530`000, including 15% co-funding from the Bulgarian Ministry of Education and Science. The implementation of the project started in 2015 and as of the school year 2017/2018, 1,134 students in 32 vocational schools in 19 towns across Bulgaria are enrolled in a dual form of education “learning by working”, over 170 companies are DOMINO-partners. By 2019, when DOMINO will be completed, it should involve at least 1 200 students in 15 vocational schools, as well as at least ten professions. New educational programmes and curricula are being developed, and teachers, mentors and experts on dual education receive special training. Erasmus+ programme is another instrument used by Bulgarian companies, VET providers and other social partners for promotion of WBL initiatives, creation of training materials, methodologies, etc. Unfortunately, there no legally defined incentives for companies and institutions participating in WBL.
Does the funding and grant legislation directly address WBL/dual education initiatives? If yes, how (e.g. special funds or grants for certification, investments in education and trainings of head or staff to be mentors/ trainers?)	
Are there any positive or negative incentives in the legislation promoting participation in WBL initiatives? If yes, which one?	
Please indicate the source	<ul style="list-style-type: none"> DOMINO project website, available at: http://dominoproject.bg/en/; [Accessed: 10.01.2018]
Other comments	N/A



**“Work-based training approach in the field of Industry 4.0 for
competitive European Industry”**

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

Country Analysis Report CYPRUS



This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1. Introduction

The survey was carried out in Cyprus from November 1st 2017 to January 31st 2018. The first step was the creation of a Google Form for Survey – SMEs and a Google Form for Survey – VETs. Then various methods were used for distributing this survey links:

1. **Emails:** A newsletter mass email tool was used. Each Google Form link was embedded in an email, which was sent to our company’s matching target group.
2. **Social Media:** Google Form’s links were shared to our company’s social accounts (Facebook, Twitter, Google Plus).

A total of 33 responses from SMEs and 24 responses from VETs were received.

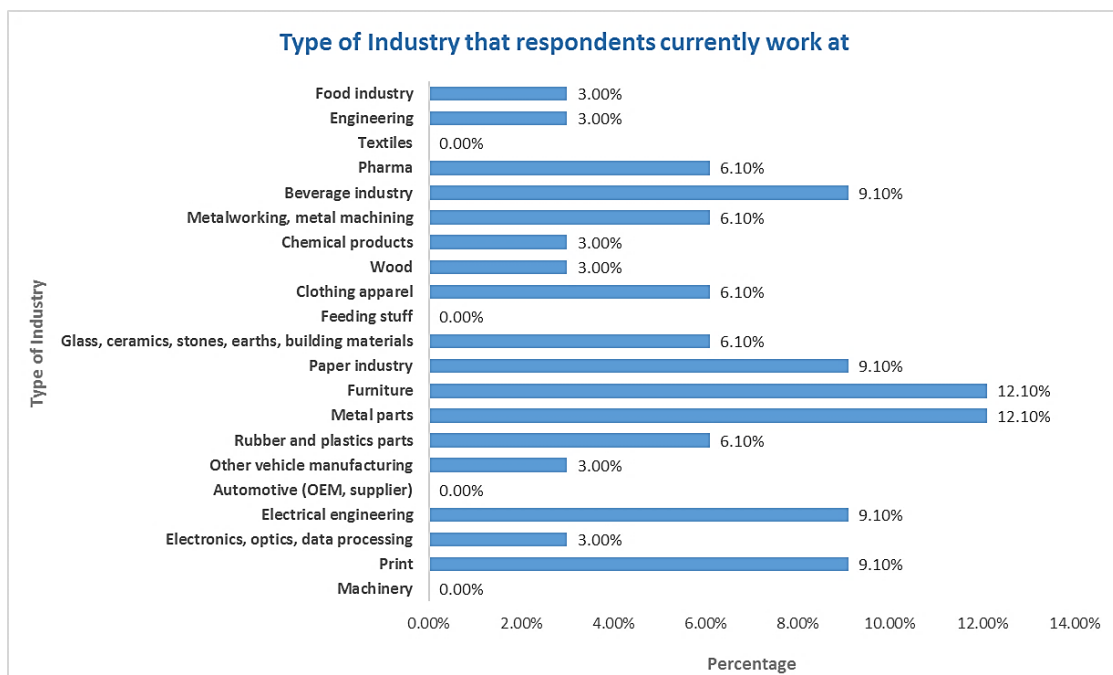
2. Analysis of results from surveys

(1) identification of respondents

The responses received from SMEs represent almost all kinds of employees in an SME. The majority of respondents are Department managers with a total of 36.40%, and next are Middle managers and Office workers with a percentage of 27.30% each. The remaining responses were provided by Managers, Skilled workers and Executives with percentages 21.20%, 12.10% and 9.10%. No response was received from Unskilled workers.

Regarding the VET companies, 54.20% of the responders declare that they are Trainers or Mentors, 45.80% of the responders are Managers of their company and 37.50% are Experts or Consultants or Advisors. The lowest rate (but a high rate at the same time) belongs to Owners and Training developers, with a percentage of 33.30% each category.

In both categories of companies to which surveys were sent (SMEs and VET), it is noticeable that an employee may have more than one work attribute at the same time. Also, we don’t have answers from unskilled workers, which is normal as we used the companies’ email to send the survey link and our company’s social media.



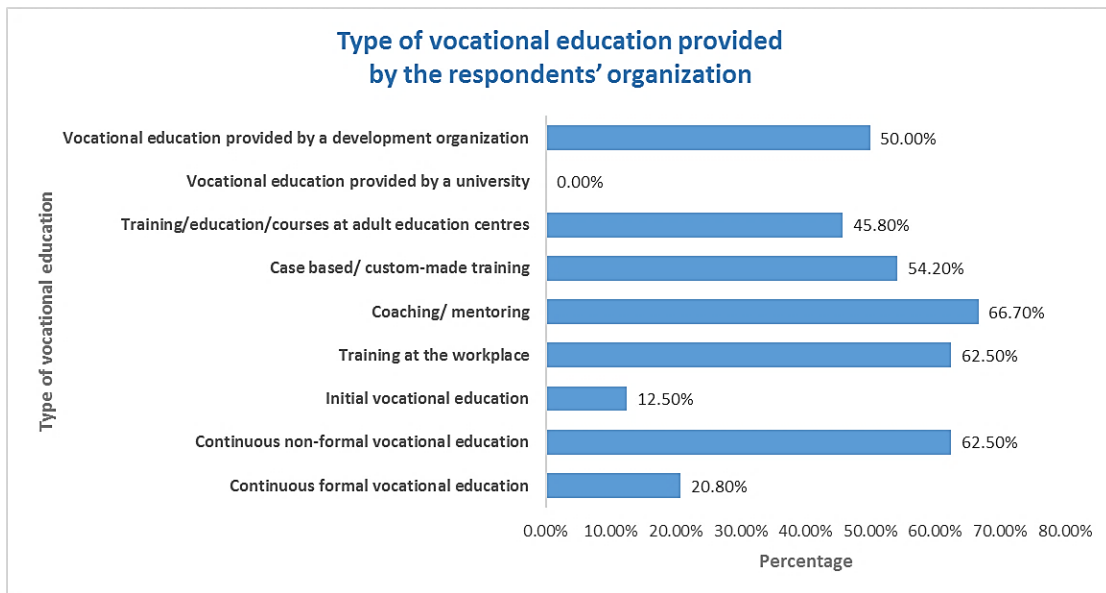


Chart 2: Type of vocational education provided by the respondents' organization

The charts above present the industry in which the respondents' enterprise is currently operating (Chart 1) and the type of vocational education provided by the respondents' organization (Chart 2).

(2) Industry 4.0 skills and knowledge gaps

Regarding the awareness of respondents with Industry 4.0, the chart below shows that in SMEs and VETs the majority of employees are aware of this issue. 78.80% of SME respondents are aware of Industry 4.0. as opposed to 21.20% of those who declare they are not. In VETs, the difference is much smaller, with 58.30% being acquainted and 41.70% not being.

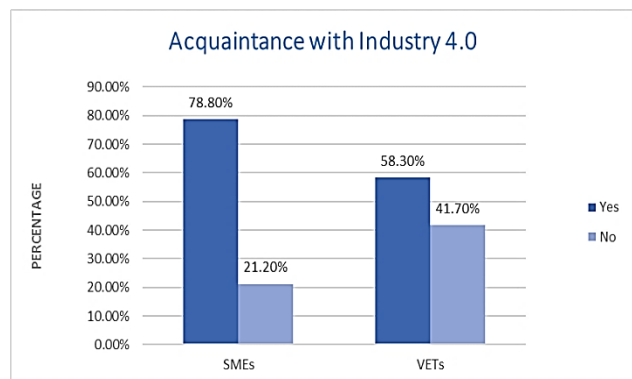
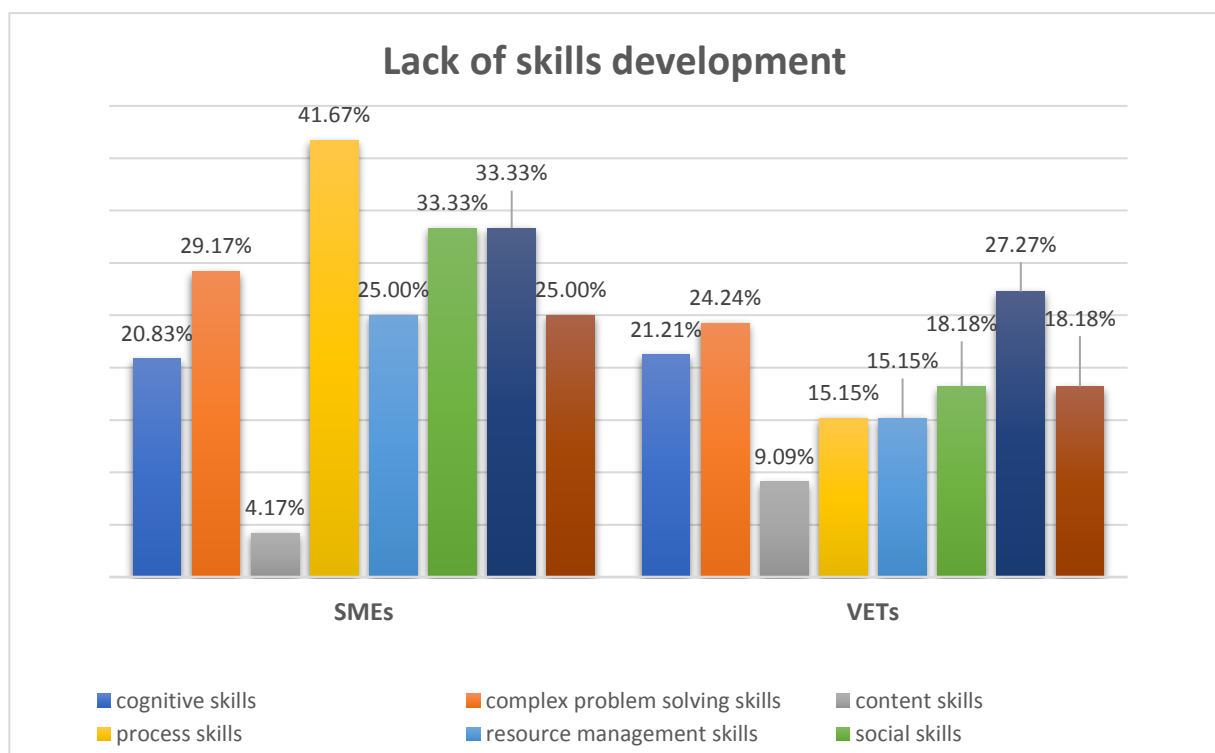
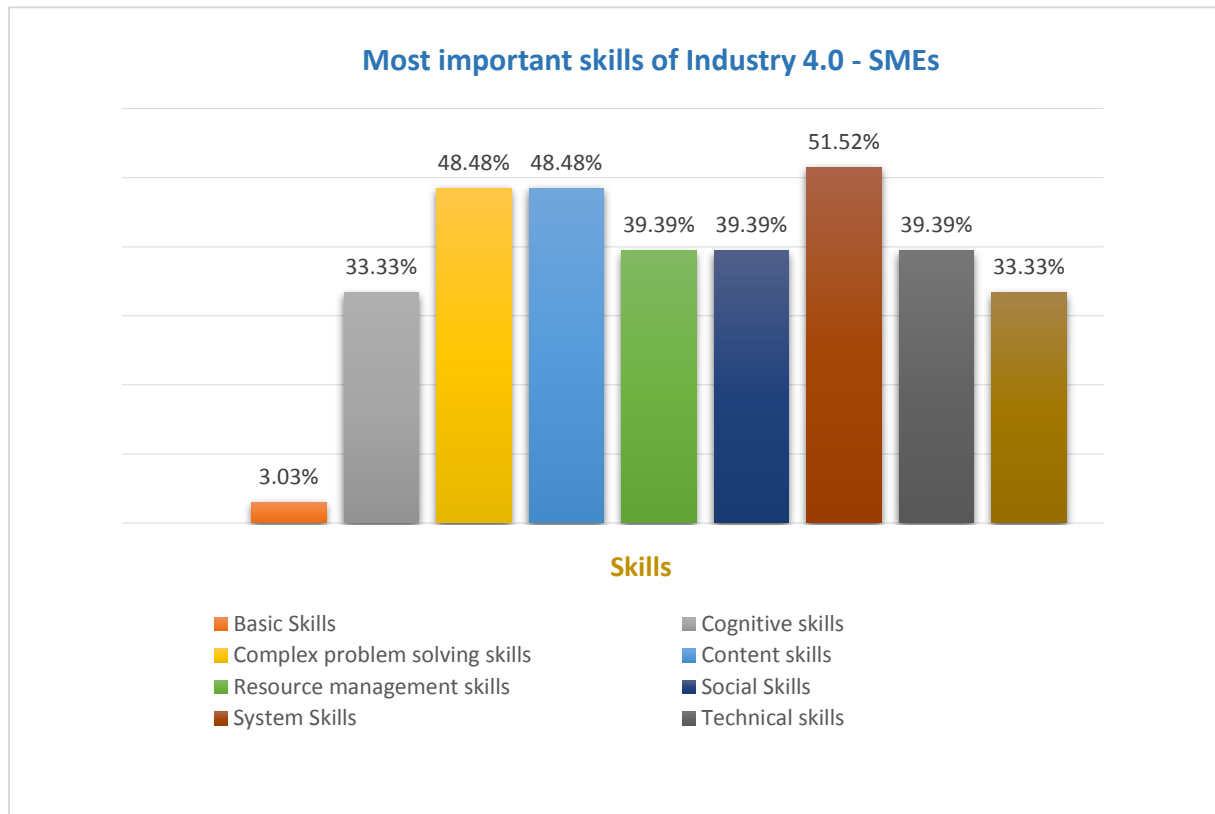


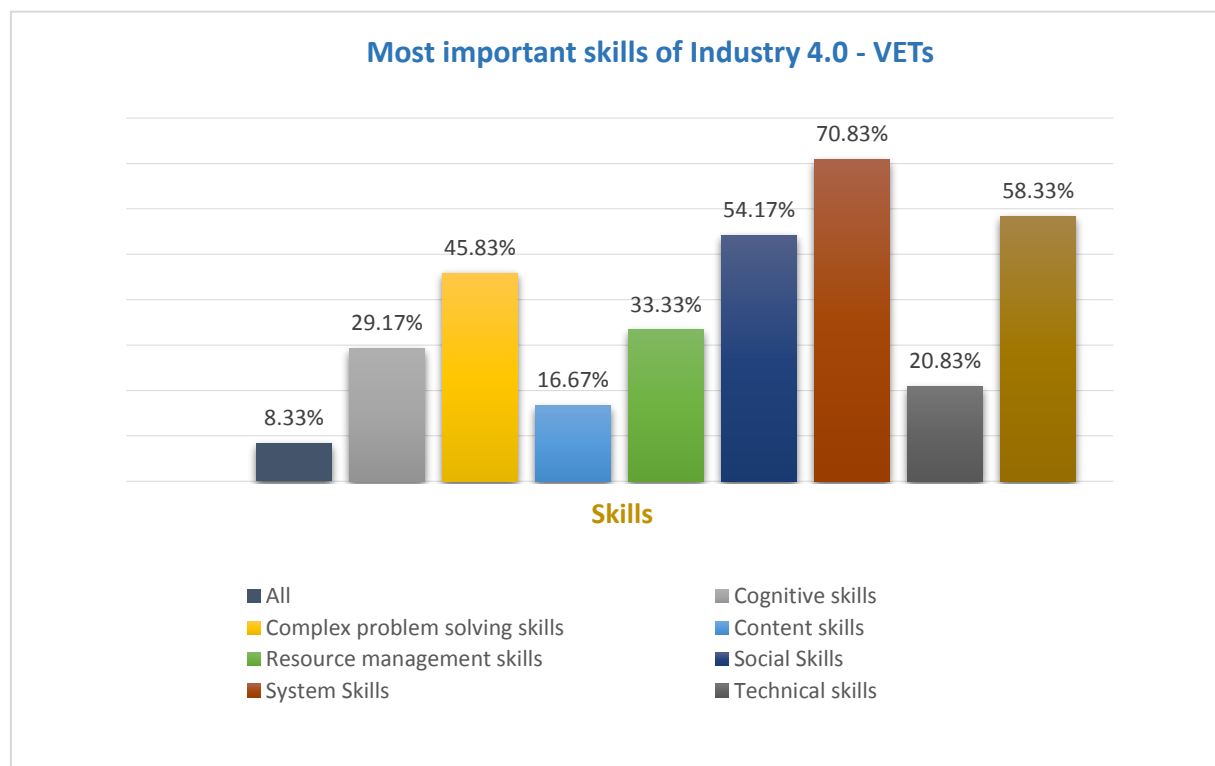
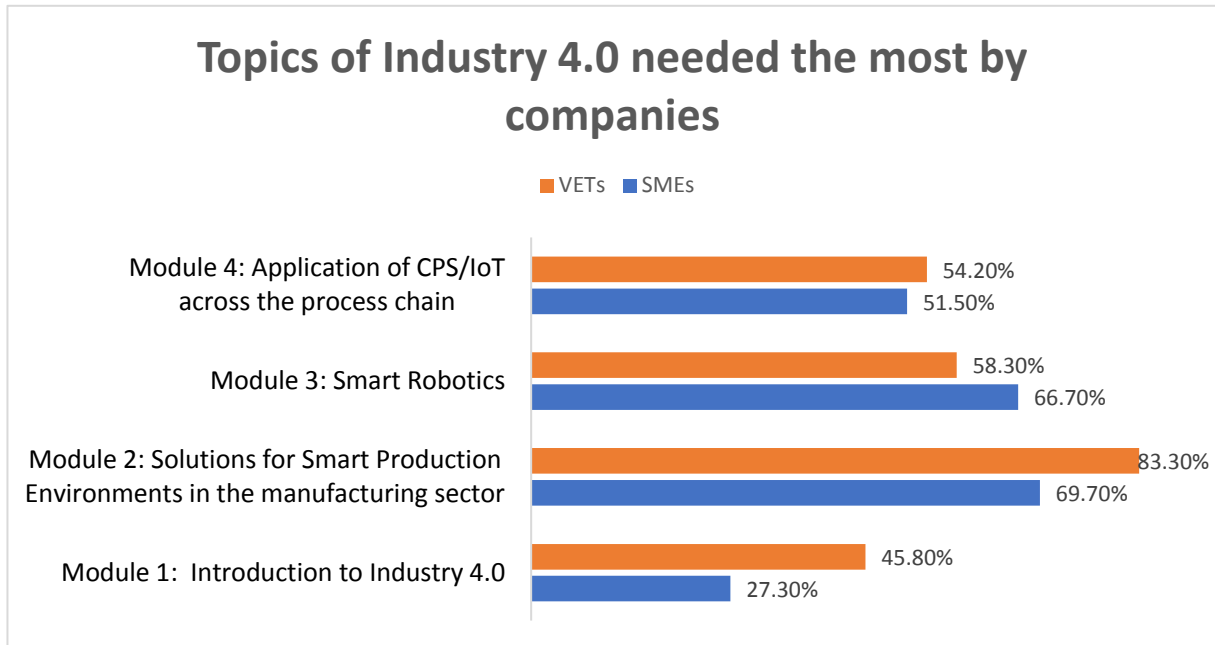
Chart 3: Respondent's acquaintance with Insudtry 4.0

Although the majority of SMEs' respondents say Industry 4.0 is somewhat important (51.50%) or very important (36.40%) for their company, the 63.60% of all them also think that the stuff of the companies is not yet familiar with Industry 4.0. The same goes for workers in VETs where the rate rises dramatically to 83.30%. And they know or believe that specific skills are the most important for Industry 4.0 implementation in their company or organization. And their stuff/trainers need to develop these skills.

Both in SMEs and VETs it is appeared that the most important skill of all is the ‘System Skills’, with percentage for 51.52% SMEs and 70.83% for VETs. And of course, the results have shown that everyone lack this skill. More specifically, 27.27% of SMEs declare that employees haven’t developed ‘System skills’ and from the VETs we can see that people haven’t developed neither ‘System skills’ (percentage 33.33%) nor ‘Process skills’ (percentage 41.67%).

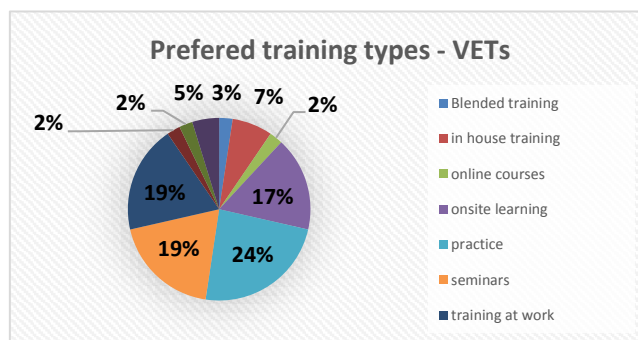
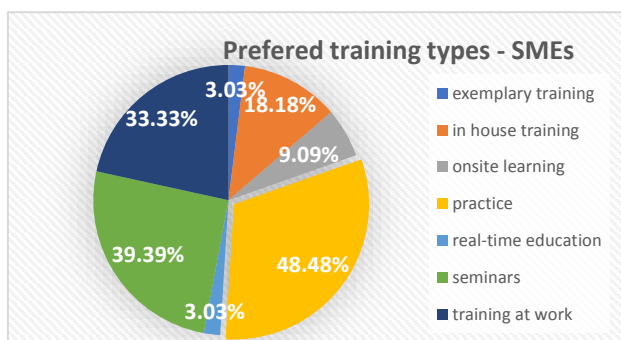


Regarding the training material, when the respondents were requested to choose among Module 1, 2, 3, 4 (one or more modules) as the most necessary for companies today, they chose Module 2: Solutions for Smart Production Environments in the manufacturing sector and Module 3: Smart Robotics. The analytical percentages are shown in the graph below.



In addition, respondents also suggested ways for human resource training in the above skills. By far, at 66.66% for SMEs and 83.33% for VETs, on the job training based on real-time examples and case-

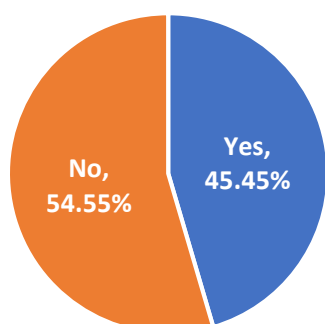
studies is the first choice. It is worth mentioning that on-the-job training was stated and reported on various terms, e.g. in-house training, onsite learning online courses, work-based learning etc.



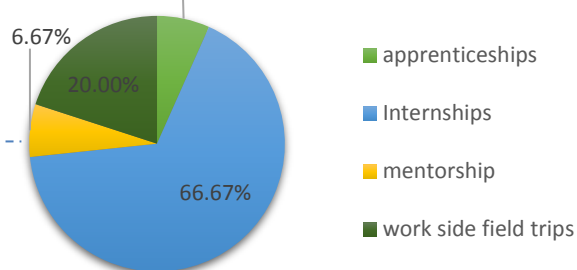
Both SMEs and VETs have almost equal percentages for the fact of having or not having participated/organized WBL initiatives. 45.45% of SMEs and 41.67% of VETs have participated in or organized work-based learning initiatives.

(3) Experience with Work-based learning

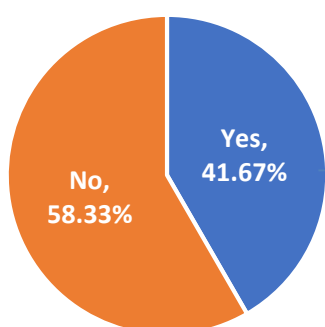
Experience with Work-based learning - SMEs



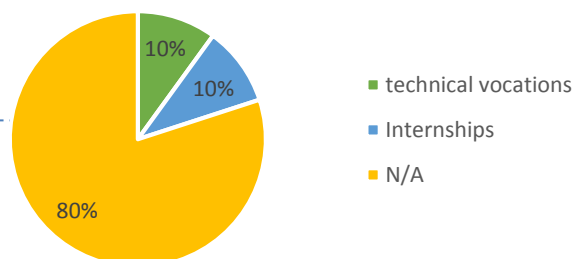
Kind of experience



Experience with Work-based learning - VETs



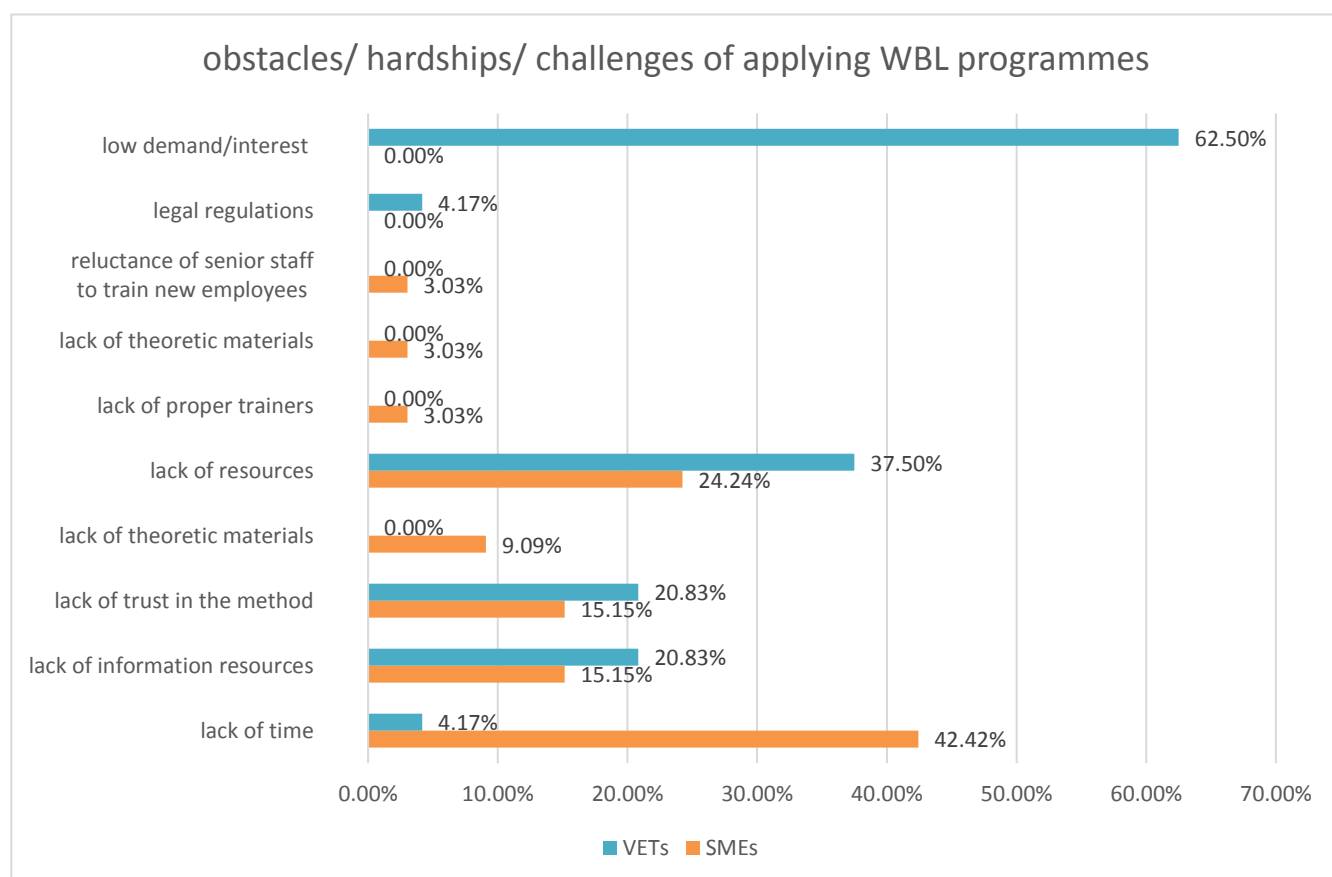
Kind of experience



The survey, also, showed that 15.15% of the SMEs implement onsite training programmes when the survey was taken, and from those 80% have internships and 20% have apprentices. Regarding VET companies, only 25% offer vary onsite training programmes to companies when the survey was taken; 16.67% offer ICT trainings, Project Management, Risk Management, Business Continuity and Information Security Management, Relationship Counselling, Virtual Team Building, Quality, Risk Assessment & Insider Threat and Frontline Management and 33.33% offer Management and Health & Safety Programs.

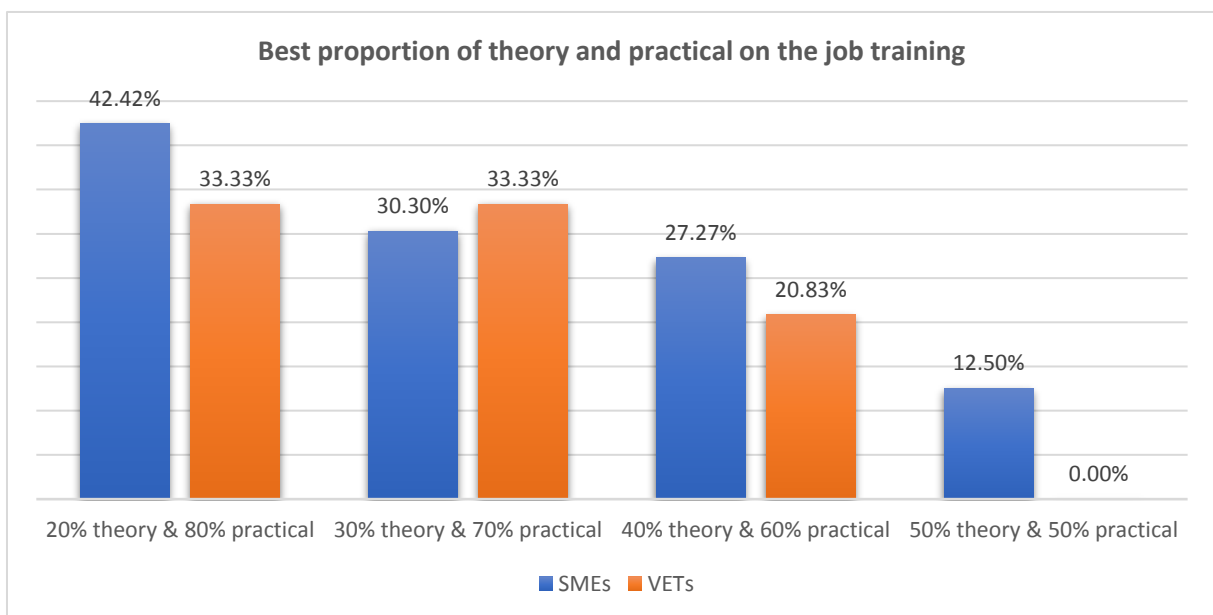
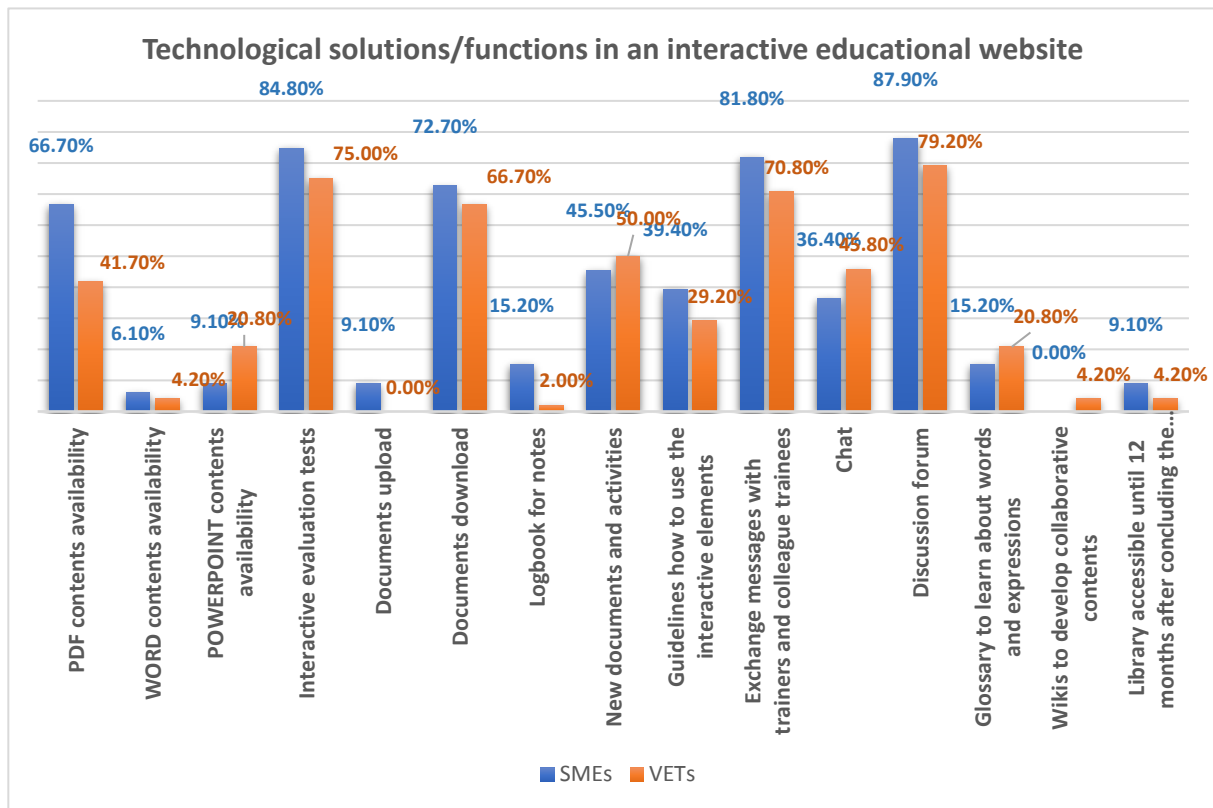
(4) Preferences and training needs

Regarding the preferences and training need, the survey shows that all kind of companies have faced (or believe that would have faced) similar difficulties and challenges with WBL programmes. They also have similar preferences in technology tools in an interactive educational website.



Also, 16.70% of VET companies offer courses connected to the changes arising by Industry 4.0 while 83.30% don't, because it is an unknown field, or the field is not among their expertise or there isn't demand from companies.

Regarding the way the education and training is implemented, we can see that everyone suggests that practice should be longer than theory.



Based on the survey, we observe that the learning tool of O2 should:

- be brief and comprehensive, as many stated that there is lack of time;
- emphasise on Module 2: Solutions for Smart Production Environments in the manufacturing sector and Module 3: Smart Robotics

3. Conclusions from legislation review and policy recommendations

The main issues the Cypriot education and training system faces, as highlighted in the National Reform Program, are to enhance participation in lifelong learning and VET. In Cyprus, there is no legislation governing WBL learning, neither for businesses nor for trainees. The legislation in force at a time is the one applicable to the program being implemented that time.

4. Conclusion

Cyprus has many years of experience in forecasting needs in skills. The main official mechanism for assessing skills needs is operated by the Human Resource Development Authority (HRDA). The Ministry of Finance prepares forecasts for the development of the economy, which include specific forecasts for various sectors of the economy. The Ministry of Education and Culture is responsible for identifying training needs as well as needs for specific skills. Various types of incentives to participate in WBL programs are provided to both individuals and businesses by HRDA or by Ministry of Labour. The main ones are the provision of free WBL programs, the allowances paid to participants in training programs and tax incentives for businesses.

5. Annexes

- [1] **Cedefop (2012). Vocational education and training in Cyprus: short description**
Luxembourg: Publications Office of the European Union, 2012.
- [2] **Cedefop ReferNet Κύπρου (2011). VET in Europe: country report Cyprus**
- [3] **Education and Training Monitor 2015 Cyprus. Luxembourg: Publications Office of the European Union, 2015**
- [4] **Cedefop (2014). Apprenticeship-type schemes and structured work-based learning programmes Cyprus.** Human Resource Development Authority (HRDA) 2014.
- [5] **Cedefop (2016). Apprenticeship-type schemes and structured work-based learning programmes Cyprus.** Human Resource Development Authority (HRDA) 2016.
- [6] **Cyprus Bar Association, Cyprus Constitution and Laws**
- [7] **MULTI-OPERATIONAL TRAINING PROGRAMS POLICY AND PROCEDURE GUIDE 2016.** Human Resource Development Authority (HRDA) 2016.
- [8] **EMPLOYMENT IN CYPRUS – 2008.** MINISTRY OF LABOUR & SOCIAL INSURANCE
- [9] **EMPLOYMENT POLICY 2007.** MINISTRY OF LABOUR & SOCIAL INSURANCE
- [10] **Cedefop ReferNet Κύπρου (2011). VET in Europe: country report Cyprus**
- [11] <http://cylaw.org/>

Annex 1: Legislation review

Legislation and WBL (work based learning)	
Please describe the legislation in the field of WBL in your country regarding the topics listed below. The questions should give you a reference point for what is needed. If you think, you should add something not targeted by the questions, please write it down.	
General overview of WBL in the national legislation	In Cyprus, the WBL forms we encounter are:
How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject?	<ol style="list-style-type: none"> 1. vocational training in educational institutes; and 2. in-house training with the use of internal trainers, who belong to the workforce of enterprises 3. in-company training with the use of external trainers at a vocational training center 4. internship programs
Who is responsible for setting legislation in regard to WBL in your country (National, regional or local level)? Is the legislation the same in the whole country?	<p>In Cyprus, all the activities regarding the provision of continuing vocational education and training are legalized by the Council of Ministers or by legislation adopted by the House of Representatives. The Government has an important role in promoting and delivering an initial one vocational education and training. The Planning Bureau, a separate department having competent minister the Minister of Finance, is a headquarters and policy-making office responsible for general education planning. All proposals for reforms in education must be ratified by the Planning Bureau (PB) before being examined for approval by the Council of Ministers and the House of Representatives.</p> <p>The main bodies responsible for formulating and implementing policy for the initial vocational education and training are the Ministry of Education and Culture (MoEC), the Ministry of Labor and Social Insurance (MLWSI), the Human Resource Development Authority (HRDA) and public higher education institutions.</p> <ul style="list-style-type: none"> • The Ministry of Education and Culture(MoEC), responsible for the Evening Technical Schools, Afternoon and Evening Departments of Technical Schools, Educational Centers and Pedagogical Institute. • The Ministry of Labor and Social Insurance (MLWSI), responsible for Public Higher Education Institutions and Public Training Institutions. • The main Body responsible for Continuing Vocational Education and Training across Cyprus is the Human Resource Development Authority (HRDA), which approves and subsidizes training programs implemented by Public and Private Training institutions and Businesses. HRDA was originally established in 1974 (Law 21/1974), under the name 'Industrial Training Authority'. Laws 6/1975, 17 and 53/1980 and 94/1988 regulated the operation, objectives and activities of the organization. Law 125 (I) / 99 renamed the Authority for Industrial Training to Human Resource Development Authority (HRDA) to better reflect the organization's goals and sphere of competence. <p>Other main bodies promoting training provision for the employed are:</p> <ul style="list-style-type: none"> • The Ministry of Agriculture, Natural Resources and Environment, which has the administrative responsibility for the Forestry College and organizes seminars to farmers. • Other Ministries responsible for training workers in specific economic sectors such as health, public administration and defense. • The Ministry of Finance, which is responsible for the training and development of civil servants. <p>It is worth noting that work based learning is partially governed by the Law</p>

	<p>on Equal Treatment of Men and Women in Employment and Vocational Education Law of 2002 (Law 205 (I) / 2002), along with the amendments Law 191 (I) / 2004, N (I) / 2006, Law 176 (I) / 2007, Law 39 (I) / 2009, Law 150 (I) / 2014.</p> <p>In 1991, the Council of Ministers (No. 35.582) decided to establish The Cyprus Academy of Public Administration (CAPA) operating under the supervision of Ministry of Finance (HQ) and offers programs specially designed for public servants.</p> <p>The decision of the Council of Ministers No. 11.330 13 a-d governs the Establishment of Pedagogical Institute (PI) supervised by the MoEC and offering training to teachers of secondary education.</p> <p>The decision of the Council of Ministers No. 64.892 date of 17.1.2007 governs the Establishment of the Foundation for the Management of European Lifelong Learning Programs.</p>
Please indicate the source	<p>[1] Cedefop (2012). Vocational education and training in Cyprus: short description Luxembourg: Publications Office of the European Union, 2012. http://www.cedefop.europa.eu/EN/Files/4118_en.pdf</p> <p>[2] Cedefop ReferNet Κύπρου (2011). VET in Europe: country report Cyprus http://libserver.cedefop.europa.eu/vetelib/2011/2011_CR_CY.pdf</p> <p>[3] Education and Training Monitor 2015 Cyprus. Luxembourg: Publications Office of the European Union, 2015. http://www.moec.gov.cy/aethee/chrisimo_yliko/education_training_2015/monitor_2015_cyprus_en.pdf</p> <p>[4] Cedefop (2014). Apprenticeship-type schemes and structured work-based learning programmes Cyprus. Human Resource Development Authority (HRDA) 2014. https://cumulus.cedefop.europa.eu/files/vetelib/2014/2014_CR_CY.pdf</p> <p>[5] Cedefop (2016). Apprenticeship-type schemes and structured work-based learning programmes Cyprus. Human Resource Development Authority (HRDA) 2016. https://cumulus.cedefop.europa.eu/files/vetelib/2016/2016_CR_CY.pdf</p> <p>[6] Cyprus Bar Association, Cyprus Constitution and Laws http://cylaw.org/</p>
Legislation for participating in WBL	<p>Every Company and Organisation in Cyprus has the right to participate in WBL training programs, with no limitation on participation, type of business or type of training. Every employer has the ability to organize and implement, at his / her own cost, any training he / she considers to contribute to the development of his / her workforce.</p> <p>Regarding training through the Human Resource Development Authority of Cyprus (HRDA), the process is slightly differentiated. The Human Resource Development Authority of Cyprus (HRDA) is the one that mostly designs, promotes and implements various Projects / Activities for companies and organisations which want comprehensive and integrated coverage of the needs of training and development of their human resources. These programs are organised and implemented in cooperation with certified Vocational Education and Training Centers.</p> <p>Such plans govern specific implementation, approval and grant policy procedures to meet the needs of enterprises / organizations for continuing training of their staff. And precisely because the HRDA subsidizes a significant part of the cost of the program for each trainee, it sets certain</p>
<p>Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)? If yes, what are the requirements?</p> <p>Is there a specific public register where interested parties can check authorized companies to participate WBL?</p>	

	<p>conditions.</p> <ol style="list-style-type: none"> 1. Beneficiaries are enterprises / organizations operating in areas controlled by the Republic of Cyprus and registered in the Register of Social Insurance as employers. 2. Beneficiary employers may operate in all sectors of the economy, except for those employers mentioned in Regulation (EU) 1407/2013 (Articles 107 and 108 of the Treaty on the Functioning of the European Union on De Minimis aid). 3. The Government of the Republic is excluded from the aid. 4. At the start of the program, administrative sanctions for exclusion from cooperation with the HRDA of the employer and / or his / her employees who participated in the program should not be in force. <p>Any business or organization wishing to participate in such programs may visit the official website of the Human Resource Development Authority of Cyprus (HRDA) and more specifically the page http://www.hrdauth.org.cy/el/katartisi/ergodotoumenoi (Title: Training Programs for Employers / Organizations).</p>
Please indicate the source	<p>[1] MULTI-OPERATIONAL TRAINING PROGRAMS POLICY AND PROCEDURE GUIDE 2016. Human Resource Development Authority (HRDA) 2016. http://www.hrdauth.org.cy/images/media/assetfile/%CE%A0%CE%95%CE%A1%CE%99%CE%93%CE%A1%CE%91%CE%A6%CE%97%20%CE%A3%CE%A7%CE%95%CE%94%CE%99%CE%9F%CE%A5%20%CE%95%CE%95%CE%95%20%CE%91%CE%9D%CE%91%CE%98%CE%95%CE%A9%CE%A1%CE%97%CE%A3%CE%97%2022%2012%2015.pdf</p> <p>[2] Cedefop ReferNet Κύπρου (2011). VET in Europe: country report Cyprus http://libserver.cedefop.europa.eu/vetelib/2011/2011_CR_CY.pdf</p>
Labour legislation and WBL	<p>The main objectives of the employment policy in Cyprus, in line with the European Employment Strategy, are enhancing the conditions of full employment, improving quality and productivity at work and strengthening social cohesion (which are reflected in the National Reform Program (NRP) for the Lisbon Strategy 2005-2008). The achievement of these objectives requires an effective tackling of the major challenges confronting Cyprus which are:</p> <ol style="list-style-type: none"> 1. Maintaining high rates of increase of labour supply, particularly by raising old-aged and female participation rates and reduce gender inequality; 2. Increasing the flexibility of the labour market; 3. The orderly management of foreign workers issues to serve the economic and social needs of the country; 4. The further development of human capital; 5. Further enhancement of the conditions of social cohesion. <p>In addressing the challenges faced by the labour market the following policy priorities and measures were set out in the Renewed National Lisbon Reform Programme of Cyprus for the period October 2008 - October 2010, which continues and enhances the previous National Reform Programme that covered the period October 2005 – October 2008, and it has been prepared with the maximum possible social consensus. These policy priorities and measures are still in force until today.</p> <ol style="list-style-type: none"> 1. Improve matching of labour market needs <ul style="list-style-type: none"> • Modernisation and strengthening of labour market institutions. • Better anticipation of skill needs, labour market

	<p>shortages and bottlenecks.</p> <ol style="list-style-type: none"> 2. Expand and improve investment in human capital <ul style="list-style-type: none"> • Reduce the number of early school leavers • Implementation of the National Lifelong learning strategy. 3. Adapt education and training systems in response to new competence requirements <ul style="list-style-type: none"> • Further development of a Vocational Qualifications System, co-financed by the ESF. • Implementation of an action aiming at introducing modern technology in education, co-financed by the ESF. • Upgrading the Apprenticeship Scheme. • Enrichment of the Learning Management System “e-Gnosis”. • Further support to the training infrastructure of institutions and enterprises. 4. Ensure inclusive labour markets, enhance work attractiveness, and make work pay for job-seekers, including disadvantaged people, and the inactive. <ul style="list-style-type: none"> • Development of close cooperation with local authorities and social partners in the promotion of employment of vulnerable groups. • The development, accreditation and implementation of a quality system regarding the services provided by the Cyprus PES. 5. Orderly management of economic migration issues and prevention of social exclusion of migrant workers. 6. Promote flexibility combined with employment security and reduce labour market segmentation. 7. Promote a lifecycle approach to work through increasing the participation of women and older persons in the labour market, as well as build employment pathways for young people and the unemployed and reducing gender inequality. 8. Ensuring an Adequate Standard of Living for Disadvantaged and Vulnerable Groups and Encouraging their Integration/Reintegration into the Labour Market <p>The Human Resource Development Authority of Cyprus (HRDA), every six months, approves a number of training programs exclusively for employees and also internships for new entrants to the labor market. In both types of programs, the Government of Cyprus helps and finances employers to develop the skills of their workforce and to increase the available jobs, respectively.</p> <p>Internshipping workers may or may not be salaried, depending on the organisation that is sponsoring the placement. Usually, internshipping workers receive a nominal payment, which will vary depending on the employer. The employer is also responsible for ensuring that any workers are covered by the company’s liability insurance throughout the duration of the placement.</p> <p>The maximum weekly hours of work are 48 hours, including overtime. Additionally, the employee is entitled to at least 11 continuous hours of rest per day. If the daily period of work is greater than 6 continuous hours, the employee is entitled to a 15-minute break.</p>
<p>Are companies who participate in WBL initiatives subject of more regular audits from labour monitoring institutions?</p>	<p>If the training is an initiative of a company and is organized and implemented exclusively by the company, then there is no additional audit of the specified audits that are or would be carried out in this company.</p>

	<p>If a company participates in vocational training programs through Human Resource Development Authority of Cyprus (HRDA) and collaborating VETs, then the Human Resource Development Authority of Cyprus (HRDA), within its framework its consistent policy of quality assurance in the implementation of the programs it adopts, shall take all necessary measures to that end. These measures include the implementation of programs checking through audit visits. The HRDA has always considered the evaluation of its impact on the labour market and the business world as a priority issue. As from 2008, a specific Evaluation System has been introduced which was designed by independent external consultants selected through public procurement procedures.</p> <p>The Framework deals with the handling of the results of the training implementation audits carried out either by HRDA Officers and / or its appointed associates in the following Drawings:</p> <ul style="list-style-type: none"> • One-Business Training Programs in Cyprus • Multi-company Training Programs - Common • Multi-company Training - Critical Programs • Continuous Training Programs for Trade Union Executives • Unemployment Training Programs <p>The HRDA ensures the quality of the programs it subsidizes with an audit in the following three stages:</p> <ul style="list-style-type: none"> • Program approval stage. • Program implementation stage. • Grant payment stage. <p>The HRDA also conducts studies evaluating the effectiveness and impact of its training and development activities.</p> <p>Practically all programs which have been designed and implemented in the recent years, and especially those co-funded by the ESF and the Government of Cyprus, do implement a policy of on- going monitoring and feedback to assess the progress made and the degree of achieving the targets set. The results of those evaluations are, usually, reviewed by the particular managers/administrators who supervise the implementation of the relevant program.</p>
<p>Please indicate the source</p>	<p>[1] EMPLOYMENT IN CYPRUS – 2008 MINISTRY OF LABOUR & SOCIAL INSURANCE http://www.mlsi.gov.cy/mlsi/dl/dl.nsf/All/80A08D469D1E862FC2256DB0004B163A/\$file/EMPLOYMENT%20IN%20CYPRUS%202008.pdf</p> <p>[2] EMPLOYMENT POLICY 2007. MINISTRY OF LABOUR & SOCIAL INSURANCE http://www.mlsi.gov.cy/mlsi/dl/dl.nsf/All/80A08D469D1E862FC2256DB0004B163A/\$file/Employment%20policy%202007.doc</p>
<p>Tax legislation and WBL</p> <p>Are there specific tax laws in favor of companies engaged in WBL initiatives, dual education?</p> <p>If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?</p>	<p>In Cyprus, vocational education and training is primarily financed through public funds, administered mainly by the Ministry of Education and Culture, MoEC (Ypourgeoio Paideias kai Politismou, YPP), the funds of the Human Resource Development Authority, HRDA which come from the human resource development levy of 0,5% on the payroll of eligible employers, as well as directly from employers.</p> <p>In order to give companies incentives to participate in WBL initiatives, all human resource development expenditure is deducted from taxation, just like other production costs. In this way, it is estimated that the state accounts for about 20-25% of the total cost of human resources</p>

	development, while the remainder is covered by private funds. On the other hand, employers must contribute every month the percentage of 1% on the salary of each employee in the Human Resource Development Fund.
<i>Please indicate the source</i>	[1] Cedefop ReferNet Κύπρου (2011). VET in Europe: country report Cyprus http://libserver.cedefop.europa.eu/vetelib/2011/2011_CR_CY.pdf
Subsidies and grant legislation with regard to WBL	<p>In order to give companies incentives to participate in WBL initiatives, all human resource development expenditure is deducted from taxation, just like other production costs. In this way, it is estimated that the state accounts for about 20-25% of the total cost of human resources development, while the remainder is covered by private funds.</p> <p>The financing provided by the ESF increased the level of funds available and at the same time improved the efficiency of the funding arrangements through the required introduction of appropriate mechanisms and tools emanating from the EU. Public investment in VET has increased and efforts have been made to increase private investment in education.</p> <p>Given the low unemployment tradition in the Cyprus economy, there was a tendency for the training system to be oriented mainly towards the lack of skills rather than towards strengthening the employability of the unemployed and the inactive. Human Resource Development Authority, HRDA operated Job placement and training of unemployed Cypriots and EU nationals to fill vacancies and / or replace labour from third countries. The scheme provides incentives to employers in the form of subsidy and guidance for the employment and individualized training of unemployed persons.</p> <p>Also, there is a measure about Job placement and training of specific people groups (unemployed, disadvantaged groups, people with disabilities etc). These measures provides incentives to enterprises to provide employment, practical training and work experience to graduates.</p>
Does the funding and grant legislation directly address WBL/dual education initiatives? If yes, how (e.g. special funds or grants for certification, investments in education and trainings of head or staff to be mentors/ trainers?)	
Are there any positive or negative incentives in the legislation promoting participation in WBL initiatives? If yes, which one?	
<i>Please indicate the source</i>	Cedefop ReferNet Κύπρου (2011). VET in Europe: country report Cyprus http://libserver.cedefop.europa.eu/vetelib/2011/2011_CR_CY.pdf
Other comments	



Methodology for development of Output 1: State-of-the-art analysis on the knowledge & skills gaps on the topic of Industry 4.0 and the requirements for WBL

„Work-based training approach in the field of Industry 4.0 for competitive
European Industry“

iNduce 4.0

Project No: 2017-1-RO01-KA202-037222

1

Authors: European Center for Quality Ltd.
October, 2017



This project has been funded under the Erasmus + Programme and with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein

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Section 1: Introduction

1.1. Project Introduction

1.1.1. Aims and Objectives

INDUCE 4.0 project is aimed at establishing sustainable VET business partnerships aimed at promoting work-based learning on the topic of Industry 4.0, with special attention to apprenticeship training, by involving social partners, companies and VET providers.

The specific objectives of the project are:

- creating flexible learning package for work-based learning aimed at providing fundamental technical knowledge on the topic of Industry 4.0
- creating thorough methodology for WBL current and future (VET students/apprentices) SME employees on the topic of Industry 4.0 and thus boosting SMEs' capacity for transition by nurturing the necessary skills for the “factory of the future”

1.1.2. Target Groups

INDUCE 4.0 is aimed at the following groups:

- Managers of manufacturing SMEs
- Heads of departments (production, logistics, etc.) in manufacturing SMEs
- Future employees of manufacturing SMEs (vocational students/apprentices)
- VET providers/trainers/consultants

1.2. Description of O1

1.2.1. Aim

The main aim of this output is to set the basis for elaboration of the INDUCE 4.0 training course (O2) and the INDUCE 4.0 Practical methodology for WBL (O3) in accordance with the target groups' needs as well as to provide basis for forming recommendations for evidence-based policy in the field of WBL.

1.2.2. Responsibilities

Leader of this output is European Center for Quality Ltd (BG). Participating organisations are:

- “Petru Maior” University of Tirgu-Mures – Romania
- CCIM – Chamber of Commerce and Industry of Mures County – Romania
- PIAP – Industrial Research Institute For Automation And Measurements – Poland
- ISQ – Institute for Technology and Quality– Portugal
- EVBB – European Association of Institutes for Vocational Training – Germany
- PCX – PCX Computers & Information Systems Ltd - Cyprus

ECQ is responsible for:

- setting the framework for conduction of the country research in each of the 6 partner countries;
- conducting research in Bulgaria;
- analyzing all country reports and compiling overall report;

All other partners are responsible for:

- carrying out all research activities in their respective countries (RO, PL, PT, DE, CY);
- supporting the output leader by providing all the necessary information for the compilation of the overall report (O1);

1.2.3. Activities

In the course of development of O1, the following activities are stipulated:

O1/ A1: Target group survey (M1-M2) /see section 2/

Tasks:

- ECQ (O1 leader): to prepare the Research methodology as well as the template questionnaire in English and distribute them among all partners;
- All partners: identify and contact stakeholders at national level;
- All partners: conduct research in their country among at least 20 SMEs and 15 VET providers/trainers/consultants
- All partners: summarize and analyze the results in EN

O1/ A2: Legislation review (M3-M4) /see section 3/

Tasks:

- ECQ: will prepare template for analysis of legal framework in the field of WBL
- All partners: perform a desk research and identify policies, legal requirements or the lack of such in the field of WBL/ training of apprentices, etc.
- All partners: documentation of results for their respective country

O1/ A3: Preparation of Country report (M5) /see section 4/

Tasks:

- All partners: compile Country report containing survey results and legislation review and policy recommendations on national level.

O1/A4: Performing of benchmark analysis of all Country reports (M6) /see section 4/

Tasks:

- ECQ: to collect research results from all partners
- ECQ: to perform comparative analysis between all 6 countries and outline differences and similarities in knowledge & skills gaps; hardships to organize WBL; policies in the field of WBL; form common recommendations & conclusion
- All partners: perform proofreading of the content of O1 and provide feedback

Section 2: Target group survey

2.1. Aim

The target group survey is aimed at: (1) defining knowledge and skills gaps among SMEs on the topic of Industry 4.0 and (2) identifying main hardships SMEs face in regard to organising WBL

2.2. Steps to conducting the survey

- 1) The survey shall be conducted based on a 2 questionnaires developed by ECQ in English (see Annex 1 and 2).
- 2) All involved partners shall prepare a **contact list** (see contact list template) with contact data of representatives of the main project target groups as described in section 1.1. Project introduction.
- 3) All involved partners shall perform the surveys via chosen communication means – via email, phone, electronic software (e.g Google docs, SurveyMonkey, LimeSurvey, etc) or face-to-face meetings - to the identified target groups’ representatives as pointed in section 1.1 of this document.
- 4) Survey 1/ Annex 1 shall be performed by applying the means mentioned in point 3) to the following types of respondents: Managers of manufacturing SMEs; Heads of departments (production, logistics, etc.) in manufacturing SMEs; employees from human resource departments, other relevant staff;
- 5) Survey 2/ Annex 2 shall be performed by applying the means mentioned in point 3) to the following types of respondents: trainers, consultants, Training developers; Mentors; other relevant staff of VET organisations
- 6) For each country the following number of respondents shall be reached: 20 responses from representatives of manufacturing SMEs & 15 responses from representatives of VET organisations, consultants, trainers, etc.
- 7) Responsible partners shall make a brief narrative analysis of the results from the conducted surveys, outlining the main findings and conclusions of both surveys and document it into a template provided by ECQ (see Country Report template). **The analysis shall be prepared only in English.**

2.3. Expected results:

- ✓ Prepared lists with contact data of representatives of the iNduce 4.0 target groups
- ✓ minimum 35 answers to the survey per country (20 from SMEs, 15 from VET providers)
- ✓ concise narrative analysis of the results and conclusions regarding the preferences of the respondents in the respective country knowledge and skills gaps among SMEs on the topic of Industry 4.0 main hardships faced in regard to organising WBL.

Section 3: Review of national legislation

3.1. Aim

The review of legislation on national level seeks to identify the policies and the legal framework set (or lack of such) in the field of WBL in partner countries and thus define policy recommendations in the field of WBL.

3.2. Steps to conducting the legislation review

- 1) The review shall be conducted according to a common template elaborated by ECQ (see Annex 3);
- 2) The legislation review shall be done only in English by each involved partner;
- 3) The review must be focused only on legislation regulations in the field of WBL topics in the template. The following topics will be subject of research:
 - How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject?
 - Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)?
 - Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc....)? If yes, how does it differ from the standard labour legislation?
 - Are there specific tax laws in favor of companies engaged in WBL initiatives, dual education? If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?
 - Other;
- 4) The review shall be a part of the national report of each country.

3.3. Expected results

- ✓ Developed legislation review in English for RO, PT, PL, BG, CY, DE;
- ✓ Number of legislation reviews: 6

Section 4: Development of Country report & Overall report summarizing research in all countries (O 1)

4.1. Aims

The Aim: summarizing the results for each country with regard to forming comprehensive report reflecting each partner country specifics which could be used by stakeholders on national level.

Aim: to identify common cross points (training needs, preferences, hardships to WBL, gaps in policy/ legal frameworks in the field of WBL, etc.) which to serve as foundation for preparation of O2 and O3 and as a tool for evidence-based policy making

4.2. Steps towards development of Country report

- 1) All involved partners use the template and structure provided by ECQ (see Country report template)
- 2) Working language is English, therefore all analysis and reviews shall be in English;
- 3) **Each country report consists of a minimum:**
 - Concise narrative analysis of the surveys' results in English
 - Annex 1 – Survey for SMEs
 - Annex 2 – Survey for VET providers
 - Annex 3 – legislation review template
- 4) Upon preparation of a Country report, each partner is responsible to send it to the output leader ECQ
- 5) Upon receiving of all 6 country reports, ECQ will analyse the results and prepare an Overall report, summarizing the common trends in legislation in the field of WBL, main skills shortages and knowledge gaps on the topic of Industry 4.0 and hardships when conducting WBL.

4.3. Expected results:

- ✓ Country reports for Romania, Portugal, Poland, Cyprus, Germany and Bulgaria containing the aforementioned minimum information
- ✓ Number of country reports: 6
- ✓ Developed overall report in English, summarizing the results of all 6 countries and outlining common trends and preferences
- ✓ Number of overall reports: 1

SECTION 5: Annexes

Annex 1: Survey for SMEs

Survey for SMEs

This questionnaire is part of the iNduce 4.0 Project „Work-based training approach in the field of Industry 4.0 for competitive European Industry”, aimed at promoting WBL on the topic of Industry 4.0 by development of a learning package and methodology to serve the aforementioned purpose. This questionnaire is a diagnostic tool for identifying knowledge and skills gaps on the topic of Industry 4.0 as well as the hardships organisations encounter when conducting work-based trainings.

The answers will be analysed and studied at national and international level, in comparison with the interviews and questionnaires obtained by other partners. We ensure complete confidentiality and anonymity of data and information collected, which will be used solely for the purpose of analysis for the above mentioned study.

Participating companies will have priority in benefiting from the tools and training opportunities developed within the project without any cost, and will receive the findings of the diagnosis of training needs.

Thank you for your time and contribution!

SECTION I: Identification of respondents

1) Please indicate to which of the below mentioned groups you belong to:

- ☐ Manager
- ☐ Executive
- ☐ Middle manager
- ☐ Department manager
- ☐ Office-worker
- ☐ Skilled worker
- ☐ Unskilled worker
- ☐ Other (*please specify*).....

2) Please indicate the industry in which your enterprise is currently operating:

- ☐ Machinery
- ☐ Print
- ☐ Electronics, optics, data processing
- ☐ Electrical engineering
- ☐ Automotive (OEM, supplier)
- ☐ Other vehicle manufacturing
- ☐ Rubber and plastics parts
- ☐ Metal parts
- ☐ Furniture
- ☐ Paper industry
- ☐ Glass, ceramics, stones, earths, building materials
- ☐ Feeding stuff
- ☐ Clothing apparel
- ☐ Wood
- ☐ Chemical products
- ☐ Metalworking, metal machining
- ☐ Beverage industry
- ☐ Pharma

- ☐ Textiles
☐ Other (please indicate).....

SECTION II: Industry 4.0 skills and knowledge gaps

3) Do you consider yourself acquainted with the concept of Industry 4.0?

- ☐ YES
☐ NO

4) Do you consider staff in your enterprise to be familiar with the concept of Industry 4.0?

- ☐ YES
☐ NO

5) How important is Industry 4.0 for your company?

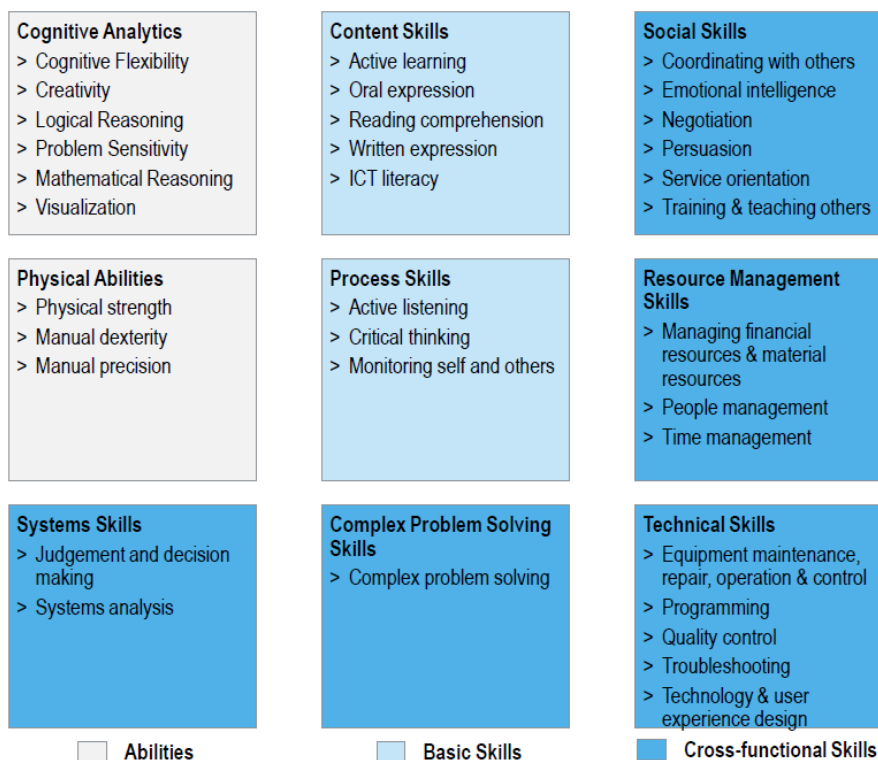
- ☐ Not important/ hasn't affected us
☐ Somewhat important
☐ Very important

6) Please indicate which of the topics listed below you find useful and would appreciate having more information on:

	Topic/training area	X
1	Module1: Introduction to Industry 4.0 1.1.The concept of Industry 4.0 1.2. What are the benefits for SMEs	<input type="checkbox"/>
2	Module 2: Solutions for Smart Production Environments in the manufacturing sector 2.1.Machine learning & Machine-to-machine (M2M) communications in smart production 2.2.Application of Cyber-Physical-Systems (CPS)/ Internet of Things (IoT) in smart production 2.3. Application of 3-D printing in smart production 2.4.Application of Big Data and Cloud computing in smart production	<input type="checkbox"/>
3	Module 3: Smart Robotics 3.1. Programmable logic controllers and industrial computers 3.2. Industrial Robots – Programming and Applications 3.3. Mobile Robots and Their Applications	<input type="checkbox"/>
4	Module 4: Application of CPS/IoT across the process chain 4.1.Vertical networking of smart production systems 4.2.Horizontal integration via a new generation of global value chain networks 4.3.Acceleration through exponential technologies	<input type="checkbox"/>
	Other (please specify):.....	<input type="checkbox"/>

7) Which of the skills illustrated on figure 1 you deem most important for successful implementation of Industry 4.0 in your company? (More than one answer is possible)

Fig. 1. Categorization of skills in skill family



Source: World Economic Forum, based on O*NET Content Model

Specify your answer here:

8) Which of the skills you have pointed in Q7 you think workers/employees in your company lack?

9) What kind of training you consider the best solution for nurturing the skills you have pointed in Q7?

SECTION III: Experience with Work-based learning

- 10) Has your company ever participated/ organized WBL initiatives (internships, mentorship programmes, apprenticeships, work side field trips, job shadowing etc.)?

- 11) Does your company have special onsite training programmes implemented at the moment (internships, mentorship programmes, apprenticeships, work side field trips, job shadowing etc.) for new employees and/or students?

☐ **YES** (If, yes, please specify further:
.....
.....)

☐ **NO** (If, no please move to question 12.)

- 12) What are the main obstacles/ hardships/ challenges that you have faced or you think you will face in case of applying WBL programmes for new employees/ students?

For instance: the legal regulations or the lack of such, lack of resources, lack of trust in the method, lack of time, reluctance on the part of senior staff to train new employees/ apprentices, lack of information resources (e.g. how to do it, with what resources), lack of theoretic materials to combine with practical elements, etc.

Specify your answer here:

SECTION IV: Preferences and training needs

- 13) What are the technological solutions/functions you value the most in an interactive educational website?

- ☐ PDF contents availability
- ☐ WORD contents availability
- ☐ POWERPOINT contents availability
- ☐ Interactive evaluation tests
- ☐ Documents upload
- ☐ Documents download
- ☐ Logbook for notes
- ☐ New documents and activities
- ☐ Guidelines how to use the interactive elements
- ☐ Exchange messages with trainers and colleague trainees
- ☐ Chat
- ☐ Discussion forum
- ☐ Glossary to learn about words and expressions
- ☐ Wikis to develop collaborative contents

- ☐ Library accessible until 12 months after concluding the training course
☐ Others (Please specify):

14) Please point the best proportion of theory and practical on the job training when organizing WBL in the field of Industry 4.0?

Annex 2: Survey for VET providing organisations

Survey for VET providing institutions

This questionnaire is part of the iNduce 4.0 Project „Work-based training approach in the field of Industry 4.0 for competitive European Industry”, aimed at promoting WBL on the topic of Industry 4.0 by development of a learning package and methodology to serve the aforementioned purpose. This questionnaire is a diagnostic tool for identifying knowledge and skills gaps on the topic of Industry 4.0 as well as the hardships organisations encounter when conducting work-based trainings.

The answers will be analysed and studied at national and international level, in comparison with the interviews and questionnaires obtained by other partners. We ensure complete confidentiality and anonymity of data and information collected, which will be used solely for the purpose of analysis for the above mentioned study.

Participating VET providers will have priority in benefiting from the tools and training opportunities developed within the project without any cost, and will receive the findings of the diagnosis of training needs.

Thank you for your time and contribution!

SECTION I: Identification of respondents

1) Please indicate to which of the groups listed below do you belong to:

- ☐ Owner/founder
- ☐ Manager
- ☐ Training developer
- ☐ Trainer/Mentor
- ☐ Expert/ consultant / advisor
- ☐ Other (please specify).....

2) Please indicate the type of vocational education provided by your organisation:

- ☐ Continuous formal vocational education
- ☐ Continuous non-formal vocational education
- ☐ Initial vocational education
- ☐ Training at the workplace
- ☐ Coaching/ mentoring
- ☐ Case based/ custom-made training
- ☐ Training/education/courses at adult education centres
- ☐ Vocational education provided by a university
- ☐ Vocational education provided by a development organization
- ☐ Other (please specify).....

SECTION II: Industry 4.0 skills and knowledge gaps

3) Do you consider yourself acquainted with the concept of Industry 4.0?

- ☐ YES
- ☐ NO

4) Do you consider teachers/trainers in your organisation to be familiar with the concept of Industry 4.0?

- ☐ YES
- ☐ NO

- 5) According to your knowledge and experience in which topics related to Industry 4.0 training is the needed the most by companies:

	Topic/training area	X
1	Module1: Introduction to Industry 4.0 1.1.The concept of Industry 4.0 1.2. What are the benefits for SMEs	<input type="checkbox"/>
2	Module 2: Solutions for Smart Production Environments in the manufacturing sector 2.1.Machine learning & Machine-to-machine (M2M) communications in smart production 2.2.Application of Cyber-Physical-Systems (CPS)/ Internet of Things (IoT) in smart production 2.3. Application of 3-D printing in smart production 2.4.Application of Big Data and Cloud computing in smart production	<input type="checkbox"/>
3	Module 3: Smart Robotics 3.1. Programmable logic controllers and industrial computers 3.2. Industrial Robots – Programming and Applications 3.3. Mobile Robots and Their Applications	<input type="checkbox"/>
4	Module 4: Application of CPS/IoT across the process chain 4.1.Vertical networking of smart production systems 4.2.Horizontal integration via a new generation of global value chain networks 4.3.Acceleration through exponential technologies	<input type="checkbox"/>
	Other (please specify):.....	<input type="checkbox"/>

- 6) According to your knowledge and experience which of the skills illustrated on figure 1 you deem most important for successful implementation of Industry 4.0 in companies? (More than one answer is possible) Fig. 1. Categorization of skills in skill family



Source: World Economic Forum, based on O*NET Content Model

Specify your answer here:

7) Which of the skills you have pointed in Q6 you think people lack?

8) What kind of training you consider the best solution for nurturing the skills you have pointed in Q6?

SECTION III: Experience with Work-based learning

9) Has your organisation ever participated/ organized joint WBL initiatives in cooperation with companies?

10) Does your organisation offer special onsite training programmes to companies at the moment?

☐ **YES** (If, yes, please specify further:
.....
.....)

☐ **NO** (If, no please move to question 12.)

11) Do you offer any kind of courses connected to the changes arising by Industry 4.0?

☐ **YES** (If, yes, please specify further:
.....
.....)

☐ **NO** (If, no please point out why
.....
.....)

12) What are the main obstacles/ hardships/ challenges that you have faced or you think you will face in case of organizing joint WBL programmes with companies?

For instance: the legal regulations or the lack of such, lack of resources, lack of trust in the method on the part of companies, low demand/interest in the educational service, reluctance on the part of employers to organize such initiatives, lack of information resources (e.g. how to do it, with what resources), lack of theoretic materials to combine with practical elements, etc.

SECTION IV: Preferences and training needs

13) What are the technological solutions/functions you consider most important for interactive educational website?

- ☐ PDF contents availability
- ☐ WORD contents availability
- ☐ POWERPOINT contents availability
- ☐ Interactive evaluation tests
- ☐ Documents upload
- ☐ Documents download
- ☐ Logbook for notes
- ☐ New documents and activities
- ☐ Guidelines how to use the interactive elements
- ☐ Exchange messages with trainers and colleague trainees
- ☐ Chat
- ☐ Discussion forum
- ☐ Glossary to learn about words and expressions
- ☐ Wikis to develop collaborative contents
- ☐ Library accessible until 12 months after concluding the training course
- ☐ Others. Please, specify:.....

14) Please point the best proportion of theory and practical on the job training when organizing WBL in the field of Industry 4.0?

Annex 3: Legislation review template

Legislation and WBL (work based learning)	
Please describe the legislation in the field of WBL in your country regarding the topics listed below. The questions should give you a reference point for what is needed. If you think, you should add something not targeted by the questions, please write it down.	
General overview of WBL in the national legislation	
How is WBL embedded in the national legislation? Is there specific legislation in the field of WBL in your country or is WBL regulated as cross-section subject?	
Who is responsible for setting legislation in regard to WBL in your country (National, regional or local level)? Is the legislation the same in the whole country?	
<i>Please indicate the source</i>	
Legislation for participating in WBL	
Are there specific legal requirements that companies need to meet in order to participate in WBL initiatives (e.g. dual education programmes)? If yes, what are the requirements?	
Is there a specific public register where interested parties can check authorized companies to participate WBL?	
<i>Please indicate the source</i>	
Labour legislation and WBL	
How does the labour legislation look like in your country? Is there a specific labour legislation dealing with the apprenticeship, internships, other WBL initiatives (e.g. maximum working time, flexible working hours, minimum salary, etc...)? If yes, how does it differ from the standard labour legislation?	
Are companies who participate in WBL initiatives subject of more regular audits from labour monitoring institutions?	
Tax legislation and WBL	
Are there specific tax laws in favor of companies engaged in WBL initiatives, dual education? If yes, which one (e.g. Special tax reductions in cases of employing certain numbers of students or other)?	
<i>Please indicate the source</i>	

Subsidies and grant legislation with regard to WBL	
Does the funding and grant legislation directly address WBL/dual education initiatives? If yes, how (e.g. special funds or grants for certification, investments in education and trainings of head or staff to be mentors/ trainers?)	
Are there any positive or negative incentives in the legislation promoting participation in WBL initiatives? If yes, which one?	
<i>Please indicate the source</i>	
Other comments	