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EDU-VET

E-Learning, Digitisation and Units for Learning at VET schools – Creating online Learning Environments in Technical Education for European metal industry

Curriculum –

Report on discussion results

December 2020
BKBW / UPB

Project Title: E-Learning, Digitisation and Units for Learning at VET schools – Creating online Learning Environments in Technical Education for European metal industry

Acronym: EDU-VET

Reference number: **2019-1-DE02-KA202-006068**

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Curriculum – Report

Results concerning the module structure and content

This report addresses the discussion results of the curriculum structure in a very briefly way. The central aspects arise from the discussion results with all project partners.

Following as well the discussed curriculum structure as the results of matching with existing syllabi in the partner countries will be presented.

As the curricular framework mentioned, the curriculum will be based on the blended learning approach, which focus on the one hand online scenarios, and on the other hand classroom scenarios. Under this roof, the EDU-VET learning modules will be developed:

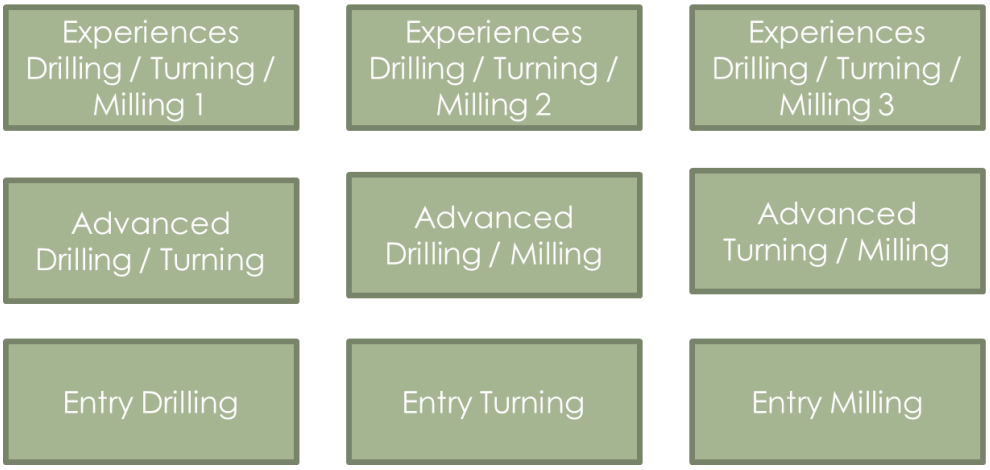

Figure 1: EDU-VET Learning modules - overview

As you can see in the graphic above, the nine modules focus the three manufacturing topics milling, drilling and turning. Moreover, they also consider the difficulty level. In total, we define three difficulty levels: 1) Entry level 2) Advanced level 3) Experienced level.

For all the different work piece types and all three different manufacturing methods (DRCT, Turning, Milling) the manufacturing process comprises the following six steps (a-f):

- Step a: Manufacturing planning (defining the machine(s), device(s), tool(s) and cutting technology
- Step b: NC programming (including simulation)
- Step c: Preparing the machine (including testing of NC-programme on the machine „air cutting“)
- Step d: Manufacturing the work piece (doing the real thing)
- Step e: Measuring and testing the manufactured work piece (dimensions, forms, surfaces)
- Step f: Documenting and presenting the manufacturing process (steps a-f)

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Results concerning the curriculum structure and content – the fundamental pillars of the EDU-VET Curriculum

The EDU-VET curriculum aims to support many different users in different European countries – this shall be made possible by integrating the specifically different viewpoints of the four EDU-VET partner schools.

The following design principles should help to meet this objective:

- The curriculum is primarily structured by the process steps of the „**EDU-VET manufacturing process model**“ in the format of an event process chain. Thus, there is a first trans-national and trans-school-system applicable integration means.
- Secondarily the curriculum is structured by the skill levels of the „**EDU-VET curriculum skill level model**“. This allows the assignment of the learning units to different student groups according their state of development.
- Thirdly the EDU-VET curriculum and learning units shall be easily integrated with the user‘s local curriculum and learning units, therefore the „**EDU-VET curriculum learning unit model**“ distinguishes different ***learning unit types*** and ***learning unit variants.***
- *Finally,* the learning units of the EDU-VET curriculum are classified regarding **delivery media** and **learning activity type** in order to support the users in the process of delivery preparation and student orientation.

The EDU-VET Process model describes a manufacturing process. An event initiates the execution of a process step. The execution of the process steps leads to the events of step is completed and step outcomes are ready.

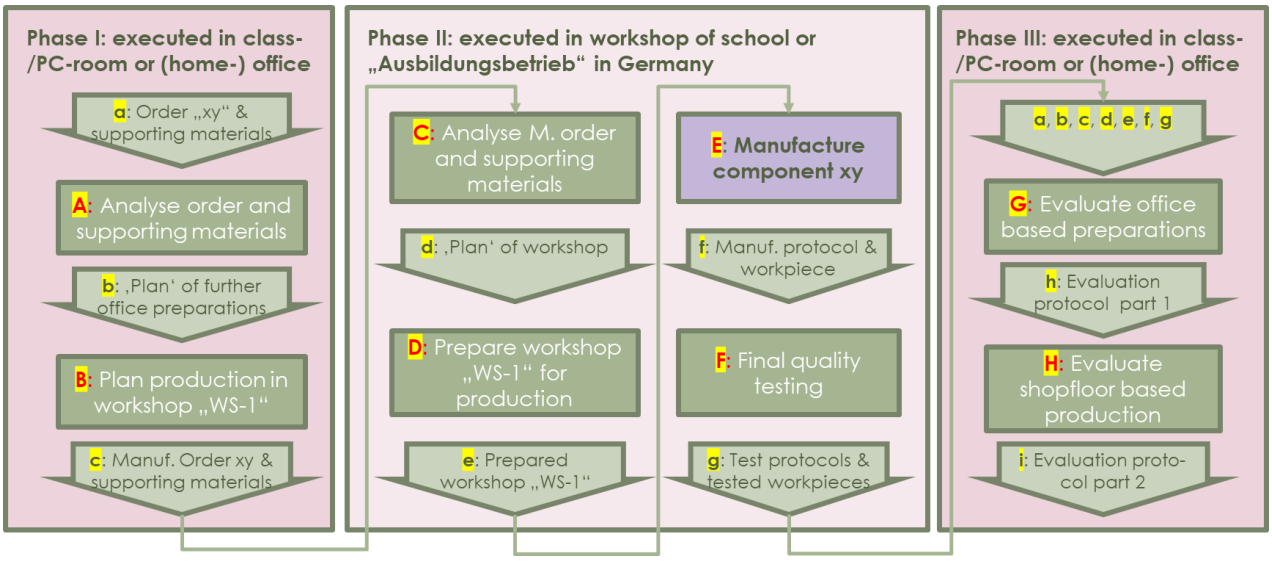

Figure 2: The EDU-VET Process model

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The EDU-VET Curriculum skill level model comprises three different skill levels distinguished by the complexity level to be handled on each skill level. Four sources drive the complexity. The EDU-VET curriculum skill level model is also linked to the difficulty levels of the EDU-VET learning modules.

Skill Level	Complexitiy Level	Complexitiy drivers
Entry Level	Low Complexitiy	• **Workpiece properties** (esp. form of raw part and finished part, Machining properties of the workpiece material) • **Manufacturing environment** (qualities and conditions particularly of avalilable machines, tools, devices, auxilliaries) • **Production process and process steps** (number and complexity of production methods / steps / equipments needed respectively planned to create the different workpiece properties) • **Task context and background** (all needed knowledge and information available, all needed resources avaliable – several bits of knowledge and/or information and/or needed resources not available – methods and sources to close those gaps known or unknown resp. available or not available)
Advanced Level	Medium Complexitiy	
Experienced Level	High Complexitiy	

Figure 3: EDU-VET Curriculum skill level model

The EDU-VET curriculum learning unit model comprises learning units of different types and variants and shall support several different learning unit application types and variants, too. This will be shown in the figure below:

Learning unit types and variants

- [Type: **e-L**] **e**lectronic-**L**earning unit
  - [Var: **EVb**] **E**DU-VET **b**uilt
  - [Var: **H-m**] **H**ome-**m**ade
  - [Var: **Sbs**] **S**upplied **b**y **s**upplier A, B, C …
- [Type: **e-E**] **e**lectronic-**E**xercise unit
- [Type: **c-L**] **c**onventional-**L**earning unit
- [Type: **c-E**] **c**onventional-**E**xercise unit

This structure should enable users to combine EDU-VET learning units with different "local" learning units according to their specific circumstances

Learning unit application types and variants

- [Type: **ILA**] **I**nsrtuctor-lead **L**earning unit **A**pplication
  - [Var: **pcr**] **p**hysical **c**lassroom
  - [Var: **vcr**] **v**irtual **c**lassroom
  - [Var: **PCr**] physical **PC**-room
  - [Var: **pWs**] (**p**hysical) **W**ork**s**hop
- [Type: **SLA**] **S**elf-directed **L**earning unit **A**pplication
  - [Var: **soi**] **s**elf-**o**rganising **i**ndividuals
  - [Var: **sog**] **s**elf-**o**rganising **g**roups
  - [Var: **smg**] (**s**elf-)**m**oderating **g**roups

This structure should enable users to apply the EDU-VET learning units in different ways according to their specific circumstances

Figure 4: EDU-VET Curriculum learning unit model – 1

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The EDU-VET curriculum learning units are classified regarding delivery media and regarding learning activity type, this creates four basic types: [e-L], [e-E], [c-L], and [c-E].

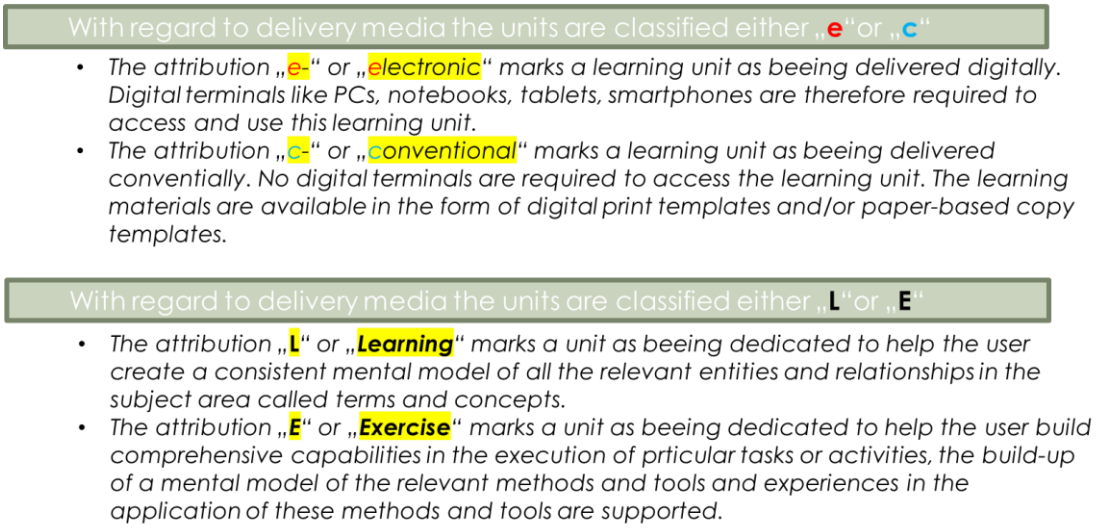

Figure 5: EDU-VET Curriculum learning unit model – 2

Summarized the curriculum will be structured with three fundamental pillars:

- Pillar 1) EDU-VET Process model
- Pillar 2) EDU-VET Curriculum skill level model
- Pillar 3) EDU-VET Curriculum learning unit model.