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European research in the field of occupations, qualifications and skills – information about selected initiatives

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European Funds
Knowledge Education Development

Republic of Poland

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European Union
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What is comparative research of skills, occupations and qualifications (to me)?

- ✓An interdisciplinary field drawing from political science, economics, didactics and curriculum research, psychometry, sociology…
- ✓With very practical applications
- ✓Influencing policy or at risk of being influenced by it?
- ✓A very promising area – complementary to socioeconomic megatrends and emerging technologies

Why is comparative research of skills, occupations and qualifications relevant?

- ✓Improvement of policy and practice in education and training
- ✓Transparency and recognition of skills
- ✓Inter- and intra-national mobility of learners and workers
- ✓Lifelong and lifewide learning

What is the subject of research?

- ✓Conceptualizations of skills and description of learning outcomes
- ✓Structure / hierarchy of standards, documents
- ✓Content of qualifications and occupations
- ✓Skills levels
- ✓+ various contexts: organisation of teaching and learning, institutions and regulations (e.g. Refernet), industrial relations, education and labour market policies…

The problem with skills, qualifications and occupations

The meanings (referents) ascribed to skills, qualifications and occupations names:

- differ between regions, sectors and countries
- change over time, with accelerating dynamic

Skills, qualifications and occupations names are in fact signs that provide interoperability for the construction of our everyday reality. We use their names as an index for our subjective meanings.

To provide a basis for intersubjectivity we need **conceptual frameworks**, **measurement tools** and **benchmarks**.

Dealing with skills, qualifications and occupations

- ✓EQF and NQFs provide a conceptual framework for increasing transparency and comparability of qualifications

- ✓OECD's PISA and PIAAC provide a set of definitions, measurement tools and allow for comparions of a relatively narrow set of key skills levels
  - ✓Students skills – PISA
  - ✓Survey of adults skills – PIAAC

- ✓International classifications and well estabilished standards can be used as benchmarks for comparisons

Comparisons of conceptualizations of skills, competences and occupations

’(…) one-dimensional frameworks of competence are inadequate and are giving way to multi-dimensional frameworks. Functional and cognitive competences are increasing being added to the behavioural competencies in the USA, while in the UK cognitive and behavioural competences are being added to the occupational functional competence model. France, Germany and Austria, entering the arena more recently, appear to be adopting from the outset a more holistic framework, considering knowledge, skills and behaviours as dimensions of competence, as have most of the other countries that have adopted competence-based vocational training.’
(Le Deist, Winterton, 2005, p. 39)

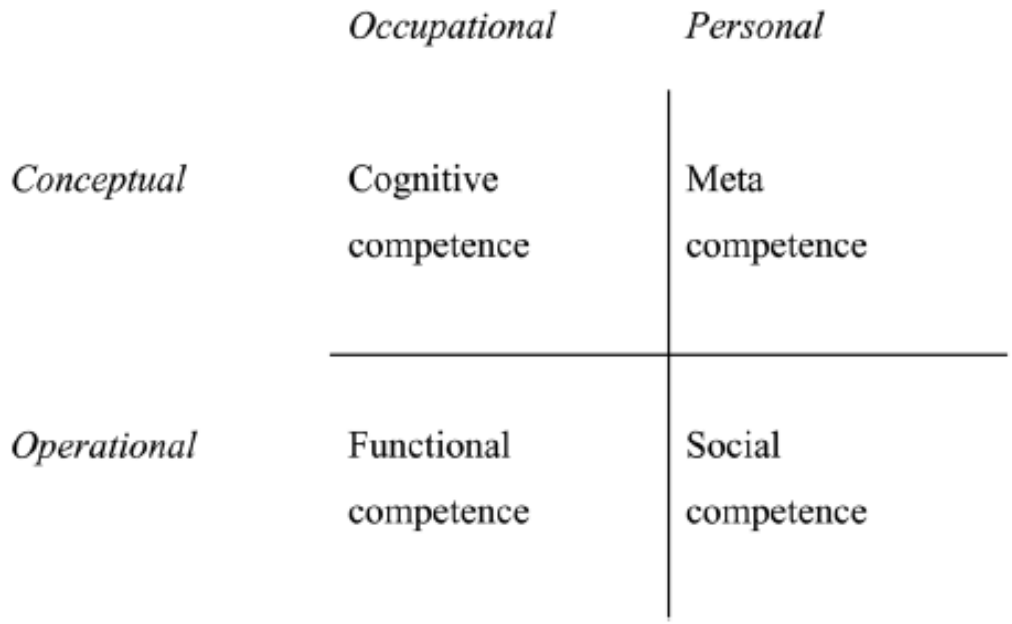


Figure 1. Typology of competence.

Le Deist, F. D., & Winterton, J. (2005). What is competence? *Human resource development international*, *8*(1), 27–46.

Brockmann, M., Clarke, L., & Winch, C. (2008). Knowledge, skills, competence: European divergences in vocational education and training (VET)—the English, German and Dutch cases. Oxford Review of Education, 34(5), 547–567.

Comparisons of conceptualizations of skills

Table 1 General versus specific skills: Alternative meanings

	General	Specific
Anglo-American labor market regime	Unskilled	Craft
German vocational training regime	Low and uncertified *Ungelernt*	High and occupational *Facharbeiter*
Human capital theory	Portable	Not portable
Asset theory	High and broad: professional	Low and narrow: occupational
Class theory	Low and easy to replace	High and difficult to replace

Table 2 General versus specific: Substantive versus economic

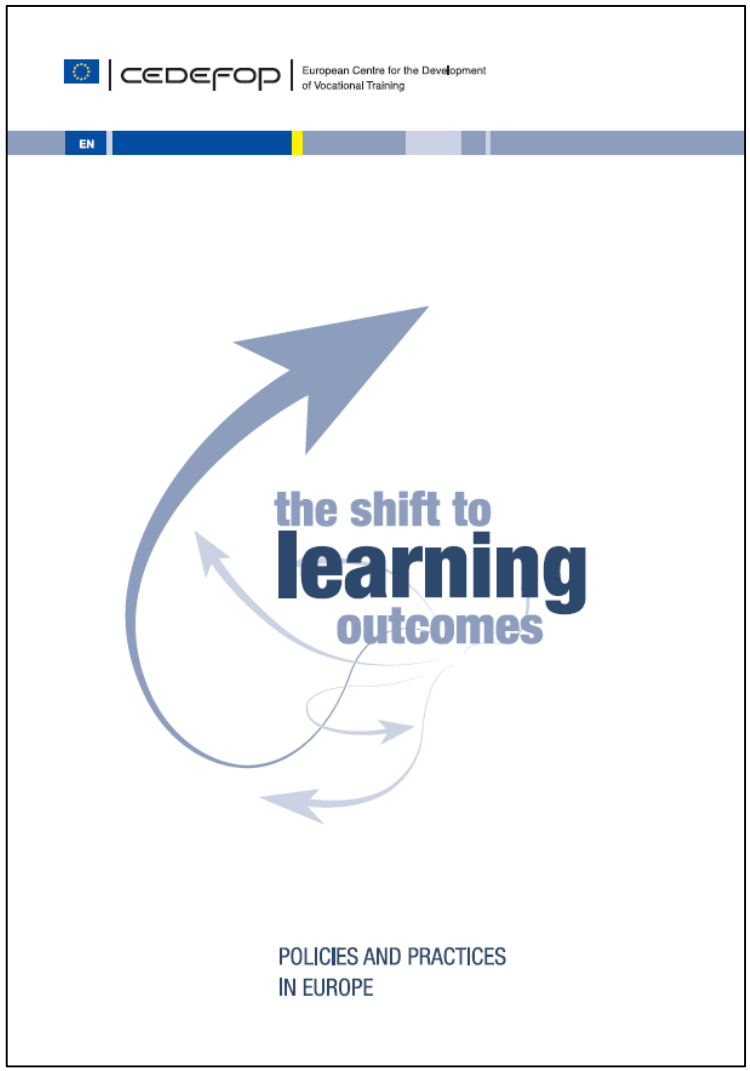
		Economic definition	
		General = portable	Specific = not portable
Substantive definition	General = broad	Mathematics *Office cleaning*	Astrophysics *Car assembly (Japan)*
	Specific = narrow	Brain surgery *Central defense*	Byzantine history *Car assembly (U.S.)*

High (academic, professional)
Low (non-academic, occupational)

Streeck, W. (2011). Skills and Politics: General and Specific (SSRN Scholarly Paper Nr ID 1781042).

Relevance of the shift to learning outcomes

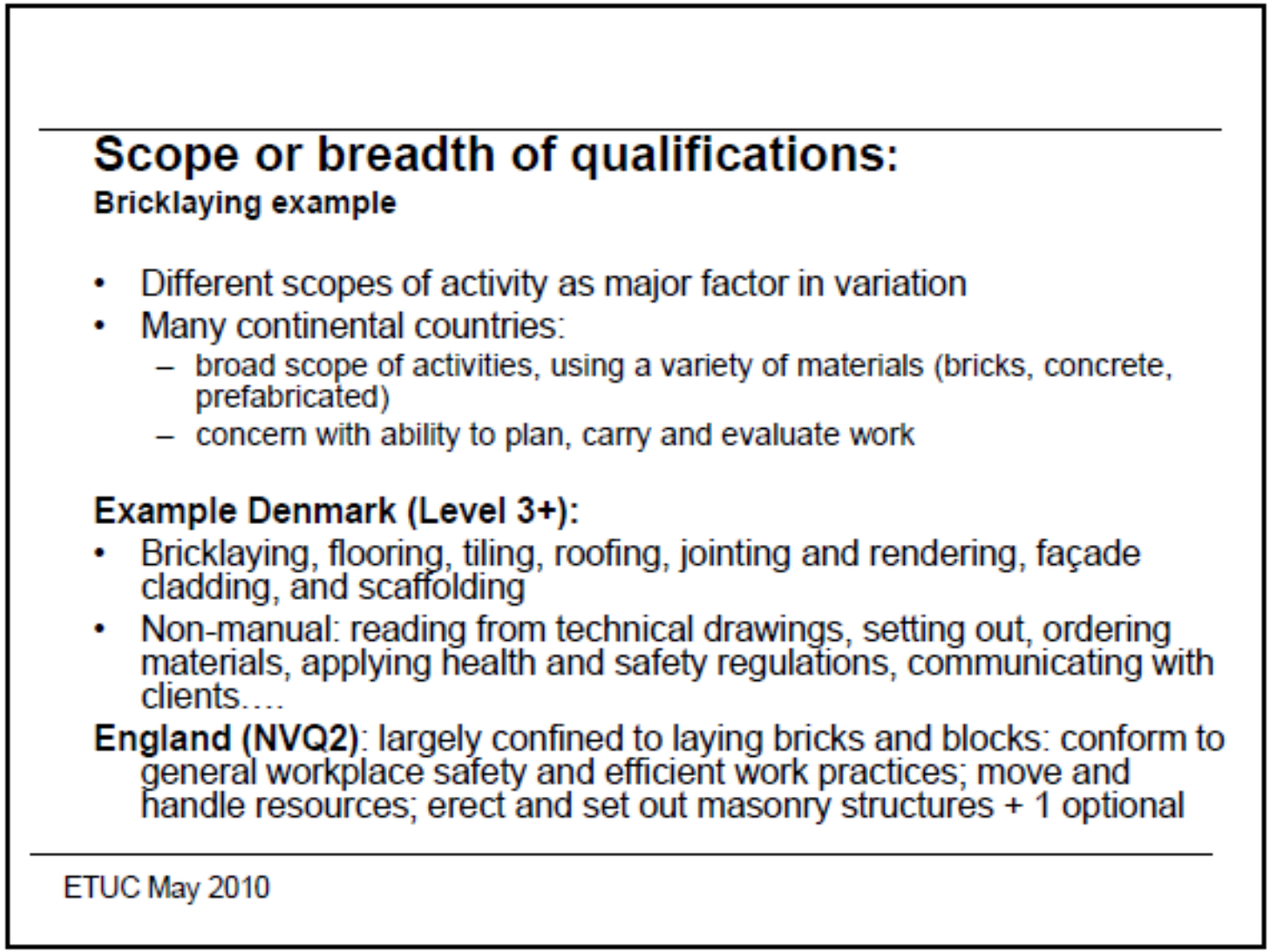
‘One of the key virtues of focusing on knowledge, skills and competences, is that these relate to learning outcomes or outputs, irrespective of the routes of acquisition involved, rather than on learning inputs’
(Winterton et al. 2006, p. 5)



Winterton, J., Le Deist, F. D., & Stringfellow, E. (2006). *Typology of knowledge, skills and competences. Clarification of the concept and prototype* [Cedefop Panorama series]. Luxembourg: Office for Official Publications of the European Community: Cedefop.

Cedefop. (2009). Shift to Learning Outcomes - Policies and Practices in Europe. Luxembourg: Publications Office of the European Union.

Bricklayer: Comparison of occupations content (2008-2010)



Scope or breadth of qualifications:

Bricklaying example

- Different scopes of activity as major factor in variation
- Many continental countries:
  - broad scope of activities, using a variety of materials (bricks, concrete, prefabricated)
  - concern with ability to plan, carry and evaluate work

Example Denmark (Level 3+):

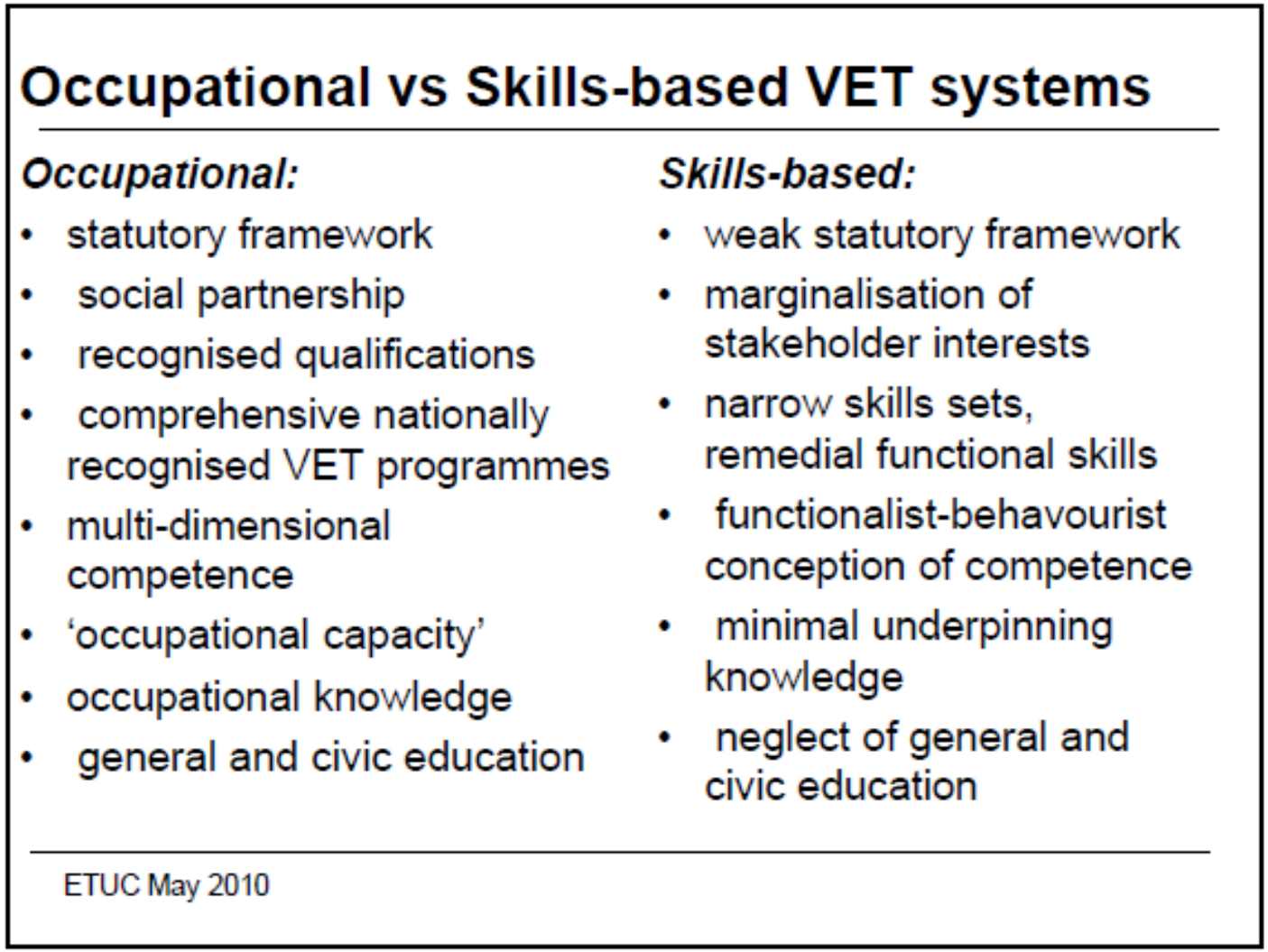
- Bricklaying, flooring, tiling, roofing, jointing and rendering, façade cladding, and scaffolding
- Non-manual: reading from technical drawings, setting out, ordering materials, applying health and safety regulations, communicating with clients….

England (NVQ2): largely confined to laying bricks and blocks: conform to general workplace safety and efficient work practices; move and handle resources; erect and set out masonry structures + 1 optional

ETUC May 2010

Source: „The EQF and apprenticeship: the case of bricklaying".Linda Clarke, presentation on ETUC Working Group on 'Lifelong Learning',10th May 2010

Bricklayer: Comparison of contents… and more



Source: „The EQF and apprenticeship: the case of bricklaying", Linda Clarke, presentation on ETUC Working Group on 'Lifelong Learning',10th May 2010

Benchmarks development – selected ECVET projects

- ✓Automobile maintenance - **ASSET**
- ✓Chemical industry - **CREDCHEM**
- ✓Tourism and catering sector **M.O.T.O.**
- ✓Master in craft qualifications **SME-Master Plus**
- ✓Foreign trade – **TRIFT**
- ✓Care and social workers – **I CARE**
- ✓…

http://www.ecvet-toolkit.eu/; http://ecvet-projects.eu/

Benchmarks development – ECVET projects (example)

Name of the Unit:	**Vehicle stability management systems**	
Reference to the qualification:	**Car mechanic**	
Area of work tasks: **VEHICLE STABILITY MANAGEMENT SYSTEMS**	EQF-level: 3	National level: 3

Description of the Unit: < brief overview of the steps, required to fulfil the task>

Knowledge	Skills	Competence
He/she knows: • Wheel anti- lock brake systems: ○ Theory of operation – integrated system, additional system ○ Study of circuits – electrical circuit, hydraulic circuit ○ Strategy of the logic controller ○ Diagnostic, maintenance and servicing • Stability and control systems: ○ Theory of operation ○ The electric circuits ○ The hydraulic circuits ○ Sensors ○ Diagnostic, maintenance and servicing	He/she is able to: • Identify the elements constituting the wheel anti- lock brake system and stability control • Establish a diagnostic procedure taking part into account the possible interactions between the periepetal systems • Apply testing procedure, • Choose the nature of action to be taken • Repair/replace the components of vehicle stability management systems	He/she is able to: • Diagnose and repair the vehicle stability management system independently and responsibly ○ Identify with precision the symptoms of the fault ○ Select the hypotheses of the fault depending on the symptoms ○ Test the system ○ Validate the malfunction and choose the ○ appropriate action to be done ○ Respect the methods and schedule • Organise the work respecting health and safety rules independently and responsibly

Additional information:
<describe the reference to syllabi or general training plans of the basic vocational education the work placement should fit in>

Developed by: SIA "IMA AUTOSERVISS"

http://www.ecvet-toolkit.eu/

Benchmarks development – ECVET projects (example)

Competence Matrix „Electronics/Electrical Engineering“

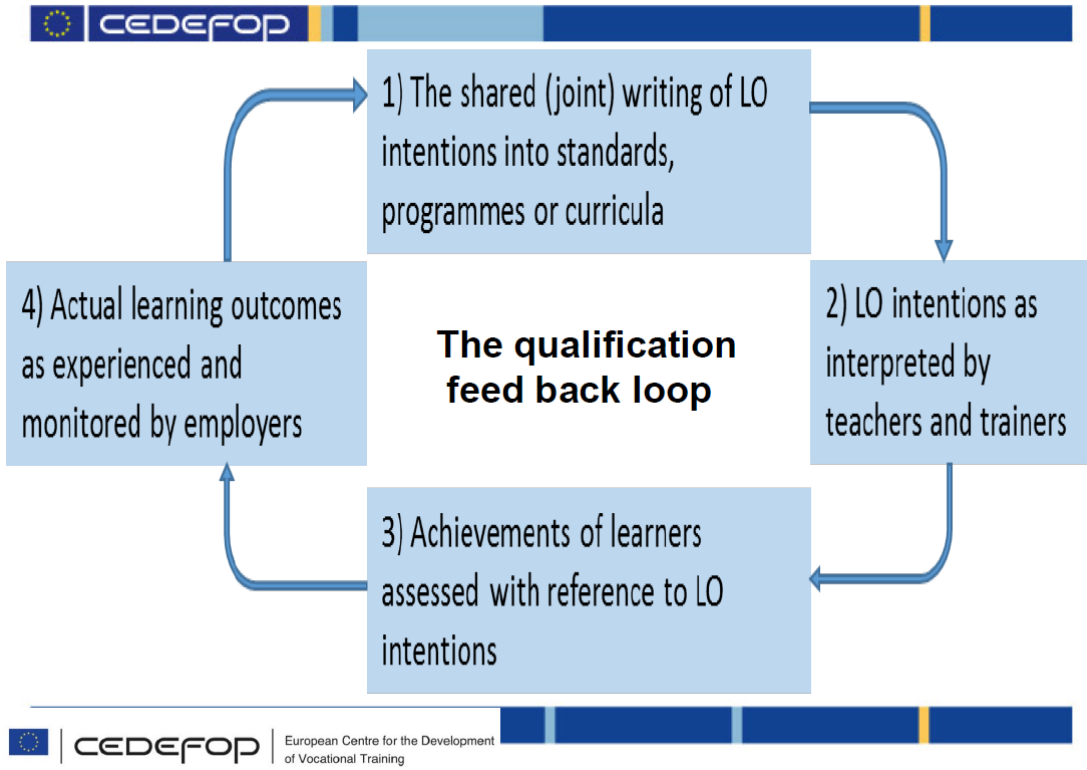
www.VocationalQualification.net

Competence areas (core work tasks)	Steps of competence development			
1. Preparing, planning, mounting and installing electrical and/or electronic systems for buildings and industrial applications	He/She can prepare and carry out simple electrical and/or electronic installations (e.g., cables, electrical outlets, connection and distribution systems, modular electronic components, computer components) as well as carry out and check the necessary wirings and mountings.	He/She can plan, prepare and connect electrical and modular electronic installations (e.g., energy supply in private and business premises, incl. lighting; alternating and three-phase current; electronic systems as units, wireless LAN, multimedia systems). He/She can advice the costumer and select the best implementation according to customer specifications.	He/She can plan complex electrical and/or electronically networked installations (e.g., systems of energy distribution, building management systems / KNX, regulation and monitoring systems, building access systems, RFID-systems) and fully wire them. He/She can configure, service and diagnose the functionality of the installation according to customer requirements and for this purpose can use computer-assisted tools.	
2. Inspecting, maintaining and servicing electrical and/or electronic systems and machinery	He/She can carry out basic and scheduled maintenance tasks, inspections and checks at electrical and/or electronic equipment according to maintenance schedules and predefined instructions (e.g., checking voltage tolerances, changing wearing parts in industrial plants, switching and control systems, electrical machinery, computer systems). He/She can use the measuring and testing tools necessary for it.	He/She can carry out and document preventative maintenance and alignment tasks at electrical and/or electronic industrial appliances and systems according to established quality assurance methods (e.g., continuous monitoring of a CNC machine tool)	He/She can analyse and determine availability and condition of electrical and/or electronic systems. He/She can analyse influencing factors on reliability and performance of electrical and/ or electronic systems and find causes of malfunctions (e.g., leakage current analysis, power factor correction, EMC analysis).	He/She can develop and document maintenance and inspection methods for electrical/electronic systems based on production and service process analysis as well as on quality management and customer requirements. He/She is able to develop related maintenance, inspection and quality assurance plans (e.g., optimizing MTBF of a production line, planning reserve power supply).
3. Setting up, putting into operation and adjusting electrical and/or electronic systems	He/She can set up, adjust and put into operation electrical and/or electronic systems (e.g., allocating frequency channels for a TV set, basic settings of a frequency converter or a thermo relay for a motor) following customer requirements and instructions from the technical documentation.	He/She can obtain and set system test parameters for setting up and operating electrical and/or electronic systems and select and carry out test procedures for installation and adjustment (e.g., adjusting interfaces in multimedia system, sensitivity setting of alarm equipment, elevator control unit).	He/She can select, set up and adjust electrical and/ or electronic systems and their control including accompanying sensors and actuators according to requirement analysis (e.g., energy supply systems, drive systems, electrical machinery, radio relay systems).	
4. Designing, modifying	He/She can modify, plan and build up simple electrical and/	He/She can modify, plan and build up standard electrical and/or	He/She can design, build up and improve electrical and/or electronic	He/She can design, build up and configure devices,

http://www.ecvet-toolkit.eu/

The use of learning outcomes to support labour market dialogue (2016 – 2017)

- ✓The feed-back loop is only partly completed in the 10 countries covered
- ✓The feed-back from employers/labour market to the education and training system (step 4 in the loop) is not systematically developed
- ✓This influences directly the relevance and quality of qualifications



Source: „Comparing the content of qualifications across borders; the strengths and limitations of the learning outcomes approach", Jens Bjørnåvold, presentation on Cedefop conference „Comparing VET qualifications" (28-29 November 2019).

The use of learning outcomes to support labour market dialogue (2016 – 2017)

- ✓The success of learning outcomes in supporting the feed-back loop depends on alignment between learning outcomes written for
  - ✓Qualification standards;
  - ✓Curricula;
  - ✓Teaching and training;
  - ✓Assessment
  - ✓Occupation standards

- ✓Learning outcomes must allow for a shared dialogue between the education and training supply side and the labour market demand side

Source: „Comparing the content of qualifications across borders; the strengths and limitations of the learning outcomes approach", Jens Bjørnåvold, presentation on Cedefop conference „Comparing VET qualifications" (28-29 November 2019).

Joint CEDEFOP, UNESCO & ETF research

✓4 VET qualifications were compared in 26 countries worldwide

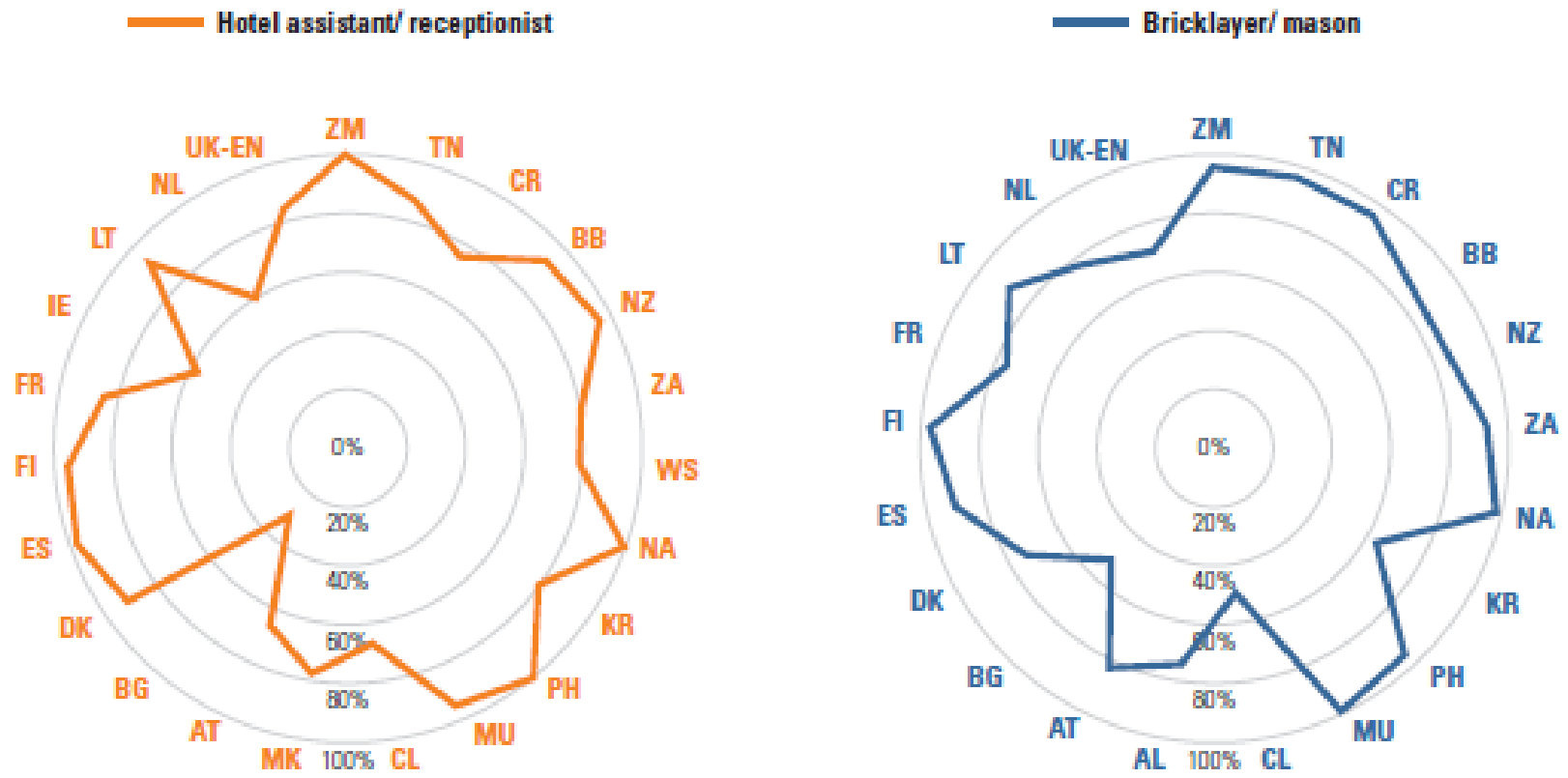
Table 7-7. Orientation of qualifications: overview per qualification profile and country

TYPE	SKILLED WORKER	TOTAL	SEMI-SKILLED WORKER	TOTAL
Bricklayer/mason	AL, AT, BB, BG, CL, CR, DK, ES, FI, FR, LT, MU, NL, PH, TN, UK-EN, ZA, ZM	18	NZ, KR	2
Healthcare assistant	AT, BG, CR, DK, ES, FI, FR, LT, MU, NL, PH	11	BB, NZ, ZA, IE, KR, UK-EN	6
Hotel assistant/ receptionist	AL, AT, BB, BG, CL, CR, DK, ES, FI, FR, LT, MU, NL, NZ, PH, TN, UK-EN, WS, ZA, ZM	20	IE, KR, NA	3
ICT service technician	AL, AT, BB, BG, CR, DK, ES FI, FR, KR, LT, NL, PH, UAE, ZM, ZA	16	IE, MU, NZ, UK-EN	4
Total		**65**		**15**

Bjørnåvold, J., & Chakroun, B. (2017). Learning outcomes in comparing VET qualification profiles: a global approach. W *Global inventory of regional and national qualications frameworks 2017. Volume I: Thematic chapters* (s. 95–112). Hamburg: UNESCO Institute for Lifelong Learning.

Joint CEDEFOP, UNESCO & ETF research

Figure 7-3. Match of national qualifications profiles to ESCO (combining occupation-specific and transversal skills and competences)



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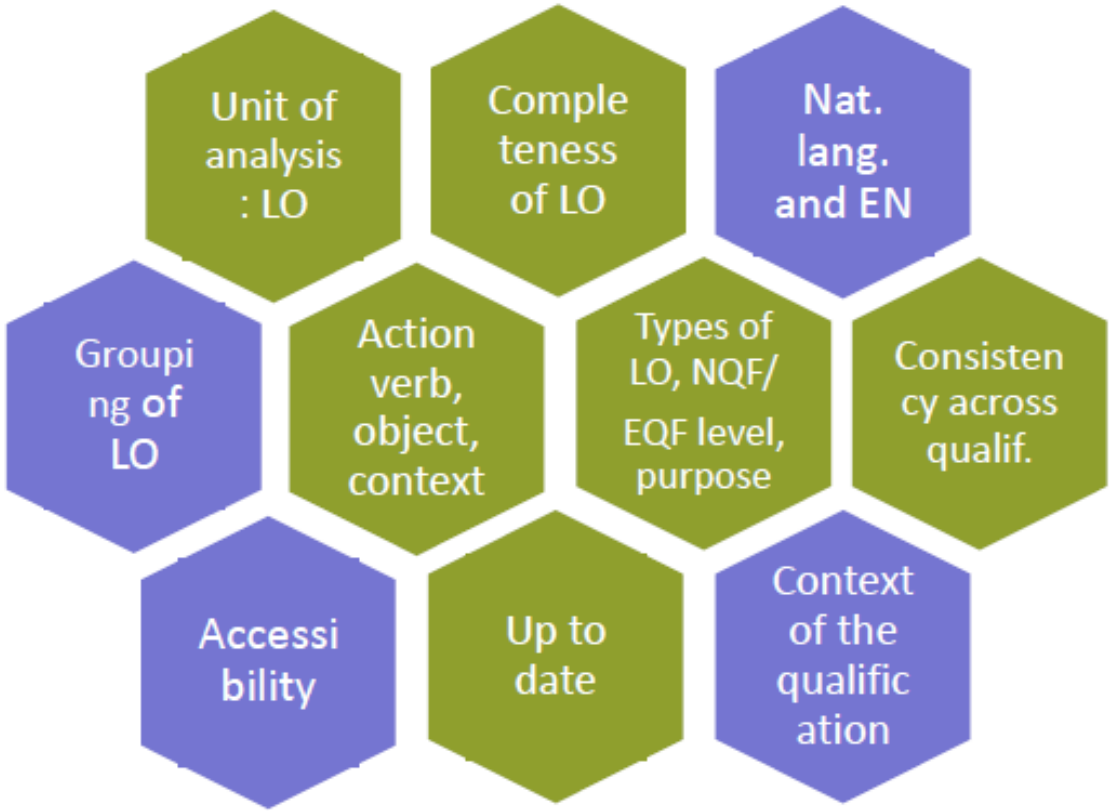
‘Comparing VET-qualifications – towards a European methodology’ (2018-2020)

- ✓On going work…
- ✓The study aims at developing a comparative methodology using fixed reference points, four were considered:
  - ✓O*NET
  - ✓ESCO
  - ✓WorldSkills Standards Specifications
  - ✓VQTS Competence Matrices
- ✓Addresses the Learning Outcomes feedback loop
  - ✓Asks what can vacancy texts say about learning outcomes linked to qualifications?
  - ✓Graduate surveys and employers satisfaction surveys
- ✓And…

‘Comparing VET-qualifications – towards a European methodology’ (2018-2020)

- ✓Approaches the issue of suitability of data sources for (automated) comparisons of qualifications



Source: „Key question 2: Do we have the data for comparison; and where can we find them? Key findings from work assignment 2 of Cedefop’s Comparing VET qualifications project”, Monika Auzinger, Karin Luomi-Messerer, presentation on Cedefop conference „Comparing VET qualifications” (28-29 November 2019)

‘Comparing VET-qualifications – towards a European methodology’ (2018-2020)

Selected challenges:

- ✓Estabilishing national reference documents (often more than one per qualification) and hierarchy between them
- ✓How to compare qualifications with optional parts?
- ✓Varying lenght and level of granularity of learning outcomes
- ✓None of the main documents in countries analyzed were availible in English
- ✓Grouping / structure of learning outcomes varies greatly across countries
- ✓LO descriptions often stored in PDF files

Source: „Key question 2: Do we have the data for comparison; and where can we find them? Key findings from work assignment 2 of Cedefop’s Comparing VET qualifications project”, Monika Auzinger, Karin Luomi-Messerer, presentation on Cedefop conference „Comparing VET qualifications” (28-29 November 2019)

‘Comparing VET-qualifications – towards a European methodology’ (2018-2020)

Availability of qualifications databases?

Country	Database	LO of IVET qualifications displayed
Bulgaria	Portal on education and training opportunities in secondary and tertiary education and lifelong learning in Bulgaria	No
Denmark	Education Guide	No
Spain	TodoFP	Yes: short summary and full description (PDF)
France	RNCP	Yes: summary & comprehensive descriptions
Ireland	QQI qualifications database	Yes: short summary (PDF) & full descriptions (PDF)
Lithuania	AIKOS	Yes: short summary
Nether-lands	Vocational Education Qualifications (*Kwalificaties mbo*)	Yes: full descriptions (PDF)
Austria	NQF Register	Only for examples of IVET qualifications: short summary
Finland (1)	eRequiremets (*ePerusteet*)	Yes: short summary & full descriptions (PDF)
UK-England	Register of regulated qualifications	No

3s

Ockham IPS

Source: „Key question 2: Do we have the data for comparison; and where can we find them? Key findings from work assignment 2 of Cedefop’s Comparing VET qualifications project”, Monika Auzinger, Karin Luomi-Messerer, presentation on Cedefop conference „Comparing VET qualifications” (28-29 November 2019)

Skills in labour market perspective

- ✓Skills in online job vacancies and the tool for vacancy analysis OVATE
- ✓European skills and jobs (ESJ) survey

* Interesting work carried out by ETF with partner countries on automation and knowledge extraction from OJV (see materials)

A few final thoughts

- ✓National challenges related to comparisons of qualifications match the ones encountered in international comparisons
- ✓How to empirically derive and structure skills for the feedback?
- ✓Ontology and/or ontologies seem to be the way forward?

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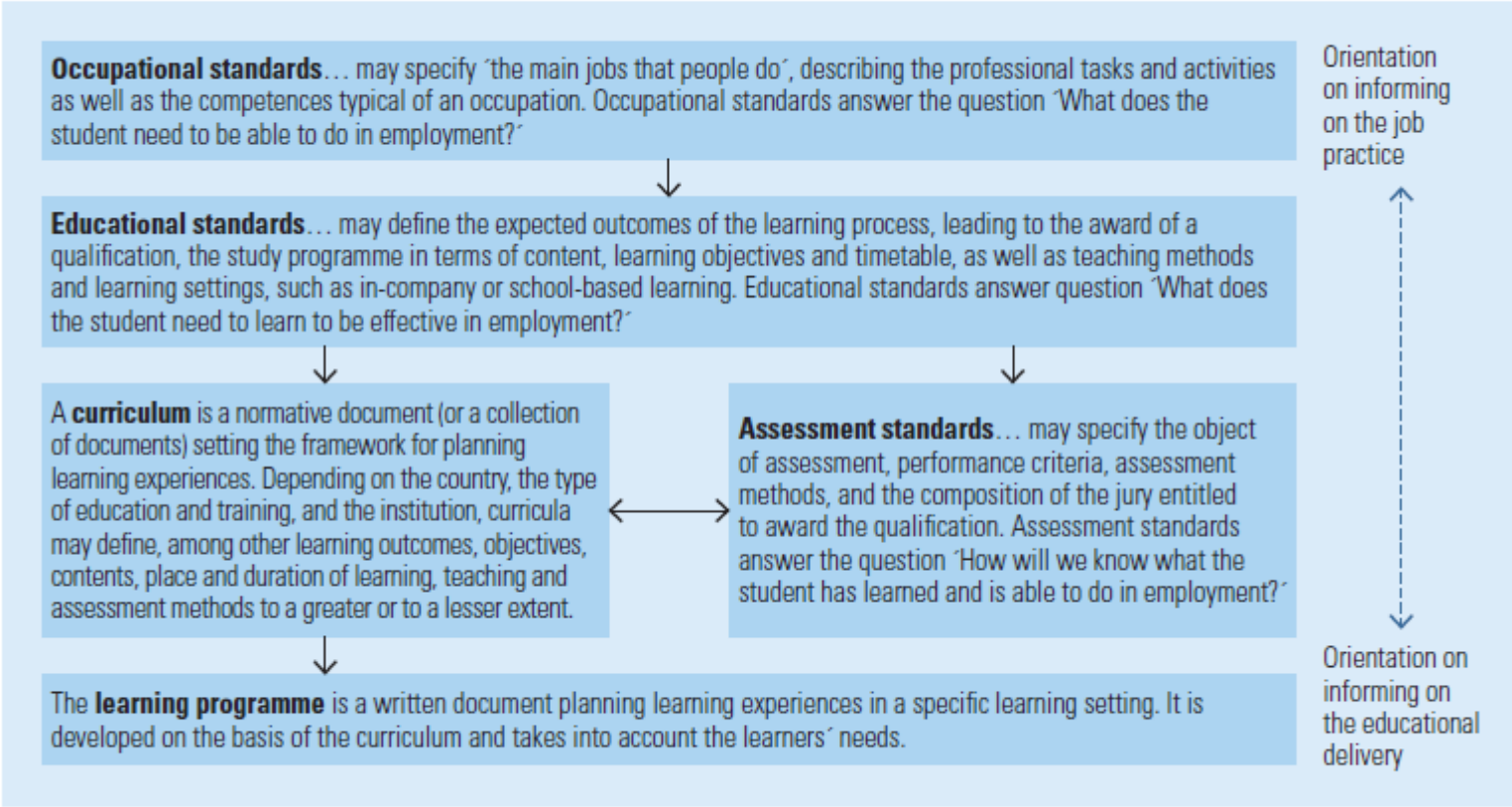
Sources of information about learning outcomes

Figure 7-1. Documents providing information on learning outcomes



Source: Cedefop, 2017.