

Identification of worker competencies
with the CM ProWork-Tool

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Possibilities and Results of Classification
into the European Qualification Framework

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1. Objective of the classification

The Leonardo innovation transfer project CM Pro Work-Transfer follows the operational programme objective of „enhancing the transparency and acknowledgement of qualifications and competencies including those that have not been acquired through formal and informal training“. As other Leonardo projects, it serves as a “bottom-up approach”. It is designed to help implementing and enforcing the educational policy objectives “transparency and comparability” of the EU in practice examples.

Compared to this, the European Qualification Framework (EQF) represents a “top-down approach”. On the basis of a construct that spans the entire field of low to very high achievement ability, resulting levels of lifelong learning are defined and complemented with descriptors. With the aid of EQF, which after years of discussion has been approved by the European Commission in 2008, EU countries are to describe the distinct qualification levels in their respective education systems in the form of National Qualification Frameworks (NQF). These National Qualification Frameworks are to be compatible to the EQF, in order to develop a European reference system for comparing and evaluating *learning outcomes*.

CM ProWork was developed for the target group of *industrial workers*. This target group comprises a more or less extensive part of employed persons in all EU countries. Depending on the national industrialisation history, the industrialisation level and the educational system various qualification configurations can be found in the target group. The usual categorisation into *unskilled* (without any education or further education), *semi skilled* (without formal education but supported learning by apprentice systems or trainings), *skilled without production-related vocational training* and *skilled* or *high-skilled* (with production-related vocational training within schools or the Dual System) characterises the competencies of this target group inadequately. Especially the high significance of *job integrated learning* relevant for the competence development of this group is concealed by this categorisation. To a great amount this significance can be explained by the dependence of competence-related demands on the respective, permanently changing production technology with the products, work organisation as well as working and learning culture in the companies between which there is a need to switch regularly while working.

Formal qualification systems as well as further education offers are not easily adapted to the target group under these circumstances. Although for example in Germany several new production related professions have been added to the Dual System of Vocational Training, the availability of respective apprenticeship training positions was moderate. Activities for second-chance qualification of semi-skilled industrial workers are negligible in numbers in German qualification events. For workers without formal qualification this deficit in anchoring within formal EU education systems is in many cases equivalent to a devaluation of competencies they have acquired through longtime “learning by doing” in a field of achievement probation that is not at all undemanding. Nevertheless, the use of the term “lowqualified” for those workers has become regular. For companies that employ not formally qualified workers the evaluation and support of the related competencies is difficult as well.

On the other hand the inclusion of results from non-formal and informal learning into the transparency and comparability policy is an explicit goal of European educational politics since the middle of the 90s: “The EQF can support individuals with extended experience from the working world or other fields of action through simplified validation of non-formal and informal learning. By emphasizing learning results the evaluation whether contents and relevance of learning results from these contexts are equivalent to formal qualifications is simplified” (EU 2008). Reality shows that the focus of national EQF implementation activities is mainly on projects on the categorisation of formal qualifications from rather higher levels into the respective NQF (CEDEFOP OVERVIEW June 2010). Approaches and procedures for validating non-formally and informally acquired competencies as in Finland and Czech Republic are related to EQF goals; however, their origin are independent national reform endeavours (cf. Dehnbostel et al. 2010, A45 f.).

2. Competence as a key category of the European Qualification Framework

From the development history of the EQF it can be suspected that originally a competence framework was to be developed. The theoretical links of the EQF refer to Dreyfuss (o.J. “ladder of competence”) and Jaques (1996 „Levels of task complexity and types of thinking“). As can be deduced from the titles, both authors tried to develop a broad taxonomy of *cognitive and actional competences* using demands

(types of tasks) of various complexity, into which generally relevant professional *learning outcomes* could be classified. Dreyfuss additionally assigned “learning modes” to the levels.

In a study by Coles and Oates from July 2004 that explicitly refers to these preliminary works, on this basis a “Reference Level Framework” was presented that in addition to “learning modes” contained descriptive elements referring to formal learning in qualifying institutions (this document including the attachments to Dreyfuss and Jaques unfortunately is not available on the CEDEFOP website anymore). In this document “qualification” as well as separately distinguished “experience of work” were introduced as definitions.

“Qualification“ in the EQF is now defined as the *„formal result of an evaluation and validation process in which a responsible body has ascertained that the learning results of a person are equivalent to given standards“*. Compared to this, “competence” is defined as *“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“* as the more extensive category. This makes it just the harder to understand that within the EQF classification system “competence” is used in a limited sense of *“in terms of responsibility and autonomy“*.

From the point of view of the author, the EQF categories “knowledge“ and “skills“ together with the attitude- and motivation-related category *“Competence in terms of responsibility and autonomy“* are therefore rather competence attributes than qualification attributes. An analogue evaluation can also be found in a document by the “Arbeitskreis Deutscher Qualifikationsrahmen“ from February 2009 that denominates “knowledge”, “skills”, “social competence” and “self competence” as “competence categories” and wants to use them thus in the DQR. This is however contrasted by the “Fachliche Prüfbericht“ by the BiBB from June 2006.

3. The model of competence measurement of the CM ProWork Tool

The number of current competence models can hardly be surveyed, let alone distinguished from each other clearly and easily (Erpenbeck / v. Rosenstiel 2003). In gen-

eral, competence models – as different as they might be – try to provide information about the internal, subject-related dispositions that express themselves in the acting and performance of individuals. Without reference to performance and performance development, competence and competence development therefore cannot be defined and explained sensibly. However, in this sphere of determination there are not only numerous possibilities, but there are also threats of tautologic competence modelling. In this case, an observable achievement in its notion is directly based on a special ability: a “tennis playing competence” for a very good tennis player, a “selling competence” for a clever salesman etc. These examples show that competence cannot be fully explained from the perspective of observable behaviour. It is necessary to also include the aspect of disposition quality into the respective competence conception of the competence at stake. Obviously there are several components that only in concurrence lead to competent behaviour. In general and on a rough level it can be assumed that the following components are to be distinguished in this concurrence:

- Intellectual abilities (KNOWLEDGE and connected cognitive processes)
- Motivation for successful acting (WILLING and connected processes of action stimulation)
- Abilities for practical execution (CAPABILITY and connected processes of action regulation)

In the context of this consideration competence constructs for actions that in their performance do not depend upon a concurrence of knowledge, willing, and capability, but on long-term trained skills do not make sense.

In the case of CM ProWork competencies from industrial production are at stake. As stated above, as basic unit and point of reference for competencies-relevant actions only actions come into question that are mentally regulated by the concurrence of motivational, actional and cognitive processes. For the field of industrial work there are comprehensive studies on work-psychology (keyword *Theory of Action Regulation*) and the conception of “Complete actions” constructive on this (cf. Hacker 2005, S. 251 ff.). Because of the target and decision possibilities connected to “Complete work actions”, this conception offers a scope of action in which motoric, cognitive and motivational processes can unfold and action integrated processes of learning can be activated. The attribute “Completeness” applies to two different characteristics:

- The „cyclic completeness“ refers to the question, in how far a worker does only deal with executing but also aspects of preparation, planning and controlling the success of tasks assigned to him.
- The „hierarchic completeness“ depends on the fact, in how far intellectual and knowledge related regulation processes have an effect on an action and not only mentally automated skills are recalled.

Development and implementation of industrially productive actional competence correspond with tasks that at least allow for complete actions or even demand them. It is not the single task but the task structure in which the worker has to succeed that is of interest here, as well as processes that found cooperation and further development in production work.

The competence model of CM ProWork therefore exhibits a double reference:

- (a) A model idea of competent acting in production work on the basis of the conception of complete actions and the linked theory of action regulation;
- (b) A model of the sphere of action in which competences can unfold and within which they can also be registered.

On (b): The actions of the workers are determined in the first line by the tasks they are assigned explicitly or implicitly. For this reason, a task inventory makes up the essence of the concept and the architecture of the CM ProWork tool. The task inventory comprises all tasks that accumulate in preparing and executing production assignments as well as in controlling and enhancing production processes in a hierarchic system of variously complex task levels.

At the basis of this task inventory approx. 100 individual tasks span a sphere of actions. In the sense of a model of completeness, this comprises not only simple executing tasks but also planning, preparing, correcting and improving single tasks of technical, organisational, analytic, designing and cooperative nature. With this spectrum of tasks the action contents of very differently qualified and appointed workers up to technical specialists and lower executives can be displayed practically without interruption.

As in the actions of workers there are processes involved that are relevant for different tasks, respective requirements were determined that are accounted for in the competence depiction. Distinguished are

- Demands of self regulation regarding cooperation in the working process (especially in team and group structures)
- Demands of communication with colleagues, supervisors and other persons regarding work and company related issues
- Demands in recognising foreign needs and interests and intermediation (also in conflict situations)
- Demands of learning changed or new tasks and acquisition of related knowledge

On (a): The competencies of a worker become visible in his actions. Workers who operate only in a narrow spectrum of rather simple tasks and can only partly do justice to work related demands are the one extreme in the concurrence of competence and performance. The other extreme holds true for workers who act in a very wide and differentiated sphere of tasks (and thereby can develop complete action structures regularly) and who also fully fulfil process related demands. In reality of industrial production performances and competencies are naturally averaged and in themselves further distinctive.

The differentiation of the two performance fields „tasks“ and „processes“ can be found in the two competence fields in the CM ProWork tool as well:

- *TASK RELATED COMPETENCIES* refer to the workers' abilities that have been acquired and shown through the responsible taking charge of and executing of work tasks.
- *PROCESS RELATED COMPETENCIES* refer to the workers' abilities and readiness regarding cooperation, communication and continued learning in the working process.

In order to be able to say something about the interior structure of these two competence fields, they were complemented by competence dimensions.

- *TASK RELATED COMPETENCIES* consist of the dimensions
 - *Task Responsibility*: It expresses the responsibility a worker is assigned for a spectrum of working tasks and that he has adopted as his personal

assignment

- *Task Mastery*: It gives information on the ability a worker shows in the completion of real working tasks.
- *Task Knowledge*: It refers to the worker's ability to master tasks that for their completion ask for the realisation and use of technical, organisational, methodological etc. knowledge as well.

- PROCESS RELATED COMPETENCIES are differentiated into the following dimensions, according to the demands mentioned above:

- *Communication Readiness*
- *Cooperation Readiness*
- *Social Competence*
- *Learning Readiness*

As these four dimensions only refer to demands related to the working process they are not meant as general personality traits but workers' competencies!

It can be seen that in the competence fields there are always actional, motivational as well as cognitive processes considered in their concurrence. In contrast, the competence dimensions focus more on either motivational, actional or cognitive dispositions.

In the *Competence Report* of the tool values for the seven competence dimensions within the range from 1 (minimal), 2 (advanced), 3 (high) and 4 (very high) are assigned. These values are calculated by the tool for the task related competences and displayed according to previous classification for the process related competences. A detailed description of the tool's architecture and its input processing / output mechanism can be found in Witzgall 2009, S. 29 ff.

4. Classification of CM competence profiles into the EQF

Regarding the question of classifying CM ProWork profiles into the EQF it must be noted that the EQF is the overall and very general framework. The CM ProWork competence profiles are results of a specific collecting method that has not been deduced from the EQF categories. A classification in the sense of complete and unam-

biguous transmission of EQF to CM ProWork and vice versa cannot be expected, even more so as the EQF in itself does not have the characteristic of isomorphism. More realistic and more interesting is the question of cross-links between EQF and CM ProWork with regard to content that might allow for an allocation.

4.1 Classification on categorical level

The 8 levels of the EQF are distinguished according to descriptors that are classified into basic categories:

- KNOWLEDGE – described as *Theoretical and/or Factual Knowledge*
- SKILLS – described as *logical skills* (using logical, intuitive and creative thinking) and *practical skills* (skilfulness and the use of methods, materials, tools and instruments).
- COMPETENCE – in the sense of *taking responsibility* and *autonomy*.

Both CM ProWork competence fields contain knowledge, skills and competencies as well, although they are not denominated as such in the tool:

- In the TASK RELATED COMPETENCES there are the following links to the EQF with regard to content:
 - (a) EQF-KNOWLEDGE and Dimension TASK KNOWLEDGE
 - (b) EQF-SKILLS and Dimension TASK CAPABILITY
 - (c) EQF-COMPETENCE and Dimension TASK RESPONSIBILITY
- In contrast to the TASK-related COMPETENCES the cross-links regarding content are more diffuse with the PROCESS RELATED COMPETENCES. It must also be noted here that the PROCESS-related COMPETENCIES show a significantly higher dispersion, i.e. a lower covariance than the TASK-related COMPETENCES. Their allocation with EQF levels is therefore disclaimed.

On (a): The descriptor KNOWLEDGE is classified into the EQF levels as follows (subsequently the more precise descriptions of the DQF – the German Qualification Framework - are used):

- *Level 1: Be in possession of elementary general knowledge. Have an initial insight into a field of ... work.*

- *Level 2: Be in possession of basic general knowledge and basic professional knowledge with a field of ... work.*
- *Level 3: Be in possession of extended general knowledge or extended professional knowledge within a field of ... occupational activity.*
- *Level 4: Be in possession of deeper general knowledge or theoretical professional knowledge within a field of ... occupational activity.*
- *Level 5: Be in possession of integrated professional knowledge within a field of activity. This also includes deeper, theoretical professional knowledge. Be familiar with the scope and limitations of the field of activity.*

In contrast to this, the CM ProWork scale levels - according to the standardized CM ProWork competence scale model - differentiate between 4 levels of TASK-related KNOWLEDGE:

- Level 1: Low task knowledge
Only simple or relatively simple tasks are fully mastered. The task fulfilment follows fixed structures, i.e. only simple routine decisions on execution variants are demanded.
- Level 2: Elevated task knowledge
Tasks that ask for a conscious choice of execution variants are mastered. Knowledge about possibilities and consequences is necessary.
- Level 3: High task knowledge
Tasks that in their fulfilment demand for an adequate form of execution depending on the situation (so-called heuristic task structure) are mastered. Extended knowledge about situations and signals, system or process-related possibilities of intervention, consequences and success criteria are necessary for this.
- Level 4: Very high task knowledge
Several tasks from different task fields that in their execution demand additional differentiated knowledge about systems, processes, as well as extended consequence knowledge for other systems and processes must be available are fully mastered.

The EQF/DQF descriptors for *KNOWLEDGE* are similar regarding content but not identical to the concept used by the CM ProWork competence model. The latter follows a concept founded in working psychology called “knowledge intensity of working tasks“ (s. a. Hacker 1995, S. 97 ff.) that mainly aims at procedural knowledge and

only indirectly touches on declarative fact knowledge. The notions of “general knowledge / theoretical expert or rather professional knowledge” of the EQF/DQF rather come from a background of education theory. It can be deduced though, that level 1 of the TASK-related KNOWLEDGE at least equates the DQF-KNOWLEDGE descriptor level 1, maybe even level 2 (depending on the knowledge intensity of the “simple tasks” as well). TASK-related KNOWLEDGE level 2 respectively indicates DQF-KNOWLEDGE level 2 or 3, if the worker maintains an intense knowledge exchange with qualified superiors and colleagues. TASK-related KNOWLEDGE level 3 can easily be identified with DQF-KNOWLEDGE level 3. The highest level of TASK-related KNOWLEDGE can be (primarily) allotted with DQF-KNOWLEDGE level 4 as well as level 5. This ultimately depends on the range of action covered by the worker.

On (b): The EQF SKILLS are allocated to the first four EQF LEVELS according to the tasks to be mastered and problems to be solved in a practical task field. The more complex a task and the more sophisticated the respective problem the higher the EQF level. The German Qualification Framework DQF in which skill-related descriptors are described more clearly and in a more differentiated way is used in the following again. Level 5 in the EQF therefore no longer aims at practical but rather at abstract assignments / problems. The DQF, which does not feature this limitation, enables accounting also for the practical field of activities.

- *Level 1: „Be in possession of cognitive and practical skills required to carry out simple tasks in accordance with pre-stipulated rules and to evaluate the results of such tasks. Establish elementary correlations.“*
- *Level 2: „Be in possession of basic cognitive skills required to carry out tasks within a field of ...work, evaluate the results of such tasks in accordance with prestipulated criteria and establish correlations.“*
- *Level 3: „Be in possession of a spectrum of cognitive and practical skills for the planning and processing of technical tasks within a field of ... occupational activity. Evaluate results in accordance with criteria which are largely prestipulated, provide simple transfers to methods and results.“*
- *Level 4: „Be in possession of a broad spectrum of cognitive and practical skills which facilitate autonomous preparation of tasks and problem solving and the evaluation of work results and processes according consideration of alternative courses of action and reciprocal effects with neighbouring areas. Provide transfers of methods and solutions“.*

- *Level 5: „Be in possession of an extremely broad spectrum of specialised, cognitive and practical skills. Plan work processes across work areas and evaluate such processes according comprehensive consideration to alternative courses of action and reciprocal affect with neighbouring areas. Provide comprehensive transfers of methods and solutions.“*

Corresponding with the general CM ProWork competence scale model the dimension of TASK CAPABILITY can take four levels:

- **Level 1: Low TASK CAPABILITY**
Only a few tasks from a small number of task fields are mastered partly.
- **Level 2: Advanced TASK CAPABILITY**
Several tasks from various task fields are mastered, some even fully.
- **Level 3: High TASK CAPABILITY**
Even more and more difficult tasks from a greater number of different task fields are fully mastered.
- **Level 4: Very high TASK CAPABILITY**
Many tasks from a number of different task fields are fully mastered.

Trying to assign levels 1 to 4 of the CM ProWork TASK CAPABILITY dimensions to the EQF/DQF descriptors SKILLS it must be noticed that TASK CAPABILITY gives information on the number and variability in content of tasks in the first place. An evaluation of the tasks' complexity is possible only indirectly through the classification "full task mastery = mastery in difficult conditions as well". Assigning the lowest TASK CAPABILITY value 1 to the lowest level of the EQF SKILLS is obviously easy. Allocating TASK CAPABILITY values 2 and 3 to the EQF SKILLS levels 2 and 3 can be justified as well, as presumed mastery of a growing number of more complex tasks under increasingly difficult conditions demands for thinking coherently and showing transfer abilities. Level 4 of the TASK CAPABILITY aims at the mastery of a complex field of activities and therefore is linked to EQF SKILLS level 4 regarding content; however, if this field of activities includes a number of planning and controlling or optimising tasks, it can also refer to EQF SKILLS level 5.

On (c): The EQF descriptor COMPETENCE is "*described in terms of responsibility and autonomy*". It is classified into the EQF levels as follows:

- *Level 1: Work under direct supervision in a structured context*

- *Level 2: Work under direct supervision with some autonomy*
- *Level 3: Take responsibility for completion of tasks in work. Adapt own behaviour to circumstances in problem solving.*
- *Level 4: Exercise self-management within the guidelines of work contexts that are usually predictable, but are subject to chance. Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work ... activities.*
- *Level 5: Exercise management and supervision in context of work ... activities where there is unpredictable change. Review and develop performance of self and others.*

The CM ProWork scale on TASK RESPONSIBILITY is structured as follows:

- Level 1: Low task responsibility
The worker is responsible for only a few tasks from task fields with direct process connection.
- Level 2: Advanced task responsibility
The worker is responsible for the execution of several tasks also in not directly process connected task fields.
- Level 3: High task responsibility
The worker is responsible for relatively many tasks from several different task fields, including tasks for preparation, controlling and optimisation
- Level 4: Very high task responsibility
The worker is responsible for many tasks including such with a high degree of freedom in the majority of different task fields.

Level 1 of TASK RESPONSIBILITY can obviously be well allocated to level 1 of the EQF COMPETENCE. Level 2 of TASK RESPONSIBILITY is respectively linked to levels 2 or 3 of EQF COMPETENCE. Following this line, level 3 of TASK RESPONSIBILITY equates level 3 or partly 4 of EQF COMPETENCE and level 4 of TASK RESPONSIBILITY is assigned to level 4 of EQF COMPETENCE. In the case of a high proportion of planning and controlling tasks the worker is responsible for an allocation to EQF COMPETENCE level 5 is justifiable.

In the following table the EQF levels and descriptors and the characteristics of task-related competencies of the CM ProWork tool are allocated with arrows as dis-

cussed. The table is oriented primarily along the structure of the EQF. In its application to empirical CM ProWork competence profiles correspondingly the congruence for the descriptor KNOWLEDGE, then for SKILLS and finally for COMPETENCE must be checked. The further right the descriptor the more probably the empirical competence values can – and must even – differ.

Notice that certain levels of task-related competences do not correspond to only one EQF level but to two different ones. This fact is indicated in the table by a double arrow (straight/diagonal).

EQF/DQF Level	Descriptor KNOWLEDGE	Descriptor SKILLS	Descriptor COMPETENCE
1	← Level 1 TK	← Level 1 TC	← Level 1 TR
2	↙ ← Level 2 TK	← Level 2 TC	← Level 2 TR
3	↙ ← Level 3 TK	← Level 3 TC	↙ ← Level 3 TR
4	← Level 4 TK	← Level 3 TC	↙ ← Level 4 TR
5	↙	↙	↙

TK = Task Knowledge; TC = Task Capability; TR = Task Responsibility

4.2 Classification on empirical level

For the attempted empirical classification, data from an application testing of the tool CM ProWork in 2010 were used. During this testing a production site of a medium-sized manufacture in Northwest Germany was examined. The production of this manufacture is organised according to modern standards with a concept oriented towards the Toyota system. The workers employed in this realm and involved in the analysis have predominantly been working there for a longer time.

At the production site examined there are two different production modules that are lead by two respective module leaders (with foreman qualification):

- At the time of examination there were 31 workers employed in the module „montage“, including the superiors beneath the module leader. In “montage” the degree of mechanisation is rather low, as a great number of product variants must be assembled in a highly flexible fashion. However, the integrated paint shop is very modern. The workers in the module “montage” for the most part have a high percentage of formal qualifications (predominantly a degree as industrial mechanic): shift leader 100%, order pickers almost 100%, assemblers and lacquerers 50%, packers 20%.
- In the module “manufacturing of components“ 25 workers were employed including lower superiors. In this unit there is a high degree of automatisisation (CNC processing centres). The percentage of formal skilled workers is even higher here and amounts to more than 95%.

The tool was used by the module leaders. In the tool output the respective results were made anonymous for this classification attempt. In the following two tables there are on the one hand the competence measurement results from the tool testing; on the other hand there is the evaluation (right column) for all workers of both production units which was done by the author. Competence measurement values were arranged in the columns so that TW (Value of Task Knowledge) comes furthest left and TC (Value of Task Capability) and TR (Task Responsibility) follow. Classification results are listed in the column “EQF/DQF level”. In those cases (34%) where a clear identification was not possible two levels were assigned. The primary criterion for classification was the Value of Task Knowledge (TK), the secondary was the Value of Task Capability (TC) and tertiary the Value of Task Responsibility (TR); all three are part of the task-related competences. It became clear that a static horizontal identification of all three descriptors with the levels of the EQF model cannot be matched empirically with the competence values measured by the CM ProWork tool.

Function	TK	TC	TR	EQF/DQF level
Assembler	1	1	2	1 to 2
Packer	1	1	2	1 to 2
Assembler	1	1	2	1 to 2
Assembler	1	1	2	1 to 2
Assembler	1	1	2	1 to 2
Assembler	1	1	2	1 to 2
Assembler	1	2	2	1 to 2
Assembler	1	2	2	1 to 2
Assembler	1	2	2	1 to 2
Lacquerer	2	1	2	2
Packer	2	1	2	2
Packer	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Assembler	2	2	2	2
Order picker	2	2	2	2
Shift leader	2	2	4	2 to 3
Lacquerer	3	2	2	2 to 3
Lacquerer	3	2	2	2 to 3
Lacquerer	3	2	2	2 to 3
Assembler	3	3	2	3
Assembler	3	3	2	3
Assembler	3	3	3	3
Shift leader	3	3	3	3
Shift leader	3	3	3	3

Classification results in the module „montage“

The competence measurement values of the module “montage“ can mostly be identified with levels 2 and 3 of the EQF/DQF (cf. following table). Level 1 is “broached”.

The distribution of level values follow first of all the real but differentiated functions of the workers with the respective task and responsibility layouts. Secondly, the formal qualification level is relevant. The “EQF competence” varies independently of “skills” and “knowledge”.

Function	TK	TC	TR	EQF/DQF level
Order picker	2	2	1	2
Order picker	2	2	1	2
Cutting machine operator	3	2	1	2 to 3
Cutting machine operator	3	2	2	2 to 3
Cutting machine operator	3	3	1	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Cutting machine operator	3	3	2	3
Machine operator	4	3	2	3 to 4
Cutting machine operator	4	3	2	3 to 4
Cutting machine operator	4	3	2	3 to 4
Shift leader	4	3	3	4
Cutting machine operator	4	3	3	4
Shift leader	4	3	3	4
Cutting machine operator	4	3	3	4
Shift leader	4	4	4	4 to 5

Classification results in the module “manufacture of components”

In the production module “manufacturing of components“ the classification leads to level values between 2 and 4. In one case (shift leader) even level 5 is reached. The two order pickers do not have a qualification as skilled worker, their task and responsibility layout is rather narrow. Apart from that, the functions of the shift leaders reside in upper levels. The formal qualified and skilled cutting machine operators are predominantly assigned to levels 3 and 4. The nonformal qualified machine operator has developed into remarkably high competence and EQF levels.

5. Conclusions for the evaluation of CM ProWork competence profiles

It was shown that cross-links between EQF descriptors and competence dimensions of the CM ProWork tool are strong enough with regard to content to conduct a plausible identification of empirical competence profiles with the EQF levels. However,

the EQF levels were not always hit directly but double classifications had to be made up in several cases – which in our opinion is a natural part of the examined issue.

Furthermore it became clear that for the target group of workers in modern production processes the EQF levels 2 to 4 are relevant. Level 1 is surpassed in most cases, if it is not for a worker with a very narrow profile of predominantly simple tasks or a worker in training phase. Level 5 is reached only by a minority of workers. Those have a formal qualification and a broad task profile that includes relatively many complex tasks with process and leadership responsibility.

The fact that workers' functions can be assigned to three or even five EQF levels again confirms the high significance of competence development through job design (allocation of many also difficult tasks in various task fields) and experience acquisition in this field of action. Formal qualifications can only lead to higher worker qualification levels if they are used and developed further by respective forms of activities.

Workers without formal qualification can definitely reach EQF levels beyond 2. The fact that workers without formal qualification can develop to average competence levels of formally qualified workers under suitable circumstances (training, knowledge exchange) is known to the author from earlier studies as well (Witzgall 2007, S. 19 ff.).

With the help of the CM ProWork tool a validation of results from non-formal and informal learning can be achieved that especially for workers without appropriate professional qualification can be very useful. A similar benefit can be assumed for the operational personnel development for the target group of workers and for questions of finding the appropriate further education offers. However, this implies that the potential benefit of aiming at an illustration and comparability of competences in the practice of professional training and further education is recognised.

Through the identification of CM ProWork competence values with EQF descriptors and levels a further validation of the tool was achieved. This is an unintended but welcome side effect.

6. LITERATURE

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