

# Strategic Plan





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### Abbreviations

AI	Artificial Intelligence
AM	Advanced Manufacturing
Cedefop	European Centre for the Development of Vocational Training
CoVE	Centres of Vocational Excellence
EAfA	European Alliance for Apprenticeships
EC	European Commission
ECVET	European Credit System for Vocational Education and Training
EntreComp	The Entrepreneurship Competence Framework
EQAVET	European Quality Assurance in Vocational Education and Trainin
EQF	European Qualifications Framework
ESCO	European Skills, Competences and Occupations
ETF	European Training Foundation
EU	European Union
HE	Higher Education
HVET	Higher Vocational Education and Training
14.0	Industry 4.0
КЕТ	Key Enabling Technology
OECD	Organisation for Economic Cooperation and Development
SWOT	Strengths, Weaknesses, Opportunities, Threats
TVET	Technical and Vocational Education and Training
VET	Vocational Education and Training
WBL	Work Based Learning



The EXAM 4.0 platform aims at becoming the European reference platform for knowledge generation and exchange, innovation, collaboration and service provision for VET/HVET centres and companies working in Advanced Manufacturing.

In this document, we describe our strategy for the next years. We have divided the document into four sections:

**Section 1:** Explains the alignment of the platform to EU policy. As a European Platform of Excellence in Advanced Manufacturing (AM), we start by analysing the European initiative on VET excellence, the key European policy initiatives for the 2021-2027 period, and the main societal challenges and we outline how we will address them.

**Section 2:** Alignment of the platform to the main trends of EU VET. There are technological, sociological and economic changes in Europe which affect VET/HVET systems at European level . In this section we will provide a short overview of some of these trends, understanding that they influence what VET/HVET systems in different countries are doing. As we will see, the main features of the EXAM 4.0 platform are designed to meet these needs.

**Section 3:** The interests of the EXAM 4.0 partners. The initiative to create the platform comes from the EXAM 4.0 project. The project represents different stakeholders such as VET/HVET, companies, company associations, research bodies, and authorities. It is very important to know what they expect from a platform and section 3 summarizes their main interests.

Section 4: On online platforms. We want to create a platform but what is a platform? There have been some discussions among project partners and we would like to summarise them in this section.

Section 5: Strategy of the platform for the period 2021-2027. We will evaluate our Strengths, Weaknesses, Opportunities and Threats (SWOT), our vision, mission, values, strategic objectives and key initiatives to achieve them.



<sup>1</sup> It does not mean that they are the only changes affecting VET systems, but we will mostly focus on them in our analysis.

Section 1: Alignment of the platform to EU policy

As the European reference platform for knowledge generation and exchange, innovation, collaboration and service provision for VET/HVET centres and companies working in Advanced Manufacturing, we are strongly committed to making European initiatives thrive. To do that, we should be aligned with the main policy initiatives for the 2021-2027 period.

This section describes some of the major features of the current European situation and the alignment of the platform with them:

- 1. The European initiative on VET excellence.
- 2. Key EU initiatives for the 2021-2027 period.
- 3. A Green Europe.
- 4. A Digital Europe.
- 5. A Fair Europe.
- 6. Advanced Manufacturing and Industry 4.0 in Europe.

### THE EUROPEAN INITIATIVE ON VET EXCELLENCE

This platform was born under the European initiative on Centres of Vocational Excellence (CoVE) and we will continue supporting it.

The first call for proposals of Centres of Vocational Excellence was launched by the European Commission in 2018 under the Sector Skills Alliance action of the Erasmus+ programme. In the first call 5 pilot projects were approved<sup>2</sup>:

- 1. DEUS project
- 2. DIHUB project
- 3. PoVE water project
- 4. Talentjourney project
- 5. EXAM 4.0 project

<sup>&</sup>lt;sup>2</sup> For more information about the projects, please consult Annex 1.

In the second call of proposals 7 pilot projects were approved under the KA3 action of Erasmus+:

- 1. GREENOVET European VET Excellence Platform for Green Innovation
- 2. European Centre of Vocational Excellence in Microelectronics

**3.** Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy

- 4. Alliance of Centres of Vocational Excellence in the Furniture and Wood Sector
- 5. Governance for Inclusive Vocational Excellence
- 6. European Platform for Urban Greening

**7.** Blue Region Initiatives for Developing Growth, Employability and Skills in the farming of finfish

And, according to the *European Skills Agenda for Sustainable Competitiveness, Social Fairness* and Resilience (European Commission 2020 c) and the <u>Commission Proposal for a Council</u> <u>Recommendation on VET</u>, (European Commission 2020 d) the Commission plans to continue launching calls for projects on platforms for Centres of Vocational Excellence.

The European Commission will also establish a digital platform of support services for CoVEs and a Community of Practice on Vocational Excellence. According to presentations delivered by Mr. Joao Santos, senior expert in the Directorate General for Employment, Social Affairs, and Inclusion at the European Commission in Brussels, the support services will be organised in three hubs:



Source: we took this picture from a presentation delivered by Mr. Joao Santos, on June 17, 2020.

The European Commission also recommends that Member States support the establishment of Centres of Vocational Excellence in their countries.

This is the context in which the EXAM 4.0 platform was developed.

On a different note, but in a very close connection with the European initiative, the ETF launched an International Network of Centres of Vocational Excellence. It is aimed mainly at collaboration between EU and about 17 non-EU countries<sup>3</sup>. The launch conference was held on December 3<sup>rd</sup> 2020.

The goal of the International Network of Centres of Vocational Excellence is to help CoVEs to internationalise and to forge partnerships outside the EU. It is a complementary initiative to the platforms of vocational excellence, and it will help CoVEs in partner countries to collaborate with European CoVEs.

The network is focused on eight themes:

**1.** Lifelong learning in vocational education and training – from initial to continuing training and adult education

- 2. Education-business collaboration and cooperation
- 3. Pedagogy and professional development
- 4. Smart specialisation Mobilising Innovation, ecosystems and SMEs
- 5. Industry 4.0 and digitalisation
- 6. Autonomy and Institutional Development (financing, leadership, governance)
- 7. Going green supporting sustainable goals
- 8. Social inclusion

On March 25 2021, the New Erasmus Guide defines the initiative on CoVEs as one of the priority actions and will launch a call for proposals that will be closed on September 7 2021. They plan to fund about 100 CoVE projects between 2021 and 2027.



<sup>&</sup>lt;sup>3</sup> More information about the initiative and the countries involved could be consulted in their webpage: https://www.etf.europa.eu/en

### KEY EU INITIATIVES FOR THE 2021-2027 PERIOD

Although the European initiative on CoVEs is a key element in defining the context in which the EXAM 4.0 platform was born, it does not define the whole context. We are a platform of excellence, but a European platform. In this sense, we need to align our work with the key European initiatives.

We are experiencing one of the worst recessions in our history and the European Commission has set a priority to overcome it. However, Europe does not just want to come out of the crisis: it wants to do so by becoming a climate-neutral continent by 2050 (according to the *European Green Deal*), by becoming a highly digitalised continent (see *European Digital Strategy*, among others), and maintaining high standards of well-being, justice, and democracy (see *Charter of Fundamental Rights of the European Union*, *European Pillar of Social Rights, A Strong Social Europe for Just Transitions* ).

The green and digital transitions are jointly referred to as the "twin transitions"<sup>4</sup> and VET and HVET will play a big role in it. The EXAM 4.0 platform should also have a strong focus on both transitions.

The twin transitions also mean for us that we should start paying attention to the greening aspect of VET/HVET companies in AM. Up to now we have been more focused on the digitalisation part, but now is the time for us to start thinking about the greening part.

These two transitions are related to each other, and it will not cause any considerable disruption to our work, but we should include aspects related to sustainability.

<sup>&</sup>lt;sup>4</sup> See for example the European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience.

## A GREEN EUROPE

As sustainability and greening could be quite vague to be properly interpreted, we will follow the *European Green Deal*, the EU's growth strategy for the next period. The priority of the strategy is to come out of the recession becoming a greener society, a more sustainable Europe, based on three pillars (European Commission 2019):

- 1. Zero energy emissions by 2050
- 2. Economic growth is decoupled from resource use
- 3. No person and no place is left behind

The main elements of the strategy are:

- 1. Increasing the EUs climate ambition for 2030 and 2050
- 2. Supplying clean, affordable, and secure energy
- 3. Mobilising industry for a clean and circular economy
- 4. Building and renovating in an energy and resource efficient way
- 5. A zero pollution ambition for a toxic-free environment
- 6. Preserving and restoring ecosystems and biodiversity
- 7. From "Farm to Fork": a fair, friendly and environmentally friendly food ecosystem
- 8. Accelerating the shift to sustainable and smart mobility



Source: European Commission (2019)

Our platform could play a role in supporting and disseminating many elements of the European Green Deal. Students and workers will need to have new competences which allow them to support the changes. Big part of the workforce comes from the VET/HVET systems that will have a key role to play in supporting the green transition. Companies will need services to help them become greener.

Many elements of the European Green Deal will have a huge effect on occupations that are usually related to the VET/HVET system's qualifications. What new competences will the AM sector demand to become more sustainable? Our platform should work on that.

Again, for the EXAM 4.0 platform, all this means that we should strengthen our focus on the Green Transition. We have been very focused on digitalisation, which is perfectly fine, but due to the latest developments of EU policy and the future needs of the AM sector, we need to include the Green Transition as one of our priorities.

As we will see, the European Commission is fully aware of the relevance of VET/HVET as an enabler for the green transition.

### A DIGITAL EUROPE

Most jobs involve digital competences and it is foreseen that this need will continue increasing. In addition, the partial or total lockdowns decreed by most of the European governments to fight against the COVID-19 pandemic have accelerated the speed of digitalisation. Millions of workers have been forced to work from home. (OCDE 2020)

This skill shortage will not be addressed by VET/HVET providers or by companies alone. Collaboration between both of them, and other agents of the ecosystem, and support from authorities are necessary. In other words, our platform should look for a collaborative approach involving companies and VET/HVET centres who could work together to address skill needs.

The European Digital Strategy has four big workstreams: description (the next four paragraphs are copied from <a href="https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy">https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy</a> :

1. Technology that works for people. Development, deployment and uptake of technology that makes a real difference to people's daily lives. A strong and competitive economy that masters and shapes technology in a way that respects European values. Digital Skills and Jobs, Artificial Intelligence, Cloud Computing, Blockchain, High-Performance Computing, Quantum Technologies, Connectivity, 5G, Internet of Things, Cybersecurity, Digital Inclusion, Photonics, and Electronics, are included in this workstream.

2. A fair and competitive digital economy. A frictionless single market, where companies of all sizes and in any sector can compete on equal terms, and can develop, market and use digital technologies, products and services at a scale that boosts their productivity and global competitiveness, and consumers can be confident that their rights are respected. Data, Online Platforms, eCommerce, Copyright, Digitising European Industry, Start-up Europe, The Digital Economy and Society Index (DESI), are included in this workstream.

3. An open, democratic, and sustainable digital society. A trustworthy environment in which citizens are empowered in how they act and interact, and of the data they provide both online and offline. A European way to digital transformation which enhances our democratic values, respects our fundamental rights, and contributes to a sustainable, climate-neutral and resource-efficient economy. Disinformation, Media and Digital Culture, Trust, ePrivacy, eHealth, eGovernment, Smarter Cities, Safer Internet, Women in ICT, are included in this workstream.

4. Europe as a global digital player. The EU is committed to setting global standards for emerging technologies and will remain the most open region for trade and investment in the world, provided that anyone who comes to do business here accepts and respects our rules. European Foreign Policy, Standardisation, and Next Generation Internet are included here.

More information related to the Digital Strategy can be found here: <u>https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy</u>

The EXAM 4.0 platform should always keep an eye on the latest developments on Digitalisation and the European Digital Strategy. We could play a role in helping Europe to achieve its goals regarding digitalisation. Artificial Intelligence, Digital Skills and Jobs, Women in ICT, and other things mentioned in the Strategy are directly related to our work.

We will need to promote cooperation between relevant actors, mainly AM companies and VET/HVET centres, to address these needs. This kind of cooperation is strongly aligned to EU policy:

There is a strong potential in boosting joint action to maximise the impact of skills investment. Skills policies and actions are shared between many actors. Ministries, education and training providers, the industry itself, research organisations, social partners, chambers of commerce and employment agencies are only a number of those who contribute to making up- and reskilling a reality. Concerted efforts can bring clarity to individuals and companies throughout the value chain, reduce costs and focus on priorities. (European Commission 2020 c: 6)

The EXAM 4.0 Platform should be the place to boost joint action to address AM needs.

## A FAIR EUROPE

Europe is well known for its good quality of life, its democratic values and its justice. We want to continue being so and become a more just society. Greening and digitalisation will mean little if we are not a society with a high quality of life.

Europe is famous for paying the highest respect to Human Rights. <u>The European Pillar of</u> <u>Social Rights</u>, the <u>Charter of Fundamental Rights of the European Union</u> and the <u>Communication from the Commission to the European Parliament, the Council, the</u> <u>European Economic and Social Committee and the Committee of the Regions A Strong</u> <u>Social Europe for Just Transitions</u> set the framework on that.

We will not name all the specific points of these very important documents, but we will just highlight the relevance of education as a right of every European citizen.

The first chapter of the European Pillar of Social Rights states that:

"Education, training and life-long learning. Everyone has the right to quality and inclusive education, training and life-long learning in order to maintain and acquire skills that enable them to participate fully in society and manage successful transitions in the labour market." (European Commission 2017)

Similarly, the Charter of Fundamental Rights of the European Union states in Article 14-Right to Education-that:

"Everyone has the right to education and to have access to vocational and continuing training.

This right includes the possibility to receive free compulsory education.

The freedom to found educational establishments with due respect for democratic principles and the right of parents to ensure the education and teaching of their children in conformity with their religious, philosophical and pedagogical convictions shall be respected, in accordance with the national laws governing the exercise of such freedom and right." (European Commission 2012)

The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions A Strong Social Europe for Just Transitions presents itself as a road to an Action Plan to achieve what the European Pillar of Social Rights puts a priority on Education and on VET. According to the Communication, Skills are the key for the future.

Our platform will need to address these issues but, apart from this ideal sphere, there are serious potential threats to our well-being: population changes, gender issues and the economic recession Europe is experiencing right now in 2020 and 2021. The EXAM 4.0 platform should also have a positive impact on them if we want Europe to be a good place to live in.

Population changes are caused by several factors like ageing, low birth rates, and longer life expectancy. In the near future, we will have less people in working age than what we have now and the ratio between workers and retired persons will grow. This is also causing the age of retirement to change: European workers are retiring later than before. What does it mean for our platform? We should help European AM companies to up- and reskill their workers. Cooperation between VET/HVET and companies is crucial.

There is also the issue of migration. More and more migrants are living in Europe. At this moment Europe is more multicultural than ever before. They need to be included in our society and to have the opportunity of having a good livelihood. There are several regions who will be lacking workforce due to low birth-rates and high numbers of retired workers.

Disparities between men and women are still an issue in Europe. In a similar way, some VET degrees are highly masculinized, while others are very feminized. A better balance is desirable. It is a very tricky issue, related to something we might call "mindset", and it will be difficult to address it, but at the same time, there are very important reasons for us to foster gender equality in AM and VET/HVET:

1. It is a EU priority.

2. AM training and employment tends to be highly masculinized. (see <u>https://eige.europa.eu/gender-statistics/dgs/indicator/ta\_wrklab\_lab\_employ\_selected\_kwnd\_htec\_emp\_nat2</u>)

Being highly masculinized is potentially causing the AM sector to be less competitive and less innovative. Assuming that talent, intelligence, and the like are spreaded equally between genders, and that each gender accounts for (more or less) 50% of the population, being highly masculinized means that the AM sector is "losing" almost half of the talent potentially available to make the sector thrive. It needs to change.

The way to address these issues will be by boosting cooperation between VET/HVET and AM companies and by seeking the support of relevant stakeholders.

### ADVANCED MANUFACTURING AND INDUSTRY 4.0 IN EUROPE

Europe has a long industrial tradition and industry is very relevant for the EU's economy. However, since the mid-1990s, the manufacturing industry has experienced a decline (Cedefop 2020: 37). Many factories moved to non-European countries looking for cheaper workforce. This made Europe to bet on a high-skilled workforce development, which, in turn, has placed a serious demand on VET systems.

European manufacturing companies have bet on Applied Research, Development and Innovation, working on cutting edge technologies and processes to produce innovative, high value, and difficult to manufacture, products and services, as a way of facing the increasing competition from other continents and countries. All these technical changes, including the introduction of digitalisation, has put a huge pressure on education systems. Companies need highly skilled workforce and VET, HVET and universities should provide the labour market with very well trained students and they should also be able to upskill and reskill workers.

New technologies pose opportunities and threats. Just as an example:

"It is expected that artificial intelligence and robotics alone will create almost 60 million new jobs worldwide within the next 5 years, while many jobs will change or disappear. New technologies will generate new job opportunities and allow for more flexible work arrangements, but we need to make sure that new jobs are also quality jobs and that people are equipped with the right skills to take them up." (European Commission 2020a)

The EC estimates that "half of the current workforce will need to update their skills within the next five years" (my italics) (European Commission 2020a). This has enormous implications for the EXAM 4.0 platform: what new skills will they need? What technologies should VET/HVET centres start incorporating?

The green and digital transitions are expected to revolutionise European Industry:

- 1. There is already a lack of ICT workers and this scarcity will probably increase.
- 2. The green transition will create new jobs.
- 3. Many jobs will disappear and others change.

The green transition is expected to create more than 1 million jobs by 2030 and, at this moment, there are already 1 million vacancies in Europe for digital technology experts. 70 % of the companies report that they are delaying investments because they cannot find the people with the right skills (European Commission 2020b: 11).

New types of employment, such as temporary employment and part time employment, have been rising during the last years (Cedefop 2020: 37). There is a lot of job mobility as well. It is very likely that European workers will change jobs more than once in their working life. This makes lifelong-learning, upskilling and reskilling a necessity and our platform should be aware of that.



### ALIGNMENT OF THE PLATFORM TO EU POLICY: WRAP UP

From the analysis of the EU context, we could conclude that our platform will:

- 1. Support the EU initiative on VET excellence. The CoVEs.
- 2. Cooperate with the ETF initiative on VET excellence.

**3.** Include greening, in relation to AM and VET/HVET and companies, as one of the priorities of the platform.

4. Include digitalisation, in relation to AM and VET/HVET and companies, as one of the priorities of the platform.

5. Boost cooperation between the AM sector and VET/HVET in AM to upskill, reskill and to meet skill needs.

However, as a platform related to VET/HVET, we need to analyse the developments of European VET and to align our work to the reality of it. In the next section, we elaborate further on that.

### **B** Section 2: Alignment of the platform with the main trends of EU VET

The EXAM 4.0 platform is focused on VET/HVET, but in Europe these terms could have different meanings:

1. Level of the education according to the European Qualifications Framework (EQF). We can find VET studies from very low EQF levels to EQF level 8. VET has been extended to lower EQF levels and to higher education in several European countries.

2. Duration of the degrees. There is no such thing as a definite duration of a VET degree.

**3.** Modality of the training. VET could be studied in a variety of ways: dual education, different models of apprenticeships, blended learning, online, part time, night offer, etc.

**4.** Management. VET systems are differently managed in Europe: public systems, public-private partnerships, private management, national government management, regional government, etc.

- **5.** Institutions providing it.
- 6. Names.
- 7. Image of VET. How VET is perceived in a specific society.

Two widely accepted definitions of VET are:

#### **UNESCO. TVET:**

All forms and levels of the education process involving, in addition to general knowledge, the study of technologies and related sciences, the acquisition of practical skills, know-how, attitudes and understanding relating to occupations in the various sectors of economic and social life.

#### Cedefop. VET:

Education and training which aims to equip people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly in the labour market.

There are some features in both definitions that deserve some attention (Hazelkorn and Edwards, 2019: 9-10):

**1.** They identify VET with a specific educational approach rather than with a specific type of institution.

2. They do not pay any attention to the qualification levels. They are dealing more with the approach, than with the level.

3. They do not specifically refer to any age cohort as the recipient of VET.

4. They encompass initial VET and continuing VET.

VET has been in the focus of the European institutions since the very beginning. The major milestones of European VET policy are summarized in the image below (Cedefop 2020: 60-61).

1995		2000	2005	2010	2015	2020				
LLL paradigm, validatio	on of non-formal an	d informal learning, and	learning outcomes approa	aches						
•	<b>1996</b> European year of lifelong learning	2000 Memorandum of life learning	əlong	2008 EQF	Since 2011 Multiplications of NQFs	<b>→</b>				
Ongoing education exp	ansion									
<ul> <li>Upper secondary qualific</li> </ul>	ations standardisatic	n and increasing enrolment in tertiary education								
		Enhanced European cooperation in higher education and vocational education								
		1999 2002 Bologna Cope declaration	nhagen declaration	2010 Bruges communiqué	<mark>2014</mark> Riga communiqué					
			Renaissanc	e of apprenticeship						
			Increasing in & offers of hi	iterest in work-based learning igher apprenticeships	2013 European alliance of apprentices	ship				
		Digitalisation of,	and improved access to, s	skills information						
		Emergence of occ	upational and skills informa	ation systems						
			2003 Ploteu		2015 EU Skills Panorama					
		Increasing standardisa	tion and comparative asse	essment						
		Increasing standardisatio admission tests	n of national school leaving	j and graduate						
		2001 PISA study			2013 PIAAC study					
		Emergence of coordinat	ed European labour markef	t policy						
	<mark>1997</mark> Treaty of Amsterdam	2000 New ESF funding p	period includes lifelong learr	ning	2011 Start of European Semester					
argement										
199!	5		2005	2007	2013 2015					
ical events	5		EU-25	EU-27	EU-28 Brexit vote					
1 solution of Soviet Union	1992/1999 Bosnia/Kosovo	2001 wars 9/11 attack	S	2007 Global financial crisis	2011 2015 Fukushima Refugee crisis					
ological innovation										
						· · · · · · · · · · · · · · · · · · ·				

Source: Cedefop 2020 page 60-61.

Although, according to the Subsidiarity principle, the competence of education belongs to each Member State, VET systems have been open to European cooperation. This cooperation has been quite successful in some respects and not so successful in others. Among the successes, or relative successes, we could name (Markowitsch 2019: 12):

- 1. Europass
- 2. Common European Reference for Languages
- 3. EQAVET
- 4. ESCO
- 5. EQF
- 6. EAfA
- 7. ECVET

The important thing here is to acknowledge that this cooperation process, regardless of the successes and the failures, is likely to continue to be strengthened in future years.

Regardless of all the developments of the last few years, VET has traditionally been a second choice for many students and for their parents, as it seems to be the case in most countries. The problem with this is that Europe has more academic style university graduates than the amount of graduates the labour market can absorb.

Our platform should acknowledge the diversity of VET in Europe and make use of the European tools whenever it is possible and promote VET/HVET as a first choice education.

In the following points, we outline the main trends in EU VET and how our platform relates to them.



### **SKILLS MISMATCHES**

Skills mismatches are a very serious issue and can result in a loss of competitiveness for Europe. They could be classified into two basic types (Cedefop, 2010):

1. A vertical mismatch (overeducation) can occur when:

**a.** an individual is hired for a job advertised as requiring a lower level of education than the individual possesses; or

b. an individual is employed in a job which requires a lower level of education.

2. A horizontal skills mismatch can occur when not the level, but the type of education or skills are inappropriate for the job. Those with specific degrees do better than those with more general degrees (arts and humanities). This suggests that better information should be provided for potential students to address and prevent mismatches of this type.

Mismatches could happen to VET and university graduates alike. Indeed, there are authors who argue that:

"Having vocational education may be a benefit at the start of a work career but it turns into a disadvantage later in life. Specific job-related skills acquired in IVET are likely to become obsolete quickly in modern economies with rapid technological change while academic educaton's emphasis on general skills and the ability to learn new things quickly may help its graduates -supported by further learning- to live up to ever changing job demands. Hence, there could be a trade-off between the short- and long-term benefits of vocational education: it may help when entering the labour market (as employers may prefer ready-to-use skills of VET graduates) but general education contributes to a higher probability of being employed at older ages and individuals with general education are more likely to receive lifelong training." (Cedefop, 2018, quoted from Markowitsch, 2019: 9-10) Skills mismatches are a very serious issue for Europe, and this is caused by, among other things (Cedefop 2010):

**1.** The European population is ageing rapidly, leading to a large outflow of experienced workers in the coming decades while those nearing retirement will need to adapt to the new skills that many jobs require.

2. The dynamics of today's labour markets not only create new jobs while others shrink or disappear, but also contribute to changing skill requirements in many existing jobs.

3. Shortages in some sectors may occur simultaneously with overeducation in others.

4. Skill mismatch is a widespread phenomenon in Europe, with overeducation incidence averaging around 30 % and a substantial share of the population under-educated. The prominence of skill mismatch as a core challenge on many policy agendas. When skill mismatch takes time to resolve it imposes real costs on individuals, enterprises and societies.

5. Skilled people frequently working in elementary jobs is a pervasive international phenomenon.

6. Skill matching should be improved to confront rising unemployment.

7. Skill mismatch is a crucial policy issue, not only for policy-makers but also for social partners including employers' associations and trade unions.

8. Reducing skill mismatch is likely to generate social benefits with higher job satisfaction for employees and possibly reduced stress from work, increasing health and wellbeing.

**9.** At macro level, skill shortages and skill gaps can potentially lead to a loss of competitiveness as wage rates are bid up and productivity lowered within industries where skill problems exist.

**10.** Productivity may also suffer if firms are forced to place lower-skilled workers in skilled positions and/or if where a skills shortage exists, workers use their position to alter their employment terms and conditions in a way that harms productivity.

**11.** An increasing pace of technological change is likely, however, to result in growing skill shortages and skill gaps if appropriate education and training is not provided. At the same time the routine tasks of the middle-skilled may be eliminated by new technologies (hollowing out).

Skills mismatches are related to the issue of forecasting: what competences, what skills, what knowledge will workers need in the future years? This is a vital question for VET systems. They should make decisions on methodologies they want to use, investments in equipment for labs, alliances, etc. and these decisions should be based on what they expect will be happening in the coming years.

Although there is not a fool proof way of predicting the future skill needs of the labour market, the European Commission and the Member States are trying to foster cooperation between the main stakeholders. The first action of the European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience was the *Pact for Skills*. It was signed during the Skills week in November 2020.

The European Commission is also supporting the creation of Sector Skills Councils and Blueprints for Sectoral cooperation under specific calls in the Erasmus+ programme and there are some European mechanisms for Skills Intelligence as well.

One of the aims of our platform is to address skills mismatches of VET/HVET students in AM. To do that we will promote a close cooperation between VET/HVET centres and AM industries, work in defining the competences needed for each occupation, design specific courses, types of labs where students should be trained, and the most convenient methodologies to be used.

### WORK BASED LEARNING AND APPRENTICESHIPS

An excellent approach to address skill mismatches is to promote WBL. The European Commission is fostering apprenticeships and work-based learning and most Member States are doing the same. After the last recession it became evident that this type of education increases the employability of students. There are different examples (Markowitsch 2019: 7-8):

**1.** Countries without former experience in this type of training started to include this type of education.

- 2. Countries with poor apprenticeship systems strengthened it.
- 3. Countries with traditional apprenticeship systems diversified their offer.

Markowitsch (2019: 8) differentiates different approaches to apprenticeships in European countries. He talks about two general approaches:

**1.** Apprenticeships as a specific type of programme, like in Germany, Austria, Switzerland, Denmark and Norway.

2. Apprenticeships as a mode of learning, like in France, in Finland or in the United Kingdom. This second type of approach is becoming more and more popular.

By fostering cooperation between industries and VET/HVET centres, the platform should promote work based learning in all its forms.

In this regard, we should also cooperate with the *European Alliance for Apprenticeships*, which unites governments and other key stakeholders.

### CUTTING EDGE TECHNOLOGIES AND LABS

Advanced Manufacturing companies are undergoing serious technological changes and VET students, future workers of those companies, need to be trained in cutting-edge labs. VET centres need to equip themselves with such facilities or to establish collaboration agreements with companies to give their students access to the best labs they could be trained in.

In the EXAM 4.0 project we have developed a Collaborative Learning Factory Model. More information on that could be consulted in the corresponding section of our webpage.



### UP AND DOWN EXPANSION OF VET

In terms of levels of qualification, VET is expanding to the upper (up to EQF 8) and to the lower (around EQF 2) levels.

Let us start with the upward expansion of VET/HVET. In some countries we find a division in the tertiary education system which is divided in traditional academic universities and other institutions, such as Universities of Applied Sciences (in many European countries), Fachhochschule (Germany), University Colleges (in Scandinavia), Hogescholen (in the Netherlands), Polytechnics (in Finland), Institutes of Technology (in Ireland). (Markowitsch 2019: 5)

In other countries, like Spain, VET specific institutions, the so-called centro integrado de formación profesional, which have traditionally been giving courses in the levels 3 and 5 of the EQF, are finding ways to elongate the duration of their EQF level 5 courses by means of Specialisation Courses<sup>5</sup>.

At the same time, academic universities themselves are turning to a more practical education and establishing a closer relationship with the labour market. It is fairly common to find apprenticeships programmes in several European university degrees. This allows us to talk about a "vetization" of Universities. (Hazelkorn, E. and Edwards, 2019)

"In pursuit of professionalism and higher ranked credentials, many post-secondary VET programmes in the EU have been upgraded into a separate strand of professional higher education (HE). Moreover, new vocationally or professionally oriented higher-level degree programmes have been added to the traditional provision of universities. Some countries also offer higher level vocationally oriented education and training outside higher education, i.e. outside the Framework of Qualifications of the European Higher Education Area -EHEA. For instance, Switzerland has established the so-called 'Tertiary B' sector in addition to 'Tertiary A' which comprises universities and universities of applied sciences ('Fachhochschulen') and started to assign first vocational qualifications up to EQF level 8 in their national qualifications framework." (Markowitsch 2019: 5)

Flexibility is a key word here. Pathways are being opened in many European countries between secondary or post-secondary level VET and tertiary VET or University. Double qualifications are also making their appearance:students can now have access to a VET certificate and gain access to higher forms of education.

This has some advantages in terms of flexibility for the students, but it could also be seen as a threat to the VET system which could be perceived as a step in a longer process which ends in a non-VET qualification.

<sup>&</sup>lt;sup>5</sup> http://www.educacionyfp.gob.es/servicios-al-ciudadano/normativa/educacion/ensenanzas/fp/cursos-especializacion.html

Our platform should contribute to expanding and strengthening HVET in Europe. We should work on the design of HVET programmes.

Regarding the downward expansion of VET, the need for inclusion of vulnerable groups and students who fail in the regular secondary education is also causing the offer to extend downwards and cover lower educational levels.

Examples of this can be found in several European countries. For example, "Switzerland has developed shorter forms of apprenticeships for the disadvantaged youth, (...) Austria has introduced the option of partial qualifications and of prolonging the duration of apprenticeship for disabled people" (Markowitsch 2019: 5). In Spain, a lower form of VET was introduced into the VET offer under the name of "basic vocational education and training" or "Formación Profesional Básica".

Our platform should also be sensitive to the inclusion needs of many people.

### **TRANSVERSAL COMPETENCES**

Apart from specific technical skills needed in each economic sector, employers are asking for soft skills. They tend to complain about the poor communication skills, the poor critical thinking, the poor teamwork, the poor emotional intelligence, entrepreneurship and other skills of this kind.

Together with this demand from companies, there is also the fact that most VET students will work in jobs that do not exist and that, very likely, they will change jobs more than once throughout their working lives. The implications of these trends are that they should be able to adapt to new situations and to be resilient and they will need soft skills for that.

In May 2018 the Council approved a recommendation on *Key competences for lifelong learning, understanding* "Key Competences" as (European Commission 2018):

Those which all individuals need for personal fulfilment and development, employability, social inclusion, sustainable lifestyle, successful life in peaceful societies, health-conscious life management and active citizenship. They are developed in a lifelong learning perspective, from early childhood throughout adult life, and through formal, non-formal and informal learning in all contexts, including family, school, workplace, neighbourhood and other communities.

And they define eight competences as the key competences for lifelong learning (European Commission 2018):

- 1. Literacy competence
- 2. Multilingual competence
- 3. Science, Technology, Engineering and Mathematics
- 4. Digital Competence
- 5. Personal, social and learning to learn competence
- 6. Citizenship competence
- 7. Entrepreneurship competence
- 8. Cultural awareness and expression competence.

This framework could easily be complemented with the Digital Competence Framework (*DigiComp*), the Entrepreneurship Competence Framework (*EntreComp*), and the future Green Competence Framework envisaged in the *European Skills Agenda for Sustainable Competitiveness, Social Fairness, and Resilience.* 

Similar frameworks, such as the 21st Century Skills, can be found in other sources as well, but for the aims of this platform, we will give preference to the European framework.

The recognition of the relevance of transversal competences for the labour market means for our platform that we should support types of training that allow students to develop them. In this regard, we are developing the Collaborative Learning Factory.

### ENTREPRENEURSHIP

Entrepreneurship should not be confused with general business or economic studies. Entrepreneurship refers to an individual's ability to turn ideas into action. It covers creativity, innovation, risk taking, communication, networking, or the ability to plan and manage projects to achieve objectives. It is, therefore, something that supports everyone in day-to-day life at home and in society.

The main rationale for providing students with an entrepreneurial mindset derives from the main features of today's Europe: unemployment, changing jobs, self employment as an option, continuous technological changes, ageing and new opportunities coming mainly from greening and technological advances. (Lindner, 2020: 5)

In this sense, entrepreneurship education is defined by the European Commission as follows:

"Entrepreneurship education is about learners developing the skills and mindset to be able to turn creative ideas into entrepreneurial action. This is a key competence for all learners, supporting personal development, active citizenship, social inclusion, and employability. It is relevant across the lifelong learning process, in all disciplines of learning and to all forms of education and training (formal, non-formal and informal) which contribute to an entrepreneurial spirit or behaviour, with or without a commercial objective" (Lindner, 2020).

But apart from this understanding of entrepreneurship as a competence, which has been included among other relevant soft skills in the previous section, there is also a very relevant type of entrepreneurship related to the creation of new companies. As the platform of excellence in AM, we should promote both types of entrepreneurship. And when it comes to company creation, especially technology related entrepreneurship in the AM sector.

### UPSKILLING AND RESKILLING ACTIONS

Due to some sociological and economical factors, such as digitalisation, sustainability, and ageing, upskilling and reskilling actions will probably gain relevance.

Many companies will need to update the competences of their workers to continue being competitive in the new period and many unemployed persons will need specific training to become employable again.

Our platform should be aware of the relevance of upskilling and reskilling actions. We should cooperate with companies and help them to identify skill needs and to match these needs with VET/HVET centres who could address them. It should be important to create a catalogue of existing courses and the type of competences acquired in each of them. Creating new tailored courses should also not be rejected.



### ALIGNMENT OF THE PLATFORM WITH THE MAIN TRENDS OF EU VET. WRAP UP

From our analysis we could conclude that our platform will:

- 1. Acknowledge the diversity of VET in Europe.
- 2. Make use of the European tools whenever it is possible.
- **3.** Promote VET/HVET as a first choice education in Europe.
- 4. Address skills mismatches of VET/HVET students in AM.
- 5. Promote a close cooperation between VET/HVET centres and AM industries

6. Work in defining the competences needed for each occupation, design specific courses, types of labs where students should be trained, and the most convenient methodologies to be used.

7. Promote work based learning in all its forms. Also cooperating with the *European Alliance for Apprenticeships.* 

- 8. Contribute to expand and strengthen HVET in Europe.
- 9. Design HVET programmes.
- **10.** Be sensitive to the inclusion needs of many people.

**11.** Encourage company creation, especially technology related entrepreneurship in the AM sector.

**12.** Cooperate with companies and help them to identify skill needs and to match these needs with VET/HVET centres who could address them. It should be important to create a catalogue of existing courses and the type of competences acquired in each of them. Creating new tailored courses should also not be rejected.

Section 3: The interests of the EXAM 4.0 partners

To complement the context in which our platform operates, we also carried out an identification of main interests with the EXAM 4.0 project partners. We completed tables and answered questions intended to identify their main interests. <sup>6</sup>We asked each partner about their expectations from our platform, key services they would like to get, and where and how they could contribute to the services of the platform.

The responses emphasized being the "prime platform", "most relevant", "the biggest (...) platform", "a European Advanced Manufacturing excellence area". This should be interpreted as an ambitious goal on our side: we want to develop a very important platform in VET-HVET Advanced Manufacturing in Europe.

One of the key features of any platform is that it offers some services to its users. In other words, platforms are attractive because they offer services to its users and because these users value the services offered by the platform.

We should provide, according to the answers, the following services:

1. Collaboration projects between different centres: networking area in the platform; peer review area.

2. Information/ knowledge/ data services: knowledge repository; latest trends and research information in AM and in the field of expertise of each group, implementing 4.0 in education, use cases from leading industry describing I4.0 technology implementation, the challenges they faced and the qualification most suitable for working skills; information of study labs, new training programmes, curricula changes, new forms of education, microcredentials, OER; Data exchange between private users of the platform (data coming from the labs); good practice exchanges; peer review area; staff training opportunities; technological project development; transfer company needs to education system;

3. Guidance services to help institutions provide a better training in AM: skills assessment tool/ I4.0 technological framework, I4.0 skills framework; I4.0 qualifications; virtual tours through institutions and labs; augmented reality and learning environments; labs, costs, equipment, specifications, etc.; peer review area; contact point for expert support; staff training opportunities.

<sup>&</sup>lt;sup>6</sup> The answers of each partner are included in the Annexes.

4. News section: upcoming events; new publications; new initiatives, etc.; social media use.

5. Links to other relevant tools., webpages.

6. An area to become a platform member: to facilitate other institutions to become members.

Another important aspect is who should be involved in the platform to ensure the provision of these services and to make it attractive for new members.

All project partners agree on the fact that the platform should facilitate networking and cooperation among different agents, with an emphasis in collaboration between VET/HVET centres and companies, and, accordingly, expect that the platform will facilitate networking and collaboration. The agents that are mentioned in most of the responses are:

- 1. VET/HVET institutions and HE institutions
- 2. Advanced manufacturing industries, companies, SMEs, or company associations
- 3. Research agents
- 4. Governments, policy makers, authorities.

Less mentioned agents that are mentioned include:

- 1. Scientific associations, mentioned in one of the answers.
- 2. Educational experts, mentioned in one of the answers.
- 3. Civil society, mentioned in one of the answers<sup>7</sup>.

<sup>&</sup>lt;sup>7</sup> The answer actually mentioned the "quadruple helix" and for there we assume that the answer refers somehow to civil society as well.

From the responses, we could conclude that the platform is aimed at three main groups:

- **1.** VET/HVET and HE institutions.
- 2. Advanced Manufacturing companies.
- **3.** Research bodies.

The most convenient way to proceed will be to define different roles for each type of agent:

**1.** VET/HVET and HE institutions, AM industries and Research agents, will be the main agents in terms of activity. They are in charge of creating materials, and most of the services related to the platform.

2. Governments, policy makers, authorities, experts and any other type of association should play an advisory and dissemination role.

The idea is to allow each type of agent to perform the work they are better prepared to do and to avoid them from interfering in discussions where they do not hold any relevant expertise.


One of the goals of the EXAM 4.0 project is to create an online platform that will gather VET/HVET centres and companies working in Advanced Manufacturing.

It is a very hot topic. They are becoming relevant economic players and their development has led the European Commission (as well as other international organisations, national governments, etc.) to start reflecting on and regulating them. But what are online platforms? What is a platform? The EXAM 4.0 partnership started reflecting on these issues from the very beginning of the project in the kick off meeting.

# WHAT IS A PLATFORM?

Although we will not show all our partnership discussions here, starting in our kick off meeting, we have devoted several hours to discuss what a platform is, what are the differences between hubs and platforms, what we want to be, etc.

The meaning of the word "platform" is indeed quite vague. Gillespie (2010) is an interesting read to reflect on the vaguity of the term. During the last years, the EC (and many other institutions) has been working on that and they set up the Observatory for the Online Platform Economy on 26th April 2018:

Following a competitive selection process, in September 2018 the Commission appointed, for a 2 years term, 15 independent experts as members of the expert group for the Observatory on the Online Platform Economy. This expert group took on the challenge of looking at some of the most prominent issues in the online platform economy. *(EU Observatory on the Online Platform Economy).* 

We can find platforms:

1. Online: on the internet. There are several famous examples such as Youtube, Uber, Amazon, Facebook, etc. Most of us are users of more than one of them. There are very different business models behind them and the services a platform offers varies a lot.

2. Offline: like the traditional marketplaces in every city. They gather buyers and sellers in a common place to facilitate contact.

If we delve into online platforms, we will discover that there are several typologies of them. Authors do not agree on a specific classification and we will not expend time here discussing categorisation and classification issues. There are several classifications of types of online platforms. The OECD (OECD 2019) differentiates between functional and structural typologies. But they recognise that "there simply is not one superior, one-size-fits-all way to categorise online platforms" (OECD 2019: 60).

Very probably, it may be impossible to find a satisfactory definition and typology of "online platform" because:

1. Platforms could be studied from several disciplines like economics, sociology, informatics, history, etc. Each discipline tends to emphasize some aspects over others and give a rather biased vision of the term. They will provide satisfactory definitions in their fields, considering the areas in which their research interest focuses, but not satisfactory for all instances. For example, an economist may highlight the economic aspects of platforms, sociologists may be more concerned with their impact on society, philosophers with their ethical aspects, etc. and all of them provide good definitions in their field that are not absolutely satisfactory when used outside of their fields.

2. There is no such thing as a clearly defined research area on "platform studies". Several people are talking about the issue from different perspectives. It is an emerging field which is growing in extension and diversity. This means that the notion of "platform" will probably be enlarged to include things not considered up to now as platforms.

**3.** The processes involved in platforms are complex and their structure is difficult to analyse. It is also difficult to differentiate the ontological question "what is X?" from other issues such as processes, services, users or other aspects involved in platforms.

This is why we should be very careful in considering any definition of "platform" as the definitive definition. So far we will probably find only temporary definitions.

Having say that, in a previous working meeting the EXAM 4.0 partnership agreed that a platform will be understood following the definition of the OECD (2019):

Platform (OECD)	Platform (EXAM 4.0)	
An online platform is a digital service that facilitates interactions between two or more distinct but interdependent sets of users (whether firms or individuals) who interact through the service via the internet.	PLATFORM of CoVEs in AM is a digital service that facilitates interactions between CoVEs and other agents of the Strategic Triangle in advanced manufacturing, who interact through the service via the Internet and these	
	interactions do not involve economic	

gains for participants.

Stating that we do not believe in a satisfactory definition of platform and, at the same time, accepting one may seem contradictory. However, for the sake of progress, we should proceed so and be aware of the fact that:

1. This definition will be temporarily, for our goals right now, valid and useful.

2. This definition, as well as this whole strategy document, are and will be subject to constant iterations and revisions.

This is why we will use the definition of the OECD.

Online platforms tend to have some features that make them special. EXAM 4.0 project partners analysed some examples of existing online platforms to reflect on their most common features. What are the most common characteristics of online platforms? (European Commission 2016: 2):

**1.** capacity to facilitate, and extract value, from direct interactions or transactions between users;

2. ability to collect, use and process a large amount of personal and non-personal data in order to optimize, inter alia, the service and experience of each user. This data aggregation capacity ("economies of scope") gives platforms an informational advantage over individual platform users and causes information asymmetry;

**3.** capacity to build networks where any additional user will enhance the experience of all existing users -so-called "network effects";

4. ability to create and shape new markets into more efficient arrangements that bring benefits to users but may also disrupt traditional ones. The ability to organise new forms of civil participation based on collecting, processing, altering and editing information; and

5. reliance on information technology as the means to achieve all of the above.

Platform users generate most of the value. There is a huge difference between traditional business models, where a supplier generates the value and the client buys it, and platforms, where users create value for other users. (European Commission 2016: 4). When we talk about "value creation", we should understand it in very general and abstract terms. Not necessarily meaning the provision of a service, product, etc.

Platforms create, and we should do so as well, what economists call "network effects", "the effect that one user of a good or service has on the value of that product to other people". (European Commission 2016: 4).

For example, the presence of more traders at an online marketplace increases the value of the online marketplace for shoppers. In that way, individual stores benefit indirectly by the addition of other stores due to increased website traffic. This process also works conversely: the presence of more shoppers increases the value of joining for sellers. Consequently, shoppers benefit indirectly from the interest of other shoppers in the marketplace as the increased number of potential customers attracts more sellers resulting in wider choice for each shopper. Similarly, the presence of a wide selection of hotels on a travel marketplace, for example, attracts more accommodation seekers to the platform. This then increases the value of the platform for hotels and leads to even more hotels joining, thereby resulting in higher customer interest. (European Commission 2016: 4).

As a result of that, a platform needs a critical mass of users to survive. The success in bringing users depends a lot on the matching mechanisms the platform uses: the efficiency of matching mechanisms determines to a big extent the benefits users could get from the platform. All users should be able to find what they are looking for.

Online platforms usually create an environment for interaction and offer its users matching mechanisms to find what they want. However, many platforms are not responsible for the quality of the services they offer. To minimise the risk, platforms create a kind of risk management through internal regulation "self-regulation based on community codes of conduct, user reviews, ex-ante control of suppliers' credentials, dispute resolution, insurance schemes, etc". (European Commission 2016: 7).

Some platforms go further and "have already voluntarily put in place some proactive measures which go beyond their legal obligations. Measures range from various filtering technologies (e.g. PhotoDNA hashic technology for child abuse content or fingerprinting technology for music files in course of upload, with their own tools such as Youtube's ContentID or with commercial solutions such as Audible Magic), blocking (e.g. URL blocking based on black-list of Internet Watch Foundation), moderation of content by algorithms, staff or community (e.g. manual checking of algorithmically flagged comments in the discussion forums), enforcement of termination policy (e.g. toward users who repeteadly infringed rights), implementation of terms of service or of community guidelines (e.g. quality standards for customers), improved notice submission systems (e.g. by establishing "trusted flaggers" or by allowing direct removal of counterfeiting efforts)." (European Commission 2016: 7).

Platforms are also becoming drivers of innovation. This type of "user innovation" has been analysed by some authors. Von Hippel (2005) starts his famous book with this paragraph:

When I say that innovation is being democratized, I mean that users of products and services -both firms and individual consumers- are increasingly able to innovate for themselves. User-centered innovation processes offer great advantages over the manufacturing-centric innovation systems that have been the mainstay of commerce for hundreds of years. Users that innovate can develop exactly what they want, rather than relying on manufacturers to act as their (often very imperfect) agents. Moreover, individual users do not have to develop everything they need on their own: they can benefit from innovations developed and freely shared by others. (Von Hippel 2005: 1).

In a nutshell, regardless of definition and typology issues, a platform should make information more accessible, communication and interaction easier, create new business opportunities, and support user driven innovation. This means that our platform should offer benefits for VET/HVET providers (information, curricula update, work on skills needs, networking, innovation), and benefits for companies (networking, advertise their products, search for employees, work on skills needs, innovation).

# OUR PLATFORM

According to what we said so far, let us see some of the major features we envisage for our platform:

# Pursue positive network effects by offering services and products that will led to an increment of membership as much as possible, but only allowing relevant members to join

Our platform should provide a medium of interaction to the VET/HVET centres and companies mainly, and maybe to other interesting agents related to Advanced Manufacturing, such as research centres or more academic universities.

The platform will gain benefits from having more users: they are the creators of value. However, we should be strict with the type of institutions we allow to join and, above all, not accept everyone just to increase numbers of users. Positive network effects will only be present if:

1. We are able to have a lot of relevant members and zero irrelevant ones.

2. We are able to distinguish roles for different types of members to ensure that each one is acting in her field of expertise.

THis is why we could say that:

1. VET/HVET centres, companies, company associations and research bodies joining the community and the platform should comply with certain requirements. These requirements are defined in our Statutes.

2. We do not want to be an "everything VET" platform, one more platform full of useless comments made by agents with no expertise in the topic. We want to be a leading platform in AM and VET/HVET and the only way to attract relevant players is to only have relevant players. Therefore, general discussions held by people with no experience in VET/HVET and AM should be avoided.

3. Policy makers, not specific AM networks, governments, social partners, ONGs and the like will only be allowed to play an advisory and dissemination role, mainly for policy recommendations and other types of documents aimed at policymakers or international organisations. There will be a special type of membership for them, they will only be called to some meetings and they will have the opportunity to join conferences, but more as advisors and observers. This will put them in a privileged position to follow the latest developments in the area and to find inspiration for policy making. In no case should they be allowed to interfere in the discussions of experts and to create material as other members.

Excellent VET/HVET centres will make the platform attractive for companies. VET/HVET need inputs from industry so does the platform. But why do companies need to take part in an educational platform?

Motivations for companies/association to take part on a VET/HVET platform of AM:

**1.** Take part in regional skill ecosystems as a strategy to attract talent and upskill/reskill workforce.

2. Need to address technical and soft skills and competence related challenges arising from digital and green transitions.

**3.** For considering VET institutions as strategic partners in the development of technological solutions

4. For considering VET institutions potential customers of their products

5. Participate in DUAL/workBasedLearning/apprenticeship program

6. Identify reference training providers

7. Some companies/company associations might be interested in hiring new workers or providing training opportunities for VET/HVET students and teachers, others might be more interested in addressing skill needs or designing new courses or curricula to fit their needs, other companies might also be interested in selling their products and services to VET/HVET centres.

Motivation for VET/HVET centres specialized on Advanced Manufacturing to join the platform

- 1. Co-creation and exchange information on AM.
- 2. Collaborate on research, innovation, and educational projects.
- **3.** Work on international mobilities, trainers & students.

It will be an excellent networking platform. Especially if compared with other existing networking options where every type of organisation can take part and it becomes very difficult to find high quality partners.

Excellent VET/HVET centres will also make the platform attractive for other VET/HVET centres. Such a platform will allow VET/HVET centres to collaborate on research, innovation, and educational projects, to work on international mobilities and to exchange information on AM. It will be an excellent networking platform. Especially if compared with other existing networking options where every type of organisation can take part and it becomes very difficult to find high quality partners.

Companies will make the platform attractive for VET/HVET centres.

Companies/associations of companies will make the platform attractive for other companies/associations of companies.

The platform will be attractive for international networks, ONGs, social partners, governments, etc. They will encourage VET/HVET centres and companies from their areas to join. They could use the platform to have access to high quality information.

# Have an internal and an external area

The platform will be accessible for any person, European or not, expert or layman. Most of the resources will be open. However, we will proceed as described in our Statute with applicant organisations to become members and produce things inside the platform. Our goal is that any person should have access to lots of good quality information for free, but only the best ones can create information and provide services.

# We will build the platform using technology that allows for iteration

The platform will be alive, and we will probably need to add, eliminate, and modify some of its aspects. Creating new services that we cannot imagine now and eliminating others that go outdated should be acceptable and expected. Knowing that, we will build it using a technology that allows us to do as many changes as needed as we evolve.

#### Services

Considering what we just said in the previous point, in an initial stage, we want to give our users these services:

1. **Networking/collaboration:** an area where users can interact with each other. There will be different working groups where platform users could discuss about technologies, skills, projects, occupations, etc. related to each one of them. This area will look like a forum. Platform users would use this forum for peer reviewing documents as well.

2. **Information/publications:** the platform should have an area where users could publish and consult articles, case studies, etc. From a technical perspective, this area should allow us to upload archives in various formats.

**3. Guidance service:** VET/HVET centres or companies interested in getting guidance on the implementation of new technologies will have an area where they could make their requests and find a platform member who could provide them a service. This area should work similar to a matchmaking platform. We should be able to use Artificial Intelligence to find the best match and to connect users with the highest matching potential based on existing data.

4. Lab's collaboration /connection: the EXAM 4.0 project has developed a model of a collaborative Learning Factory to put into practice a system to co-create value among different organizations. The added value would be not only to create and produce products in collaboration but also to share data from the respective Labs. Members of the platform who would be interested in participating in such an initiative and go further in that direction would have the opportunity to do so. There are a lot of challenges to address, both conceptual and technical.

**5. EXAM 4.0 CUBE:** the EXAM 4.0 CUBE is a tool partially developed in the EXAM 4.0 project. It should be an interactive tool where industries and VET/HVET centres can collaborate to define the skill and competence needs of different occupations in the AM sector.

6. **Online training:** the EXAM platform should be able to create training courses that could be accessed by anyone.

**7. Events:** platform members will organise different types of events and in this area, we will inform all the users about them.

**8. Become a member:** there should be an area in the platform where interested VET/HVET centres and companies/associations of companies could submit their applications.

9. News.

**10. Links:** an area of the platform that gives links to already existing interesting initiatives, tools, platforms, etc.

The platform should have an internal, only for members area, and an external, open for everyone, area. Details on that are provided in our Statute.

# Ethics

We are a European platform and we will strictly follow all European regulations affecting online platforms. We also have a strong sense of ethics and this will influence all our activities.

# Funding

When it comes to the funding of the platform, there are different costs to be considered:

- 1. Building the platform
- 2. Operation and Maintenance

The initial development and actual building of the technical platform is an issue of investment. There are different ways for us to find the funding:

- 1. We, the members, invest the money.
- 2. We find a donor who wants to support us.
- 3. We find funding options in a European programme.
- 4. We find funding options at national/regional level.
- 5. We combine two, or more, of the previous options.

Then, for the operation and maintenance of the platform, we should think about costs related to the technical support (updates, cybersecurity, etc.) and functional support related to content (management and creation).

Once the issue of creating the platform has been solved, there are different funding options for the platform. Funding is closely related to eventual ownership of/responsibility for the platform. Different case studies show different options.

# In general, we could envision:

1. Contributions from members. We should think about charging members with a fee and probably different fees for different members. For instance, companies who might use the platform for advertising and selling their products to VET/HVET centres should pay more than VET/HVET centres. Also, if a VET/HVET centre is producing high quality material it should pay less than a member who is following the discussions without much contribution.

2. Subscriptions/fees per use from users of the specific services on the platform. Some users will be interested in accessing certain services such as training courses on our platform. In the case they do not fulfil the criteria to become members, we should think about charging them a fee or subscription for specific services.

In any case, we do not want to become an income platform: our only profits will be knowledge and innovation. Fees, subscriptions and other sources of funding will be used to cover costs, but never as a source of revenue.

# TECHNICAL ASPECTS OF THE PLATFORM

Technically speaking, when we say "Platform" we mean "website" and, therefore, our platform should be built using a website builder.

There are several website builders available. Some of them are free, some of them paid, or a combination of free packages with paid features.

Important things for us to consider when creating our website are8:

**1.** A user friendly interface and a well performing website, since unfriendly interfaces and poor performing websites tend to push users away. Website speed is important as well.

2. The server should allow us to store large amounts of data.We will probably hire a service provider for that.

**3.** The webpage should be scalable: it should allow us to eliminate features and to add new ones. When we say features we mean services and everything a user could find on the page.

4. It should differentiate an internal, only for members part, with specific functionalities, and an external, open to everybody, part.

- 5. It must be very secure.
- 6. We prefer cloud hosting.
- 7. It should allow us for third party integration.
- 8. The website should be updated (from the technical point of view).
- 9. We will need to have technical support 24/7.
- **10.** We want the platform to be free of advertisement

**11.** Mobile optimization: the website looks good on the computer and on the smartphone.

Much more reflection and planning is needed in the technical aspect.

<sup>&</sup>lt;sup>8</sup> This ideas are based on the information provided in these two webpages:

https://www.infinijith.com/blog/full-stack-development/web-application-architecture https://www.purchasecommerce.com/blog/popular-ecommerce-platform

# ON PLATFORMS: WRAP UP

From our analysis on platforms, we infer that:

- 1. We want to become THE platform in AM for VET/HVET.
- 2. We want to be strict with our membership conditions to ensure high quality services.
- 3. We want to offer:

a. Networking/collaboration: an area where users can interact with each other. There will be different working groups (WHICH GROUPS) where platform users could discuss about technologies, skills, projects, occupations, etc. related to each one of them. This area will look like a forum. Platform users would use this forum for peer reviewing documents as well.

**b. Information/publications:** the platform should have an area where users could publish and consult articles, case studies, etc. From a technical perspective, this area should allow us to upload archives in various formats.

**c. Guidance service:** VET/HVET centres or companies interested in getting guidance on the implementation of new technologies will have an area where they could make their requests and find a platform member who could provide them a service. This area should work similar to a matchmaking platform. We should be able to use Artificial Intelligence to find the best match and to connect users with the highest matching potential based on existing data.

**d.** Lab's collaboration /connection: the EXAM 4.0 project has developed a model of a collaborative Learning Factory to put into practice a system to co-create value among different organizations. The added value would be not only to create and produce products in collaboration but also to share data from the respective Labs. Members of the platform who would be interested in participating in such an initiative and go further in that direction would have the opportunity to do so. There are a lot of challenges to address, both conceptual and technical.

e. EXAM 4.0 CUBE: the EXAM 4.0 CUBE is a tool partially developed in the EXAM 4.0 project. It should be an interactive tool where industries and VET/HVET centres can collaborate to define the skill and competence needs of different occupations in the AM sector

**f. Online training:** the EXAM platform should be able to create training courses that could be accessed by anyone.

**g. Events:** platform members will organise different types of events and in this area, we will inform all the users about them.

**h. Become a member:** there should be an area in the platform where interested VET/HVET centres and companies/associations of companies could submit their applications.

# i. News.

**j.** Links: an area of the platform that gives links to already existing interesting initiatives, tools, platforms, etc.



Section 5: Strategy for the period 2021-2027

In the previous sections we have analysed our context in terms of EU policy, VET/HVET developments, needs of the project partners and a reflection on platforms. Now, we should make clear our strategy to achieve what we want.

Let us start by summarising all the results from our analysis. Our platform will:

- 1. Become THE platform in AM in VET/HVET.
- 2. Support the EU initiative on VET excellence. The CoVEs.
- 3. Cooperate with the ETF initiative on VET excellence.

4. Include greening, in relation to AM and VET/HVET and companies, as one of the priorities of the platform.

**5.** Include digitalisation, in relation to AM and VET/HVET and companies, as one of the priorities of the platform.

6. Boost cooperation between AM industry and VET/HVET in AM to upskill, reskill and meet skill needs.

- 7. Acknowledge the diversity of VET in Europe.
- 8. Make use of the European tools whenever it is possible.
- 9. Promote VET/HVET as a first choice education in Europe.
- **10.** Address skills mismatches of VET/HVET students in AM.

11. Promote a close cooperation between VET/HVET centres and AM industries

**12.** Work in defining the competences needed for each occupation, design specific courses, types of labs where students should be trained, and the most convenient methodologies to be used.

**13.** Promote work based learning in all its forms. Also cooperating with the *European Alliance for Apprenticeships*.

- **14.** Contribute to expand and strengthen HVET in Europe.
- **15.** Design HVET programmes.

**16.** Be sensitive to the inclusion needs of many people.

**17.** Encourage company creation, especially technology related entrepreneurship in the AM sector.

**18.** Cooperate with companies and help them to identify skill needs and to match these needs with VET/HVET centres who could address them. It should be important to create a catalogue of existing courses and the type of competences acquired in each of them. It should not also be rejected the idea of creating new tailored courses where they are needed.

**19.** Be composed of VET/HVET and HE institutions, AM industries and Research agents. They are in charge of creating materials, and most of the services related to the platform.

**20.** Allow governments, policy makers, authorities, experts and any other type of association to join and to play an advisory and dissemination role.

**21.** Be very strict with our membership conditions to ensure high quality services.

22. Provide these services:

**a. Networking/collaboration:** an area where users can interact with each other. There will be different working groups (WHICH GROUPS) where platform users could discuss about technologies, skills, projects, occupations, etc. related to each one of them. This area will look like a forum. Platform users would use this forum for peer reviewing documents as well.

**b. Information/publications:** the platform should have an area where users could publish and consult articles, case studies, etc. From a technical perspective, this area should allow us to upload archives in various formats.

**c. Guidance service:** VET/HVET centres or companies interested in getting guidance on the implementation of new technologies will have an area where they could make their requests and find a platform member who could provide them a service. This area should work similar to a matchmaking platform. We should be able to use Artificial Intelligence to find the best match and to connect users with the highest matching potential based on existing data.

**d.** Lab's collaboration /connection: the EXAM 4.0 project has developed a model of a collaborative Learning Factory to put into practice a system to co-create value among different organizations. The added value would be not only to create and produce products in collaboration but also to share data from the respective Labs. Members of the platform who would be interested in participating in such an initiative and go further in that direction would have the opportunity to do so. There are a lot of challenges to address, both conceptual and technical.

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**g.** Events: platform members will organise different types of events and in this area, we will inform all the users about them.

**h. Become a member:** there should be an area in the platform where interested VET/HVET centres and companies/associations of companies could submit their applications.

i. News.

**j.** Links: an area of the platform that gives links to already existing interesting initiatives, tools, platforms, etc.

But how are we equipped to do that? What are our strengths? What are our weaknesses? What opportunities do we have? What are our threats?

# SWOT ANALYSIS

As a partnership, we have conducted a SWOT analysis to define our initial situation. All the answers of the SWOT are collected in the Annexes, but we provide a summary of them here:

First, we will talk about our strengths:

1. We have an already established partnership, representing VET/HVET centres, businesses, and governments. Our partnership has plenty of expertise in different fields related to our intentions. We count on relevant skills and expertise and we represent different EU countries in which each of us is very well connected.

2. We have already developed very innovative ideas such as the CUBE and the Collaborative Learning Factory. As far as we know, we are the first and the only one international collaboration among institutions based on collaborative learning factories connecting labs from different countries with Industry 4.0 technologies.

**3.** We are a group of practitioners, we have not been set up by a government, we represent a bottom up approach. This gives us credibility.

Second, there are several opportunities for us:

**1.** The EC is supporting the creation of these types of platforms. They have allocated a big budget for 2021-2027.

2. A Platform like the one we are envisioning does not exist and will be a very useful service for HVET centres and companies in AM.

**3.** Industry is technologically evolving continuously and industry, especially the SMEs, needs help to adapt to these changes.

4. Many institutions may be interested in joining the project and the platform.

Third, there are some weaknesses in our platform that we should try to overcome:

1. We still have a very small amount of content to publish. It reminds of the chicken-egg puzzle: the more content we have, the more people will be interested in joining; and the more people join, the more content we will have.

2. We should come up with a solution for platform maintenance funding once the project is finished.

**3.** Some partners are not committed to work or lack the necessary resources. The next project may imply more working days. Also, the partnership is quite small for such an ambitious endeavour. We should augment our partnership.

4. Lack of experienced partners on building platforms from scratch.

**5.** We have our origin in an Erasmus+ project. Some organisations will probably doubt our quality. We will need to work on building trust to attract good organisations.

Four, there are some threats for us:

**1.** The CoVE call for proposals will be very competitive. It will not be easy to have the project proposal approved for funding.

2. There is also some likelihood of other institutions presenting similar projects to the same call. Projects dealing with KETs, AM, digitalisation, etc. They are all hot topics of the moment.

**3.** We know that we will need to augment our partnership and we risk choosing wrong partners in doing so.

At this point, there are many weaknesses and threats. If we consider them, weaknesses + threats together, as risks or potential obstacles to achieving our aims, we could work on a risk management strategy for the platform.

If we do so, we have identified eight risks that can be classified in three groups:

**1.** Risks related to the platform: initial funding to create the platforms, maintenance funding to create the platform, dissemination of the platform.

2. Risks related to the partnership: partners without enough resources, partners lacking the needed knowledge, need to include new partners and the risk of not choosing the right ones.

**3.** Risks related to the quality of the platform content.

Following this classification, we can categorise our risk mitigation actions according to the relation with each group of risks:

1. Mitigation actions aimed at reducing the risks related to the platform:

**a.** The creation of the platform will require a strong initial funding. We will look for it in the next CoVE call.

**b.** The maintenance funding will depend on the quality of the platform content and services: if institutions see benefits, they will be happy to contribute with fees to maintain it.

**c.** Describe a long-term plan and find sustainable funding solutions for its stages: support from the government, payment of fees by platform members, etc.

**d.** Attract new members by means of dissemination activities. It is necessary to have high quality materials and services before doing that.

**e.** Identify our market niche, our unique selling proposition, the things that no-one else is doing.

2. Mitigation actions aimed at reducing the risks related to the partnership:

**a.** Look for partners with experience, in building platforms and in learning factories, for the next call. It will also be important to meet the new partners with plenty of time and to discuss their capacities before the submission of the project.

**3.** Mitigation actions aimed at reducing the risks related to the quality of the platform content:

**a.** At first, a way to have more content in our platform could be that each partner analyses what they have and to upload it to the platform.

b. Build digitally sophisticated tools

**c.** Continue working on use cases: more use cases, job profiles and skills (cube), CLF, description of labs, skills assessment tool, latest trends.

And, finally, regarding the actions to take advantage of our opportunities, we should think about submitting a project proposal for the next CoVE call. It is the most realistic option to get funding for the creation of a platform in VET/HVET.

However, it is important to note that we are not limiting ourselves to the restrictions of a project. The project will allow us to take the first steps, but then the initiative will be self-sustainable and we expect to create a platform with a long way to go.

# MISSION, VISION AND VALUES

This section summarizes the findings of a template filled in by project partners to brainstorm and agree on the mission, vision, values objectives, etc. of the platform. The templates and our analysis of them are in the Annexes.

# **VISION:**

The EXAM 4.0 platform aims at becoming the European reference platform for knowledge generation and exchange, collaboration and service provision for VET/HVET centres and companies working in the Advanced Manufacturing sector.

### **MISSION:**

Collaboration and networking between VET/HVET centres and companies/company associations working in the Advanced Manufacturing sector to reduce skills gaps in the industry and to transfer knowledge between VET centres and companies.

# VALUES:

- 1. GENEROSITY
- 2. COOPERATION
- 3. TRANSPARENCY
- 4. TRUST
- 5. AGILITY
- 6. DEFENCE OF THE EUROPEAN PROJECT

# STRATEGIC OBJECTIVES

The main strategic objective of the platform is to create an easy-to-use digital tool beneficial to the different stakeholder groups. This objective is divided into smaller strategic objectives related to key initiatives to achieve them:

- 1. To submit a project to fund creation of the platform
- 2. To create the platform
- 3. To create/provide the services of the platform
- 4. To position the platform in Europe
- 5. To make the platform self-sustainable

# KEY INITIATIVES TO REACH THE STRATEGIC OBJECTIVES

We have defined the key initiatives that will help us to achieve the strategic objectives mentioned above. Under the first strategic objective: to submit a project to fund the creation of the platform, we have defined the following key initiatives:

**1.** Define the main features of the project, WPs, veliverbales, types of partners we are looking for, etc.

2. Find and meet with potential partners to discuss their possible involvement in the project.

**3.** Write and submit the proposal.

Under the second strategic objective, to create the platform, we have defined these key initiatives:

**1.** Define our unique selling proposition. Define the typical user. Understand what the user might look for, and what he will not find elsewhere. Define the key services for each group.

- 2. Understand each stakeholder's interest on the platform.
- 3. Build the platform.

For the third strategic objective, to create/provide the services of the platform, the key initiatives defined are:

**1.** To start offering the key services on the platform. (The key services are explained at the beginning of section 5).

Our fourth strategic objective is to position the platform in Europe, and to achieve it, our key initiative is:

1. Dissemination of the platform.

And the last one is to make the platform self-sustainable, which will be achieved by:

1. Defining how the platform will be funded.

To make it more accountable and easy to monitor, we have defined some indicators:

Strategic objective	Key initiative	Indicator
To submit a project to fund the creation of the platform	Define the main features of the project, WPs, veliverbales, types of partners we are looking for, etc.	The project idea draft is written.
	Create a list of interesting potential partners in different EU countries (mainly from industry and VET/HVET)	The lits is created
	Meet with potential partners to discuss their possible involvement in the project.	10 meetings with 10 potential partners.
	First project draft	First project draft is written.
	Second project draft	Second project draft is written.
	Project budget.	Project budget is estimated and agreed with partners.
	Third project draft	Third project draft is written
	Submit the proposal.	The proposal has been submitted on time.
To create the platform	Define our unique selling proposition. Define the typical user. Understand what the user might look for, and what he will not find elsewhere. Define the key services for each group.	The unique selling position has been identified.
		The typical user has been defined.
		The key services for each group are defined.
	Understand each stakeholder's interest on the platform.	10 questionnaires to 10 stakeholders.
	Build the platform.	The platform is built.
To create/provide the services of the platform	To start offering the key services on the platform.	A report summarising a pilot on the first provision of services.
To position the platform in Europe	Dissemination of the platform.	Numbers.
To make the platform self-sustainable	Define how the platform will be funded.	The financial rules of the platform are written and approved by members.

# CONCLUSION

We, the EXAM 4.0 partnership, with the vision of:

becoming the European reference platform for knowledge generation and exchange, collaboration and service provision for VET/HVET centres and companies working in the Advanced Manufacturing sector,

will support:

collaboration and networking between VET/HVET centres and companies/company associations working in the Advanced Manufacturing sector to reduce skills gaps in the industry and to transfer knowledge between VET centres and companies.

By means of the creation of an easy-to-use digital tool beneficial to the different stakeholder groups.

We will do that by aligning ourselves with the main trends of EU policy, under the initiative on Platforms of centres of Vocational Excellence, and supporting the digital and green transitions.

We have already defined the key services of our platform, our strategic objective, key initiatives to achieve them and indicators to monitor our progress.



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**b:** Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. A New Industrial Strategy for Europe.

**c:** European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience. <u>https://ec.europa.eu/social/main.jsp?catId=1223&langId=en</u>

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## Annex 1

It is too early to say something about the projects of the second call, but the projects of the first call are summarised in the following five points.

# Name:

Pilot PoVE Water- Pilot Platform of Vocational Excellence Water

# **Duration:**

24 months

#### Budget:

998.022EUR

## **Partners:**

#### Belgium

- European Forum of Technical and Vocational Education and Training

Czech Republic

- Crea hydro&energy zs
- Mendelova univerzita v Brne

#### Latvia

- Olaines mehanikas un tehnologijas Koledza
- Rigas tehniska universitate

# Malta

- Malta college of arts science and technology
- Water services corporation WSC

Netherlands

- Learning hub Friesland foundation
- Stichting platform beta techniek
- Vitens nv

United Kingdom

- Glasgow Clyde college - the board of management of Glasgow Clyde college.

# Summary:

PoVE Water is a transnational project that draws on existing and emerging vocational competences and skills needs in the water sector, translating them into an approach of vocational excellence. This ensures upward convergence of VET with (EU) knowledge triangles and a strong engagement with the regional economic and social ecosystems. The project intends to create the infrastructure necessary to embed vocational excellence

in the water sector in Europe, thus laying the grounds for vocational curriculum development and consequently competence development of VET students.

# **Project aims**

• Ensure that VET is at the forefront of research and technological developments in the water sector;

• Ensure that current and future water sector professionals have the work attitude, knowledge and competences that the rapid changing EU water industry demands;

· Identify the existing and emerging labour market needs and enhance the responsiveness of initial and continuing VET systems to these needs;

· Promote synergies, cooperation and cross-fertilisation.

### Main deliverables

• Vocational Excellence Scanning tools to identify the existing systems of Vocational Excellence of the participating organisations and prepare the knowledge sharing process;

5 Centres of Vocational Excellence Water, acting up as regional 'Skills ecosystems';

• The platform of Vocational Excellence Water, bringing an EU dimension to Vocational Excellence in the water sector;

• An Upscaling strategy, for the PoVE Water, to grow and create a critical mass and sustainable ground for further development.

# Name:

Digital Innovation Hub for Cloud based Services

# **Duration:**

24 months

#### Budget:

999.882EUR

# **Partners:**

#### Bulgaria

- Bulgarian Romanian chamber of commerce and industry;
- Sdrudzenie znam i moga

# Estonia

- AS bcs koolitus
- Tartu linn

## Finland

- Haaga-helia ammattikorkeakoulu oy
- Helsingin seudun kauppakamari Helsingforsregionens handelskammare ry

# Croatia

- Algebra university college
- Croatian employers' Association

#### Portugal

- Associacao para o polo das tecnologias da informacao, comunicacao e electronica tice.pt
- Inova+ Innovation services, SA.

# Summary:

The main goal of this project is to establish a state of art European wide cluster of interconnected nodes for innovations development, education and for generation of new start-ups benefiting of the latest cloud computing technologies. Five European countries will collaborate in this project to develop the hub model of clustered of nodes. The cluster is mainly aimed for vocational education institutions, which are using it in teaching the cloud technologies, data analyses, machine learning, blockchains and artificial intelligence.

It will develop a European-wide, transnational, interconnected development service model and network based on cloud and mobile technologies (4G/5G) connecting five local partnerships of VET providers and Industry. The platform will offer a learning and development environment to VET students. It will also use Cloud computing technology to provide services to the SMEs involved to update their knowhow.

### **Main Deliverables**

• Establish a European wide cluster of interconnected nodes for innovations development, education and for

· generation of new start-ups using the latest cloud computing technologies

Cloud education and innovation environment supporting co-development and collaboration between participating countries and institutions, supporting an increase in exchange of teaching personnel and students between institutions.

- · Innovative training material presenting the latest cloud tools and technologies.
- Report on cluster of interconnected nodes and training programme.

• Dissemination of the interconnected nodes cluster model, environment and training material.



# Name:

European Open Design School for Sustainable Regional Development

# **Duration:**

24 months

#### Budget:

874.093EUR

## **Partners:**

## Austria

- Creative.region Linz & upper Austria GMBH;

## Denmark

- Fonden creative business cup;

# Finland

- Kaakkois-suomen ammattikorkeakoulu oy;

### Italy

- Consorzio materahub industrie culturali e creative;

# Lithuania

- Vytauto didziojo universitetas;

## Malta

- Valletta 2018 foundation;

# Netherlands

- Stichting european creative business network;

# Slovakia

- Creative industry Kosice, no;

# United Kingdom

- University of Wales Trinity Saint David Royal charter.

# Summary:

DeuS is a regional Vocational Educational Training (VET) project in the cultural and creative sector joining relevant players from Austria, Denmark, Finland, Italy, Lithuania, Malta, Netherlands, Slovakia and UK. It builds on the work in the Open Design School pilot initiative promoted under ECoC Matera 2019.

DeuS is shaped around the Open Design School, the pillar project of Matera 2019, European Capital of Culture. The Open Design School is a design laboratory using a peer-to-peer approach, where professionals of any discipline work together sharing knowledge and expertise and testing the design solutions with the local community.

# Main Deliverables:

· Identity and develop a learning and training approach (in accordance with ECVET and inspired by the EntreComp Framework) that is employability-driven and builds on pedagogies that draw on a work-based approach, along with a training and learning scheme that is expected to be open, inclusive and non-hierarchical

• Develop a co-creation process involving local/regional CCI communities, policy makers and citizens in order to identify local challenges and generate solutions adoptable at EU level

• Establish innovation hubs (Living Labs) that support SMEs, professionals and VET learners to conduct research and develop innovative products and services

• Design a Knowledge Creative Platform specific to the CCI sector that becomes a point of reference for VET learners and trainers and all sectoral professionals

• Develop a financial model to promote sustainability that combines public and private funding and income-generating activities)

# Name:

Talentjourney- Platform for CDS VET Excellence

# **Duration:**

24 months

# Budget:

953.550EUR

# **Partners:**

## Slovenia

- Šolski center Nova Gorica
- Šolski center Kranj
- Šolski center Velenje
- Center Republike Slovenije za poklicno izobraževanje
- Mahle EDS

# Finland

- Sataedu
- SAMK

# Estonia

- Tallinna Polütehnikum
- Estonian Electronics Industries Association

## Germany

- Elfl-Tech
- Park GmbH

### Italy

- ECIPA
- ISIS Malignani

# Summary:

Talentjourney project aims to narrow the skills' gap in the manufacturing sector, in the field of Connectivity Devices and Services/CDS (IoT in smart manufacturing), which focuses on user-oriented, user-friendly and eco-friendly solutions.

Project partnership wants to bring VET stakeholder collaboration to excellence in content and ways of VET provision by innovating, acting agile and improving the responsiveness of VET providers to the needs of industry 4.0, new era society and young generations and become as such a worldwide known example for the excellence in IoT in smart manufacturing.

# **Project aims**

• to narrow the skills' gap in the manufacturing sector

• to innovate and improve the responsiveness of VET providers to the needs of new era industry, new era society and young generation needs, as well as make it sustainable and agile

 $\cdot$  to bring VET stakeholder collaboration to excellence in content and ways of VET provision

# Main Deliverables:

· data collection on skills needs in IOT in smart manufacturing;

• trainings for professional development of trainers/ teachers/company experts as tutors, leadership;

- master class trainings
- trans-national curricula and life-long trainings design;
- establishing IOT demo labs;
- testing and prototyping the services of Talentjourney;
- · digital platform for promoting and offering Talentjourney services.

# Name:

Excellent Advanced Manufacturing 4.0, EXAM 4.0

# **Duration:**

24 months

# Budget:

799.332EUR

# Partners:

## Netherlands

- 10xl B.V.
- ROC da Vinci College

# Germany

- Duale hochschule Baden-Wurttemberg

# Spain

- AFM- Advanced Manufacturing Technologies
- CIFP Miguel Altuna
- Tknika

# Sweden

- Curt Nicolin gymnasiet AB

# Belgium

# - EARLALL

# Summary:

The goal of the EXAM 4.0 HUB, is to drive innovation in the advanced manufacturing sector.

The project will establish a platform of excellent advanced manufacturing VET centres. The EXAM 4.0 hub aims at becoming a reference in skills governance in the participating regions/countries and at European level, setting up European regional skills ecosystems that bring together VET/HVET centres, companies, policy makers and individual lifelong learners.

### Main deliverables

• Support the introduction of new technological, social and environmental trends in education and industry;

• Design approaches and methods to anticipate skills needs and adapt the training provision;

• Support regional development and Smart Specialization Strategies by providing a portfolio of skills required to implement those strategies in the AM sector;

• Develop innovative learning methodologies and implement joint initiatives and projects;

• Enhance the continuing professional development of teachers and trainers by providing pedagogical and technical skills and facilitating their participation in joint research projects;

• Provide business incubators for VET learners to develop their entrepreneurial skills and projects;

• Design and test an AM Workshop 4.0 Model including the infrastructure, ICT applications and tools required to meet the skills needs.
#### Annex 2

#### Name of the platform:

**Smart Specialisation Platform** 

Link:

https://s3platform.jrc.ec.europa.eu/

#### What is the goal of the platform?

The S3 Platform provides advice to EU countries and regions for the design and implementation of their Smart Specialisation Strategy (S3):

- 1. Provide guidance material and good practice examples
- 2. Inform strategy formation and policy-making
- 3. Facilitate peer-reviews and mutual learning
- 4. Support access to relevant data
- 5. Train policy-makers

# What are the main users of the platform? Does it have one type of user or are there more types of users?

Regional authorities or policy makers in charge of designing and monitoring Smart Specialisation Strategies. If you want to be an user you need to send an email to a contact person.

### Please, describe the structure (architecture) of the platform:

1. **Website logo:** Is included in the top part of the website, in the header. It consists of the logo of the European Commission and the Letters "Smart Specialisation Platform" written in blue color. It is a permanent fixture of the website.

2. **Menu:** in the header and consisting of 7 elements "home", S3 platform", "sections", "tools", "news", "events", "knowledge repository".

3. **Body:** in the body of the website the specific option clicked by the user is shown.

4. **Highlight:** the homepage highlights the services and tools offered to users.

5. **Sidebar:** showing a calendar of events, giving access to certain services and summarizing the social media activity.

# How does the platform facilitate the interaction between users?

By means of events and thematic platforms where users can interact.

#### What service/set of services is provided?

The platform offers:

- 1. General information
- 2. Guidelines for designing and implementing Smart Specialisation Strategies.
- 3. Information about events;
- 4. Peer review services.

5. A combination of mapping tools that allow users to identify regions' economic domains of specialisation and aim at facilitating interregional cooperation and the creation of partnerships among various actors throughout Europe.

#### Who is in charge of managing the platform?

The Joint Research Centre of the European Commission.

#### How is it funded?

EU funds.

### What type of content is available at the platform?

Different types of contents are available:

- 1. News and a newsletter
- 2. Short videos
- 3. Events (workshops, webinars, conferences, etc.)
- 4. Tools
- 5. Documents

#### Are there other activities related to the platform? (conferences, workshops, etc.)

Yes. The platform organizes workshops and various events on topics related to Smart Specialisation Strategies. They have a section where all the events could be consulted.

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# Is there any feature of the platform that you would also like to have in the EXAM 4.0 platform?

They offer a very clear set of services and tools to any user of the platform. Both of them are very visible by being highlighted in the home section.

#### Is there something you do not like about the platform?

No

### Name of the platform:

EU Digital Skills and Jobs Coalition

Link:

https://pledgeviewer.eu/

#### What is the goal of the platform?

"The Digital Skills and Jobs Coalition brings together Member States, companies, social partners, non-profit organisations and education providers, who take action to tackle the lack of digital skills in Europe."

Charter: The Digital Skills and Jobs Coalition Members Charter (europa.eu)

# What are the main users of the platform? Does it have one type of user or are there more types of users?

Policy makers, training providers, companies, universities, research institutions, business associations, worker associations, NGOs.

#### Please, describe the structure (architecture) of the platform:

- Management: European Commission
- Governance: Board of 12 Members
- 549 Members, classified by national coalitions and sector

Structure of the pledge viewer:

- Pledges viewer
- Scoreboard
- Members
- About
- Support

Plus an intranet that allows interaction among members.

# How does the platform facilitate the interaction between users?

Through the possibility to upload best practices (pledges) and perform peer-reviewing through the pledger viewer.

Direct exchange of information through a Linkedin community.

## What service/set of services is provided?

- The pledge viewer platform, gathering best practices: <u>*Pledges* | *Pledge Viewer*</u> and allowing interaction

- Digital Opportunity traineeships: boosting digital skills on the job | Shaping Europe's digital future (europa.eu)

- European Digital Skills Awards: <u>https://ec.europa.eu/digital-single-market/en/digital-skills-initiatives</u>

- A LinkedIn community: <u>https://www.linkedin.com/groups/4943197</u>

## Who is in charge of managing the platform?

The platform is governed by a Board: <u>The Governing Board of the Digital Skills and Jobs</u> <u>Coalition | Shaping Europe's digital future (europa.eu)</u>

Managed by the European Commission

### How is it funded?

European Commission

### What type of content is available at the platform?

Initiatives from all over Europe aimed at bridging the digital skills gap.

### Are there other activities related to the platform? (conferences, workshops, etc.)

Yes.

# Is there any feature of the platform that you would also like to have in the EXAM 4.0 platform?

The peer-review possibility and rankings are a good tool for empowerment of actions.

Classification of members

## Is there something you do not like about the platform?

- Lack of general awareness about it
- Lack of facilitation and engagement activities from the management
- Lack of truly collaborative spaces: blog, etc. (like EPALE)

## Name of the platform:

## BASQUE DIGITAL INNOVATION HUB

Link:

https://basqueindustry.spri.eus/en/basque-digital-innovation-hub/

## What is the goal of the platform?

Connected network of advanced manufacturing assets and services Infrastructure for training, research, testing and validation available for companies.

# What are the main users of the platform? Does it have one type of user or are there more types of users?

Industrial companies.

### Please, describe the structure (architecture) of the platform:

It is a platform promoted by the Basque Government. The entities that provide technological services to companies participate in the hub (technology research centres, VET centres, universities). The website provides information divided in 5 categories, additive manufacturing, advanced materials, robotics, cybersecurity and smart machines. Each of them is also divided into different technologies. The company looks for a technology they want to improve and they find the assets that are available.

### How does the platform facilitate the interaction between users?

Once you find the interesting asset, you can find the contact person in order to start the collaboration.

### What service/set of services is provided?

They provide companies with infrastructure, equipment and knowledge.

- Technological-economic advice:Need Analysis, 360 vision technological assessment, Collaboration & coworking, Technological Prospective & State of the Art, Technological Analysis, Economic viability Analysis, Proof of Concept

- Design, prototyping and validation: Conceptual Design, Simulation, solution architecture, Safety Analysis, Prototyping, programming and experimental validation, Technological transfer for industrialiZation.

- Awareness and Training: Showroom, Training Workshops (<1 day), Training (+ 1 day)

#### Who is in charge of managing the platform?

**Basque Government** 

#### How is it funded?

Not specified, probably public funds.

#### What type of content is available at the platform?

Information about the assets, services that can be obtained in each case, and contact information in order to get in touch with those responsible for each asset.

#### Are there other activities related to the platform? (conferences, workshops, etc.)

This hub is integrated in the Basque Industry 4.0 initiative, with many conferences and workshops.

# Is there any feature of the platform that you would also like to have in the EXAM 4.0 platform?

It can be useful in order to get ideas. The categories, technologies, assets... can be inspiring for the EXAM platform.

The information is clear, the site is very simple and at the same time it contains a lot of information.

#### Is there something you do not like about the platform?

European VET systems are very diverse. In this section we provide an overview of the main VET trends in Sweden, Germany, Belgium, the Netherlands and Spain, as an example of the diversity of VET in Europe.

Country

Sweden

## **Documents analysed**

https://www.skolverket.se/undervisning/gymnasieskolan/laroplan-program-och-amnen-i-gymnasieskolan/laroplan-gy11-for-gymnasieskolan

# What are the main objectives of VET and HVET in the country?

The main task is to impart knowledge and create conditions for students to acquire and develop knowledge. The education shall promote the students' development into responsible people, who actively participate in and develop professional and social life. It should contribute to the students' all-round development.

The school has the task to transfer values to the students, imparting knowledge and preparing them to work and work in society. The school shall impart such more consistent knowledge that constitutes the common frame of reference in society and which is based on fundamental democratic values and the human rights to which everyone is covered. Students must also be able to orientate themselves and act in a complex reality with a large flow of information, increased digitization and a rapid pace of change. Their ability to find, acquire and use new knowledge therefore becomes important. Students should practice thinking critically, reviewing information and conditions and realizing the consequences of different alternatives. In this way, students approach a scientific way of thinking and working.

Through the studies, students will strengthen the foundation for lifelong learning. Changes in working life, digitalisation and technological development, internationalization and the complexity of environmental issues place new demands on people's knowledge and ways of working. The school should stimulate students' creativity, curiosity and self-confidence as well as the willingness to try and put ideas into action and to solve problems. All students must be allowed to develop their ability to take initiative and responsibility and to work both independently and together with others. The school shall contribute to all students

developing knowledge and attitudes that promote entrepreneurship and innovation thinking which increase students' opportunities for future employment, through entrepreneurship or employment. In an increasingly digital society, the school must also contribute to developing students' digital skills. The school must contribute to the students developing an understanding of how digitalisation affects the individual and the development of society. All students should be given the opportunity to develop their ability to use digital technology. They must also be given the opportunity to develop a critical and responsible approach to digital technology, to be able to see opportunities and understand risks and to be able to evaluate information. Through these knowledge and attitudes linked to digital competence, entrepreneurship and innovation thinking, students develop abilities that are important in both work and social life as well as in further studies. Furthermore, the school must develop students' communicative and social skills and pay attention to health, lifestyle and consumer issues. The school must also strive to provide students with the conditions to regularly engage in physical activities.

Developments in working life include that there is a need for cross-border work between different professional areas and that demands are made on awareness of both one's own and others' competence. This in turn places demands on the school's working methods and work organization.

The ethical perspective is important for many of the issues raised in education. Teaching in different subjects should address this perspective and provide a basis for and promote students' ability to make personal decisions and act responsibly towards themselves and others.

The environmental perspective in the teaching must give the students insights so that they can partly contribute to preventing harmful environmental impact, and partly acquire a personal approach to the overall and global environmental issues. The teaching should shed light on how society's functions and our way of living and working can be adapted to create sustainable development.

An international perspective is important in order to be able to see one's own reality in a global context and to create international solidarity. The teaching of various subjects will give the students knowledge about the European Union and its significance for Sweden and prepare the students for a society with ever closer contacts across national and cultural borders. The international perspective should also contribute to developing students' understanding of the cultural diversity within the country.

The historical perspective in the teaching must develop the students' understanding of the present and readiness for the future. The teaching must also develop an understanding of the relativity of knowledge and the ability to think dynamically.

# What are the main challenges VET and HVET is facing in the country?

The covid-19 epidemic resulted/results in the closing of Sweden's VET and HVET centres. This had/has a large impact on the education that the centres can provide as well as learning for the individual students. The closing resulted in digital education which far from all centres were fully prepared for. Theoretical parts of the education fits well with digital education since all students are equipped with computers. The practical part of education, thus practical programmes, were and are in most cases not prepared for digital education. Learners in programmes that are dependent on practical educational tasks will therefore be in lack of a lot of learning content.

### Is there any flagship initiative which should be emphasized?

There are a lot of digitalization initiatives in Sweden and East Middle Sweden. These initiatives, directly and indirectly, contribute to the development for digitization in VET/HVET centres.

# Is there a specific VET-HVET excellence policy in the country?

Students from VET/HVET should have the knowledge, skills and competencies to get a job and work independently after their education.

VET/HVET centres should always work towards continuous improvements.



# Country

Germany

# **Documents analysed**

Bundesministerium für Bildung und Forschung, Referat Digitaler Wandel in der Bildung [Federal Ministry of Education and Research] (2016). Bildungsoffensive für die digitale Wissensgesellschaft Strategie des Bundesministeriums für Bildung und Forschung. Berlin: BMBF Retrieved from

https://www.bmbf.de/files/Bildungsoffensive\_fuer\_die\_digitale\_Wissensgesellschaft.pdf

Hochschulforum Digitalisierung [The German Forum for Higher Education in the Digital Age)]. (2018). Strategien für Hochschulbildung im digitalen Zeitalter. Retrieved April 20, 2018, from <u>https://hochschulforumdigitalisierung.de/de/peer2peer</u>

# What are the main objectives of VET and HVET in the country?

1. Main Challenge - Digitization

When looking at the process of digitalization within the context of German HVET/HE, three complementing axes are noteworthy; the federal digital agenda, the think tank 'Hochschulforum Digitalisierung', and calls for research proposals by the federal government, which foster research on digitalization in HE through funding by the German Ministry of Education and Research (BMBF). In order to realise major societal, political and economic transformation, the German government devised a national digital agenda from 2014 to 2017, addressing all education levels (Die Bundesregierung,2014). The federal government sees digitalization as a way to enable knowledge transfer and innovation in science, however it also expects its citizens to be digitally literate, in order to be able to fully participate in education and society (pp. 27–28).

# 2. Main Challenge - Industry 4.0 skills

The use of digital technologies in industry will result in a multitude of new production processes, business models and products. Approx. 15 million jobs in Germany are directly or indirectly linked to the production of goods, meaning that new digital evolutions in industry offer key opportunities for companies. As a leading supplier of industrial equipment at the global level, the digital restructuring of industry offers plenty of opportunities to boost international competitiveness of German production and better conditions for job creation. Forward-looking, some key challenges concern reaching out to SMEs and adapting qualifications and skills demands at firm-level in support of the actual I4.0 implementation.

Accordingly, the industry is asking for graduates that are educated interdisciplinary and practice-oriented. Some institutions already meet these expectations, using learning factories for realistic, action-oriented classes and trainings. Lecturers are confronted with the challenge to identify future job profiles and correlated qualification requirements, especially regarding the conceptualization and implementation of CPPS, and to adapt and enhance their education concepts and methods adequately and consequently.

# What are the main challenges VET and HVET is facing in the country?

Digitalization strategies in Germany are only just taking off, and the results derived from these implementations may take time to crystallize into the micro-level of teaching and learning in classrooms.

To drive the digital transformation of teaching and learning within German VET and higher education institutions, it is paramount to understand the technology skills and knowledge of both teachers and students, to discover their respective needs, and to aim for a mutual understanding of both perspectives (bottom-up). Beyond that, a sustainable implementation of digital media can only succeed if the overall project 'Digital Transformation in Education' is grounded within the current context of the institutions, and is supported and pushed by the institutions' administration (top-down).

The increasingly digitalisation offers great opportunities for Industry 4.0 leading to the generation of new teaching and learning possibilities in VET and higher education institutions. This has enabled to move forward rapidly as a global society in many respects, but has also led to complex, diverse and interdisciplinary challenges that affect all areas of knowledge in order to meet major challenges. In order to adequately and timely respond to the need of equipping students with suitable qualification, skills and competencies the education institutions should adapt the curricula. The effects of the related changes will be significant and require a carefully developed and implemented skills assessment.

The current significant issues of qualified people, made changes in engineering education that will be an important step in raising the standard of engineering education programmes also adopting **Education 4.0**.

# Is there any flagship initiative which should be emphasized?

In order to focus on a broad range of digitalization aspects within the HE context, such as internationalization, organizational change, and the transformation of teaching and learning, an expert forum was established, called the Hochschulforum Digitalisierung. (The German Forum for Higher Education in the Digital Age, HFD,2018). This think tank generated and disseminated working papers and policy statements between 2014 and 2016, including 20 central theses on digitalization and HE (Hochschulforum Digitalisierung,2016). Of these theses, several address the context of teaching and learning, stating for example:

- "Innovations in digital teaching are not just technical innovations but rather academic, curricular, organisational and structural innovations"

- "The use of digital media contributes to the improvement of higher education teaching"

- "Technological change not only creates new virtual learning environments but also alters existing physical learning environments"

- "There is no shortage of digital teaching and learning innovations at universities but their structural and strategic advancement is deficient"

- "The integration of digital media in teaching and learning is a complex process of negotiation between different stakeholders within the universities"

(Hochschulforum Digitalisierung, 2016, n.p.)

# Public funding from BMBF and BMWI

Funding of up to €200 million has been provided by the government, following BMBF and BMWI contributions. BMBF has given €120 million for research activities and calls for proposals targeting areas of IT systems for CPS, IoTS and I4.0. BMBF has also provided funding for testbeds, aimed at SMEs in particular. BMWI has responsibility for funding I40's work on standardisation and regulation. It has also offered €80 million in research funding, for example through the "Autonomics for Industrie 4.0" and "Smart Service World" programmes.

The **dynamic I40 platform** was developed in 2015 and is tasked to develop recommendations and advise policy-makers on I40 implementation, support the creation of knowledge, standards and examples, mobilise businesses and SMEs, disseminate understanding, promote global networking and ensure the practical operation of I40. The platform initiates, funds and supports research and company-led projects and test-beds and competence centres for the piloting of production systems.

# Is there a specific VET-HVET excellence policy in the country?

140's policy levers include an agenda-setting, visionary and top down

steering role for the government through the BMBF and BMWI ministries and in the form of strategies and funding. However, emphasis has been given to build up collaboration and partnerships. Idea development and practical implementation is largely carried out by industry, science and social partners e.g. through the National Academy of Science and Engineering (Acatech) and the I40 Platform, but in collaboration with policy-makers.



# Country

Spain

## **Documents analysed**

## **Country context:**

Plan de Modernización de la Formación Profesional. <u>https://www.todofp.es/dam/jcr:5d43ab06-7cdf-4db6-a95c-b97b4a0e1b74/220720-plan-mo</u> <u>dernizacion-fp.pdf</u>

Catálogo Nacional de Cualificaciones. http://incual.mecd.es/documents/35348/80300/CNCP\_listadoQ.pdf/

INCUAL folleto descriptivo. http://incual.mecd.es/documents/35348/80300/boletin\_informativo/

Real Decreto 481/2020, de 7 de abril, por el que se establece el Curso de especialización en fabricación inteligente y se fijan los aspectos básicos del currículo, y se modifican el Real Decreto 93/2019, de 1 de marzo, y el Real Decreto 94/2019, de 1 de marzo, por los que se establecen dos cursos de especialización y los aspectos básicos del currículo. <u>https://www.boe.es/eli/es/rd/2020/04/07/481/dof/spa/pdf</u>

### **Regional context:**

LEY 4/2018, de 28 de junio de Formación Profesional del País Vasco https://www.euskadi.eus/gobierno-vasco/-/eli/es-pv/l/2018/06/28/4/dof/spa/html/\_

V Plan Vasco de Formación Profesional <u>https://www.euskadi.eus/contenidos/informacion/fpgeneral/es\_def/adjuntos/V-PLAN-FP-CA</u><u>Sazk.pdf</u>

# What are the main objectives of VET and HVET in the country?

## **Country context:**

VET offer in Spain has two forms:

- VET of the Education System.
- Professional certificates of the Ministry of Labour.

## **VET of the Education System**

In Spain VET offers more than 150 training cycles within 26 professional families, with theoretical and practical contents adapted to the different professional fields.

Within each professional family, the following are offered:

- Basic VET (secondary education). Title: basic professional.
- Intermediate VET (post-compulsory secondary education). Title: technician.
- Higher VET (tertiary education). Title: Higher Technician.

The qualifications obtained after completing VET education are official and have the same academic and professional validity throughout the national territory.

There are also some specialisation courses to be completed after finishing Higher VET and one of them deserves an specific mention due to its relation to the topics of EXAM 4.0 project: <u>Specialisation Course in Intelligent Manufacturing</u>. We will come back to it later.

There are different modalities to obtain these qualifications:

- 1. Dual education,
- 2. Part time studies,
- 3. Blended studies (theoretical subjects are done online),
- 4. At night.

Basic VET, Intermediate VET and Higher VET, have a minimum duration of 2000 hours divided into two academic years and with a compulsory work placement in a company of, at least, 350 hours.

# VET of the employment system: professional certificates

There are 583 professional certificates in the same 26 professional families.

## New developments

The Spanish Ministry of Education and VET is carrying our a deep reform of the Spanish VET system and their main element to do that is the <u>Plan to Modernize VET</u>.

The main goal of the Plan is to:

Create an ecosystem for economic relaunch based on a commitment to human capital and talent.

This Plan is based on the following principles:

1. Permanent public-private collaboration.

2. The implementation of a new, effective and efficient single vocational training system that guarantees vocational training and lifelong learning throughout the life of students and the active population.

3. The generalisation of the procedures for the recognition and accreditation of the professional.

4. The generalisation of procedures for the recognition and accreditation of the professional competence of the active population, in particular of people expelled from the labour market during this COVID 19 crisis.

5. Support for people expelled from the labour market during this crisis COVID 19 through absolutely flexible VET plans adapted to exceptional circumstances, complementing the accredited competences.

6. Redimensioning of the VET offer.

7. The creation of a collaborative and specialised VET ecosystem

# **Regional context Basque Country**

The Basque Country is an Autonomous Community in the North East of Spain and, therefore, the VET system is the same as in the rest of the country.

There are, however, some peculiarities:

1. There is an autonomy of about 45% to modify and adapt to the regions specific needs the curricula designed by the central government. In this regard, several curriculums are being modified to insert in them features of 4.0 industry.

2. In relation to very specialised occupations needed in some companies, the Basque VET Vice Ministry has designed specialisation programmes (instead of specialisation courses). These programmes have a certification of the Vice Ministry and the companies involved in them, but they are not an official qualification.

3. From a management perspective, the Basque VET Vice Ministry has two organisms to help the Basque VET centres: the Basque Institute of Qualifications (IVAC) and Tknika (The Basque VET Applied Research Centre)

The Basque VET Law of 2018 and the V Basque VET Plan (2019-2021) both have as one of the priority lines to foster research and innovation in 4.0 industrial environments.

There are some specialisation programmes closely related to 4.0 Industry and advanced manufacturing. They are all available at <u>IVAC's webpage</u>. Tknika is coordinating several <u>projects related to 4.0 industry</u> and several <u>VET centres are working on the same issues</u>.

Some VET centres of the Basque Country are implementing the Specialisation Course on Intelligent Manufacturing in our region.

# What are the main challenges VET and HVET is facing in the country?

According to the VET modernization Plan, our challenges are:

**1.** Ageing population. Spain has 48.874.500 inhabitants. 24,75% of the population is younger than 25 and 19,07% is older than 65.

2. Imbalance between the skill levels of the working population and the future needs of the labour market. Cedefop's prospective studies for Spain indicate that there will be a growing demand for intermediate and higher level qualifications and a decrease in the demand for lower levels of qualification. By 2025 37% of the jobs will demand a high qualification level, 49% intermediate qualification and 14% low qualification. More STEM profiles will be required. However, the enrolment in VET degrees, a big part of the demand according to prospectives, is very low.

**3.** Low numbers of active population. The total active population amounts to 22.994.300, with an overall activity rate of 58.18%. This is an activity rate below that of neighbouring countries and the European Union, which stands at 58.3%.

4. Lack of intermediate qualifications. The training structure of the working population in Spain shows that our reality is in line with a "diabolo" model, with few intermediate qualifications, as opposed to the forecasts of a "barrel" model of qualification required by the productive system.

**5.** Lots of workers without any professional qualification. Of the total of almost 23 million people in the labour force in Spain, 11,043,300 people, equivalent to 48.02%, have a level of education that does not qualify them professionally. Nearly half of the Spanish population (48%) between 16 and 65 years of age lacks formal accreditation of their professional skills. This does not mean that they do not have any skills, but that they do not have them accredited. Having been trained through professional practice, do not have any formal recognition. The lack of a formally accredited qualification prevents many citizens from pursuing further training, as they have no formal starting point to enrol in formal training programmes. Currently, the procedures for the accreditation of professional competences require specific calls by the administrations, focused on one or several qualifications, which greatly limits the potential of this measure to a small part of the potential beneficiaries.

6. High unemployment. Spain has an unemployment rate of above 16%.

7. Division in two subsystems. Organic Law 5/2002, of 19 June 2002, on Qualifications and Vocational Education and Training divided VET into two training subsystems: VET for the education system (VET training cycles), and VET for employment (certificates of professionalism) dependent on two different administrations. This double structuring of the VET system has proved to be a source of tension and inefficiency.

8. A rigid system. Very closed programmes with little or no margin for the design of training itineraries adapted both to the specific needs of each territorial context and to personal preferences and interests in relation to labour market

**9.** Low level of digital competence. Only 55% of 16-74 year olds have basic digital skills (lower than the EU average which is 57%). The share of ICT specialists in the labour force is lower than in the EU (2.9 % compared to 3.7 % in the EU). ICT graduates in Spain represent 3.9% of the total. The COVID-19 as accelerated the need of digitalization.

**10.** Low innovation capacity. According to the Global Competitiveness Report of the World Economic Forum, Spain ranks 85th in technology and innovation, behind not only the leading developed countries but also Azerbaijan, Namibia, Kenya, Cambodia, Mali, Ghana, Nigeria and Laos.

The VET Modernisation Plan of Spain outlines 11 Strategic Areas:

# **1.** Recognition and accreditation of basic and professional competences acquired through work experience.

Actions:

**a.** Opening of a permanent open call process for the recognition and accreditation of professional competences.

**b.** Incorporation of the accreditation of basic competences in the procedures for the recognition and accreditation of professional competences.

**c.** Implementation of skills accreditation schemes by sector and company, with the collaboration of trade unions and employers' organisations in each sector.

# 2. Flexibility and accessibility of training for a single VET system.

Actions:

- **a.** Implementation of a modular VET offer.
- **b.** Creation of a modular offer catalogue. Courses on "elements of professional competence".

**c.** Unification of curricula of training courses that develop the same professional qualifications.

**d.** Complementary and permanent modular offer from the Ministry of Education and VET.

**e.** Modular offer through non-regulated strategies under the Ministry of Education and Vocational Education and Training.

- f. Tailored training offer for companies.
- g. Expansion of blended and distance training.
- h. Creation of a single register of VET.

# 3. Digitalisation and VET.

Actions:

**a.** Incorporation of a training module on digitalisation applied to the productive sector.

**b.** Training offer of the digitisation module applied to the productive sector for unemployed and employed persons.

- **c.** Tailored training plans to digitalize the workforce.
- d. Offer of Digital degrees.
- e. Design of new digital degrees.
- **f.** Modular offer of specialisation courses to the entire working population (unemployed and employed).
- g. Designing a new vocational training plan for employment.
- **h.** Specific digitalisation training for VET teachers.

## 4. Innovation and VET.

Actions:

- **a.** Incorporation of a final project associated with innovation or entrepreneurship.
- **b.** Open call for innovation projects between VET centres-companies

**c.** Creation of technology hubs and innovation clusters around VET centres and companies.

d. Launching of innovation training projects for SMEs and micro-SMEs.

**e.** Network of VET "centres of excellence in innovation" in the sectors defined as priority sectors.

**f.** Integrated and joint training of professionals from the vocational sector and teachers of the vocational family.

g. Creation of the FPCONECTA platform.

# 5. Entrepreneurship and VET.

Actions:

**a.** Launching of entrepreneurship training projects for unemployed and employed persons.

- **b.** Final project associated with innovation or entrepreneurship.
- c. Vocational guidance for entrepreneurship incorporated into VET qualifications.
- d. Network of "VET centres of excellence in entrepreneurship".
- e. Support for entrepreneurship projects in VET.

### 6. Renewal of the training catalogue. Definition of strategic sectors.

Actions:

- a. Ongoing review of VET qualifications.
- b. Design of new VET qualifications, in any productive sector.

**c.** Preferential attention to prioritised sectors, where human capital VET will be intensified.

### 7. Resizing of VET provision.

Actions:

a. 200,000 more places in VET.

**b.** Expansion of the VET offer for the active population (unemployed and employed).

c. Elaboration of a VET Map and a specific VET Digital Needs Map.

# 8. Strengthening dual VET.

Actions:

- a. Incorporation of the companies in each sector, including
- b. SMEs and micro-SMEs, into the VET ecosystem.
- c. Extension of the duration of the Workplace Training module in the VET.
- **d.** Creation of a specific type of contract to qualify 16 to 20 year olds (early school-leavers).

9. VET institutions as organisers of applied technology. Networks of centres for innovation and applied creativity in VET. Comprehensive support structures for the system.

Actions:

- **a.** Creation of the FPCONECTA platform.
- **b.** Promotion of projects for the conversion of VET classrooms into applied technology spaces.
- c. Progressive incorporation of simulators and digital twins in VET.
- **d.** Opening of the education system's VET centres to the offer of VET for employment.
- e. Collaboration projects of senior professionals from companies in VET centres.
- **f.** Launch of the networks of centres of excellence in innovation and centres of excellence in entrepreneurship in the system

# 10. Career guidance.

Actions:

- **a.** Expansion of career guidance tools on the existing TODOFP platform.
- **b.** Training module on vocational guidance for guidance counsellors in the education system.

# **11.** Evaluation and quality of the system.

Actions:

- **a.** Creation of a quality certification for centres and companies.
- **b.** Creation of a digital tool for the evaluation of all VET offers by beneficiaries, in the case of unemployed and employed people.

**c.** Designing a comprehensive evaluation and quality model for the single VET system.

Not specific for excellence, but many topics covered by the European initiative of VET excellence are considered policy priorities in Spain.



# Country

Netherlands

#### **Documents analysed**

Cedefop, Spotlight on VET. The Netherlands. https://www.cedefop.europa.eu/files/8090 en.pdf

Cedefop. Vocational Education and Training for the Future of Work. The Netherlands. <u>https://cumulus.cedefop.europa.eu/files/vetelib/2020/vocational\_education\_training\_future\_work\_Netherlands\_Cedefop\_ReferNet.pdf</u>

Cedefop. Vocational Education and Training in Europe. The Netherlands. <u>https://cumulus.cedefop.europa.eu/files/vetelib/2019/Vocational Education Training Europe</u> <u>Netherlands 2018 Cedefop ReferNet.pdf</u>

Cedefop. Developments in Vocational Education and Training Policy. 2015-29. The Netherlands.

https://www.cedefop.europa.eu/files/developments in vocational education and training p olicy in 2015-19 netherlands.pdf

### What are the main objectives of VET and HVET in the country?

There are two types of VET In the Netherlands:

- 1. BOL, beroepsopleidende leerweg (School-based)
- 2. BBL, beroepsbegeleidende leerweg (Work-based)

Both of them lead to the same qualifications. It is difficult to differentiate I-VET and C-VET.

The policy priorities for 2016-2020 were (Cedefop 2020: 11):

1. further improve the quality of apprenticeships and internships;

2. pilot experiments to combine the two models of Dutch VET, starting with school-based periods and finishing the programme with work-based learning periods in a company/with an employment contract;

**3.** guarantee a sufficient number of work placements (either internships or apprenticeships).

# What are the main challenges VET and HVET is facing in the country?

According to Cedefop (Cedefop 2020), the main challenges of VET in the Netherlands are:

- 1. Decreasing number of students in the dual (BBL) VET programmes;
- 2. Need of more dual places
- 3. Need for more apprenticeships in technology sectors.

4. concerns about the employability prospects of upper secondary VET graduates (at levels 2 and 3

- 5. Need for more students in technology studies.
- 6. Need for technological learning environments.
- 7. Need to strengthen public-private partnerships.
- 8. Need to improve numeracy skills of VET students.

#### Is there any flagship initiative which should be emphasized?

There are some interesting initiatives in VET in the Netherlands:

- In 2016, the Action plan for equal opportunities was published.
- In 2016, the Secondary education act was amended.
- In 2016 the structure of VET qualifications was revised.
- Since 2016 the validation of prior learning system has been examined.
- In 2017, the Law on right to enrollment for all.

In 2017, the Social and Economic Council of the Netherlands, published a study which proposed several recommendations (Cedefop 2020: 13):

- 1. encourage workplace learning both in school-based and dual VET;
- 2. stimulate VET-institutes to take a major role in lifelong learning and development;
- 3. encourage cooperation between schools and the business community;
- 4. work on a strong learning climate for professionals in the VET schools

In 2019 the cascade funding scheme for apprenticeships was abolished.

<u>https://www.kiesmbo.nl/</u> The webpage was created to offer guidance on several aspects related to VET studies.

A renewed national approach to quality assurance in VET. VET centres should develop strategic plans for the period 2019-2022.

# Is there a specific VET-HVET excellence policy in the country?

There is no specific VET-HVET excellence polity in The Netherlands. There are, however, different national and regional initiatives, such as <u>www.mboe.nl</u>, in which Da Vinci College participates.



### Introduction

Project partners have been asked to fill in several templates aimed at collecting relevant information for WP03.

This appendix reports on the responses to a specific template designed for carrying out a strategic reflection on the main strategic elements (Mission, Vision, Objectives, SWOT) of the platform.

Each partner has filled in the template shown below and this report summarizes the main conclusions of the templates.



# The template we used

Partner:	
What do you expect from a Platform of VET-HVET excellence in Advanced Manufacturing?	
Are there any key services you would like to receive from the platform?	
Please mention 5 to 10 services you would like to receive. Please, try to specify as much as possible.	
Are there any areas of expertise in which you feel you are strong, and where you could contribute?	
Please imagine that you are in 2025 and that the EXAM 4.0 platform is highly successful. With this imagery in mind, please, take some minutes to reflect on the Vision of the platform and then state it here.	
Considering the vision you have just written, please take some minutes to write the mission of the platform.	
What are the strategic objectives of the platform you have just envisioned?	
Please, fill in the two tables below	

Feel free to add rows as needed.

Strategic objective	Key initiative to achieve the objective

Please, when filling in the SWOT analysis, have the Vision, the Mission, the Strategic objectives and key initiatives to reach them in mind.

If you have never done a SWOT analysis before, we encourage you to first find some information on the internet on how to do it.

Weaknesses
Threats

Here the original responses of each partner are copied literally and without any modification. This is the source from which we have inferred our conclusions.

# **Curt Nicolin Gymnasiet**

Partner:	Curt Nicolin Gymnasiet
What do you expect from a Platform of VET-HVET excellence in Advanced Manufacturing?	I expect it to be the number one platform for advanced manufacturing in Europe, connecting actors and creating interconnected networks, sharing information and news.
Are there any key services you would like to receive from the platform? Please mention 5 to 10 services you would like to receive. Please, try to specify as much as possible.	<ol> <li>A broad network of partners e.g VET/HVET centres, companies and scientific associations.</li> <li>Collaboration projects between different centres.</li> <li>Updated information regarding the latest trends within advanced manufacturing.</li> <li>Information regarding teaching Industry 4.0 and how it should be implemented in education.</li> <li>A FAQ regarding Industry 4.0 and the platform in general.</li> </ol>
Are there any areas of expertise in which you feel you are strong, and where you could contribute?	Curt Nicolin Gymnasiet could provide within Additive Manufacturing, having programmes specifically targeting this technology. CNG are currently creating a mobile LAB with 3D-printing and robotics, intended to travel around Sweden and spread education and knowledge. This LAB could be used for the platform, thus sent to different EU-countries.
Please imagine that you are in 2025 and that the EXAM 4.0 platform is highly successful. With this imagery in mind, please, take some minutes to reflect on the Vision of the platform and then state it here.	The EXAM 4.0 platform could be the prime platform for advanced manufacturing and VET/HVET excellence. The platform could be the largest network regarding these topics, interweaving different organisations and spreading knowledge all over Europe.
Considering the vision you have just written, please take some minutes to write the mission of the platform.	To create advanced manufacturing collaboration excellence between companies, VET/HVET centres and stakeholder.
What are the strategic objectives of the platform you have just envisioned?	Collaboration between organisations Dissemination of information Dissemination of knowledge Dissemination of equipment Digital factory collaboration
Please, fill in the two tables below	

Feel free to add rows as needed.

Strategic objective	Key initiative to achieve the objective
Dissemination of information	Have a pagges with information and news on the platform.
Dissemination of equipment	CNG's "AM in a box" could be used.
Collaboration between organisations	Webinars and meetings.
Dissemination of knowledge	Learning content on the platform
Digital factory collaboration	Starting within the consortium.

Please, when filling in the SWOT analysis, have the Vision, the Mission, the Strategic objectives and key initiatives to reach them in mind.

If you have never done a SWOT analysis before, we encourage you to first find some information on the internet on how to do it.

Strengths	Weaknesses
A lot of research. Different nationalities, thus broader networks. Possible funding for the creation of the platform.	Who will run the platform in upcoming years. Who will pay for the platform upcoming years. Lack of content to publish.
<b>O</b>	
Opportunities	Threats

# **Dualle Hochschule Baden Württemberg**

Partner:	DHBW
	Aiming to enhance the digitisation of industrial processes and provide know-how for different target groups, <b>European Exam 4.0 network platform</b> targets VET/HVET and HE institutions, companies being active in implementing I4.0 technologies, educational experts and in particular SMEs in different industry sectors.
	The <b>European Exam 4.0 network platform</b> should build bridges between institutions, industry, science, and policy-makers, facilitating collaboration among European institutions, coordination of education programmes and cross-industry exchange of know-how and technological innovation.
What do you expect from a Platform of VET-HVET excellence in Advanced Manufacturing?	A I4.0 platform should inform about the latest trends and demands from the industry regarding their skills expectations for different job profiles. The I4.0 should inform about new learning and training opportunities in labs. It would be beneficial to get informed which skills are educated in what kind of labs.
	By facilitating partnerships and international collaboration among institutions,a <b>European Exam 4.0</b> <b>network platform</b> could help to collaborate in teaching and fostering joint work-based training in 14.0 labs and learning factories by using integrative embedded systems and data exchange.
	The collaboration with industry partners could help to identify the required competencies of future professionals as well as the identification of the existing gaps in the educational programmes and in the related curriculum in the partner institutions.
Are there any key services you would like to receive from the platform? <i>Please mention 5 to 10 services</i> you would like to receive. <i>Please, try to specify as</i> much as possible.	The key components of the European Exam 4.0 network platform should be divided in, a. information, b. data and c. services a. Information i. Each stakeholder group should provide the latest information in their field of experience ii. Example industry: Use cases from leading industry will describe I4.0 technology implementation, the challenges they faced and the qualification most suitable to the working skills iii. Example institutions: Faculty /study programmes will inform about their labs, new training programmes, curricula changes and new forms of education and 4.0 specific micro-credentials for more specialisation and flexibility, exchangeable among the partner institutions as open education sources iv. Definition of the requirements for a new curricula or curricula revision for Industry 4.0 applying Education 4.0 (e.g. new types of work-based initiatives and /or learning equipment in labs) b. Data i. latest information and research within 4.0 from institutions, trend analyses, ii. in a closed section among institutions and within their close collaboration, data - generated in the labs - can be exchanged among the teachers and students for research or teaching purpose iii. open data exchange among institutions from labs, e.g. costs of labs, equipment, specifications etc. c. Services i. Skills assessment tool ii. 4.0 Technological framework iii. 4.0 Skills framework iii. 4.0 Qualifications v. Virtual tours through institutions and labs vi. Augmented reality and learning environments (fee based)
Are there any areas of expertise in which you feel you are strong, and where you could contribute?	Robotics. Joint Collaboration of Learning Factories. Inclusion of other partners in the region.
Please imagine that you are in 2025 and that the EXAM 4.0 platform is highly successful. With this imagery in mind, please, take some minutes to reflect on the Vision of the allofform end these states is	The core partners of Exam 4.0 have developed a collaboration of labs in a learning factory environment by designing and building a "product" together. Other local partners from industry and other institutions have been engaged into this collaboration for their own training purpose. They have extended the "product" and benefit from the network in their training environment and vice versa.
here.	In depth information is provided for a great variety of 14.0 jobs, the respective qualifications, the study programmes aligned and the skills required listed. In a 3-D application and tool users can click through industry 4.0 jobs, understand the jobs and the work related tasks and interdisciplinarities, search for different qualifications suitable for the jobs and learning about the skills being trained in the study programmes and labs.

Considering the vision you have just written, please take some minutes to write the mission of the platform.	The mission for the <b>European Exam 4.0 network platform</b> is to provide an entry point and visualisation tool for various stakeholders, e.g. learners, teachers and company experts sharing best practice examples for the partners
What are the strategic objectives of the platform you have just envisioned?	The strategic objective as an easy-to-use information tool beneficial to the different stakeholder groups. It is of strategic importance to define the relevant information needed for the different stakeholder groups. Home-base of the collaborative learning factory
Please, fill in the two tables below	

## Feel free to add rows as needed.

Strategic objective	Key initiative to achieve the objective
Define the overall strategy	<b>Define the typical user</b> Understand what the user might look for, what he will not find elsewhere = unique selling proposition
	Users perspective: Define a. information, b. data and c. services for each stakeholder group
Understand each stakeholder interest on the European Exam 4.0 network platform	Describe in detail "What's in for me"
Build a (ore more) learning factory (ies) among different institutions in Europe	Set up a collaboration of 4-5 institutions forming a collaborative learning factors for the benefit of their students
Engage leading industry as benchmarks for the different I4.o technology enablers	Extent use cases from industry partners

Please, when filling in the SWOT analysis, have the Vision, the Mission, the Strategic objectives and key initiatives to reach them in mind.

If you have never done a SWOT analysis before, we encourage you to first find some information on the internet on how to do it.

Strengths	Weaknesses
First international collaboration institutions based on a learning factory in I4.0	Missing information about industry specific skills needs
Opportunities	Threats

# European Association of Regional and Local Authorities for Lifelong Learning

Partner:	EARLALL
What do you expect from a Platform of VET-HVET excellence in Advanced Manufacturing?	Networking opportunities with well-established actors. Access to avant-garde information and research with a holistic approach, gathering education & pedagogy on one side, and industrial and economic development on the other. Opportunities to showcase our work and best practices.
Are there any key services you would like to receive from the platform? Please mention 5 to 10 services you would like to receive. Please, try to specify as much as possible.	Regular (online and offline) activities that foster engagement and networking: conferences, competitions, surveys, etc. Source of validated, relevant and up-to-date information. A contact point for expert support. Staff training opportunities. Discussion fora
Are there any areas of expertise in which you feel you are strong, and where you could contribute?	Policy development European vision linking the regional level to the EU European projects Event management and communication Social media
Please imagine that you are in 2025 and that the EXAM 4.0 platform is highly successful. With this imagery in mind, please, take some minutes to reflect on the Vision of the platform and then state it here.	European companies, regions and education centres cooperating at regional and interregional level. World-class R&D projects running with an origin in the platform.
Considering the vision you have just written, please take some minutes to write the mission of the platform.	Creating a European AM excellence area with a strong education component.
What are the strategic objectives of the platform you have just envisioned?	Bringing together actors from the AM and education (VET, HE, upskilling/reskilling) sectors under a European platform. Promote the development of a European excellent AM sector through 4-helix cooperation.
Please, fill in the two tables below	

# Feel free to add rows as needed.

Strategic objective	Key initiative to achieve the objective
Bringing together actors from the AM and education (VET, HE) sectors under a European platform.	Strong communication and member capturing strategy QA of the platform
Promote the development of a European excellent AM sector through 4-helix cooperation.	Foster the development of joint (self-, national- and EU- funded) bottom-up initiatives and projects by platform members.

Please, when filling in the SWOT analysis, have the Vision, the Mission, the Strategic objectives and key initiatives to reach them in mind.

If you have never done a SWOT analysis before, we encourage you to first find some information on the internet on how to do it.

Strengths	Weaknesses
Bottom-up approach (credibility) Quality services offered USP - combining an avant-garde industry with the education sector: bringing actors together to maximize human capital development and well- being at the workplace.	Partners not so experienced in building a platform from scratch. Small initial partnership. Origin in an Erasmus+ project - need to build trust and attract relevant organisations
Opportunities	Threats

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THE EXCELLENT ADVANCED MANUFACTURING 4.0
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## **AFM Cluster**

Partner:	AFM CLUSTER
What do you expect from a Platform of VET-HVET excellence in Advanced Manufacturing?	Connect different European VET centers with other educational centres, companies and associations. Improve technological knowledge and transfer this knowledge to companies and students.
Are there any key services you would like to receive from the platform? Please mention 5 to 10 services you would like to receive. Please, try to specify as much as possible.	Network between members, foster collaboration Technological project development Trainings, specializations to be prepared for new technologies Contribute to reduce the skills gap Detection of needed skills and new job profiles Transfer company needs to education system Contribute to attract talent to the industry
Are there any areas of expertise in which you feel you are strong, and where you could contribute?	Contact with companies
Please imagine that you are in 2025 and that the EXAM 4.0 platform is highly successful. With this imagery in mind, please, take some minutes to reflect on the Vision of the platform and then state it here.	To be the biggest VET centres platform in Europe, where all the excellent VET centres collaborate between them in order to reduce the skills gap. To be the reference point for industry companies when they need to develop technological projects or innovate in production processes. To be a strong knowledge generator in the field of advanced manufacturing technologies.
Considering the vision you have just written, please take some minutes to write the mission of the platform.	Network of excellent VET centres, advanced manufacturing companies and industry associations with the common aim of reducing the skills gap in the industry, transferring knowledge between VET centres and companies.
What are the strategic objectives of the platform you have just envisioned?	Detection of skill needs in the industry Transfer knowledge to educational system Transfer knowledge to industry Attract talent to the industry
Please, fill in the two tables below	

## Feel free to add rows as needed.

Strategic objective	Key initiative to achieve the objective
Detection of skill needs in the industry	Contact with companies and associations
Transfer knowledge to educational system	Generate the knowledge through projects Transfer the knowledge through trainings
Transfer knowledge to industry	Generate the knowledge through projects Transfer the knowledge through trainings
Attract talent to the industry	Coordinate activities to promote the technical studies among kids

Please, when filling in the SWOT analysis, have the Vision, the Mission, the Strategic objectives and key initiatives to reach them in mind.

If you have never done a SWOT analysis before, we encourage you to first find some information on the internet on how to do it.

Strengths	Weaknesses
Excellent VET centres are generally willing to collaborate. Each VET centre has companies and associations around them that could participate. Each VET centre has experience in this field in its geographical area (technological projects, contact with companies, collaboration with other educational centres)	Financing for the platform once the EU funds finish.
Opportunities	Threats
There is no other similar platform for VET centres in Europe. Industry is technologically evolving continuously and industry needs help to adapt to these changes.	Difficulties to create a platform and maintain it active. The participation of companies. It will be real when they get results from their participation in the platform.



## Tknika

Partner:	ΤΚΝΙΚΑ
	Networking:
	<ol> <li>Connect different European Advanced Manufacturing HVET centers with companies (or company associations), research bodies (universities, technology centres, etc.) and public administrations.</li> </ol>
	2. Provide physical and virtual spaces for collaboration.
	3. Proximity to EU public administration bodies, to bolster policies and strategies for public-private collaboration within the framework of VET/HVET education and advanced manufacturing systems.
	<ol> <li>Synergies with complementary technologies, through collaboration with other, similar EU platforms (both CoVEs and AM related).</li> </ol>
	5. Synergies with industrial associations/platforms/initiatives in AM as example ADMA, EIT manufacturing, I4.0 platform and many others.
	6. Be aware and follow up new strategic initiatives in VET/HVET and AM at EU level.
	7. Spaces to work on collaborative projects between countries.
	8. An international liaison, to serve as a mirror of international manufacturing initiatives. (non European).
What do you ownost from a Diatform of VET LIVET	Knowledge:
excellence in Advanced Manufacturing?	<ol><li>Technological knowledge creation and transfer among companies, HVET centres, research bodies and public administrations.</li></ol>
	10. Technological, hands-on, project development in collaboration between different HVET centres, companies and R&D centres to build new labs, to integrate new technologies, to improve lab management, etc.
	11. European project development including programmes in R&D+i programmes, such as H2020, and Erasmus.
	12. Detect skills needs and address them by preparing new training courses adapted to the needs of the labour market.
	13. To act as an intermediary to find interesting training resources for HVET teachers of AM and to organise training courses to update HVET teachers knowledge in AM.
	14. Share good practices and experiences in AM and HVET.
	15. Joint publications and peer review systems.
	Lobbying:
	16. Represent the view of HVET in relation to AM and transfer these views by means of policy briefs, meetings, conferences, etc. to relevant administrations, VET-HVET associations and companies and company associations.

	1. A networking area in the platform to collaborate with HVET centres, companies and R&D centres in AM.
	2. A knowledge repository area in the platform with relevant publications.
	3. Spaces for teams to work in different technologies related to AM.
Are there any key services you would like to receive from the platform? Please mention 5 to 10 services you would like to receive. Please, try to specify as much as possible.	4. Organisation of different events to share good practices, work on new projects, network with different agents, etc. An area in the platform where all these events will be published and where all interested members could register.
	5. A peer review area in the platform where publications could be uploaded in a draft version and other platform members could collaborate and review.
	6. A guidance area in the platform where external users could ask for guidance on implementation, material, etc. to work with different technologies related to AM and where platform members could provide advice.
	7. An area in the platform which gives access to different tools, some of them could be created by platform members and in other cases the platform will just give access to other tools which may be relevant for AM and HVET.
	8. An area to "become a member" in the platform where all the interested potential partners could submit their applications and where all the criteria are made clear.
Are there any areas of expertise in which you feel you are strong, and where you could contribute?	Tknika can act as a bridge between AM initiatives related to VET/HVET in the Basque Country and the platform. We have access to all AM projects in Basque VET centres.
Please imagine that you are in 2025 and that the EXAM 4.0 platform is highly successful. With this imagery in mind, please, take some minutes to reflect on the Vision of the platform and then state it here.	To be the most relevant platform of Advanced Manufacturing in HVET in Europe.
Considering the vision you have just written, please take some minutes to write the mission of the platform.	To provide networking, knowledge and lobbying services to HVET centres working in AM in Europe.
What are the strategic objectives of the platform you have just envisioned?	<ol> <li>To create the platform.*</li> <li>To build the knowledge area of the platform.</li> <li>To build the networking area of the platform.</li> <li>To find a space in HVET policy influencing.</li> </ol>
	*This objective may sound strange, but, although we are talking about it, the platform does not exist and this should be our first objective: to create what we are envisioning.
Please, fill in the two tables below	

Feel free to add rows as needed.



Feel free to add rows as needed.

Strategic objective	Key initiative to achieve the objective
To create the platform	Build a first draft of the platform. Submit a project to the next call of platforms of centres of Vocational excellence with a specific work package and with all the necessary funds allocated to create such a platform.
To build the knowledge area of the platform	Create a complete interactive guide to implement 4.0 technologies in AM labs in HVET centres: maturity models, self evaluation tools, improvement actions, assessment of experts, connection with training courses, etc. Design a specific training course for teachers, centred in technology, to update their knowledge and to build their capacity to be excellent AM teachers in HVET. Design an international course aimed at HVET students to specialise them in AM: skill need detection, design of the course, pilot, recognition of the course, etc. To upload reports and articles to the knowledge area of the platform.
To build the networking area of the platform	To create systematic and collaborative working tools for the working teams of the platform. Define the groups, their aims, their key initiatives, how they will collaborate, how their knowledge will be transferred to the rest of the platform members, etc. To organise a first EU level conference of the platform. To establish contacts with other relñevant initiatives on AM at EU and international (out of EU) level.
To find a space in HVET policy influencing	To write a position paper, manifesto, declaration, etc. to express our views and to make the policy makers aware of them. To establish a systematic for this type of collaboration (maybe by building a sector skills alliance or similar initiatives).



Please, when filling in the SWOT analysis, have the Vision, the Mission, the Strategic objectives and key initiatives to reach them in mind.

If you have never done a SWOT analysis before, we encourage you to first find some information on the internet on how to do it.

Strengths	Weaknesses
<ol> <li>An already established partnership which could be strengthened and enhanced by adding new partners with relevant skills and expertise.</li> <li>Good ideas and relevant initiatives developed during the EXAM 4.0 project.</li> <li>Knowledgeable partners who could lead the way in AM-HVET.</li> <li>Experience in this type of project.</li> </ol>	1. Partners who do not seem to have the necessary personnel to meet all the requirements of such a project. (it will imply a lot of working days, not just doing some tasks here and then).
Opportunities	Threats
<ol> <li>The EU Commission is supporting the initiative on Platforms of Centres of Vocational Excellence with a budget of about 4 million euros during the next funding period (2021-2027).</li> <li>AM is one of the most relevant sectors for the EU economy.</li> <li>VET/HVET are gaining more and more attention and relevance at EU and at national levels.</li> <li>A platform like this does not exist and will be very useful for good HVET centres, companies and R&amp;D centres working in AM.</li> <li>Many institutions will be interested in joining the project.</li> </ol>	<ol> <li>The next call of platforms of centres of vocational excellence will be very competitive. Many institutions want to establish this type of platform.</li> <li>High likelihood of several institutions presenting similar projects to the same call, i.e. projects related to AM, KETs, digitalisation, etc.</li> <li>Not choosing the right partners.</li> <li>Funding the platform once EU funding is over.</li> </ol>

### Our Vision and our Mission

In three of the responses there is an emphasis on being the "prime platform", "most relevant", "the biggest (...) platform". Another one points out to "a European Advanced Manufacturing excellence area".

This should be interpreted as an ambitious goal on our side: we want to develop a very important platform in VET-HVET Advanced Manufacturing in Europe.

We have categorised in four chunks elements mentioned in the vision statements of the respondents:

1. Knowledge element. Responses related to it: spreading knowledge all over Europe// To be a strong knowledge generator in the field of Advanced Manufacturing technologies./ World-class R&D projects running with an origin in the platform.

2. Collaboration elements: interweaving different organisations. /European companies, regions and education centres cooperating at regional and interregional level. /Involvement of local partners from industry./ Collaboration of labs in a learning factory environment by designing and building a "product together".

**3.** Service provision element: to be the reference point for industry companies then they need to develop technological projects or innovate in production processes./ in depth information of I4.0 jobs, qualifications, and study programmes.

Taking all this into account, we could state the vision of the platform as:

The EXAM 4.0 platform aims at becoming the European reference platform for knowledge generation and exchange, collaboration and service provision for VET/HVET centres and companies working in the Advanced Manufacturing sector.

Keeping this vision in mind, let us move to the mission statement of the platform. If we analyse the responses of partners, we find the following ideas:

1. Collaboration excellence between companies, VET centres and stakeholders.

2. Provide an entry point and visualization tool for various stakeholders, e.g. learners, teachers and company experts sharing best practice examples for the partners.

- 3. Networking, knowledge and lobbying services.
- 4. A European AM excellence area with a strong education component.
- 5. Network of excellent VET centres.
- 6. Reducing skills gaps in the industry.
- 7. Transferring knowledge between VET centres and companies.

And from there, we infer that project partners see the mission of the platform as:

Collaboration and networking between VET/HVET centres and companies/company associations working in the Advanced Manufacturing sector to reduce skills gaps in the industry and to transfer knowledge between VET centres and companies.

Needless to say, there are some values related to our mission and vision. These values are to be understood as the ethical code of platform members. Our values are:

**1.** Generosity, because we want to share knowledge and resources, to help each other and to assist any platform user.

2. Cooperation, because the only way to fulfil our aims is by means of a strong and enduring cooperation among companies, education providers, research bodies, and any other stakeholder.

**3.** Transparency, because this is a key prerequisite to achieve effective cooperation.

- 4. Trust, because we need to trust each other and to be trusted by our users.
- 5. Agility, because services need to be provided fast and efficiently.

6. Defence of the European project, because we are an EU funded initiative and we want to contribute to make Europe better by means of reducing skills gaps, helping the Advanced Manufacturing sector thrive and helping to make Europe a knowledge economy with high standards of wellbeing and high quality employment.

We can now put everything together:

#### VISION:

The EXAM 4.0 platform aims at becoming the European reference platform for knowledge generation and exchange, collaboration and service provision for VET/HVET centres and companies working in Advanced Manufacturing.

#### MISSION:

Collaboration and networking between VET/HVET centres and companies/company associations working in the Advanced Manufacturing sector to reduce skills gaps in the industry and to transfer knowledge between VET centres and companies.

- GENEROSITY
- COOPERATION
- TRANSPARENCY
- TRUST
- AGILITY
- DEFENCE OF THE EUROPEAN PROJECT

#### Who should be involved?

As we have just analysed, all project partners agree on the fact that the platform should facilitate networking and cooperation among different agents, with an emphasis in collaboration between VET/HVET centres and companies, and, accordingly, expect that the platform will facilitate networking and collaboration. The agents that are mentioned in most of the responses are:

- VET/HVET institutions and HE institutions
- Advanced manufacturing industries, companies, SMEs, or company associations
- Research agents
- Governments, policy makers, authorities)

Less mentioned agents that are mentioned include:

- Scientific associations, mentioned in one of the answers.
- Educational experts, mentioned in one of the answers.
- Civil society, mentioned in one of the answers9.

From the responses, we could conclude that the platform is aimed at three main groups:

- VET/HVET and HE institutions.
- Advanced Manufacturing companies.
- Research bodies.

<sup>&</sup>lt;sup>9</sup> The answer actually mentioned the "quadruple helix" and for there we assume that the answer refers somehow to civil society as well.

## What are the strategic objectives of the platform?

The main strategic objective of the platform is to create an easy-to-use digital tool beneficial to the different stakeholder groups. This objective is divided into smaller strategic objectives related to key initiatives to achieve them.

Strategic Objective	Initiative
Submit a project to fund the creation of the platform	Define the main features of the project. WPs, Deliverables, Types of partners
	Find potential partners
	Write and submit the project
Create the platform	Define our unique selling proposition Define the typical user. Understand what the user might look for, and what he will not find elsewhere. Define the services for each group.
	Understand each stakeholder's interest on the Platform. Describe in detail "what's in for me?"
	Build the platform
Services of the platform	Create and feed the different services. The key services are outlined in the previous section.
Position the platform	Dissemination of the platform to attract users to it.

# SWOT analysis

The following table summarises the SWOT analysis of all partners.

Lack of content to publish in some of the key services defined in the answers. Funding, maintenance and running of the platform once the project funding is over. Some partners are not committed to work or lack the necessary resources. The pert project may imply more working days
Lack of experienced partners on building platforms from scratch. Small initial partnership. More partners will be needed. Origin in an Erasmus+ project -need to build trust and attract relevant organisations.
Threats
A lot of competition in the call for platforms of vocational excellence. High likelihood of other institutions presenting similar projects to the same call. Projects dealing with KETs, AM, digitalisation, etc.
<ul> <li>Failing to choose the right partners.</li> <li>Other platforms which might provide similar services.</li> <li>Reachout and engagement.</li> <li>Quality not reaching expectations.</li> <li>Companies may not be interested in the platform until they see real results.</li> <li>Difficulties to create a platform and to maintain it active. Funding of</li> </ul>
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