A Competence Framework for the Textile Care Sector

A proposal for vocational training for low-skilled workers in the textile care sector

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Marcus Flachmeyer

Preface

Many thanks to Udo, without whom this project would never have come about. Full of ideas and energy, he managed, as he so often did, to inspire and convince other people ... and give them a lot of work to do!

Many thanks to the many staff members of the project partner organisations of the Erasmus+ project "Educate! E-Learning for the Textile Care Sector", who not only implemented the research on site, but also repeatedly provided an authentic insight into the country-specific conditions beyond the literature and material.

And finally, many thanks to all the project partner organisations which, in addition to the European Union with the Erasmus+ funding programme, made this project and thus also this product possible through their financial contribution. These were:

European Textile Services Association (Brussels, Belgium)
Federatie van de Belgische Textielverzorging/Federation Belge de l'entretien du textile (Belgium)
Asociace prádelen a čistíren ČR, z. s. (Czech Republic)
Deutscher Textilreinigungs-Verband e.V. (Germany)
Tvätteriförbundets Service AB/ Sveriges Tvätteriförbund (Sweden)
HeurekaNet - Freies Institut für Bildung, Forschung und Innovation e.V. (Germany)

Many thanks.

Content

(0)   Introduction

Getting an insight into other education systems, exchanging experiences, sharing approaches and setting out together - all these opportunities are offered by an Erasmus+ project such as "Educate! - E-Learning Modules for the Textile Care Sector" project, in which this brochure was produced. But just as Rome was not built in a day, this path towards a common European education area is far from over, and even more so: there is no end in sight.

Based on this insight, this brochure has become a little more extensive and its intention has also been broader than originally intended. Thus, as intended, a competence framework is provided (section 4 of this brochure), but beyond that, the competence framework is comprehensively contextualised in a European perspective. This enables its further discussion in the textile care sector also beyond the countries involved in the project and the reflexive implementation in vocational education and training in the individual countries of the European Union.

The content of the brochure is divided into four large sections in which the competence framework for the Textile Care Sector (TCS) and its possible uses are developed with consecutively numbered chapters.

Section 1 highlights the context. It first describes the project context and then the broader educational context in which the design and development of our competence framework is embedded. This is followed by a discussion of other sector-specific competence frameworks (including the European e-Competence Framework, DigComp2.1, VQTS) and their development methods, before describing and justifying our holistic approach.

Section 2 reviews the existing relevant sector-specific material. The relevant sector-specific documents from employment and qualification are presented in this section, first from the project partner countries Belgium, Germany and the Czech Republic, then from Switzerland and the UK. In a comparative analysis of the employment and qualification profiles, similarities and differences and - as far as possible - the underlying understanding of education and competences are elaborated against the background of the conceptual discussion in section 1. The section ends with an analysis of the contribution of the documents in terms of their usefulness for a competence framework in textile care.

Section 3 looks ahead. In order for a competence framework in textile care to achieve a certain half-life, it not only needs an optimal depth of definition, but above all its content specifications must meet the requirements of the coming years. These educational requirements arise within the sector itself but are also embedded in macro developments of a technical and non-technical nature. The turn towards the development of transversal cognitive, interpersonal and intrapersonal competences is shown. This section concludes with what the sector experts from the project partner countries see as needs for future learning.

Section 4 presents the Educate! Competence Framework. At the beginning of this section, the pedagogical idea and the educational goals underlying the competence framework are presented and the content structure of the framework is justified. The structural elements of the competence framework are defined. This is followed by a presentation of the three competence pillars, the assigned competence areas, and the competences. The section ends with indications on how the competence framework can be used in curriculum development, lesson planning and the development of validation procedures.

Section A:
Working on a competence framework: Introduction

The Competence Framework in Textile Care is one of six products of the Erasmus+ project "Educate! E-Learning for the Textile Care Sector". This section first describes the project context and then the broader educational context in which the design and development of our competence framework is embedded. This is followed by a discussion of other sector-specific competence frameworks (including the European e-Competence Framework, DigComp2.1, VQTS) and their development methodologies, before describing and justifying our holistic approach.

(1) Project context: the Erasmus+ project "Educate! E-Learning Modules for the Textile Care Sector"

The textile care sector is not in the public spotlight and is obviously not the first choice when it comes to a job or apprenticeship. Thus, the diversity and importance of this sector for the economy and employment is often overlooked. Today, the textile care sector covers a wide range of services, company sizes and customers. The customers are companies, public institutions, hotels, hospitals, elderly care homes as well as private customers that need workwear, private clothing bed linen, carpets or other textiles cleaned or washed regularly. The products range from medical devices (surgical drapes and gowns), PPE clothing (for fire workers or workers in the chemical industry) to clean room clothing for the ICT industry as well as bed linen and hygiene products for hospitals and elderly care homes, for the food, cosmetic or pharmaceutical industry. Most of the companies are SMEs. The sector in Europe represents a of appr. 12 billion EUR.

The business processes in textile care can be described as a mix of manual and automated interactions between customers, employees, and machines. Under the aegis of the fourth industrial revolution this mix will have a significant potential for automation, depending on the company. Manual and automatic processes will be efficiently linked to each other and to the customer's actions through digital workflow solutions. Start-ups like ZipJet with its on-demand business case already provide an insight into the expectations of customers regarding service and process efficiency. It is becoming apparent that the requirements for process understanding, customer orientation and digital and media skills will increase, not to mention the rising environmental standards.

These increasing demands apply to a group of employees whose size varies within the EU, depending on various factors, including consumer lifestyles: for example, around 5,000 employees work in this sector in the Czech Republic, around 70,000 in Germany. These employees are predominantly female, very often low skilled and have a migrant background to varying degrees depending on the EU country. In Sweden, for example, 40% were born abroad, partly in Asia, while in the Czech Republic a similarly high proportion come from Eastern European countries, e.g. Ukraine, Latvia and Romania. Due to their life situation and educational biography these employees do not have an adequate access to vocational education and training.

Against this background, the first talks between HeurekaNet and the TBZ (Textilreiniger-Bildungszentrum Münsterland e.V.), which plays a very active role in further training in textile care throughout Germany, took place as early as 2015. The idea quickly came up that these educational barriers could be overcome with a very flexible, low-threshold online offer. After it became clear bit by bit that this challenge was not limited to Germany, but also arose in other European countries, HeurekaNet and the German Textile Care Association (Deutscher Textilreinigungs-Verband e.V.) took the initiative in 2017 and, together with four other partners, the national textile care associations from Belgium, the Czech Republic and Sweden, as well as the European

sector association, submitted an application for funding for a strategic partnership in vocational education and training in the Erasmus+ programme in spring 2018. This transnational approach makes it possible to join forces in a sector that receives little attention not only from the public but also from vocational training systems. Faced with similar challenges, it made sense to pool the few resources available and find answers in a transnational, European context.

The application was approved so that the three-year Erasmus+ project "Educate! E-Learning for the Textile Care Sector" (2018-1-DE02-KA202-005227) could start on 1 September 2018.

The partnership is made up of the following six organisations:

- HeurekaNet - Freies Institut für Bildung, Forschung und Innovation e.V. (Germany; Project coordinator)
- European Textile Services Association (Based in Belgium)
- Federatie van de Belgische Textielverzorging/Federation Belge de l'entretien du textile (Belgium)
- Asociace prádelen a čistíren ČR, z. s. (Czech Republic)
- Deutscher Textilreinigungs-Verband e.V. (Germany)
- Tvätteriförbundets Service AB/ Sveriges Tvätteriförbund (Sweden).

The aim of this project is the development of OER digital learning materials as e-learning modules, e-tutorials, and a learning platform. The work is carried out in six intellectual outputs so that at the end of the project in August 2021 an innovative learning offer for low-skilled employees in the textile care sector will be available, named "E-Washboard" with the URL e-washboard.eu. This platform will offer up to 20 e-learning modules, each in Czech, English, German, French, and Dutch. This product opens the door to vocational training for the target group, it strengthens the employees' reflexivity and self-confidence, encourages new forms of learning and at the same time promotes media and media literacy. As a work-based learning approach, it is also perfect for use in in-company training.

With a view to the functionality and sustainability of the e-washboard platform, further products are being developed in the project. This is an e-learning course for the training of e-moderators/e-tutors, to be able to accompany the participants professionally if necessary. Of course, the administrative side of the learning platform is also important, which is realised in this project with Moodle. To prepare for this task, an admin course is being developed. To give orientation to the development of modules in terms of content, a proposal for a sector-specific competence framework is being made, which is done with this brochure. Supported and framed in this way, the development of the "E-Washboard" platform with its e-learning modules for low-skilled workers in textile care can continue to progress even after the end of the project.

References and further reading

HeurekaNet - Freies Institut für Bildung, Forschung und Innovation e.V. (Germany; Project coordinator)
https://www.heurekanet.de/

European Textile Services Association (Based in Belgium)
https://www.textile-services.eu/

Federatie van de Belgische Textielverzorging/Federation Belge de l'entretien du textile (Belgium)
https://www.fbt-online.be/

Asociace prádelen a čistíren ČR, z. s. (Czech Republic)
https://apac.cz/

Deutscher Textilreinigungs-Verband e.V. (Germany)
https://www.dtv-deutschland.org/

Tvätteriförbundets Service AB/ Sveriges Tvätteriförbund (Sweden)
https://tvatteriforbundet.se/.

(2)   Competence: approaching a "fuzzy concept"

In developing a proposal for a competence framework in textile care in this European project, it must be recognised that both the notion of competence framework and - fundamentally - the notion of competence is not as clear and unambiguous as they may appear in everyday vocational education usage. The opposite is the case, as became clear, for example, in the development and implementation of the European Qualifications Framework, where the different understandings of competence and education clashed. Since the 1990s, the term and concept of competence have been regarded as confused and debated (cf. Winterton et al., 2006). Van der Klink and Boon (2003) referred to competence as a "fuzzy concept", but nevertheless recognised competence as a "useful concept" that bridges the gap between education and professional requirements.

Before discussing the meanings of terms and concepts, however, the obvious should first be briefly mentioned. The noun competence is used on two levels of meaning, generalised and specific. For example, an assessment can determine sufficient competence to act in a certain occupation (generalised: "He has the required professional competence to act"), but at the same time outstanding competence in a single task (specific: "He irons excellently"). In both cases, competence is used in the singular, in the one case as a result of a multitude of individual competences, in the other case to refer to a single competence.

Another linguistic feature that is irritating, at least for readers who do not come from an English-speaking culture, before any discussion of terms and concepts, is the variety of English words. While in German the singular form "Kompetenz" and the plural form "Kompetenzen" are common, in English and American two singular forms, "competence" and "competency", and two plural forms "competences" and "competencies" are used. According to the Oxford Dictionary or Miriam-Webster, "competences" is the plural of "competence" and "competencies" is the plural of "competency", but in fact "competencies" is also used in conjunction with "competence" in the literature. In academic discourse, there is also no clear pattern to the use of "competence" and "competency", as Le Deist and Winterton (2005) show.

Once these linguistic irritations have been overcome, it becomes clear what an enormous spectrum of concepts is associated with the term "competence". In a literature review for the OECD's DeSeCo project, Weinert (2001) identified nine different academic approaches to the term "competence" and presented them in his report. He lists competence as: general cognitive competencies; specialized cognitive competencies; the competence-performance model; modifications of the competence-performance model; cognitive competencies and motivational action tendencies; objective and subjective competence concepts; action competence; key competencies; metacompetencies. However, he sees something common in all these approaches:

"Restricting our focus to the use of the term competence in philosophy, psychology, linguistics, sociology, political science, and economics still yields a wide variety of definitions. Nonetheless, in all of these disciplines, competence is interpreted as a roughly specialized system of abilities, proficiencies, or skills that are necessary or sufficient to reach a specific goal. This can be applied to individual dispositions or to the distribution of such dispositions within a social group or an institution (e.g., a firm)." (Weinert. 2001, p. 45).

With the development of a competence framework, we are moving within vocational education and training and vocational pedagogy, relevant are also labour sciences and qualification research. With the development of a competence framework, we refer to both the system of vocational education and training and the discipline of vocational pedagogy. They react to their environment, i.e. to the demands of the economy, society and state, but at the same time they have their own discussions, their own beliefs and their own traditions. This is also reflected in the reception of the concept of competence, which will be briefly presented in its diversity in the following sections, using the in Great Britain, France, and Germany dominating concepts as examples. First, however, the ideas associated with the concept of competence in the United States will be discussed.

In the literature, White (1959) is credited with introducing the term "competence" into the psychological discussion. In its very basic understanding, competence refers to the ability of an organism to interact effectively with its environment (p. 297). White asked what drives humans (and other highly evolved mammals) to acquire this ability, in part slowly, through lengthy learning processes. Given the purposefulness and persistence of the behaviour that leads to these learning achievements, he believes that the motivation required to achieve competence cannot be derived entirely from energy sources conceptualised as drives or instincts, as Hull did in his drive reduction theory and Freud did with his psychoanalytic theory. Following on from Piaget's studies in developmental psychology and epistemology on children's play, among other things, he instead sees in people the basal need to be competent and effective in the world.

McClelland (1973) took up the term "competence" a few years later and used it against the dominant practice of intelligence and aptitude tests in educational institutions and personnel selection. He criticised the socio-political dimension of this practice, which he argued denied certain groups of the population access to social advancement, and he doubted the prognostic power of these tests for job and life success. He suggested instead tests that assess competencies in relation to different areas of life. Some of these competencies, McClelland said, "may be more traditional cognitive skills such as reading, writing and arithmetic. Others should be what are traditionally called personality variables, although they might better be called competencies." (p. 10). He then gives as examples (a) Communication skills, (b) Patience, (c) Moderate goal setting, and (d) Ego development, competencies that we would classify as social, personal, and methodological competencies. Subsequently, the assessment of competencies as an alternative to intelligence and aptitude tests was further developed by McClelland (1998) and others, whereby competencies in this approach are not stable characteristics but behaviour-oriented and can be acquired through learning.

Thus, competences as learnable constructs are interesting for persons and institutions in whose domain the planning and modelling of teaching/learning processes fall, e.g. for institutions of vocational training, but also for company human resource management. In the USA and the UK in particular, comprehensive competence frameworks have been developed, embedded in the corporate strategy, which are intended to ensure the necessary human resources through personnel selection, personnel assessment, and personnel development. A competence framework is usually seen as a mechanism for linking human resource development to business strategy: "a descriptive tool that identifies the skills, knowledge, personal characteristics, and behaviours needed to effectively perform a role in the organisation and help the business meet its strategic objectives" (Lucia & Lepsinger, 1999, p. 5). Such company- or organisation-specific competence frameworks are being set up even more recently (e.g. OECD, 2014; UNESCO, 2015).

But what kind of competence are we talking about when we talk about the interest of companies or organisations? In the company-related study of competences, Sparrow (1997) identifies three development contexts or models:

"1. management competence (often called the technical/functional approach),

2. behavioural competency (sometimes also called the soft skills approach), and

3. organisational competency (or strategic core competence)." (Sparrow, 2002, p. 110)

All three contexts or models appear in company-/organisation-specific competence frameworks. The first-mentioned model, the model of management competence, has become particularly relevant for the competence discussion beyond HRM.

This model is a task-centred approach and used functional analyses of job roles and responsibilities to analyse expectations of workplace performance. Management educationalists and trainers influenced this perspective and used it to specify occupational standards of performance or expectations of workplace performance. In the UK this formed the initial core of developments in the Management Charter Initiative (MCI) and National Vocational Qualifications (NVQs).

The UK approach to competence

The functional approach originating from the company context was systematically transferred in the UK to the context of initial vocational education and of vocational reintegration of unemployed people. The starting point for the development of occupational standards and National Vocational Qualifications was the Department of Employment's White Paper "A new training initiative" (1981), which announced a very flexible, competence-based, and job-oriented vocational training system to get more people into higher qualifications and better jobs. As a basis for such an approach, new vocational qualifications have been successively created (National Vocational Qualifications, NVQs, in England and Wales; Scottish Vocational Qualifications, SVQs, in Scotland). They are based on a functional analysis of work activities carried out by special agencies together with employers' organisations (and trade unions, where

required) and companies and recorded in occupational standards. Competence is understood as the ability to perform in such a specific work context and fulfilling the standards.

This output-orientated and narrow understanding of competence was consequently promoted and enforced, nevertheless it also caused concerns among advocates of NVQs/SVQs. "In truth, this trend has been apparent in some industries, where the statements of competence set reflect the current, often narrow jobs which people perform. Considerable effort is now being exerted by NCVQ, the Training Agency, the CBI and others advising industry lead bodies, to broaden this concept of competence." (Jessup, 1991, p. 24). In the Beaumont Report, which evaluated the success and implementation problems of NVQs/SVQs in the mid-1990s, the concept of competence was then defined somewhat more broadly: According to this, competence is the "ability to apply knowledge, understanding and skills in performing to the standards required in employment. This includes solving problems and meeting changing demands' (Beaumont, 1995, p. 12).

In view of this self-formulated claim, however, NVQs/SVQs have been widely criticised. Hyland (1994) saw a tendency to train and test defined tasks instead of developing competence in the given sense, Norris (1991) even states a behaviourist version of competence-based education and training in the strategy of the National Council for Vocational Qualifications (NCVQ). Ten years later, Oates (2004) stated: "NVQs appear to have fallen short of their stated aims, which were - after all - extremely ambitious. We should be very alert to the limitations of outcomes-based qualifications and standards - they will do some things but not others" (p. 68).

The French approach to competence

As in the USA and the UK, interest in the concept of competences and competence-based human resource development developed in France, initially within companies, in the face of growing demands on the professional skills of their employees (Cannac & CEGOS, 1985). However, the concept of competence very quickly found its way into public education. In 1991, faced with the closure of mines in eastern France, the French central government introduced the right to a "competence balance", drawn up by independent organisations to provide a basis for personal and professional development outside the original employment relationship. The law of 31 December 1991 states that the "bilan de compétences" should include an analysis of "professional and personal competences, employability and motivation" and lead to the definition of a "vocational plan" and, if necessary, a "training plan". In 1993, the professions already catalogued were specified by the national employment agency (Agence nationale pour l'emploi) with the required competences. From 2001 onwards, the issue of validation of prior learning ("validation des acquis de l'expérience") was on the agenda at national level, and validation was incorporated into French law as a pillar of the French education system in 2002.

What idea of competence is now emerging in this development? The French approach is considered to be more comprehensive than the British approach and "typically seen as a

triptych comprising savoir (compétences théoriques, i.e. knowledge), savoir-faire (compétences pratiques, i.e. functional competences) and savoir-etre (compétences sociales et comportementales, i.e. social or behavioural competences)" (Le Deist, 2009). According to D'Hainaut, a competence is "a set of knowledge (savoir), know-how (savoir-faire) and interpersonal skills (savoir-être) that enable one to perform a role, function or activity appropriately. Appropriately means here that the handling of situations will lead to the result hoped for by the person handling them or to an optimal result. (p. 472) This triad has also been taken up in the "Livret Personnel de Compétences" of general education schools, where competence is described as "a coherent and inseparable set of knowledge (connaissances), capabilities (capacités) and attitudes (attitudes)" (Ministère de l'éducation nationale, 2011).

Brockmann et al. (2008a) summarise a number of characteristics for the French competence model, including the following:

- "The notion of 'competence' is conceptualised in terms of 'capacity' in relation to a broad occupational field rather than in terms of performance of particular skills;
- The description of competences is fairly general and is rarely defined in terms of precise and discrete tasks;
- Individual competences are related to each other and are difficult to dissociate from the overall occupational or job profile; they are integrative rather than cumulative;
- Competences are built up and cannot be merely deduced from the employment context." (p. 235)

The German approach to competence

In Germany, too, the 1990s saw a great deal of interest in the concept of competence in continuing vocational training, human resource development and human resource management. Against the backdrop of the transformation processes and educational challenges of German reunification (e.g. Erpenbeck & Weinberg, 1993), the Federal Ministry of Education and Research commissioned a series of expert reports in 1995 that proactively introduced the concept of competence development into the academic debate. The publication in 1996 also included the memorandum "Von der beruflichen Weiterbildung zur Kompetenzentwicklung" (From continuing vocational training to competence development) (Kuratorium AG QUEM/ABWF, 1996), which was provocative for many. In this new discourse, the self-organisation capacity of people was emphasised; vocational action competence emerges through the integration of cognitive, emotional-motivational, volitive, and social aspects of human action in work situations (p. 19). In the following years, central actors of the ABWF pushed the discourse on the in-company measurement of competences and on competence management and also developed their own approaches such as CODE (e.g. Erpenbeck & Rosenstiel, 2003, 2007).

Beside of this discourse, the use of the term "competence" has its own tradition (and connotation) in the (West) German education system, which was already established in

the 1970s with the pedagogical-anthropological work of Roth (1971). According to him, the goal of educational processes is action competence (Handlungskompetenz), which is given when professional knowledge and skills are paired with responsibility. As an educational goal, he formulates the triad of factual, social, and self-competence; he understands the action competence to be aimed for as a holistic construct. A little later, this holistic approach finds its way into a policy paper of the German Education Council, which understands competence as a person-bound category that includes the individual's ability to act on his or her own responsibility in private, professional, and social situations, both now and in the future (Deutscher Bildungsrat, 1974). Competence understood as action competence is therefore first and foremost a guiding concept for educational programmes. In this sense, the concept of competence in the dominant German educational tradition is input-oriented.

In the course of the reorganisation of the VET system in the second half of the 1990s, the approach of "Handlungskompetenz" (action competence) is introduced in a binding manner, whereby vocational action competence comprises technical competence (Fachkompetenz), social competence (soziale Kompetenz), and personal competence (personale Kompetenz). "Technical competence refers to the willingness and ability to solve tasks in a goal-oriented, appropriate, method-guided and independent manner on the basis of technical knowledge and skills and to assess the result. Social competence includes the willingness and ability to grasp and understand social relationships and interests as well as to deal with and communicate with others in a responsible manner. Finally, personal competence refers to the readiness and ability to reflect on one's own development and to develop it further in connection with individual and social values". (KMK, 1999, p. 4f.)

The term "competence" in the European Qualification Framework (EQF)

In 2005, the European Commission proposes a composite definition of competence based on the study of published literature from France, the United Kingdom, Germany and the United States of America. According to this, competence includes: "i) cognitive competence involving the use of theory and concepts, as well as informal tacit knowledge gained experientially; ii) functional competence (skills or know-how), those things that a person should be able to do when they are functioning in a given area of work, learning or social activity; iii) personal competence involving knowing how to conduct oneself in a specific situation; and iv) ethical competence involving the possession of certain personal and professional values." (p. 11). And it continues: "The concept is thus used in an integrative manner; as an expression of the ability of individuals to combine – in a self-directed way, tacitly or explicitly and in a particular context – the different elements of knowledge and skills they possess." (p. 11).

This multi-dimensional, integrative understanding of competence was also cited in condensed form in the in the annex to the European Qualifications Framework (EQF) adopted by the European Parliament in April 2008. It states: ""competence" means the proven ability to use knowledge, skills and personal, social and/ or methodological abilities, in work or study situations and in professional and personal development." (European Commission, 2008, p. 11). This understanding is partially reflected in the

development of the EQF, which is to be understood as a meta-framework that attempts to create a common reference framework for national training programmes and qualifications with learning outcome-based descriptors at eight levels. Nevertheless, the EQF does not define itself as a competence framework, as it can in principle also be a reference framework for educational programmes that teach knowledge but do not necessarily aim at the development of competences.

Learning outcomes were understood in the EQF as "statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence" (p. 11). As can be seen, in the EQF definition the term "competence" is used as a structural element of the description of learning outcomes, but then with a different meaning: "In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy." (p. 11). Ten years later, this ambiguity has been revised and the term "competence" is no longer intended as a structural element to describe learning outcomes in the EQF. Thus, in the current version of the EQF, learning outcomes are described in terms of "knowledge", "skills" and "responsibility and autonomy" (Council of the European Union, 2017).

Looking on the differences

The different understandings of the concept of competences in Europe on the background of specific traditions and educational systems were the subject of academic literature (including Bohlinger, 2007/2008; Brockmann, 2007; Brockmann at al., 2008a, 2008b; Brockmann et al., 2009; Clarke & Winch, 2004, 2006, 2015; Le Deist et al., 2005; Mehaut & Winch, 2012; Mulder et al., 2006; Winterton et al., 2006), accompanying the EU education policy initiative on a common European Qualifications Framework (EQF). In the process, some differences were worked out that today not only play a role in the education policy discussion and in the implementation of EU education initiatives such as the EQF or the validation of informally and non-formally acquired competences, but are also relevant for transnational, European development projects in VET. "What are we talking about?", "What exactly is meant by this?" and "How can this be related to our understanding?" - these questions can only be answered if the differences are named. The focus is on vocational education and training up to level 4 of the EQF.

Knowledge as a dimension of competence

In the European Qualification Framework (EQF), the term "'knowledge' means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practises that is related to a field of study or work. In the European Qualifications Framework, knowledge is described as theoretical and/or factual" (EC, 2016, p. 16). Factual knowledge starts as a descriptor at level 2, theoretical knowledge at level 4.

From an educational science perspective, according to Krathwohl (2002), the knowledge dimension can be structured more specifically into four categories: (1)

factual knowledge, (2) conceptual knowledge, (3) procedural knowledge, and (4) metacognitive knowledge:

- Factual knowledge are the basic elements needed to be acquainted with a discipline or to solve problems in that discipline. Factual knowledge includes terminology and specific details and elements.
- Conceptual knowledge maps the relationships between basic elements within a larger structure that enable them to function together. Conceptual knowledge extends to classifications and categories, principles and generalisations, and theories, models, and structures.
- Procedural knowledge includes methods of investigation and criteria for the application of skills, algorithms, techniques, and methods. It covers knowledge of subject-specific skills and algorithms, subject-specific techniques and methods, as well as the criteria for determining the right time to use appropriate procedures.
- Metacognitive knowledge includes knowledge about cognition in general as well as awareness and knowledge about one's own cognition. Specifically, it covers strategic knowledge, knowledge about cognitive tasks, including appropriate contextual and conditional knowledge, and self-knowledge.

From the perspective of cognitive psychology and epistemology, a distinction is often made between declarative knowledge (also called descriptive knowledge, propositional knowledge, or constitutive knowledge) and procedural knowledge (also called operational knowledge) (e.g. Anderson, 1976; Burgin, 2016).

- Declarative knowledge is descriptive and use independent. It embodies concepts, principles, ideas, schemas, and theories (Chi & Ohlsson, 2005), it is also called "knowing that" (Ryle, 1949). This category of knowledge or pieces of its can be expressed in a declarative sentence or an indicative statement. In relation to Krathwohl (2002), this knowledge includes the three categories of factual knowledge, conceptual knowledge, and metacognitive knowledge.
- Procedural knowledge, also called "knowing how" (Ryle, 1949), is goal-orientated and use-related. Procedural knowledge is on performing actions, executing operations, and coping with requirements or tasks in an appropriate way. After acquiring, procedural knowledge is mostly implicit.

Although the distinction between declarative and procedural knowledge can be considered well established, their relationship to each other is seen differently. Declarative knowledge can be seen as part of procedural knowledge (Berge and Hezewijk, 1999) or as two different components in a cognitive architecture such as Adaptive Control of Thought-Rational (ACT-R), in which declarative chunks and production rules form a production system (Anderson & Lebiere, 1998; Lovett & Anderson, 2005).

After the facets or categories of knowledge frequently used in the vocational education discussion have been presented, the question can be answered which differences can be found in the various approaches to the competence construct.

If one follows the literature, the concept of competence in VET in France, as in Germany, is associated with a clear proportion of declarative and procedural knowledge. Like the German VET system, the French system has maintained a comprehensive concept of the "profession" based on a broad range of activities. Embedded in this way, a broad knowledge base is imparted, which includes knowledge about the occupation and the sector as well as general educational knowledge, in addition to knowledge about the activities at the workplace. Brockmann (2008b), referring to this conceptualisation of VET in Germany, speaks of a knowledge-based approach (p. 550).

In contrast, the importance of knowledge, especially declarative knowledge and here in particular general knowledge in vocational education and training and in the prevailing understanding of competences in England and Wales is consistently assessed in the literature as comparatively low (e.g. Green, 1998). Some authors contextualise this low importance of knowledge with the highly influential work of philosophers Ryle (1949) and Oakeshott (1962), who emphasise the value of practical experience and knowledge acquired in practice over any teaching of technical knowledge or theory (e.g. Clarke & Winch, 2004). Brockmann (2008b), referring to this conceptualisation of VET in England, speaks of a skilled-based approach (p. 550).

Skills as a dimension of competence

In the European Qualification Framework (EQF), the term "'skills' means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the European Qualifications Framework, skills are described as cognitive (use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments)" (EC, 2008, p. 11).

The "notion of 'skills' epitomises the Anglo-Saxon approach" (Brockmann et al, 2008b, p. 551). These authors make a connection with Ryle (1949), in whose conception it is possible to learn an activity without ever learning the rules at all and more often than not *how* is learned by practice, unaided by theory (Ryle, 1949, p. 41). The concept of competence, as it is used in the English NVQs, is one-dimensionally filled with narrowly defined skills. According to Clarke and Winch (2006) the "Anglo-Saxon notion of skill is used in a similar way to 'know-how' and 'technique'. Here a worker with 'skill' is understood to possess know-how appropriate to the task in hand and may or may not possess a 'qualification' certifying possession. 'Possession' is therefore in this sense equated with a property, in the nineteenth-century sense of 'property in skill'." (p. 258). "The notion that skills can be measured in terms of the practical performance of a task is at the heart of the National Vocational Qualification (NVQ) system in England" (Brockmann et al, 2008b, p. 551).

Clarke and Winch (2006) state that there is "no German equivalent to the Anglo-Saxon concept of skill." (p. 263). Skills in the sense of *Fähigkeiten* and *Fertigkeiten* contribute to a comprehensive professional action competence, which is not only formed from several competence dimensions (see above) but is also comparatively broad and deep in its technical dimension. In a comparative study of the construction industry and bricklaying, Clarke et al. (2013) show how this breadth and depth affects the status on the labour market and the opportunities for advancement in the course of a career.

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(3)   Looking around: other (sector-specific) competence frameworks

Before developing the competence framework for the textile care sector, it is instructive to look around the field of other European projects with a similar subject. Learning from others - this also always applies to one's own development work. In this chapter, three (sector-specific) competence frameworks will be presented: the Digital Competence Framework for Citizens (DigComp 2.1), the European e-Competence Framework, and the VQTS model. This presentation gives not a complete and deep look at the specific competence frameworks - the original literature is recommended for this - but elaborates rather the structural characteristics, the competence approach, and the development process.

The Digital Competence Framework for Citizens (DigComp 2.1)

According to the self-description, "DigComp is a reference framework that describes what it means to be digitally competent. It can be used across sectors, disciplines and systems to enable people to develop digital competence. DigComp sets out the 21 competences necessary to be digitally competent and maps these across 8 proficiency levels, from the most basic to advanced levels." (Kluzer & Pujol Priego, 2018, p. 7).

DigComp was developed by the Joint Research Centre (JRC) of the European Commission as a scientific project, initially on behalf of the Directorate General for Education and Culture (DG EAC) and, more recently, on behalf of the Directorate General for Employment, Social Affairs and Inclusion (DG EMPL). In order to produce the framework, an extensive literature review, case study research and stakeholder consultation process were carried out. More than 200 experts and a variety of stakeholders from EU Member States have been involved in developing DigComp (Ferrari, 2013; Vuorikari et al., 2016, Carretero et al., 2017; Kluzer & Pujol Priego, 2018).

The 21 competences are divided into five competence areas:

1. Information and data literacy
2. Communication and collaboration
3. Digital content creation
4. Safety
5. Problem solving.

Competence areas 1, 2 and 3 deal with competences that can be retraced in terms of specific activities and uses. Competence areas 4 and 5 are termed transversal as they can relate to any specific activity and application.

Each of these 21 competences has a concise name and an additional description of the essential aspects, e.g.:

Competence area:
1: Information and data literacy
Competence title:
1.1: Browsing, searching and filtering data, information and digital content
Competence descriptors:
To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them. To create and update personal search strategies.

Another structural element are proficiency levels, which can be applied to the 21 competences. The DigComp has four broad or overall proficiency levels:

- Foundation
- Intermediate
- Advanced
- Highly specialised,

each of which is further subdivided into two proficiency levels, resulting in a total of eight granular levels. Criteria for the classification into the eight proficiency levels are:

- Complexity of tasks, e.g. simple task, different tasks and problems;
- Autonomy, e.g. with guidance, on my own, guiding others;
- Cognitive domain, e.g. remembering, understanding.

Another structural element, which was called Dimension 4 "Knowledge, Skills and Attitudes" in previous versions, is no longer featured in the revised version DigComp 2.1. It is "not included as a separate dimension but integrated in the description of learning outcomes" (Kluzer & Pujol Priego, 2018, p. 67)

The result is a competence matrix in which the 21 competences are described at eight levels, e.g. like this:

Competence area:
1: Information and data literacy
Competence title:
1.1: Browsing, searching and filtering data, information and digital content
Description on proficiency level 1:
At basic level and with guidance, I can:
- identify my information needs,
- find data, information and content through a simple search in digital environments,
- find how to access these data, information and content and navigate between them.
- identify simple personal search strategies (Carretero et al., 2017, p 23).

Resuming, the authors describe the DigComp in its function as a reference framework as follows:

"The DigComp framework defines the scope and the components of digital competence for citizens in a clear way. It provides an overall, complete and shared understanding of what digital competence is, and offers an updated vocabulary based on consensus building with multiple stakeholders. The DigComp framework provides competence descriptions in general terms. It intentionally leaves open, for instance, which specific digital devices or software applications should be used. This makes the framework technology-neutral and, given that digital technology constantly changes, it also prevents the rapid obsolescence of the framework." (Kluzer & Pujol Priego, 2018, p. 24)

The European e-Competence Framework (e-CF) 3.0

"The European e-Competence Framework version 1.0 was published in 2008 from the outcome of two-years e-Skills multistakeholder, ICT and human resources experts' work from multiple organisation levels (CWA 15893-1 and CWA 15893-2)." (CEN - European Committee for Standardization, 2010, p. 2)

"The European e-Competence Framework (e-CF) version 3.0 provides a reference of 40 competences as required and applied at the Information and Communication Technology (ICT) workplace, using a common language for competences, skills and capability levels that can be understood across Europe. As the first sector-specific implementation of the European Qualifications Framework (EQF), the e-CF was created for application by ICT service, user and supply companies, for managers and human resource (HR) departments, for education institutions and training bodies including higher education, for market watchers and policy makers, and other organisations in public and private sectors" (CEN - European Committee for Standardization, 2014, p. 3).

The European e-Competence Framework 3.0 comprises 40 competences, which are distributed across five competence areas. These five areas are derived from the ITC business process:

- A: Plan - with nine e-competences, e.g. A.5. Architecture Design
- B: Build - with six e-competences, e.g. B.3. Testing
- C: Run - with four e-competences, e.g. C.3. Service Delivery
- D: Enable - with twelve e-competences, e.g. D.8. Contract Management
- E: Manage- with nine e-competences, e.g. E.3. Risk Management. (p. 5)

For each competence, different proficiencies - as far as possible - are assigned to the specially formed levels e-1 to e-5 and described with a short statement. The levels refer to EQF levels 3 to 8.

The description of each e-competence is structured in four dimensions as the following example shows:

Dimension 1: e-competence area: A. Plan
Dimension 2: e-Competence: Title + generic description: A.1. IS and Business Strategy Alignment; Anticipates long term business requirements and determines the IS model in line with organisation policy. Makes strategic IS policy decisions for the enterprise,

including sourcing strategies

Dimension 3: e-competence proficiency levels D: Level 1 - 3 blank, Level 4: Provides leadership for the construction and implementation of long term innovative IS solutions; Level 5: Provides IS strategic leadership to reach consensus and commitment from the management team of the enterprise.

Dimension 4: Knowledge examples, Skills examples: Knows/ Aware of/ Familiar with: K1 business strategy concepts, K2 trends and implications of ICT internal or external developments for typical organisations, K3 the potential and opportunities of relevant business models, K4 the business aims and organisational objectives, K5 the issues and implications of sourcing models; Able to: S1 analyse future developments in business process and technology application, S2 determine requirements for processes related to ICT services, S3 identify and analyse long term user/ customer needs, S4 contribute to the development of ICT strategy and policy, S5 contribute to the development of the business strategy.

"Dimension 4: Samples of knowledge and skills relate to the e-Competences in dimension 2. They are provided to add value and context and are not intended to be exhaustive" (CEN, 2014, p. 10).

It can be seen from the titles and the generic descriptions of the e-competences, as well as from the descriptions of the competences' proficiencies, that these professional competences are complex constructs composed of knowledge, skills and attitudes. Their arrangement along a typical ICT business process underlines their alignment with the requirements that can be derived from the core processes.

VQTS Vocational Qualification Transfer System model for mechatronics and electronics/electrical engineering

The VQTS model was developed within the framework of two European Leonardo projects (2003-2006 and 2007-2009) for the two vocational fields "mechatronics" and "electronics/electrical engineering". Its context was the initiative to develop the European Credit System for Vocational Education and Training (ECVET). The system, to be implemented by Member States by 2012, is a voluntary framework for describing qualifications in terms of units of learning outcomes. Each of these units is associated with a certain number of ECVET points developed on the basis of common European standards.

"The VQTS project contributed to these activities by developing a model that facilitates transnational comparison of competences and qualifications by offering a solution for a structured description of work-related competences and their acquisition (including credit points): the VQTS model" (Luomi-Messerer, 2009, p. 10). Of particular interest at this point is the competence matrix.

The competence matrix developed in the VQTS has two dimensions:

- Competence area
- Steps of competence development.

The competence areas that form the left column of the competence matrix (vertical axis) correspond to empirically derived complex core work tasks. Core work tasks are understood as comprehensive tasks in the work context of a person with the respective occupational profile. Core work tasks have a certain complexity, correspondingly competence areas also represent a certain complexity.

The steps of competence development are shown in this matrix along the horizontal axis. For each competence area a variable number of steps of competence development is holistically described as competence. The competences or the respective development steps are related to work processes and ascending from left to right in terms of professional expertise as well as autonomy and responsibility. An individual number of steps is identified for each competence area, varying from three to six steps.

What does this look like in concrete terms, for example, in the "Mechatronics" competence matrix? This competence matrix has nine areas of competence:

1. Maintaining and assuring the reliability of mechatronic systems
2. Installing and dismantling mechatronic systems and facilities
3. Installing and adjusting mechatronic components in systems and production lines
4. Designing, adapting, and building mechatronic systems and facilities on the basis of client needs and site plans
5. Putting mechatronic systems into operation and providing clients with technical and economic support
6. Supervising and evaluating both the process sequences of mechatronic systems and facilities and the operational sequence (including quality assurance)
7. Installing, configuring, programming and testing hardware and software components for control and regulation of mechatronic systems and facilities
8. Preparing and distributing the technical information for adjustment of each enterprise's mechatronic systems
9. Diagnosing and repairing malfunctions with mechatronic systems and facilities, advising clients on avoiding malfunctions, and modifying and expanding mechatronic systems (Luomi-Messerer, 2009, p. 36/37).

In the first competence area, "Maintaining and assuring the reliability of mechatronic systems", four sequential steps of competence development were identified:

- He/She can perform the basic scheduled maintenance on mechatronic machines and systems and adhere to the equipment maintenance plans.
- He/She can master the maintenance procedures for mechatronic systems such as the use of service documents and maintenance plans and, if faced with new challenges, can make the necessary adaptations.
- He/She can use preventive maintenance to assure the troublefree operation of mechatronic systems. In addition, he/she can modify operational sequences to implement quality-assurance measures.
- He/She can develop the necessary procedures for maintenance of mechatronic devices and systems, and can schedule the maintenance and quality-assurance procedures. (Luomi-Messerer, 2009, p. 36).

The competence areas that form the left column of the competence matrix were identified based on core work tasks. According Luomi-Messerer (2009) core work tasks are comprehensive tasks within the work context of a person with the respective occupational profile, in this case the mechatronics-profile. The authors derived them not from existing educational material but empirically from the work practice/workplace. The aim is to record and include only holistic competences that are actually observable in the world of work.

The concept of competence applied in the VQTS model is action-orientated, it "does not only refer to the disposition but also includes the visibility/apparentness of the professional competence itself. (...) The descriptions of occupational competences must refer to the sector, the domain, the context and the occupational tasks (Luomi-Messerer, 2009, p. 19).

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(4)   Developing the Competence Framework for the Textile Care Sector (TCS)

So far, this section has described the "Educate!" project context, analysed the core and guiding concept of competence in detail in an international context and presented three competence frameworks/models/grids as examples of implementation in terms of their structural features, the way they were developed and the concept of competence they revealed. Regarding the development of one's own competence framework, some findings and guiding ideas should be noted at this point.

On the shoulders of giants: Using what is there.

Even though empirical analyses of work processes are often considered necessary as a basis for the development of occupational and qualification standards, and of competence frameworks, this development project - in view of scarce resources - relies on the materialised experiential knowledge and the observations and interpretations of stakeholders and experts for this first proposal. But can this be trusted? Yes! But aren't we then treading water? No. An international format such as the "Educate!" project can connect to very different discourses and take up very divergent lines of development, evaluate them reflexively and, if necessary, adjust the goals.

Making the competence framework compatible.

The discussion of the influential competence concepts has highlighted differences that should not simply be regarded as non-existent, in the interest of employees, but also of companies and VET organisations. The goal must therefore be to clearly show the differences, which has been done in this section, and to formulate a competence framework that is broadly compatible and can be a starting point for further work in the various educational cultures.

Framing the input, build up competence.

Competence frameworks, like qualifications frameworks, can pursue different objectives. We have seen with the English NVQ that a well-intentioned goal was to get people into national qualifications and thus enable advancement and recognition. The main mechanism for this was the assessment and recognition of small learning achievements in the workplace, based on extremely differentiated standards. In Germany, on the other hand, great importance is attached to ensuring that the framework curriculum of a profession ensures that at the end of an apprenticeship there is the professional competence that was promised at the beginning. The competence framework, as it is now to be developed here, is rather intended to frame the input of a continuing VET. Nevertheless, each trainer or teacher must make his job. No framework can determine a well-sounded didactical concept, it can only show the direction.

Action competence is more than skills.

When it comes to professional competence, a holistic understanding of competence is required that can integrate the different types of knowledge, practical and theoretical skills, as well as attitudes, motivation, and volitation. This applies to initial vocational education, but also to the continuing vocational training of adult employees. A shortening of the concept of competence to skills, as can be seen, for example in DigComp 2.1, is not expedient in vocational education and training.

Action competence is more than technical competence.

The discussion of competence concepts and the educational traditions behind them has shown that one-dimensional competence frameworks, which are geared towards the implementation of narrowly defined action routines, not only do not meet the growing complexity of work requirements, but also do not contribute to the development of professional and occupational competence of employees and leave them in a precarious occupational situation. Certainly, a competence framework that is geared towards the continuing vocational training of employees, some of whom are already experienced in life, has different didactic requirements than those to be placed on in initial vocational training. Nevertheless, such a framework must be multidimensional and include not only technical competences but also the development of social and personal competences. Ethical and meta-competencies, listed by Cheetham and Chivers (1996, 1998) as separate dimensions of their holistic competence model, are included here.

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Section B:
Competence framework: National specification documents in occupation and qualification as a starting point

After deriving and explaining our approach to the development of the competence framework in textile care in the introduction, this section presents the relevant sector‑specific documents from employment and qualification, first from the project partner countries Belgium, Germany, and the Czech Republic (in Sweden there is no specific vocational education in den TCS), and then from Switzerland and the UK. In a comparative analysis of the employment and qualification profiles, similarities, and differences of a formal nature, such as structure and depth of description, and of a content-related nature are worked out. As far as possible, the underlying understanding of education and competence is shown on the background of secondary literature. The section ends with an analysis of the contribution of the documents in terms of their usefulness for a competence framework in textile care.

(5)   Belgium: *Operator* and *Medewerker textielverzorging*

The country of Belgium is a federal constitutional monarchy with a parliamentary system whose institutional organisation is subdivided both regionally and linguistically. The regional units are the Flemish Region (Flanders), the Walloon Region (Wallonia) and the Brussels-Capital Region (Brussels). The linguistic units are the Flemish Community (BE-FL), the French Community (BE-FR) and the German-speaking Community (BE-DE). School education and initial vocational education are organised within the language units.

The focus of the document analysis was on the Flemish part of Belgium. Two sector-specific professional qualifications are set up here:

- *Operator textielverzorging* (m/v) (Operator textile care) -> NQF 4
- *Medewerker textielverzorging* (m/v) (Textile care worker) -> NQF 2

There are two types of documents for each of the two professional qualifications:

- Beroepskwalificatiedossier (Professional qualification file)
- Standaardtraject ([Educational] Standard track).

Both types of documents are the responsibility of the *Vlaams ministerie van Onderwijs en Vorming* (Flemish Ministry of Education and Training), the professional qualification document is the reference document for the standard track document.

The description of the professional qualification in the "Beroepskwalificatiedossier" is done by defining the profession, determining the necessary competences, and describing the context, autonomy and responsibility of the professional.

The two vocational educations are described in a "Standaardtraject" regarding their embedding in the qualification structure, admission requirements, contents and the knowledge and skills to be acquired. Both qualifications can be achieved through a vocational education (2 resp. 3 years) or validation.

The "Beroepskwalificatiedossier" contains a list of activities (divided in the categories basic activities and specific activities) that must be mastered and the underlying knowledge (kennis) and skills (vaardigheiden). This is followed by a specification of the required competences, as a list in the dimension cognitive skills (Cognitieve vaardigheden), problem solving skills (Probleemoplossende vaardigheden) and motor skills (Motorische vaardigheden). In the "Standaardtraject", this list is taken up and linked to teaching content.

The "Beroepskwalificatiedossier" also describes in detail the competence in the sense of autonomy and responsibility (EQF/NQF).

The establishment of a professional qualification is the task of professional associations, social partners and state agencies involved in vocational training. The professional

qualifications are recognised by the Flemish Government and recorded in a qualification register.

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(6)   Germany: *Textilreiniger/Textilreinigerin*

The Federal Republic of Germany is a federal state in which the school system is the responsibility of the individual states (Bundesländer). A large part of vocational education, which is implemented as a dual track at schools and in companies, is regulated by the federal Vocational Training Act (Berufsbildungsgesetz - BBiG) and the regulations derived from it, with the participation of the social partners. This also applies to the textile care sector.

One sector-specific professional qualification is set up under the umbrella of the BBiG:

- *Textilreiniger/Textilreinigerin* (Textile Cleaner) -> *NQF4*

The qualification profile is defined in a legal regulation of the vocational education ("Ausbildungsordnung") as the result of a vocational education process (§ 3 "Ausbildungsberufsbild").

This qualification can be achieved through a vocational education (3 years) which is regulated by three documents: regulation of vocational education ("Ausbildungsverordnung"), a framework plan ("Ausbildungsrahmenplan") and a framework curriculum ("Rahmenlehrplan"). These documents define admission requirements, the integrated competence concept of the education, the structure of the educational content, and the assessments.

These regulation documents define primarily the input. The regulation of vocational education ("Ausbildungsverordnung") define the occupational profile of the education in 14 sections, each of them listing the knowledge and skills to be taught. Section 1 is e.g. vocational education, labour law and collective agreement law.

The framework curriculum ("Rahmenlehrplan") structures the vocational school lessons in 12 learning fields. For each learning field (e.g. learning field 1: receiving and preparing items) the goal is formulated in detail and the learning contents are given in an overview.

This qualification is the core product of vocational education and training in the textile care sector in Germany, and there is a comparatively large amount of material available for it that can be used in the development of a competence framework.

The desired result of vocational education is the *Handlungskompetenz* (action competence). This concept in the German speaking VET encompasses the dimensions of *Fachkompetenz* (technical competence), *Sozialkompetenz* (social competence) and *Personalkompetenz* (personal competence) and *Methodenkompetenz* (procedural competence). The implementation of these dimensions in the descriptions of the objectives and contents of the training is partly visible. However, the dimensions are not worked out systematically and in a structured way. On the one hand, this is occasionally the subject of discussion; on the other hand, this multidimensional, holistic approach to

competence should also be understood as a challenge to implement this approach in all parts of education in general.

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(7)   Czech Republic: *Technik prádelen a čistíren* and more

In the Czech Republic all qualifications are registered in the National Register of Qualifications (NSK). This is the prerequisite for vocational education and training with the aim of obtaining a vocational qualification. The NSK-register was set up within the framework of the NSK project with the support of the European Social Fund and with funds from the Czech State, Ministry of Education, Youth and Sports, and is now managed by the National Pedagogical Institute of the Czech Republic (Národní pedagogické institutu České republiky). The development of a professional qualification is the task of professional associations, state agencies and ministries.

In the textile care sector, there are 3 basic professional qualifications defined of which only the two up to NQF level 4 are relevant in this context. Each of them is the result of a vocational education (on different levels):

- Pracovník prádelen a čistíren (Laundry and dry-cleaning worker/ operator) (NQF 3)
- Technik prádelen a čistíren (Laundry and dry-cleaning technician) (NQF 4)
- Manažer prádelen a čistíren (Laundry and dry-cleaning manager) (NQF 7)

Starting from these three basic qualifications, there is a wide range of specialisations for laundry, dry cleaning, leather and fur cleaning and rental laundry as well as master craftsman.

Parallel to the National Register of Qualifications, these professions are also recorded in the National System of Professions, which is maintained by the Ministry of Labour and Social Affairs (Ministerstvo práce a sociálních věcí České republiky), whereby the register entries hardly differ even in their detailed and extremely differentiated presentation.

The description of the qualification resp. the professional/occupational profile contains a list of the essential competencies, described as typical professional actions. Each of these competences or typical professional actions are further operationalised with a number of very concrete sub-actions. The focus is on skills.

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(8) Switzerland: *Fachfrau / Fachmann Textilpflege (EFZ)*

Although no partner from Switzerland was directly involved in the "Educate!" project, developments in vocational education and training in general and specifically in the textile care sector in Germany are nevertheless well observed. Thus, it was also perceived that the educational plan for vocational training in textile care has recently been revised (2016).

Similar to Germany, vocational education and training is regulated by federal legislation in close cooperation with the 26 cantons and the "organisations of the world of work" ("Organisationen der Arbeitswelt"). Under this umbrella there is vocational training and vocational qualification, namely:

- *Fachfrau / Fachmann Textilpflege mit eidgenössischem Fähigkeitszeugnis (EFZ)* (Specialist in textile care with federal certificate of competence) -> NQF4

The qualification profile is defined in a legal regulation of the vocational education ("Verordnung über die Berufliche Grundbildung - BiVo") as the result of a vocational education process.

This qualification can be achieved through a vocational education (3 years). This vocational education is regulated by three documents: Federal Act on VET (Bundesgesetz über die Berufsbildung), Regulation on Vocational Education ("Verordnung über die Berufliche Grundbildung") and a Education Plan ("Bildungsplan"). These documents define admission requirements, the integrated competence concept of the education, the structure of the educational content, and the assessments.

The Education Plan ("Bildungsplan") contains three thematic sections: vocational-pedagogical basics, qualification profile, and action competence areas, action competences and targets for each learning site. The latter section includes a differentiated description of four areas of competence and within these of twelve competences. Each competence is described in a holistic manner, considering four dimensions of competence: technical competence, procedural competence, social competence, and self-competence. On the level of teaching/performance targets of the vocational school and of the company, a desired behaviour or action is described a little deeper (but not measurable).

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(9)   United Kingdom: NOS and NVQ Certificates

Although no partner from UK was directly involved in the "Educate!" project, developments in vocational education and training in general and specifically in the textile care sector are nevertheless well observed. The influence of the English approach on vocational education and training in the individual states in Europe and on the development of the European Qualifications Framework cannot be overlooked and has been discussed many times. Especially regarding the textile care sector, the Textile Services Association in UK has an important voice within the structure of the national societies in Europe.

As already described, in UK each qualification must be considered in a first step from an employment perspective. In the UK, this perspective is set out in the National Occupational Standards (NOS). The NOS are developed by Standard Setting Organisations (SSO) in consultation with employers and other stakeholders across each of the UK nations (Scotland, Wales, Northern Ireland, and England). National Occupational Standards (NOS) are specifying the standards of performance individuals must achieve in the workplace, together with the knowledge and understanding required for job roles.

Skillset/ Skillfast UK - Sector Skills Council for the Fashion and Textiles Industry, the sector relevant SSO until October 2017, has published 26 sector specific national occupational standards. These standards mostly focus on core working processes, e.g. *Inspect and dispatch laundered and cleaned items (SKSLDC17).* A few NOS are general or transversal, e.g. *Maintain effective working relationships at work (SKSLDC25)* or *Health, safety and security at work in the laundry & dry-cleaning industry (SKSLDC HS2).*

Each NOS inform in a specific structure:

- (Brief) definition of the employees for whom the NOS is relevant
- List of performance criteria ("You must be able to:")
- List of Knowledge and understanding ("You need to know and understand:")
- List of skills.

From the perspective of qualification, two kinds of standards are relevant: the National Vocational Standards (here focus on England and Wales) and the Apprenticeship Standards.

The literature review could identify two regulated qualifications in the scope of National Vocational Standards:

- *Level 2 NVQ Certificate in Laundry Operations*
- *Edexcel Level 2 NVQ Certificate in Dry Cleaning Operations (QCF)*

The available description of the first one includes - over three pages - information on the requirements of the certificate with a list of mandatory and optional units (of

learning), e.g. "Tumble-dry items" (PAA\VQ-SET, 2018, p. 2). This NVQ held by the Process Awards Authority (PAA) was removed in 2017 (UKFT, 2017).

The description of the second one is much more detailed (Edexcel, 2012). In a first part the purpose of the qualification, the addresses, the benefits, the potential job roles, and progression opportunities are explained. In a second part a list with mandatory and optional units and information on assessment and graduation can be found. In a third part each unit is specified in detail, including structured learning time, learning outcomes and assessment criteria. This NVQ was offered by Edexcel, an awarding organisation, and was removed in 2017.

Edexcel offered another sector-specific qualification, a BTEC Specialist qualifications:

- *Edexcel BTEC Level 2 Certificate in Laundry and Dry Cleaning Technology (QCF).*

The description of this BTEC qualification is also very detailed and follows the same structure as above (Edexcel, 2011). This qualification was removed in 2017.

In recent years, intensive work has been done on the innovation of the apprenticeship approach and an Apprenticeship Standard has been developed for this structured learning opportunity in the textile care sector:

- *Textile Care Operative ->* NQF 2 (England and Northern-Ireland)/ EQF 3

This qualification profile is defined as an apprenticeship standard (Reference number: ST0604) in an official register which is run by the Institute for Apprenticeships and Technical Education. The creation of this standard started in 2017, the first version of the standard was published 2018.

This qualification can be achieved through an apprenticeship, typically with a duration of 12-14 month. "It`s a genuine job, with training, meaning you can earn while you learn and gain the necessary skills and professional competencies in your chosen career." (National Apprenticeship Service, November 2017, p. 1)

The Apprenticeship Standard "Textile Care Operative" describes "Core Knowledge", "Core Skills" and "Core Behaviours". Furthermore, the standard describes "Option Knowledge" and "Option Skills" in either commercial laundry or dry/wet cleaning. (Institute for Apprenticeship & Technical Education, 13.06.2019)

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(10) Comparative analysis: similarities and differences

Overall, the material can be described as very diverse. We find descriptions in the sense of an occupational profile, a qualification profile, or an educational plan, and these at different qualification levels and with different extent of input. The different volumes of material and the differences in the scope and depth of regulation are also striking. Taking the conceptual discussion in section 1 as a background for analysis, differences can also be found in the system environment, the orientation marks, and the competence concept.

Four aspects that are significant for the further processing of the material will now be considered in more detail:

- System environment of the material
- Orientation marks of the material
- Inherent concept of competence
- Competence/qualification level.

System environment of the material

A first distinction can be made between material that (1) describes how work in the textile care sector should be carried out, and material that (2) focuses on the VET input, which enables the student or trainee to be a good professional at the end of the training. Behind these very different approaches stand two different social systems: the employment/occupational system and the VET system. Each of them has its specific function, each of them is self-referential and has its specific production of meaning (German: Sinn), which enables its members to experience and act in reduced complexity.

The material from UK reflects in total the primate of the employment/occupational system. Of course, the National Occupational Standards are a product of the employment system. But the NQS, which were successively imposed on the English education system in the 1980s and 1990s, also lack an independent sense of the VET system. The current Apprenticeship Standards can be seen as another attempt at a new beginning (on the concept of "Modern Apprenticeship", inaugurated in 1994, see Brockmann et al., 2010).

The material from the Czech Republic follows this approach and rolls it out in full breadth and depth to several occupations and specialisations from level 3 to level 7 as part of an ESF project. As we have seen above, both systems are in charge, with the Ministry of Labour representing the National System of Occupations and the Ministry of Education representing the National Register of Qualifications. In fact, however, the VET system does not currently realise any of the training and specialisation courses, so the question of the anchoring of this material in the VET system inevitably arises.

For the material from Belgium, the two dossiers on vocational qualifications and the two educational standard tracks, the Ministry of Education is responsible. The link to the EQF underlines its provenance in the education system. Neither of the two courses of education is currently being implemented.

The sector-specific educations (with its material) in Switzerland and in Germany are covered by a strong legal VET-umbrella and anchored in the VET-systems. As known, the vocational education in these countries follows a dual-track approach with a fundamental involvement of the social partners (DE) resp. the organisations of the world of work (CH).

Orientation marks of the material

A second distinction can be made between material that reflects (1) more an input-orientated approach, and (2) more an output-orientated approach in the VET-system.

The documents from Germany regulate primarily the input of a vocational education.

The documents from Switzerland regulate the input of the vocational education, too. However, it can be seen from the material, which is much younger than the material from Germany, it was published in 2016, that the discussion of recent years on the determination of learning outcomes has been taken up in a moderate way. The definitions of the performance objectives (related to the student) are so comprehensively that it would not meet the requirements of the CEDFOP for the formulation of learning outcomes (CEDEFOP, 2017).

The material from Belgium must be considered in a differentiated way. The vocational qualification dossier gives clear indications of what the qualification holds in terms of vocational requirements and in this respect reflects an output orientation. The standard track of education makes the link between qualification as an outcome and as a process and thus combines output orientation with input orientation. This is also possible due to its low level of regulation.

The documents from UK describe and regulate the requirements to be met in certain occupational tasks. In the context of VET, they focus primarily on output. The break-down of learning stuff in small units, the deep definition of learning outcomes and the detailed description of assessment and graduation procedures underpin this strong output-orientation.

The documents from the Czech Republic also reflect a clear output-orientation. The qualification standards of each basic vocational education (see above) contain not only a description of the competence but also for each of them several assessment instructions.

Inherent concept of competence

The whole material reflects a competence orientation, but - and this is the third distinction - with varying depth of operationalisation and differences in the concept/notion of competence.

The notion/concept of competence in the German speaking VET is multi-dimensional and holistic. In the education plans in Switzerland and Germany, the didactic explanations are preceded by a detailed clarification of the educational theoretical principles and the multidimensionality and holistic nature of the concept of professional action competence and the educational mandate. The competencies are weakly operationalised. A common understanding within and between the different user and stakeholder groups requires a zone of mutual trust and a process of reflection and understanding that needs to be renewed again and again.

On the other side, the notion/concept of competence that can be seen in the material from UK and from the Czech Republic seems to be functional and fragmented. The competencies are deeper operationalised, especially in the material from UK. The strength: Deeply operationalised competences/partial competences, in combination with a clear set of rules, offer persons outside the education system some possibilities to observe and assess behaviour in everyday work in a structured way.

The material from Belgium seems to be influenced by both the continental and the Anglo-Saxon understanding of competence.

Competence/Qualification Level

A fourth distinction can be made regarding the range of competence/qualification levels. Taken together, the material covers a range from level 2 to level 7 of NQF/EQF.

Most of the material addresses the qualification levels 2, 3 and 4. These levels are relevant for the "Educate!" project.

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(11) Usefulness for a TCS competence framework

The material as a whole can be considered rich and usable and forms a sufficient starting point for the development of a competence framework in the textile care sector. This material materialises development work that not only reflects the interests of stakeholders but is also based on many years of experience and technical expertise.

However, the material is not only the starting point for the development of the competence framework, but its scope also goes far beyond that. It stands on its own and can be accessed and used as a supplement for one's own pedagogical work, for example, when planning a didactic unit, formulating examination tasks, describing an assessment, or creating items.

Section C:
Learning for the 21st century: Future skills and trends in vocational education and training

In order for a competence framework in textile care to achieve a certain half-life, it not only needs an optimal depth of definition, but above all its content specifications must meet the requirements of the coming years. These educational requirements arise within the sector itself, but they are also embedded in macro-developments of technical and non-technical nature.

This section is dedicated to the educational requirements of the future, which are often discussed under the label "educational goals for 21st century learning", "21st century skills" or "learning for the 21st century". It is shown that the turning away from a narrowly defined preparation for a few tasks and the turning towards the development of transferable cognitive, interpersonal and intrapersonal competences expressed in these should in principle also be reflected in the competence framework to be developed in textile care and then also in the qualification of employees. This section concludes with what the sector experts from the project partner countries see as needs for future learning.

(12) The perspective of the European Union on learning for the 21st century

With the Memorandum on Lifelong Learning at the beginning of the millennium, the European Commission not only sent out a strong signal on education policy and, among other things, put the importance of non-formal and informal learning and its recognition on the education policy agenda, but, following the Lisbon European Council conclusions, paragraph 25 and 26, it also claimed the importance of "new basic skills" for shaping economic and social change. The "basic skills" mentioned there are IT skills, foreign languages, technological culture, entrepreneurship and social skills.

"Some of these skills – such as digital literacy – are genuinely new, whereas others – such as foreign languages – are becoming more important for many more people than in the past. Social skills such as self-confidence, self-direction and risk-taking are also increasingly important, because people are expected to be able to behave much more autonomously than in the past. Entrepreneurial skills release capacities both to improve individual job performance and to diversify company activities; they also contribute to job creation, both within existing enterprises – especially SMEs – and for self-employment. Learning how to learn, to adapt to change and to make sense of vast information flows are now generic skills that everyone should acquire. Employers are increasingly demanding the ability to learn and acquire new skills rapidly and to adapt to new challenges and situations.

A solid command of these basic skills is crucial for everyone, but it is only the beginning of a continuum of learning throughout life." (Commission, 2000, p. 11)

In the following years, a multitude of initiatives were taken, research and development were initiated and carried out, and political declarations and decisions were made. In the process, the term "basic competences" mentioned in 2000 was further differentiated, concretised, and completed by the term "key competences".

Milestones in clarifying educational goals for the 21st century are

- Recommendations: Key competences for lifelong learning (2006)
- Communication: A new skills agenda for Europe (2016)
- Recommendations: Key competences for lifelong learning (2018)
- Communication: European skills agenda for sustainable competitiveness, social fairness and resilience (2020).

In view of the economic and social challenges mentioned in the memorandum, products have been developed to promote "basic skills" and "key competences", in which the necessary competences are further explained and specified:

- CEFR: Common European framework of reference for languages
- DigComp: European digital competence framework
- EntreComp: The entrepreneurship competence framework

- RFCDC: Reference framework of competences for democratic culture
- LifeComp: The European framework for personal, social and learning to learn key competence
- Key competences for lifelong learning - a European reference framework (First as the Annex to the Recommendations 2018).

Of these products, we will discuss two in more detail below: the European reference and the LifeComp. Finally, a look is taken at the European skills agenda (2020) and the possible starting points for further development that can be identified there are discussed.

Key competences for lifelong learning - a European reference framework (Annex to the Recommendations 2018)

The framework uses the term "key competences", in the external communication on the official side of the EC the terms "key competences" and "basic skills" are mentioned together. A distinction between the content of the two terms is not apparent; in educational practice, the term "basic skills" tends to be used when referring to the development of key competences at a low level.

In the document, key competences are understood structurally as a combination of knowledge, skills and attitudes. By their very nature, key competences are those competences 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" (Council, 2018, p. 7).

"The Reference Framework sets out eight key competences:

- Literacy competence,
- Multilingual competence,
- Mathematical competence and competence in science, technology and engineering,
- Digital competence,
- Personal, social and learning to learn competence,
- Citizenship competence,
- Entrepreneurship competence,
- Cultural awareness and expression competence" (p. 7-8).

What does this mean in detail? In clarifying this, the central definitions are taken from the document itself.

Literacy competence

"Literacy is the ability to identify, understand, express, create, and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts. It implies the ability to communicate and connect effectively with others, in an appropriate and creative way.

Development of literacy forms the basis for further learning and further linguistic interaction. Depending on the context, literacy competence can be developed in the mother tongue, the language of schooling and/or the official language in a country or region." (p. 8).

Multilingual competence

"This competence defines the ability to use different languages appropriately and effectively for communication. It broadly shares the main skill dimensions of literacy: it is based on the ability to understand, express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing) in an appropriate range of societal and cultural contexts according to one's wants or needs. Languages competences integrate a historical dimension and intercultural competences. It relies on the ability to mediate between different languages and media, as outlined in the Common European Framework of Reference. As appropriate, it can include maintaining and further developing mother tongue competences, as well as the acquisition of a country's official language(s)." (p. 8)

Mathematical competence and competence in science, technology, engineering

"A. Mathematical competence is the ability to develop and apply mathematical thinking and insight in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Mathematical competence involves, to different degrees, the ability and willingness to use mathematical modes of thought and presentation (formulas, models, constructs, graphs, charts).
B. Competence in science refers to the ability and willingness to explain the natural world by making use of the body of knowledge and methodology employed, including observation and experimentation, in order to identify questions and to draw evidence-based conclusions. Competences in technology and engineering are applications of that knowledge and methodology in response to perceived human wants or needs. Competence in science, technology and engineering involves an understanding of the changes caused by human activity and responsibility as an individual citizen." (p. 9).

Digital competence

"Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking." (p. 9).

Personal, social and learning to learn competence

"Personal, social and learning to learn competence is the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way,

remain resilient and manage one's own learning and career. It includes the ability to cope with uncertainty and complexity, learn to learn, support one's physical and emotional wellbeing, to maintain physical and mental health, and to be able to lead a health-conscious, future-oriented life, empathize and manage conflict in an inclusive and supportive context." (p. 10).

Citizenship competence

"Citizenship competence is the ability to act as responsible citizens and to fully participate in civic and social life, based on understanding of social, economic, legal and political concepts and structures, as well as global developments and sustainability." (p. 10).

Entrepreneurship competence

"Entrepreneurship competence refers to the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value." (p. 11).

Cultural awareness and expression competence

"Competence in cultural awareness and expression involves having an understanding of and respect for how ideas and meaning are creatively expressed and communicated in different cultures and through a range of arts and other cultural forms. It involves being engaged in understanding, developing and expressing one's own ideas and sense of place or role in society in a variety of ways and contexts." (p. 11).

It is obvious that a reference framework can "only" outline the key competences required for the future and thus identify fields of learning. Whether some are more important than others for the development of the economy and society in the 21st century is something a reference framework with this general claim to relevance cannot say anything about.

A spotlight on LifeComp - the European framework for personal, social and learning to learn key competence (2020)

As to seen above, "Personal, Social and Learning to Learn" was set as one of the eight key competences in the reference framework for key competences for lifelong learning (2018). LifeComp is - like DigComp and EntreComp - another framework focussing on one specific key competence.

"LifeComp offers a conceptual framework for the "Personal, Social, and Learning to Learn" key competence for education systems, students, and learners on the whole. LifeComp intends to systematise the need to improve personal and social competences through education and lifelong learning, as well as promoting learning how to learn.

The framework has undergone several consultations, over the course of which, the consensus was to come up with three areas encompassing three competences each. Every competence has three descriptors, following a model 'awareness, understanding, action'." (Sala et al., 2020, p. 4).

LifeComp is a conceptual framework. It is non-prescriptive and can be used as a basis for the development of curricula and learning activities. The framework describes nine competences (P1-3, S1-3, L1-3) that are structured in 3 intertwined competence areas: Personal, Social, and Learning to learn.

Personal area (P)

The Personal area includes three competences: P1 self-regulation, P2 flexibility, and P3 wellbeing:

- P1 self-regulation, defined as: "Awareness and management of emotions, thoughts and behaviour",
- P2 flexibility, defined as: "Ability to manage transitions and uncertainty, and to face challenges",
- P3 wellbeing, defined as: "Pursuit of life satisfaction, care of physical, mental and social health, and adoption of a sustainable lifestyle".

Social area (S)

The Social area includes three competences: S1 empathy, S2 communication, and S3 collaboration:

- S1 empathy, defined as: "The understanding of another person's emotions, experiences and values, and the provision of appropriate responses",
- S2 communication, defined as: "Use of relevant communication strategies, domain-specific codes and tools depending on the context and the content",
- S3 collaboration, defined as: "Engagement in group activity and teamwork acknowledging and respecting others".

Learning to learn area (L)

The Learning to learn area includes three competences: L1 growth mindset, L2 critical thinking, and L3 managing learning:

- L1 growth mindset, defined as: "Belief in one's and others' potential to continuously learn and progress",
- L2 critical thinking, defined as: "Assessment of information and arguments to support reasoned conclusions and develop innovative solutions",
- L3 managing learning, defined as: "The planning, organising, monitoring and reviewing of one's own learning". (All references: Sala et al, 2020, p. 20).

As mentioned above, for each of these nine competences additionally three descriptors are formulated, following the structure "awareness", "understanding", and "action".

European skills agenda for sustainable competitiveness, social fairness and resilience (2020)

The European Skills Agenda is not only a response to the disruptions in the economy and society triggered by the coronavirus pandemic, but also a strategic document insofar as it relates to the challenges of the twin green and digital transitions. With regard to the nature of the competences of the future, at least two points of the document are worth mentioning: (1) the green transition, and (2) the improvement of the data basis for up- and re-skilling.

Green transition

The document says it aims to help the EU workforce take full advantage of the green and digital transformation. If then not only the digital transformation but also the green transformation is a central guiding principle of economic and labour market policy, it is not yet clear what competences are required for the green transition.

In view of the new political course, it would make sense to review the European key competence framework (2018) to see whether it does not fall short with its focus on the transformation of the economy and society. It should be read critically under the question of how far it sufficiently takes into account the key competence for a sustainable use of natural resources and for mastering the challenges of climate change. It is advisable to take into account the approaches in education for sustainable development (e.g. de Haan, 2006).

Improving skills intelligence: the foundation for up- and reskilling

The document announces in section 2.1 an improvement of knowledge about qualifications as a basis for up- and reskilling. It states that information on current and future skills needs often comes too late to make decisions. Instead, "accessible, easily understandable, targeted and up-to-date skills intelligence is necessary" (European Commission, 2020, p. 8), relying on the potential of AI to obtain it. Reference is made to Cedefop's Skills-OVATE project, which analyses skills needs from job advertisements and displays results by country and ESCO level (Cedefop, 2021).

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(13) The perspective of the OECD on learning for the 21st century

The OECD, the Organisation for Economic Co-operation and Development, is an association, particularly of countries with high per capita incomes, which aims to contribute to the optimal economic development, high employment and rising living standards in its member states and to an expansion of world trade on a multilateral basis (OECD, 1960, Article 1). Against this background, the OECD has been working for many years on the question of which competencies are conducive to prosperity development. Looking back at the past, the OECD's DeSeCo initiative at the turn of the millennium is very well known and much cited in the literature. More recently, the OECD has published expert reports on the importance of social and emotional skills for social progress (OECD, 2015) and on skills in the digital age (Elliot, 2017). Following this work, an overarching competence framework was again developed, the OECD Learning Compass 2030.

The DeSeCo initiative

The background to this initiative was the observation that, while various large-scale studies captured the output of education systems, there was "a lack of an explicit, overarching conceptual framework based on broad theories of what skills, knowledge and competencies are and how they relate to each other.

"The OECD Program, Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo), was initiated to work towards filling this gap. Under the leadership of the Swiss Federal Statistical Office (SFSO) and with the support of the United States Department of Education National Center for Education Statistics (NCES), DeSeCo seeks, through an interdisciplinary approach in collaboration with ongoing OECD assessment programs, to

- advance the theoretical foundation of key competencies;
- provide a reference point for indicator development and interpretation of empirical results;
- encourage an iterative process between theoretical and empirical work; and
- respond eventually to information needs of policymakers." (Rychen & Salganik, 2000, p. 3-4)

This initiative has the merit of having worked on the concept of competencies in an international context and to have brought it into the international discussion in its breadth. It takes a position and commits itself to a functional approach to competence, at the same time emphasising the holistic, integral nature of competencies: "Competencies are broader than knowledge and skills" (Rychen & Salganik, 2000, p. 8).

The OECD initiative identified three "generic key competences" (Rychen & Salganik, 2000) or three "categories of key competences (Rychen, 2004):

- Acting autonomously
- Using tools interactively
- Interacting in socially heterogeneous groups.

Which specific key competences are considered relevant in these three categories is clarified using the definitions from the document itself.

Acting autonomously

The idea of autonomous action is directly linked to sociality, so it is about the development of an identity and about relative autonomy as it becomes visible in deciding, choosing and acting in different social contexts. The following key competences are considered relevant for this:

"(a) the ability to defend and assert one's rights, interests, limits and needs;
(b) the ability to form and conduct life plans and personal projects;
(c) the ability to act within the big picture/the larger context (i.e. the larger historical, cultural or environmental context of actions and decisions and their long-term and indirect consequences)." (Rychen, 2004, p. 323).

Using tools interactively

"The word 'tool' is used in the broadest sense of the term to include language, information and knowledge in addition to physical tools. To use a tool interactively assumes not only a familiarity with the tool itself but also an understanding of how the tool changes the way one can interact with the world. (...) The following key competences have been identified as relevant when it comes to using tools interactively:

(a) the ability to use language, symbols and text interactively;
(b) the ability to use knowledge and information interactively (to manage and use it as a basis for understanding options, forming opinions, making decisions and for taking informed actions);
(c) the ability to use (new) technology interactively (including the ability to see potential new uses of it)." (Rychen, 2004, p. 323).

Interacting in socially heterogeneous groups.

"Living and participating in multicultural societies and coping with increasing individual and social diversity require the ability to interact and coexist with people who do not necessarily speak the same language (literally or metaphorically) or share the same memory or history. By bridging these divides, these interpersonal or social competences help create social capital. The following key competences are relevant when it comes to interacting effectively with other people:

(a) the ability to relate well to others (involving, initiating and maintaining relationships with family members, friends, neighbour, boss, colleague, etc.);

(b) the ability to cooperate (to work together toward a common goal);
(c) the ability to manage and resolve conflict (in a constructive manner). (Rychen, 2004, p. 323).

Rychen (2004) emphasises the interacting character of these key competences. "The resulting patterns of these interrelated competences can be conceived as constellations, whose forms or interplay – the particular relevance of each competence within this constellation – depend on the desired outcomes at the individual and societal level and the context in which they apply." (Rychen, 2004, p. 323).

The OECD Learning Compass 2030

The Education and Skills 2030 project was launched in 2015 against the changes of the 21st century, identified by the OECD in the fields of global cooperation and communication, technology, industry, society and daily life, work organisation, education, and curriculum (OECD, 2019, p 11-12).

"As a response, the OECD launched the Future of Education and Skills 2030 project in 2015 with the aim of helping countries prepare their education systems for the future. Stakeholders agreed that the project would focus:

- in the first phase (2015-19), on "what" questions – what kinds of competencies (knowledge, skills, attitudes and values) today's students need to thrive in and shape the future for better lives and for individual and societal well-being
- in the second phase (2019 and beyond), on "how" questions – how to design learning environments that can nurture such competencies, i.e. how to implement curricula effectively." (OECD, 2019, p. 8).

"Building on the DeSeCo framework, the OECD Learning Framework 2030 includes new insights and emerging concepts from thought leaders that may not be fully researched yet. It aims to increase its relevance to policy makers by linking the framework to curriculum design issues. The framework was constructed, and is understood by stakeholders, as actionable and multi-directional. It is both globally relevant and informed, and flexible enough for local contextualisation." (OECD, 2019, p. 14).

The Learning Compass 2030 is composed of seven "elements":

- Core foundations
- Transformative competencies
- Student agency/ co-agency
- Knowledge
- Skills
- Attitudes and values
- Anticipation-Action-Reflection cycle (OECD, 2019, p. 16-17).

Within these seven elements the guiding idea of the OECD Learning Compass 2030 is materialised: the learning young person who can take on the challenges of the 21st century and shape the future. This is also reflected in the learning process itself, which is determined by agency/co-agency and taking responsibility for his or her learning process, e.g. with the Anticipation-Action-Reflection cycle.

But what does the Learning Compass say about knowledge, skills, attitudes and values as well as transformative competencies for the 21st century? These aspects will be dealt with in more detail in the following sections, with direct quotations to ensure maximum originality and authenticity. However, despite or precisely because of this separate presentation, it is important to note: "Knowledge, skills, attitudes and values are developed interdependently" (OECD, 2019, p. 74).

Knowledge for 2030

The OECD Learning Framework 2030 distinguishes four different types of knowledge: disciplinary, interdisciplinary, epistemic and procedural.

- "Disciplinary knowledge includes subject-specific concepts and detailed content, such as that learned in the study of mathematics and language, for example.
- Interdisciplinary knowledge involves relating the concepts and content of one discipline/subject to the concepts and content of other disciplines/subjects.
- Epistemic knowledge is the understanding of how expert practitioners of disciplines work and think. This knowledge helps students find the purpose of learning, understand the application of learning and extend their disciplinary knowledge.
- Procedural knowledge is the understanding of how something is done, the series of steps or actions taken to accomplish a goal. Some procedural knowledge is domain-specific, some is transferable across domains. The OECD Learning Compass 2030 highlights transferable procedural knowledge, which is knowledge that students can use across different contexts and situations to identify solutions to problems" (OECD, 2019, p. 74).

Skills for 2030

The OECD Learning Compass 2030 "distinguishes between three different types of skills:

- cognitive and meta-cognitive skills, which include critical thinking, creative thinking, learning-to-learn and self-regulation
- social and emotional skills, which include empathy, self-efficacy, responsibility and collaboration
- practical and physical skills, which include using new information and communication technology devices." (OECD, 2019, p. 86).

Attitudes and values for 2030

The OECD Learning Compass 2030 defines "attitudes and values as the principles and beliefs that influence one's choices, judgements, behaviours and actions on the path towards individual, societal and environmental well-being.

Values are the guiding principles that underpin what people believe to be important when making decisions in all areas of private and public life. They determine what people will prioritise in making a judgement, and what they will strive for in seeking improvement (...).

Attitudes are underpinned by values and beliefs and have an influence on behaviour (...). It reflects a disposition to react to something or someone positively or negatively and attitudes can vary according to specific contexts and situations." (OECD, 2019, p. 102)

Values are further classified into four categories, personal values, social values, societal values, and human values:

- "Personal values are associated with who one is as a person, and how one wishes to define and lead a meaningful life and meet one's goals.
- Social values relate to those principles and beliefs that influence the quality of interpersonal relationships. They include how one behaves towards others, and how one manages interactions, including conflict. Social values also reflect cultural assumptions about social well-being, i.e. what makes a community and society work effectively.
- Societal values define the priorities of cultures and societies, the shared principles and guidelines that frame the social order and institutional life. These values endure when they are enshrined in social and institutional structures, documents and democratic practice, and when they are endorsed through public opinion.
- Human values have much in common with societal values. However, they are defined as transcending nations and cultures; they apply to the well-being of humanity. These values can be identified across spiritual texts and indigenous traditions spanning generations. They are often articulated in internationally agreed conventions, such as the Universal Declaration of Human Rights and the United Nations Sustainable Development Goals (SDGs)." (OECD, 2019, p. 102).

Transformative competencies for 2030

The OECD Learning Compass 2030 "defines "transformative competencies" as the types of knowledge, skills, attitudes and values students need to transform society and shape the future for better lives. These have been identified as creating new value, reconciling tensions and dilemmas, and taking responsibility." (OECD, 2019, 62).

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(14) The third-party perspective on learning for the 21st century

It is not only a supranational entity such as the European Union or an international association such as the OECD that is concerned about which competencies are needed to shape the challenges of the 21st century. At this point, we will select only one model from a third perspective that has generated significant interest after it was presented at the World Economic Forum: the DELTA model of the internationally active consulting firm McKinsey & Company.

DELTA's: distinct elements of talent (McKinsey & Company)

McKinsey & Company is generally known as a consulting firm, less in the public consciousness is that this company also produces studies on, among other things, technological trends and their impact on the economy and workforce (e.g. Bughin et al. 2018). The DELTAs are the result of such a study, conducted in 2019.

In this research 18,000 people in 15 countries were asked about their views on the competences that will be relevant in the future. The authors of the study identified a set of 56 foundational skills "that will benefit all citizens and showed that higher proficiency in them is already associated with a higher likelihood of employment, higher incomes, and job satisfaction." (Dondi et al., 2021, p. 2).

These foundational skills were called DELTAs. "Looking for still more precision, we identified 56 distinct elements of talent (DELTAs) that fall within these skills groups. We call them DELTAs, rather than skills, because they are a mix of skills and attitudes. "Adaptability" and "coping with uncertainty" are attitudes, for example." (Dondi et al., 2021, p. 2).

These 56 DELTA's were grouped across 13 skill groups and four categories, named cognitive, self-leadership, interpersonal, and digital DEALTAs.

Category: cognitive DELTAs

In this category the authors identified 16 DELTA's in four groups:

- Critical thinking: Structured problem solving; Logical reasoning; Understanding biases; Seeking relevant information (4).
- Communication: Storytelling and public speaking; Asking the right questions; Synthesizing messages; Active listening (4).
- Planning and ways of working: Work-plan development; Time management and prioritization; Agile thinking (3).
- Mental flexibility: Creativity and imagination; Translating knowledge to different contexts; Adopting a different perspective; Adaptability; Ability to learn (5).

Category: Self-leadership DELTAs

In this category the authors identified 15 DELTA's in three groups:

- Self-awareness and self-management: Understanding own emotions and triggers; Self-control and regulation; Understanding own strengths; Integrity; Self-motivation and wellness; Self-confidence (6).
- Entrepreneurship: Courage and risk-taking; Driving change and innovation; Energy, passion, and optimism; Breaking orthodoxies (4).
- Goals achievement: Ownership and decisiveness; Achievement orientation; Grit and persistence; Coping with uncertainty; Self-development (5)

Category: Interpersonal DELTAs

In this category the authors identified 14 DELTA's in three groups:

- Mobilizing systems: Role modeling; Win-win negotiations; Crafting an inspiring vision; Organizational awareness (4).
- Developing relationships: Empathy; Inspiring trust; Humility; Sociability (4).
- Teamwork effectiveness: Fostering inclusiveness; Motivating different personalities; Resolving conflicts; Collaboration; Coaching; Empowering (6).

Category: Digital DELTAs

In this category the authors identified 11 DELTA's in three groups:

- Digital fluency and citizenship: Digital literacy; Digital learning; Digital collaboration; Digital ethics (4).
- Software use and development: Programming literacy; Data analysis and statistics; Computational and algorithmic thinking (3).
- Understanding digital systems: Data literacy; Smart systems; Cybersecurity literacy; Tech translation and enablement (4).

Further Research: DELTA proficiency and outcomes

From there, the authors conducted further research on two aspects.

First, they sought to gauge the level of proficiency in the 56 DELTAs among today's workers compared with the level they believe will be required to future-proof citizens' ability to work. The results show relative to the total average low proficiency in the groups "communication", "Planning and ways for working" (both in category "cognitive DELTA's), "Understanding digital systems" and "Software use and development" (both in category "Digital DELTA's).

Second, they sought to gauge whether proficiency in these DELTAs was already associated with certain work-related outcomes. Regarding high incomes, the study shows a strong association with "work-plan development", "asking the right questions"

both in the cognitive category; "self-confidence", a "self-leadership" DELTA; and "organizational awareness," an interpersonal DELTA.

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(15) The internal TCS-perspective on learning for the 21st century

The perspectives of the EU, OECD and the DELTA approach of McKinsey & Company point to the growing importance of competences that can be described as non-technical or cross-technical in the context of a comprehensive change taking place in the 21st century. In addition to this literature analysis of future trends in qualification and competence development, we also focused on the textile care sector and captured sector expert knowledge in the project partner countries Belgium, Czech Republic, Germany and Sweden.

Expert interviews in the textile care sector

32 expert interviews were conducted decentral in the months of April and May 2019 in the countries Belgium, Czech Republic, Germany and Sweden by the textile care associations. In order to achieve an approximately standard quality in the conduct and analysis of the interviews, a guideline was drawn up by the lead organisation HeurekaNet in which the preparation, conduct and analysis of the expert interviews were defined and underpinned with forms.

The term expert was defined on the basis of these main topics; it did not focus on academic expertise, but on professional expertise from the field of work, acquired through experience and/or scientific knowledge. Another prerequisite for the selection of experts was that the experts should be able to reflect on their assessments and be willing to share their knowledge. Depending on the conditions in each country, the perspective of textile care companies (in the narrow sense), including small, medium and large enterprises, suppliers and vocational training was covered.

The aim of the expert interviews was to gain insights into the extent to which our assumptions about the future development of the textile care sector and the future need for qualifications were correct or, if necessary, had to be put into perspective. The aim of the expert interviews was thus to gather concrete information on three main topics:

1. Developments in the textile care sector, especially driven by digitisation.

2. Occupational capacity in the future ‑ which competences are needed?

3. Vocational education and training (VET) – current performance and development needs.

The interviews were semi-structured interviews, supported by a list of the three topics mentioned above, further subdivided into specific aspects, e.g. digital workflow management, and supplemented by helpful questions.

Focus groups with experts in the textile care sector

Four expert focus groups with in total 32 experts were conducted decentral between June and October 2019 in the countries Belgium, Czech Republic, Germany and Sweden by the textile care associations. For this, too, a guideline was prepared by the lead organisation HeurekaNet, in which the preparation, implementation and evaluation were defined and underpinned with forms.

Both the focus groups and the expert interviews provided information on the extent to which our assumptions about the future development of the textile care sector and future qualification requirements apply or need to be relativised.

Thus, the purpose of the focus group was to collect specific information about three main topics:

1. Developments in the textile care sector, especially driven by digitisation.

2. Occupational capacity in the future - which competences are needed?

3. Vocational education and training (VET) – current performance and development needs.

Building on the findings from the expert interviews, the focus within these three subject areas was now clearly sharpened. Now very specific theses were discussed to deepen the current state of knowledge. For this purpose, the lead organisation had prepared a specific list of key questions for each implementing organisation, which could be expanded as needed.

Result area 1: Developments in the textile care sector, especially driven by digitisation

The digitalisation and automation of business processes is an ongoing challenge for the sector, and one that is being taken on board since several years. A few excerpts from the expert interviews conducted by the Belgian project partner are intended to illustrate this.

Digital workflow management (DWM)

Digital workflow management (DWM) has reached the companies, its technical improvement is still in progress, RFID technology expands the possibilities.

"Digital workflow has been managed since a few years now and is a bit outdated so it must be adapted. Is it certainly a very positive evolution, especially since we work in a group with two other companies. We can switch seamlessly to our other colleagues. Investing in digitization is a 'conditio sine qua non' to survive." (BE_1, 3)

This is also partly true for small enterprises:

"We [a small company] have evolved very far concerning machinery. We can follow the whole washing and handling process from the sorting out of the laundry to the billing. The sector must go in that direction. We are leaders, but the rest will have to follow, meaning standardization and acquiring newest machinery." (BE_2, 3).

There is also a clear trend to further improve and expand the DWM:

"DWM is very important. We were an 'early adopter'. We soon changed from barcodes to RFID chips to give customers an insight in the process of the work. The devices became cheaper and more performant. (…) Industrial laundries can't do without digitization any more: there is no tender without traceability." (BE_3, 3)

Also noteworthy is a statement on the role of young entrepreneurs in this innovation process:

"The importance of digitization will only increase. We ourselves have e.g. developed dosage systems that can be operated from a smartphone. In the future we will see more apps for a better organization of orders, a better organization of stock recording, to better align stock and deliveries. All depends on the companies: there is still a lot of work to be done to continue digitization. Younger entrepreneurs are more sensitive to this evolution. The costs play a lesser role." (BE_4, 3)

Automation

The Internet of Things is always discussed under the aspects of automation, substitution of work activities and loss of jobs. In view of the physical strain on employees at certain stages of the production process, the problems in personnel recruitment and the price pressure, experts consistently see opportunities in automation. In their perception, automation in this industry at this moment does not lead to a loss of jobs, but rather changes them.

So says the expert from the view of a small company:

"Automation has an influence on jobs, but it doesn't stand for loss of jobs. Workers will get other assignments. If we don't automate, we won't be competitive anymore. The simplest jobs will continue to exist but for others, the need of knowing how to work with PC or laptop will be essential. We see that people who are working in our company for a while yet, grow with us in the use of new technology." (BE_2, 5)

This statement is embedded in the assumption of growing market shares and increasing capacities:

"Automation does not include a loss of jobs, but a shift in jobs. We have seen the same after the industrial revolution. We have created new jobs due to an increase of capacity." (BE_1, 5)

At the same time, the possibilities of automation are seen as limited, the production process is for the experts from the companies also for the near future a combination of machine and manual work:

"Automation doesn't stand for loss of jobs unless the volume of the work would suddenly decrease. There are still a lot of manual proceedings that are part of the work in laundries." (BE_5, 5)

"Automation causes no loss of jobs. There is still a lot of manual work to be done. We serve SME's – small packages – different types of laundry. We cannot automize very much, but automation is used for making the work more 'workable' (ergonomic). Automation requires some competences, but as accessible as possible. The collaboration man and machine makes the work smoother and more efficient, giving you a competitive advantage." (BE_6, 5)

Result area 2: Occupational capacity in the future - which competences are needed?

Since no one can look into the future and make reliable statements, the assumptions about the occupational capacity required in the future are very different. Even if this cannot be validated unambiguously, there seems to be a connection between these predictions and the structure of the sector (rather small-scale or large-scale industrial) and - of course - the professional background of the expert. The characteristics of future occupational capacity identified by the experts are exemplified - as already practised - with striking statements from the interviews. Their views are presented in two sections, first regarding technical competences and then regarding generic or transversal competences.

Technical competences

Embedded in a sector with many small and medium-sized enterprises, a very lively craft tradition and a still functioning vocational education and training, the future occupational capacity is basically seen as modernisation and adaptation of the current profile to the future, extended requirements. The guiding idea is the independent textile cleaner who is fully responsible for a broad range of work:

"For a textile cleaner the central occupational competence will be: removing stains, cleaning the products no matter how. It is the basic. But the trainees should be more involved in the logistic aspect of the work and how to operate with the machines, especially for those who are ambitious to achieve leading job positions. The aim of all should be, that textile cleaners could work all over the world." (DE_1, 12)

Nevertheless, the differences in requirements are recognised:

"Logistically skills will be important for workers in the bigger textile care industry companies while smaller companies will still need competence in cleaning stains and ironing clothes. Generally problem solving will be very important, because fashion are tailored more individualized and with difficult to clean materials. And more and more customer service will play an important role. In industry companies handcraft skills will be less important, while for smaller B2C-companies nothing getting less important. On the contrary handcraft and business skill getting more important." (DE_2, 12)

"The smaller the company, the more important are the craftsmanship skills." (DE_3, 17)

"Automation removes boring monotonous jobs, adds more qualified. More complex systems require more process monitoring and repairers." (SE_1, 5)

"Nevertheless, the automation is crucial for the dominant part of the industry – middle and bigger companies and young entrepreneurs – and therefore the employees must be well-educated for that." (DE_1, 5)

In countries where the craft education of a textile care worker exists less or not at all, the occupational capacity and the strategy of its development is obviously considered from a company perspective. Based on the fact that the demands on the labour force are changing and also increasing in some cases, two strategies are emerging in this workplace perspective.

One strategy is specialisation, i.e. a stronger division of labour, the focus of the individual employee on a few tasks and the development of a few skills, but then possibly at a high level (or not). Another is polyvalence, i.e. opening up the different stages of the production process, using the employee for different tasks and developing a wide range of competences, but then possibly rather at an average level.

One expert statement suggests that several specific professional profiles need to be considered:

"We should make very clear which competences belong to a specific profile. These competences can be learned. It's also better for recruitment and selection: one knows exactly what one needs." (BE_7, 12)

The other strategy of polyvalence is not seen coherently by the experts. The advantages of a polyvalent work for the individual employee are emphasised:

"Occupational competences are being learned on the job, on the work floor. Polyvalency is very important and has also an ergonomic advantage, because there is enough variety in the different jobs." (BE_6, 12)

At the same time, another expert also draws attention to the implementation problems in a company salary structure:

"We don't do polyvalency in our enterprise because the wage classification makes it impossible." (BE_5, 12)

In addition, not only a horizontal but also a vertical differentiation is made. According to the experts with the company perspective, the required professional skills depend on the task of the employees. A clear difference between leading employees, low-skilled employees and technicians is expressed by some experts:

"For large laundries, the position of technologist who decides on the workflow is very important. It is a leading employee who knows exactly what work program we are going to use for what laundry and how we will iron it. Accordingly, he is able to adjust the machines. His subordinates then have to know only the machine operators." (CZ_1, 12)

Generic or transversal competences

In addition to this technical knowledge and skills, employees in the textile care sector also need generic or transversal competences.

A high value is attributed to the ability to interact and cooperate appropriately with colleagues and superiors. This is supported by a number of statements - partly also in comparison with other competences:

"Everyone can learn to use a machine, but what we put a great deal of emphasis when we choose a worker if he or she fits into our team. Because this is the only way how to create the environment which people want to work in. So a basic interview with a HR officer is definitely needed." (CZ_2, 14)

"Social competences are and will be crucial competences for the textile industry." (DE_1, 14).

"(…) communication with the colleagues, the employer or the production manager is very important. (BE_4, 16)

"Laundries are nowadays very happy if they can find a worker who is able to work in a team, who can read and write (working with a PC) and who is open to interpersonal contact. Other competences don't matter." (BE_8, 14)

" ... language skills are essential, while reading, writing and arithmetic are still a basic competence that employees in the textile cleaning industry should bring with them." (DE_3, 19)

"Knowing the language is essential for the safety of the workers." (BE_6, 14)

Personal competences are mentioned, including learning competence, resilience, stamina:

"Another competence is stamina while working with hot machines in summer or loud working spaces." (DE_1, 14)

Digital competences are also mentioned, on different levels:

"Less need for workhorses that lift and sort. More needs for those who have computer skills." (SE_2, 11)

"Out in production, everyone must step up technically and be able to enter more combined operator role combined with manual work. The same staff as before but the staff becomes more and more technical. (SE_3, 12)

"Higher digital skills are required for those who run the laundry - responsible, supervisors, site managers, but do not get much higher skills for those who work in the laundry, more than general computer knowledge." (SE_1, 12)

"Digital knowledge is the hardest and sometimes you have to invest a whole lot of time and effort to get results from the workers. The company provides the possibility for workers to educate themselves in many ways, but the response is minimal. Training is often considered as an obligation." (BE_9, 13)

"It is important to follow new trends, to control the computer well, and to work with excel, which we often use. We send our employees to trainings to know how to do it." (CZ_3, 14).

Result area 3: Vocational education and training (VET) – current performance and development needs

Regular initial vocational education for a sector-specific occupation was only available in Germany at the time of the study. In the other countries, the companies are dependent on the performance of the secondary schools or other initial vocational educations and their in-house trainings. Irrespective of this, however, it is possible to address how the current performance of VET is assessed and what development requirements are seen. This is presented country-specifically.

Belgium

The assessments of the performance of general and vocational schools are predominantly negative, in general and in relation to the requirements of companies in textile cleaning. Some spotlights on this:

"Rather low." (BE_5, 16)

"There is a serious lack of school education, (…) there is also a gap between what young people learn at school and the practice in reality." (BE_6, 16)

"Education stands on a low level and the difference between school and workplace is too big." (BE_10, 18)

"Classical education lacks basic competences, we see very few young people with competences that are directly applicable, but this is also a social fact." (BE_3, 16)

Companies have reacted to this situation and found solutions to arise interest of young people and to build up the necessary competence. They open their company and try to interest young people in working in their company and cooperate with intermediate agencies.

"Sometimes it's a success, sometimes not. One cause is the scholastic education: there is a levelling down. And we need to challenge people! We work together with a temporary

employment agency, VDAB and schools to find younger people, but it's very difficult." (BE_1, 17)

"We use different systems to get people interested: IBO (Flanders), internships, pupils working one day per year, but the level in the schools is way too low." (BE_9, 16)

"Occupational competences have to be acquired through the company." (BE_5, 12)

The experts from the companies and from the suppliers give only a few clues as to what the training system should do for the companies in the future. Obviously, expectations are very low. Companies seem to rely on themselves and favour work-based learning in the company:

"Learning in the workplace will happen more and more." (BE_10, 12)

"Making people better on the work floor is making the whole company better. Vocational training is necessary, but production also must go on." (BE_10, 20)

"Polyvalency will become very important, if it wasn't just to compensate for sickness or leave of colleagues." (BE_9, 18)

Only one expert still sees a shared responsibility:

"Building up occupational competences is there for a shared responsibility of employer and government." (BE_4, 14)

Czech Republic

The initial vocational education is primarily a task of secondary schools. Practical, work-based training and work placements are integrated into the initial vocational education curricula as a mandatory part. This secondary education with a vocational certificate, provided typically by secondary vocational schools (SOU – střední odborná učiliště – ISCED 3C) should prepare graduates primarily for the labour market.

The few approaches in the regular vocational education system seem to be struggling to keep the teaching content up to date:

"Yesterday I had a visit from the educational institute Janštejn. There is a secondary vocational school where the laundry and textile care are taught. One of the teachers recently showed me their outdated books. For example, their students have to learn that laundry is dried in hot air dryers, but that is no longer true. Also, they have to know composition of chemical powders, which is, in my opinion, completely unnecessary. We should do something about it. I would suggest that these students go to practice with us. We would like to offer this to them." (CZ_3, 17)

Washing and textile care is also subject to training in special facilities for people with disabilities.

Germany

The performance of vocational education and training in textile care is well assessed by some experts, but they also see some challenges in the face of technological development and workforce shortages:

"In our vocational education school, we have a solid basis. But even we teachers must learn still a lot of things, especially in topics like digitalisation of textile care industry. In our case [Germany has a dual vocational education system] the companies of the industry and the schools have a cooperation, which is okay but could get better, because the companies don't really care how the curriculum could be implemented in the practical work. A big weakness in the German system is the cooperation between the school and the guild, what makes it difficult to adopt changes in the vocational education." (DE_1, 16)

"The vocational schools for textile cleaners are pretty good, despite the current situation, that fewer trainees mean fewer schools in Germany and in vice versa." (DE_2, 17)

Another expert states, that

"**...** the vocational school system explains specialist knowledge not good enough. On the other hand, this knowledge is teaching by others like suppliers, which usually advertise their own products, and the German and the regional associations." (DE_4**,** 18)

Sweden

The Swedish vocational education and training system does not provide an education in textile care, as it is known in e.g. Germany. Instead, young people enter the employment system after, for example, completing vocational education in the industrial technician programme (Industritekniska programmet – IN). Nevertheless, the industry in Sweden has developed its own ways to acquire and develop the workforce needed.

On this background the statements of the Swedish experts regarding the performance of the vocational education and training system were significantly less pronounced in scope and depth than in the other topics of the interview.

"There is no professional laundry training to talk about in Sweden. Other countries have more formal courses. Today, as a supplier, we become very important, we have a lot of training for laundries and deliver skills." (SE_4, 17)

Regarding the needs, another expert explains:

"The status of working on laundry needs to be raised. Need shorter courses for production staff, for supervisor training and for production managers. Shorter and easier training that is certificate-based for production personnel. Increased awareness among staff about how everything is related would be a profit for the industry." (SE_2, 17)

Section D:
The Educate! Competence Framework

At the beginning of this section, the educational idea and the educational goals underlying the competence framework are presented and the content structure of the framework is justified. The structural elements of the competence framework are defined. This is followed by a presentation of the three competence pillars, the assigned competence areas, and competences. The largest space is taken up by the competences covering the planning, implementation, control, and evaluation of the core processes. This is followed by the next largest competence pillar, "Being a member of a team and a company", with competence areas that focus on successful interaction and communication with superiors and colleagues and managing one's own role in and for the company and team. The third and final competence pillar, "Taking Care of Yourself," includes the competency areas that focus on maintaining health and professional development. In each competence area, the competences are described in a holistic approach as outlined. The section ends with guidance on how the competence framework can be used in curriculum development, lesson planning, and development of validation procedures.

(16) The educational idea and educational goals of the TC competence framework

In conclusion to the previous explanations, a conceptual competence framework is proposed, in the centre of which is an employee who enjoys his or her work and does it well, feels comfortable in the company and in the team and understands changes as challenges that he or she gladly accepts with the help of the company. If this succeeds, both the employee and the company are usually satisfied.

Both - company and employee - are in a reciprocal relationship. On the one hand, realistically speaking, there are the mental and physical work demands associated with the company's core processes, the work environment and leadership. They influence the employee's performance and, in perspective, his or her ability to work (Imarinen & Lehtinen, 2004). On the other hand, employees themselves have resources that influence their work performance and work ability. In addition to material and social resources, these are above all individual resources and their ability to act at work.

Such a holistic understanding of the professional action competence rests on three pillars:

- the ability to successfully complete the work tasks intended for him/her in the company with the resources intended for this purpose
- the ability to behave appropriately in the company and in the team
- the ability to take care of oneself and to maintain one's ability to work and be employed in the long term.

The conceptual competence framework in the textile care sector proposed here includes all three pillars and thus provides a broad framework for the development of professional action competence of employees. Within the pillars, the individual competences are grouped into competence areas.

The competence framework is designed in such a way that it is connectable in many ways and thus offers various options. One option, which is at the same time a strong guiding principle of the VET system in German-speaking countries, is that of comprehensive professional action competence, which is characterised not only by the integration of various competence dimensions, but also by a broad spectrum of action relevant to more than one company and a high degree of independence and assumption of responsibility. However, this action competence can also be more narrowly tailored, e.g. for laundries, which is probably an option in some other European countries.

The conceptual competence framework is designed to promote both horizontal and vertical competence building.

Horizontal competence building, including all three pillars, is a must from the perspective of both the employee and the company. On the one hand, no company will be satisfied with an employee who is able to operate a washing machine excellently, but at the same time is not able to be on time for a work shift or to deal with colleagues

appropriately. Even more, regarding the third pillar, in view of the workforce shortage, the company will also want at least some workers to be willing to learn and open to taking on new tasks. On the other hand, it is also in the interest of the employee to not only be able to perform the currently required work activities, but also to be able to meet future requirements and thus ensure his or her own employability and ability to work. However, building up competences across the board does not only mean integrating the three pillars, but professional action competence is also created by acquiring a broad spectrum of competences within the pillars. From the point of view of the company and the employee, this expands the possibilities for employment within and outside the company and thus their employability.

Vertical competence building is to be understood as deepening competences in the sense that the ability to act independently and on one's own responsibility grows. Autonomy is an important differentiation criterion in the assessment of a professional competence level. It is always coupled with a deeper occupation-specific declarative and procedural knowledge, which in combination with extended cognitive skills allows the solution of even unforeseen requirements. The starting point of the conceptual competence framework are existing qualification profiles and training plans from level 2 up to level 4. This spectrum is basically also covered by the conceptual competence framework. So it offers enough potential for what is now called up-skilling.

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(17) Competence pillar 1 "Textile Care"

The largest space is taken up by competences covering the planning, implementation, control, and evaluation of the core processes. The documents from Employment and Vocational education and training presented in section 2 focus on this and have been consulted in this chapter. As the experts can see, the education plan for basic vocational training for textile care specialists from Switzerland in particular has left clear traces.

In the following text, the professional action competences are presented in five competence areas. These competence areas are:

- Receive textiles and advise the customer
- Prepare and assemble the batches
- Treatment of textiles
- Finishing textiles
- Delivering textiles, dealing with complaints.

Competence Pillar	Textile Care
Competence Area	Receive textiles and advise the customer
Description	The employee is able to accept textiles, to communicate with the customer in an appropriate manner and to advise him/her competently. He is aware of his responsibility as a representative of the company.
Competence	Receive textiles
Competence	Communicate with the customer
Competence	Advise the customer (dry cleaning)
Competence	Advise the customer (laundry)

Competence Pillar	Textile Care
Competence Area	Receive textiles and advise the customer
Competence	Receive textiles
Description	The employee is able to receive textiles. In doing so, he observes occupational safety and health protection.

Competence Pillar	Textile Care
Competence Area	Receive textiles and advise the customer
Competence	Communicate with the customer
Description	The employee is able to communicate with the customer in an attentive and friendly manner. He is aware of the effect of the first impression. Accordingly, he pays attention to a well-groomed appearance and an attentive attitude, which manifests itself both non-verbally and verbally. He is able to classify the customer's statements, e.g. by deciding between the factual and the relational level, and thus also react appropriately to possible misunderstandings.

Competence Pillar	Textile Care
Competence Area	Receive textiles and advise the customer
Competence	Advise the customer (dry cleaning)
Description	The employee is able to advise the customer in an appropriate and technically correct manner. To do this, he captures the customer's wishes with suitable questions and records them. Taking into account the relevant parameters such as material, soiling, existing damage, etc., he shows the treatment options, their risks and costs.

Competence Pillar	Textile Care
Competence Area	Receive textiles and advise the customer
Competence	Advise the customer (laundry)
Description	The employee is able to advise the internal or external customer in an appropriate and technically correct manner. In doing so, he takes into account the article groups and specifications, the material composition, sensitive applications and coatings, the type of soiling, suitable processes and costs as well as ecological effects.

Competence Pillar	Textile Care
Competence Area	Prepare and assemble the batches
Description	The employee is able to record and label textiles and carry out a goods inspection if required. They sort the textiles and assemble the batches.
Competence	Record and label textiles
Competence	Carry out fabric inspection (dry cleaning)
Competence	Prepare and assemble batches (dry cleaning)
Competence	Prepare and assemble batches (laundry)

Competence Pillar	Textile Care
Competence Area	Prepare and assemble the batches
Competence	Record and label textiles
Description	The employee is able to record customer orders in accordance with the company's specifications and procedures and to label them in accordance with the company's standard systems.

Competence Pillar	Textile Care
Competence Area	Prepare and assemble the batches
Competence	Carry out fabric inspection (dry cleaning)
Description	The employee is able to inspect the goods according to the company's specifications. He carries out a bag check, recognises and documents any damage, compares the textile with the material and care labels and records the soiling. In the case of problematic textiles, he uses a declaration of proviso.

Competence Pillar	Textile Care
Competence Area	Prepare and assemble the batches
Competence	Sort and assemble batches (dry cleaning)

Description	The employee is able to sort textiles according to the operational specifications and to put together the corresponding batches. Depending on the operational specifications, the separation takes place according to plants, degree of soiling, textile type and condition, application, equipment, coating and colour.

Competence Pillar	Textile Care
Competence Area	Prepare and assemble the batches
Competence	Sort and assemble batches (laundry)
Description	The employee is able to sort textiles according to the operational specifications and to put together the corresponding batches. Depending on the operational specifications, the separation takes place according to plants, degree of soiling, fibres, colours and hygienic requirements. Problematic textiles are identified and treated separately.

Competence Pillar	Textile Care
Competence Area	Treatment of textiles
Description	The employee is able to wash, clean, wet-clean and detach textiles using the appropriate processes, resources, energy sources, machines and equipment.
Competence	Apply and monitor process and machine technology
Competence	Wash textiles using the appropriate processes and equipment (laundry)
Competence	Clean or wet-clean textiles using the appropriate processes and equipment (textile cleaning)
Competence	Remove stains from textiles using the appropriate processes (laundry)
Competence	Remove stains from textiles using the appropriate processes (dry cleaning)

Competence Pillar	Textile Care
Competence Area	Treatment of textiles
Competence	Apply and monitor process and machine technology
Description	The employee is able to create suitable procedures and apply them to treat the textiles. He operates the various technical installations and monitors their function. He can carry out maintenance work and rectify simple faults.

Competence Pillar	Textile Care
Competence Area	Treatment of textiles
Competence	Wash textiles using the appropriate processes and equipment (laundry)
Description	The employee is able to wash textiles using the appropriate processes, operating resources, energy sources and equipment. This involves washing lines, washer extractors, dewatering machines and so on. The machines are made ready for operation, loaded professionally, the programme is created or selected, the process is monitored, unloading takes place and the washed material is checked according to the operational standards and further distribution is determined.

Competence Pillar	Textile Care
Competence Area	Treatment of textiles
Competence	Clean or wet-clean textiles using the appropriate processes and equipment (textile cleaning)
Description	The employee is able to independently clean or wet-clean textiles using the appropriate processes, operating materials, energy sources and equipment. The machines are made ready for operation, loaded professionally, the programme is created or selected, the process is monitored, the textiles are unloaded and checked according to the operational standards and further distribution is determined.

Competence Pillar	Textile Care
Competence Area	Treatment of textiles
Competence	Remove stains from textiles using the appropriate processes (laundry)
Description	The employee is able to remove stains from textiles using the appropriate processes, operating materials, energy sources and equipment. He does this, if necessary, with a professional stain removal or decolourisation programme, and does so in a time-efficient, safe, energy-saving and ecological manner.

Competence Pillar	Textile Care
Competence Area	Treatment of textiles
Competence	Remove stains from textiles using the appropriate processes (dry cleaning)
Description	The employee is able to remove stains from textiles using the appropriate processes, operating materials, energy sources and equipment. He determines the treatment method on the basis of the type of soiling and the textile conditions and then uses the appropriate detaching agents in a professional manner. The treatment methods are time-efficient, safe, energy-saving and ecological.

Competence Pillar	Textile Care
Competence Area	Finishing textiles
Description	The employee is able to finish textiles, pick them and plan logistics.
Competence	Finishing textiles with suitable processes and equipment (laundry)
Competence	Finish textiles using the appropriate processes and equipment (dry cleaning).
Competence	Carry out quality control according to company specifications

Competence Pillar	Textile Care
Competence Area	Finishing textiles
Competence	Finishing textiles with suitable processes and equipment (laundry)
Description	The employee is able to finish textiles independently using the appropriate processes, operating resources, energy sources and equipment. Depending on the company, the equipment includes tumblers, tunnel finishers, mangle and mangle lines, automatic folding and ironing machines, presses, etc. The equipment is started up professionally, the textiles are prepared and fed into the system. After processing, the result is checked according to the usual operational and professional standards.

Competence Pillar	Textile Care
Competence Area	Finishing textiles
Competence	Finish textiles using the appropriate processes and equipment (dry cleaning).
Description	The employee is able to independently finish textiles using the appropriate processes, operating resources, energy sources and equipment. Depending on the company, the equipment includes tumble dryers, ironing tables, form finishers, etc. The equipment is commissioned professionally, the textiles are provided and fed into the system, and after processing, the result is checked according to the company's usual and professional standards.

Competence Pillar	Textile Care
Competence Area	Finishing textiles
Competence	Carry out quality control according to company specifications
Description	The employee is able to carry out quality controls in accordance with the company's specifications. To this end, he uses suitable methods, equipment, technical facilities and tools. In doing so, the quality is recorded and assessed in all process stages, faults are recorded in the sense of a deviation from the standards and the causes of faults are identified and eliminated. Quality deviations and damage to textiles are dealt with in

	accordance with company procedural rules.

Competence Pillar	Textile Care
Competence Area	Delivering textiles, dealing with complaints
Description	The employee is able to pick textiles and ensure the flow of goods to the customer. He deals with possible complaints in a professional manner.
Competence	Delivering textiles (laundry)
Competence	Delivering textiles (dry-cleaning)
Competence	Receiving and processing complaints (laundry)
Competence	Receiving and processing complaints (dry cleaning)

Competence Pillar	Textile Care
Competence Area	Delivering textiles, dealing with complaints
Competence	Delivering textiles (laundry)
Description	The employee is able to assemble customer items, check them for quality, completeness and delivery date and pack them professionally. He plans the logistics and checks the correct delivery.

Competence Pillar	Textile Care
Competence Area	Delivering textiles, dealing with complaints
Competence	Delivering textiles (dry-cleaning)
Description	The employee is able to assemble the customer's items, check them for quality, completeness and delivery date and pack them professionally. He hands out the textiles to the customer according to the company's specifications. He informs the customer of any damage or residual stains and explains the causes. In the event of damage, he offers to settle the claim in accordance with company practice. He cashes in the services.

Competence Pillar	Textile Care
Competence Area	Delivering textiles, dealing with complaints
Competence	Receiving and processing complaints (laundry)
Description	The employee is able to receive and process internal or external complaints. In the case of a quality defect, he submits reasonable rectifications. In the case of damage, he determines the causes of damage and identifies the source of the defect. He makes suggestions for correcting the fault.

Competence Pillar	Textile Care
Competence Area	Delivering textiles, dealing with complaints
Competence	Receiving and processing complaints (dry cleaning)
Description	The employee is able to receive and process a customer complaint. In the conversation, he shows himself to be responsive to the customer and understands the complaint as an opportunity for improvement and customer loyalty. In the case of a quality deficit, he proposes appropriate improvements. In the event of damage, he deals with the customer within the framework of the usual operational guidelines. In addition, he determines the causes of the damage and identifies the source of the defect. He makes suggestions for the elimination of the fault.

(18) Competence pillar 2 "Being a member of a team and a company"

"Being a member of a team and a company", that is the second pillar with competence areas that focus on successful interaction and communication with superiors and colleagues and managing one's own role in and for the company and team. The competence areas are

- Know and take into account the framework conditions
- Taking responsibility for oneself and others.

Competence Pillar	Being a member of a team and a company
Competence Area	Know and take into account the framework conditions
Description	The employee knows and takes into account the legal, professional and institutional framework conditions of his or her work.
Competence	Employee rights and obligations
Competence	Culture of the sector and the company
Competence	Participation and involvement in the company and in the workplace

Competence Pillar	Being a member of a team and a company
Competence Area	Know and take into account the framework conditions
Competence	Employee rights and obligations
Description	The employee knows his or her rights and obligations as an employee and takes them into account appropriately in his or her internal conduct.

Competence Pillar	Being a member of a team and a company
Competence Area	Know and take into account the framework conditions

Competence	Culture of the sector and the company
Description	The employee knows the specifics of the textile care sector and is also familiar with the organisation and culture of his company. He takes this into account in his presentation to managers and colleagues.

Competence Pillar	Being a member of a team and a company
Competence Area	Know and take into account the framework conditions
Competence	Participation and involvement in the company and in the workplace
Description	The employee knows the possibilities of participation and shaping in the company and, if applicable, also at work. He follows the development and actively participates in it.

Competence Pillar	Being a member of a team and a company
Competence Area	Taking responsibility for oneself and others
Description	The employee is able to identify with the company and to view his/her own task performance in a company context and to act appropriately.
Competence	Know and meet the requirements of one's own workplace
Competence	Communicate and cooperate appropriately with managers and colleagues.
Competence	Support and guide colleagues

Competence Pillar	Being a member of a team and a company
Competence Area	Taking responsibility for oneself and others
Competence	Know and meet the requirements of one's own workplace
Description	The employee knows the requirements of his/her own workplace and is able to plan and carry out his/her work in such a way that these requirements are met. If this is not the case, he

	openly communicates the cause with his manager and seeks possible solutions with him.

Competence Pillar	Being a member of a team and a company
Competence Area	Taking responsibility for oneself and others
Competence	Communicate and cooperate appropriately with managers and colleagues.
Description	The employee is aware of the different roles and areas of responsibility in a company and takes this into account in his/her internal appearance. He/she communicates appropriately with managers and colleagues and cooperates with them reliably.

Competence Pillar	Being a member of a team and a company
Competence Area	Taking responsibility for oneself and others
Competence	Support and guide colleagues
Description	The employee looks beyond his/her own workplace and is willing and able to support colleagues and also guide them when asked to do so by the manager.

(19) Competence pillar 3 "Taking Care of Yourself"

The third and final competence pillar, "Taking Care of Yourself," includes the competences that focus on maintaining health and professional development. They are grouped in these two competence areas

- e Maintaining and promoting one's own health
- Develop professionally.

Competence Pillar	Caring for oneself
Competence Area	Maintaining and promoting one's own health
Description	The employee is able to deal professionally with stresses and strains that arise in the workplace. This refers to protective, preventive behaviour directly at the workplace, but also to health-promoting compensation and dealing with challenges such as reconciling family obligations and work.
Competence	Dealing with stress and strain
Competence	Promoting one's own health
Competence	Reconciling work and family life

Competence Pillar	Caring for oneself
Competence Area	Maintaining and promoting one's own health
Competence	Dealing with stress and strain
Description	The employee is able to deal professionally with stresses and strains that arise in the workplace. He observes the hygiene and occupational safety regulations and takes ergonomic findings into account. Together with his or her manager, he or she discusses how stresses and strains can be reduced.

Competence Pillar	Caring for oneself
Competence Area	Maintaining and promoting one's own health

Competence	Promoting one's own health
Description	The employee is able to take specific measures to promote his or her health, both in and out of the workplace. In the company context, he takes the initiative and makes appropriate suggestions in the team and to his manager.

Competence Pillar	Caring for oneself
Competence Area	Maintaining and promoting one's own health
Competence	Reconciling work and family life
Description	The employee is able to raise the issue of his or her reconciliation situation with his or her manager and to make suggestions for company measures to support the reconciliation of family duties and work.

Competence Pillar	Caring for oneself
Competence Area	Develop professionally
Description	The employee is able to take care of his/her own employability and to develop professionally. To this end, he works fundamentally on his digital competence as a prerequisite for inclusion in the world of work and life. He observes the developments in his immediate working environment and works on his professional perspectives.
Competence	Develop digital skills
Competence	Develop career perspectives

Competence Pillar	Caring for oneself
Competence Area	Develop professionally
Competence	Develop digital skills
Description	The employee is aware that, in addition to other basic competences, general digital competence is the basis for inclusion in the labour market. He ensures that he is not only able to master the company-specific applications but has a broad spectrum of digital competences as mapped in the current

	competence frameworks on general digital competence.

Competence Pillar	Caring for oneself
Competence Area	Develop professionally
Competence	Develop career perspectives
Description	The employee is aware that in principle every job is affected by modernisation processes. He observes this also for his own work area and proactively develops his professional perspective, if necessary, also with counselling in the field of occupation and education. If this is possible and makes sense, he takes the initiative and discusses his plans with his manager and his company.

(20) Guidance: Using the competence framework

The section ends with guidance on how the competence framework can be used in curriculum development and design, lesson planning, and development of validation procedures.

Curriculum development and design

Even if there is no universally shared definition of what is meant by the term curriculum, there is a tendency to understand it as a concept or framework plan for a longer teaching/learning process. For the further development or the design of a curriculum, the competence framework can be helpful for a first orientation, as it defines the competence fields that are considered useful for the development of a professional competence of employees in the textile cleaning sector.

In view of the addressees of the curricular planned teaching/learning process, namely employees with sector-specific work experience and a certain spectrum of informally acquired competences, a curriculum cannot be developed from the competence framework without further consideration. For this, an intermediate step is necessary, namely a training needs analysis, in which this competence framework can be a reference framework. The results narrowed down in this way are then suitable as a starting point for curriculum development and design.

In the development and design of a curriculum - and this is especially true with regard to Pillar 1 - the idea should be taken into account that competence is an integral, multidimensional construct and more than skills. The multidimensionality is apparently clearly shown in the fact that in our competence framework professional action competence is based on three pillars. But this alone is not sufficient. On the one hand, real up-skilling in the sense of vocational action competence only works via the acquisition of declarative and procedural knowledge, which in turn has to be integrated into cognitive and practical skills, expands the range of actions and also prepares for solving unknown problems. On the other hand, with an integrated approach, not only the social competences, but above all the personal competences and attitudes must be stimulated continuously.

Lesson planning

Lesson planning is always preceded by an explicit or implicit training needs analysis, which has led to the assumption that employees have a need for competence development at one point or another. In practice, it then very quickly gets down to the level of doing, i.e. planning and implementing small VET opportunities. The methodological-didactic planning of these small units can benefit from the competence framework to a limited extent, as it is exclusively conceptual. It only defines the framework, which can possibly lead to the fact that competences that have not been

considered so far move into the horizon of attention. Methodological-didactic lesson planning remains - similar to initial vocational education and training - a task that still has to be done by professional teachers or trainers.

Validation procedures

Similar to the conception of a competence framework, two approaches can be distinguished in the validation of non-formally and informally acquired competences: a holistic, reconstructive approach and an analytical, objectivist approach. For both approaches, the competence framework is a good starting point, as it represents the framework in which professional action competence in textile care can manifest itself. For the analytical approach, as it is shown in the quantitative assessment, it is too little concrete as a conceptual framework. Instrument developers will find useful material in the sector-specific National Occupational Standards and National Vocational Qualifications in UK. For the holistic approach, it is also concrete enough in this conceptual orientation.

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