ESSA
EUROPEAN STEEL SKILLS AGENDA

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Blueprint “New Skills Agenda Steel”:
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VET Systems Requirements to meet New Skills and Training Demands

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Overview

a) WP4 Objectives and tasks
b) Industrial challenges
c) From Industry 4.0 to Workforce 4.0
d) Trends in VET
e) Skills needs
f) Case study countries: VET systems main characteristics
g) Remarks and criticalities
h) ESSA Skills Matrix

Scope of WP4: VET Requirements and Regulations/ National VET Systems

Vision: To develop a European sector skills-set framework to be implemented within existing national and European VET frameworks and rolled out on a Europe-wide scale. A research-based framework on steel industry training provision will inform the development of an occupation led skills-set framework/matrix for the sector.

Main objective: To develop a framework/matrix for optimising provision of skills to the European steel industry through VET systems:

- establish national VET benchmarks for current skills provision for occupations critical to the steel industry;
- correlate occupation skill-sets with cross-European programmes and standards frameworks
- The work package serves as an input and groundwork for the development of the Blueprint.

Scope of WP4: VET Requirements and Regulations / National VET Systems

TASKS:

• 4.1 Identification of National VET Qualifications and Skills Frameworks for Steel: analysis of VET regulation and programmes serving the steel industry at the national level in 5 case study countries (DE, ES, IT, PL, UK).

• 4.2 Analysis of cross-European VET frameworks and standards for sector skills recognition: identification of Europe-wide programmes and frameworks that shape and offer recognition to steel sector skills, qualifications and occupations (e.g. EQCA, ESCO, EQF, etc.).

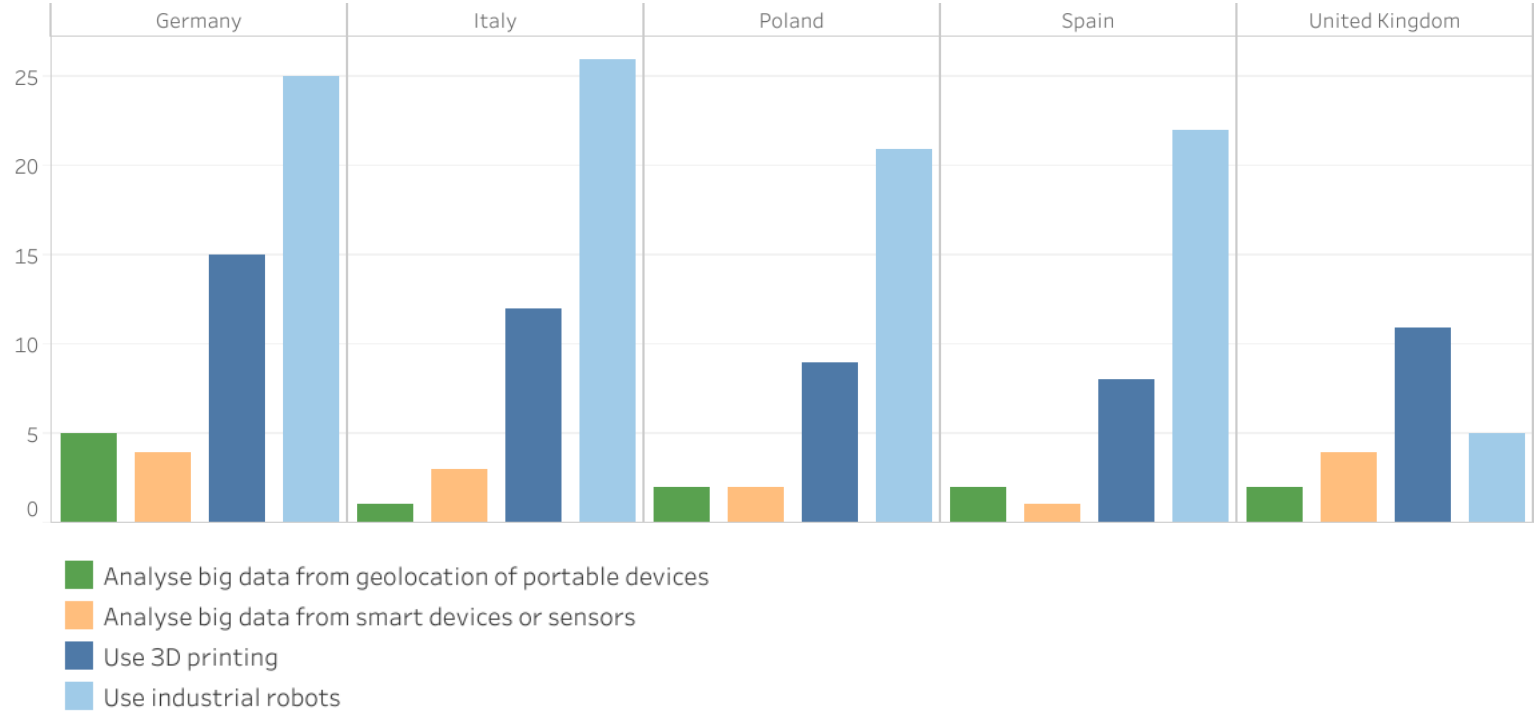
• 4.3 Development of European sector skills VET framework or matrix: establish national VET benchmarks for current skills provision and correlate occupations skill-sets with formal VET provision.

• 4.4 Develop mechanisms for application of sector skills VET framework: develop a strategy and mechanism for rolling out the skills framework across the sector and encouraging take-up within national VET systems as part of the ESSA blueprint.

Industrial challenges

- Pre-Covid economic slowdown
- Global market competition
- Covid-19 pandemic
- Industry 4.0 and Green transition
- Talent attraction and retention
- Ageing the workforce

Uptake of I4.0 technologies in the case study countries (*Eurostat data*)



From Industry 4.0 to workforce 4.0

Need of a workforce that develops in parallel with the technological shift.

Several authors have addressed this issue:

- Human Capital 4.0 (Flores et al., 2020)
- Operator 4.0 (Romero et al., 2016)
- Workforce 4.0 (Estep, 2017)
- Berufsbildung 4.0

EC Policy Brief on Industry 5.0 highlights the need for a human-centric approach

Trends in VET (1)

- Path dependance: no system has completely switched to a different one
- More balance between general education and VET at upper-secondary level
- Extension of VET programmes above EQF 4
- More hybrid programmes (vocational + general subjects)
- Overcoming dead-ends

Trends in VET (2)

- Relaunching apprenticeships
- Strengthened ties with companies in school-based systems
- More coherent, although diversified systems
- “Modular” and learning outcomes-based qualifications
- More importance given to transferable skills (cross-sectoral and soft)

Emerging skills needs

- System/process knowledge
- IT
- Data analysis
- Basic/advanced digital skills
- Soft skills (communication, teamwork, problem solving, leadership, continuous learning)
- Green skills

Emerging needs: IT & system knowledge (1)

- “IT people, for instance, I think we don’t have enough skills there, because even nowadays it is difficult to find good IT people, and they earn a lot of money, because they are in shortage. High educated people with these skills can go anywhere in the world” (Industry expert, PL)

- “Highly specialised technicians, let's say mechatronics technicians if we have to define them. They have a basic knowledge of mechanics, IT and electronics, which are precious on the market. So, it is difficult to find them, and when we do, we hang on to them because they are hard to find” (HR Officer, IT).

Emerging needs: IT & system knowledge (2)

- “Ensure that apprentices have a contextualised understanding and understand the plausibility what is happening. […] We offer programmable logic controller (PLC) for metalworkers. […] The point is not to educate them deeply in these areas. Rather, the point is that they have what I call ‘overview knowledge’ and to put it a little bit casual: ‘that they can participate in the conversation” (Training centre manager, Germany).

Emerging needs: digital & data analysis

- “I think that will be a key barrier to participation in technology in the future […] So digital skills is massive for me, but also without forgetting that millions of workers in the UK still don't have basic literacy and numeracy skills. So, if they do not have basic literacy, numeracy, how will they have those skills to then be able to replicate it digitally?” (Trade Union rep, UK)

- “In production, data analysis is fundamental. […] in the rolling mill or in the smelting furnace, everything is automated and what the worker has to do is a good analysis of the data. And then, with this data analysis, he has to transfer the solutions to unforeseen events and problems” (Trade Union rep, ES)

Emerging needs: soft skills (1)

- “The development of transversal competences from our point of view seems to be a crucial and strategic aspect in the process of continuous training of the workforce in the sector. [...] We have implemented training courses aimed at production personnel […] Very often these courses, which concern the development of technical skills, also include a section on soft skills” (Training expert, IT)

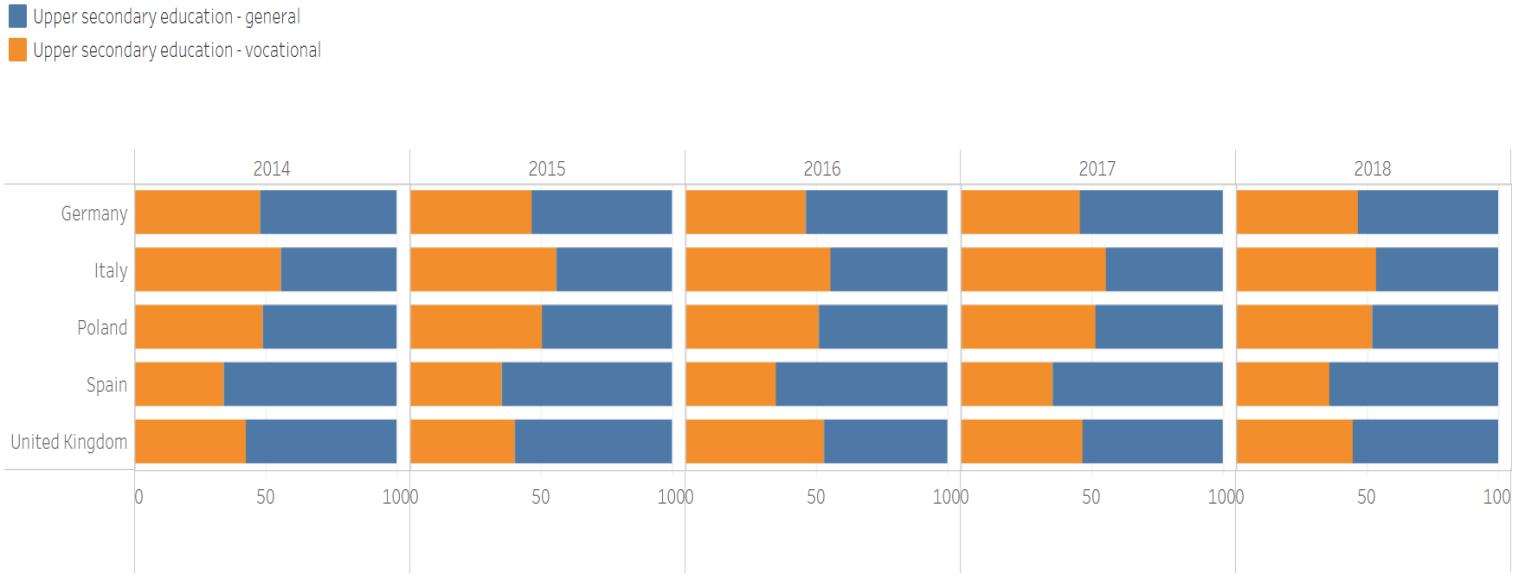
- “But the core and this is the core of occupational education is to develop personal and social competences. Because if we have developed those then people are in a good position to acquire other kinds of competences, knowledge and skills on their own” (Head of training, Germany).

Emerging needs: soft skills (2)

- “The decision-making process, and problem solving is always a key thing for us. And I think the two go sort of coupled. […] Especially with the structures we have now, a lot flatter. The teams are more flexible” (Training advisor in steel company, UK).

- “Nowadays we have these challenges…we are working on leadership, we are working on digitalization, skills related to negotiation…this part is more difficult than the technical one, but we are focusing on them” (HR manager, ES).

Case study countries: VET systems main characteristics



Case study countries: VET systems main characteristics

Country	Economic model (in relation with skills type)	Skills formation	Standardisation in IVET curricula	Distinction between IVET and CVET	Learning arrangements
DE	Coordinated Market Economy (Hall & Soskice 2001)	Collective (Busemeyer and Trampusch 2011)	High	Clear	Apprenticeship-based
ES	Mediterranean Capitalism (Amabel 2003; 2009)	Collective (Busemeyer and Trampusch 2011)	High	Clear	School-based
IT	Mediterranean Capitalism (Amabel 2003; 2009)	Statist → (collective) (Busemeyer and Trampusch 2011)	High	Clear	School-based
PL	Dependent Market Economy (Nölke and Vliegenthart 2009)	Statist → (collective) (Busemeyer and Trampusch 2011)	High	Clear	School-based
UK	Liberal Market Economy (Hall & Soskice 2001)	Liberal (Busemeyer and Trampusch 2011)	Mid-Low	Blurred	Mixed

Case study countries: VET systems main characteristics

DE	ES	IT
Technology neutral provision	Established procedures for the recognition of prior learning	Recently established national catalogue of occupations and qualifications
Solid dual system	Double VET route (education & employment)	National and regional VET provision (alternative paths)
Responsibility shared between competent Ministry and Länder	Responsibility shared between competent Ministries and Regions	Responsibility shared between competent Ministries and Regions
Occupation-based approach	Recently introduced dual VET arrangements	Recently introduced dual VET arrangements
Holistic approach to occupational competencies	Modular and based on Learning Outcomes	Post-secondary VET more connected to industry
Consensus-based regulation	Mainly school-based with practical focus	3 types of apprenticeship programmes
Co-determination of qualifications' contents	Not referenced to EQF	Mainly school-based at secondary level

Case study countries: VET systems main characteristics

PL	UK
Mechanisms for the recognition of prior learning in place	Plurality of providers
System undergoing structural reforms - transitioning until 2022	Modular VET provision
Responsibility shared between Ministries, Regional authorities and local authorities (*Powiat*)	Complex and fragmented governance: responsibility shared between central Government and Devolved Administrations, and national VET regulators
Recently introduced dual VET arrangements	Reforms or reviews of parts of the systems currently ongoing in the 4 countries (England, Northern Ireland, Scotland, Wales)
Based on learning outcomes	VET mostly taken at EQF levels 3-4
National catalogue of occupations and associated qualifications	Narrower understanding of occupational standards (compared to DE)
Distinction between programme and qualification (certificate/diploma)	Distinguishing role of awarding bodies
Mainly school-based VET	Raising demand in apprenticeships

Remarks and criticalities

- Holistic shift
- Work experience
- Continuing training
- Narrow/tailored standards
- Value-adding IVET
- Missing sector specialisation

Remarks and criticalities: holistic shift

- “Until now, much has been built on a mode that was particularly linked to a specialisation model that saw the fragmentation of skills, knowledge and the figures themselves. Recomposing, also from the point of view of the overall ability to know the production process, is one of the issues on which there is a stronger demand” (Trade Union rep, IT)

Remarks and criticalities: work experience

- “I remember the time when my colleagues were in the professional secondary schools, it was like three days teaching in school and two days the real shop floor practicing […] and after three years, he was the young professional worker with skills to use a lot of up-to-date machines and technologies. […] the real industry practice or apprenticeship is necessary” (Industry expert, PL)

- “Anyone also from other sectors, like automotive and shipbuilding, will tell you that we need to recover what used to be called apprenticeship schools in Spain. Basically, these worked as if companies assumed the FP2 training of the workers that they subsequently incorporated into their companies” (Trade Union rep, ES).

Remarks and criticalities: continuing training

- “Back in the day, apprentices were referred to as *Ausgelernte* which literally means ‘someone who has completed their learning’. Nowadays, apprentices are referred to as *Ausgebildete* which means ‘someone who has been trained’. The term *augelernt* suggest that you are done, finished learning […] Today, an apprenticeship is just your ‘initial qualification’, one that will be added to over the course of your working life” (HR manager, DE).

- “Technical progress and process automation require employees to learn and improve their qualifications practically continuously throughout their professional career […] the employer will expect employees to have the skills to continuously improve their professional qualifications" (HR Officer, PL).

Remarks and criticalities: narrow/tailored standards

- “[The reform of apprenticeship standards] you don't really know what effect it's going to have. And, as I say, there are downsides because bigger companies can influence those apprenticeships much more. So even though most companies are not large companies. They're small and medium enterprises, but they don't have the voice to push around the big players at the table” (VET expert, UK).

Remarks and criticalities: value-adding IVET

- I am always afraid to train people through companies because we will never have a cultural advantage. So, they must be trained by the school, the apprenticeship is fine, but no more than that. Because when a person arrives in a company s/he will be the driving force of the future company [...] So for me the school must have more advanced programmes, it must not be flattened on the company, but it must train people with a higher cultural level" (Automation Manager, IT)

Remarks and criticalities: missing sector specialisation

- “Fewer and fewer typically metallurgical fields of study at renowned universities in Poland. There are no vocational schools training in the steel industry” (Support Manager, PL).

- “There is no Steel VET. In the university, steel and metallurgy are merging (steel is being amortised). The sector has not been able to sell itself” (Employers’ rep, ES)

Matrix Approach I

What is captured:

- the most **steel-production relevant qualification programmes** related to Maintenance, Melt Shop, Rolling Mills, Logistics and Quality Control (mainly initial VET programmes, but also selected formal continuous VET offers) in each of the five case study countries
- Generalised **job/ occupational profile description** related to each qualification
- All Learning Outcomes concerning **transversal/ soft skills** – organised using ESSA skills classification to ensure compatibility with Work Packages 3 and 5
- **National Dimension**: national labels, classification numbers, links to curricula and regulations (if available), access to further training and education etc.
- **European Dimension:** Compatibility/ alignment with/ use of European VET tools (ECVET , Europass, ESCO, EQF)
- RAG grading/ **assessment of future proofness** of qualification (in close cooperation with representatives of steel companies in the case study countries)

Matrix approach II

Designated users:

(1) European and national *steel industry bodies*
(2) EU-level and national *Trade Unions*

Matrix provides comparative information about soft skill provision and future proofness as part of key qualification programmes that can underpin/ inform strategic decisions/ campaigning/ lobbying

(3) *National IVET providers*: industry-led assessment of future proofness constitutes systematic industry feedback on transversal skills needs and adequacy of current VET provision in light of anticipated future developments
(4) ESSA WP5/6: matrix analysis can inform targeted (regionalised) training provision

Matrix Organisation: Start with broad tasks in various steel production areas

			National Level	Similar qualification											EU Level							specific Industrie 4.0 elements
			Occupational Qualification Label	**Related metal sector-specific qualification programmes (significant curriculum overlap)**	**Related cross-sectoral qualification programmes (significant curriculum overlap)**	**Documentation of Curriculum**	**DQR**	**KldB**	**Duration**	**Type [dual; company-based; school-based**	**Access to Higher-Level VET programmes**	**Qualifies for dual VET HE programmes at BA level**	**Qualifies for HE programmes at BA level**		**ISCO No**	**ISCO Minor-Group Label**	**EQF**	**Europass compatible Information**	**ECVET compatibility**			**optional qualifications as part of IVET programme:**
Maintenance	Electrical Maintenance		Industrial electrician specialising in industrial engineering		(1) Electrician for automation technology	https://www.bibb.de/dienst/berufesuche/de/	4	26252	42	Dual	Yes	Yes	conditional		7411	Building and related electricians	4	Yes				Digital networks; IT security; Programming
			Industrial electrician specialising in industrial engineering			https://www.bibb.de/dienst/berufesuche/de/	3	26252	24	Dual	Yes	Conditional			7411	Building and related electricians	3	Yes				
	Mechanical Maintenance																					
	Mechanical Maintenance		Industrial Mechanic [Industriemechanikerin]	(1) Zerspahnungsm		https://www.bibb.de/dienst/b	4	25102	42	Dual	Yes	Yes	conditional		7233 (?)		4	Yes				System integration; Process integration;
	Electro-Mechanical Maintenance		Mechatronics fitter [Mechatroniker/in]			https://www.bibb.de/dienst/berufesuche/de/	4	26112	42	Dual	Yes	Yes	conditional		8211			Yes				Digital networks; IT security; Programming; Additive Manufacturing
Melt-Shop	Furnace & Casting operation		Process technologist for the metalworking industry -			https://www.bibb.de/dienst/b	4	24112	42	Dual	Yes	Yes			7221		4	Yes				
			Skilled metal worker specialising in cutting procedures [Fachkraft für			https://www.bibb.de/dienst/berufesuche/de/	3	24232	24						8121	Metal processing plant	3	Yes				
Rolling Mill	Mill Operation		Process Technologist: Steel Forming [Verfahrenstechnologin, FR			https://www.bibb.de/dienst/berufesuche/de/	4	24112	42	Dual	Yes	Yes			7221		4	Yes				
			Skilled metal worker specialising in metal forming and wire technology			https://www.bibb.de/dienst/berufesuche/de/	3	24212	24	Dual	Yes	Conditional			8121	Metal processing plant	3	Yes			Link to DETAILS	
Finishing																						
Logistics			Warehouse logistics operator [Fachkraft fur Lagerlogistik]		warehouse clerk	https://www.bibb.de/dienst/berufesuche/de/	4	51312	36	Dual	Yes	Yes			4321	Stock Clerk [Fachkräft für Lagerwirtsch	[4]				Link to DETAILS	
Quality Control			Materials Tester (MT)		1) MT specialising	https://www.bi	4	41422	42	Dual	Yes	Yes	Conditio		3111.7	material	[4]					----

Martin Weiher: Inclusion makes only sense in an colour-coding adequacy assessment: layer 2

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