

## **EDU-VET**

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

### **Modules for the VET training**

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

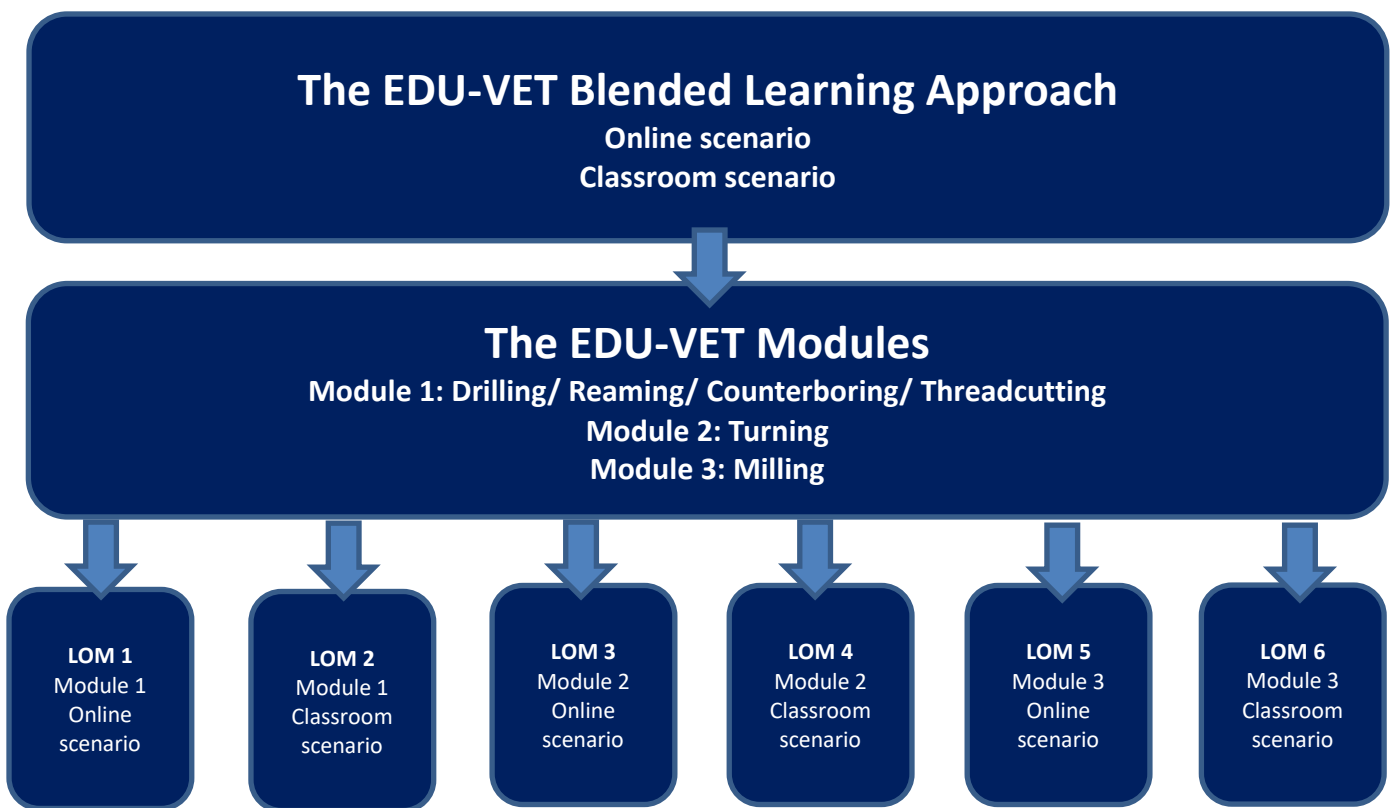
**Acronym:** EDU-VET

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### **Modules for the VET training**

A modular VET curriculum for the metal industry will be developed as a basis for the online courses and learning modules on the learning platform to be developed. The idea is to support the acquisition of key high-value competences necessary for the establishing modern and innovative learning in the field with as comparable European focus. The development of this new curriculum will require an 'ab initio' approach as there is little in terms of available coherent educational resources addressing the target groups in any partner country.

The six learning outcome matrices of EDU-VET (LOM1 to LOM6) provides insights in the addressed outcomes, suggested methodological approaches and possible assessments.



*Figure 1: The EDU-VET Curricular Framework*

The Learning Outcome Matrices are designed to inform about the development of the curriculum structure to integrate the results of the Summary Research Report. Focusing on a learning outcomes approach facilitates the tailoring of the pedagogic induction resources. This provides the possibility to suit specific cultural and societal values and ensures that local issues and necessary topics are addressed within the EDU-VET approach.

The EDU-VET modules for VET learners will be addressed in the EDU-VET curriculum. These modules based on the researches which are being conducted in each partner country:

EDU-VET focusses on three modules and their subareas for learners:

• **Module 1: Drilling/ Reaming/ Counterboring/ Threadcutting**

- Fundamental definition of terms and processes
- DRCT-Part\_1: small diameters/low bore depth (flat) bores of different types: blind/through bores, fitting bores, tapered bores (steps a-f)
- DRCT-Part\_2: medium diameters/medium depts bores of different types: blind/through bores, threaded bores, counterbores (steps a-f)

• **Module 2: Turning**

- Fundamental definition of terms and processes
- TURN-Part\_1: Simple external contour (steps a-f)
- TURN-Part\_2: Medium complex external contour with groove and thread (steps a-f)
- TURN-Part\_3: Simple internal contour (steps a-f)
- TURN-Part\_4: Medium complex internal contour with groove and thread (steps a-f)
- TURN-Part\_5: Medium complex external- and internal contour with grooves and/or threads (steps af)

• **Module 3: Milling**

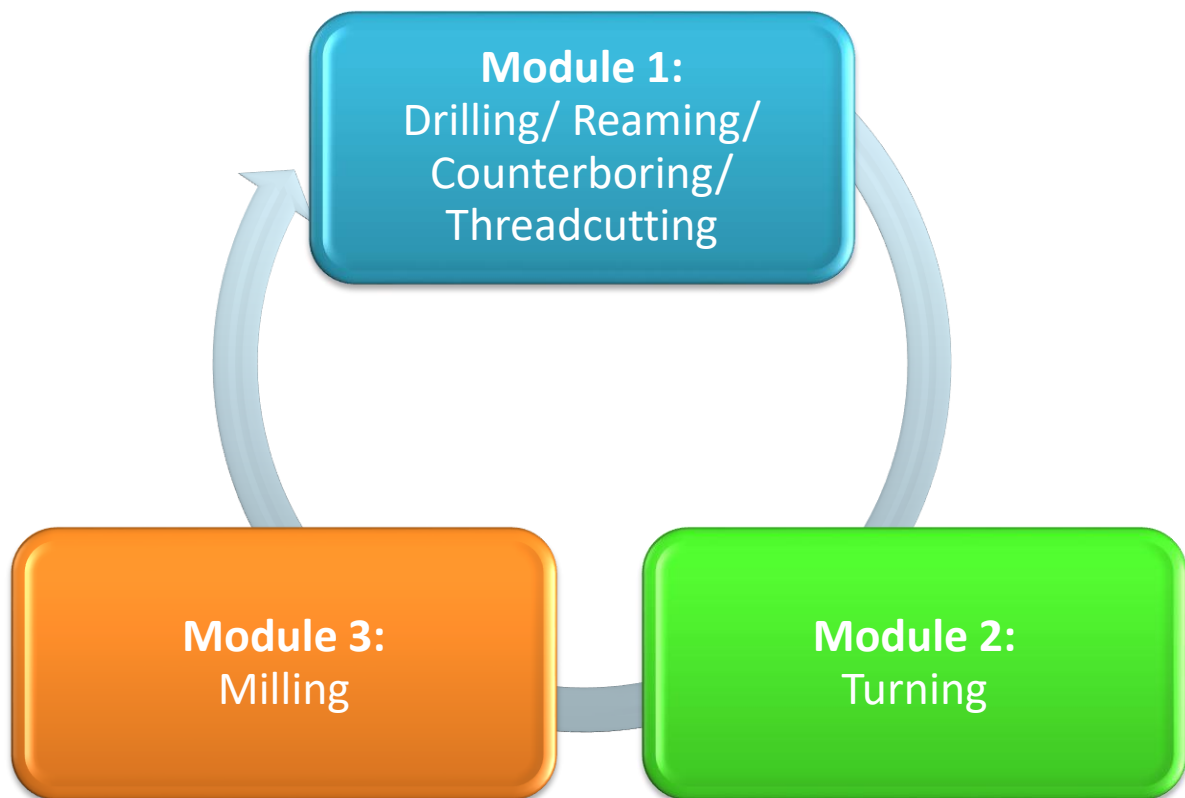
- Fundamental definition of terms and processes
- MILL-Part\_1: simple external contour (2 1/2D) (steps a-f)
- MILL-Part\_2: medium complex external contour (2 1/2D) (steps a-f)
- MILL-Part\_3: simple external contour and one or more pockets (rectangular and/or circular pockets with and/or without pin) (2 1/2D) (steps a-f)
- MILL-Part\_4: medium complex external contour and one or more slots (linear and/or arced slots) (2 1/2D) (steps a-f)
- MILL-Part\_5: medium complex part (3D) (steps a-f)

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)

Following, the modules are shown graphically once again:



*Figure 2: The EDU-VET modules for learners*

### ***Didactical und curricular conception of the modules and the LOMs***

According to the didactical and curricular conception of courses for technical education in the metal sector, the partners should create these courses for two scenarios:

#### **Online scenario:**

Firstly, they should develop online courses and materials which will be provided via the online learning platform MOODLE. EDU-VET courses come with introductions, address concrete objectives, offer descriptions and explanations as well as rationales.

They include interactive tasks and can include videos as well as audios, photos, images and illustrations. The use of the survey module provides a variety of proven questionnaire instruments for discovering interesting information about the state of mind of the EDU-VET target group.

In EDU-VET course pages themselves are a main tool for VET teachers, allowing them to add or remove and structure activities as necessary. The use of Quizzes and Assignments help to structure the courses. At the end of a course or module as general overview is provided to the learners to let them fit to their experiences and knowledge in the wider context of the whole curricular approach behind the courses and modules. Therefore, the courses and modules will be interlinked but designed in a way to fit to the needs of the learners and their own learning path as well as their own speed.

Moreover, the partners will create these online tasks via H5P. Please have a closer look into the document “O2-P1-EDU-VET-Overview tasks H5P-EN”. There, you will find all task types and examples for possible contents task designs. In total at least 80 H5P tasks should be created by the partners. Firstly, all tasks should be created in English, then follows the translation into the respective national language of the partners.

There are over 60 different types of tasks via H5P, e.g.: Multiple Choice, Advanced fill the blanks, Arithmetic Quiz, Find the words, Image Slider etc.

Furthermore, also facilitating discussions in forums, as well as asking questions, and guiding learners within the modules and courses creates a specific EDU-VET learning experience with regard to topics of the metal sector.

#### **Classroom scenario:**

The partners should also create courses and contents for face-to-face classrooms scenarios. The partners could also create additional didactical materials which can be used in the classroom in combination with the online platform.

Here, the partners can use known and existing methods of face-to-face teaching. These could be group work, discussions, creation of a poster, work in the workshop and on the machine, creation of a work piece, simulations, etc.

### ***Integration of syllabus objectives for VET learners in the metal sector***

The objectives of the syllabus for VET learners in the metal sector should also be noticed according to the development of the online and face-to-face learning courses. Furthermore, the partners should follow the didactical principles by creating the courses.

Concretely, the didactical objectives and principles<sup>1</sup> are as follows:

The objectives of VET require that instruction should be action oriented. That means that young people should learn to plan, carry out and evaluate independently within the framework of their occupation. Learning at vocational school is basically carried out in relation to concrete professional acting as well as in various mental operations.

On the basis of learning theory and didactic findings, the pragmatic approach to the design of action-oriented teaching is following:

- Didactic reference points are situations that are important for the exercise of the profession (learning for action).
- The starting point of learning is formed by actions, if possible self-executed or mentally understood (learning by doing).
- Actions must be planned and carried out by the learners as independently as possible, are checked, corrected if necessary and finally evaluated.
- Actions should promote a holistic understanding of the professional reality, e.g. technical, safety, economic, legal, ecological, social aspects include.
- Actions must be integrated into the learners' experiences and be relevant to their social impacts are reflected.
- Actions should also include social processes, e.g. the declaration of interests or conflict resolution. Action-oriented teaching is a didactic concept that is based on subject-specific and action-systematic structures are intertwined. It can be realized by different teaching methods.

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<sup>1</sup> Cf. KMK (2002): Rahmenlehrplan für den Ausbildungsberuf Metallbauer/Metallbauerin. On the internet: <https://www.kmk.org/fileadmin/Dateien/pdf/Bildung/BeruflicheBildung/rlp/metallbauer.pdf>, date: 01.04.2020.