

**EDU-VET**

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

**IO4: Guideline concept for teachers**

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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

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

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 P3 Berufskolleg Bocholt-West (BKBW), DE  
 P4 Lancaster and Morecambe College (LMC), UK  
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# Introduction

Following, insights into the guideline concept for teachers were presented. The aim is to provide teachers a guide on how to use the EDU-VET learning platform. This concept is intended to provide a fundamental orientation and can be expanded at any time and adapted to individual needs or contexts.

First of all, it must be mentioned that the guideline concept for teachers contains a frame concept as well as a detailed concept. The frame concept addresses the theoretical basis. The detailed concept serves to concretise the frame concept, which includes detailed contents and project planning.

Following a theoretical background will be presented. Afterwards, the concretisation of the guideline concept will be addresses.

## Theoretical basis of guideline concept

The guideline concept is essentially based on two models. From the technical view, the DISK approach according to Beutner / Pechuel(2021) is fundamental. On the other hand and from a pedagogical-didactic level the 3C-Model according to Kerres / De Witt (2003) is leading.

**DISK approach – Beutner / Pechuel (2021)**

“DISK-Online stands for Didactic Interactive Streaming Know-how and this approach is designed for providing a quick solution to tackle the problems schools have when forced to implement distance learning in times of a pandemic” (Beutner / Pechuel 2021, p. 180).

In principle, the concept comprises 4 interaction levels, which will be discussed in more detail below. The first level has a low level of knowledge about online interaction, while the last level requires a high level of interaction (cf. ibid.).

*DISK 1*

This level is teacher-oriented and it “is the easiest implementation level which offers simple teaching situations online in which the teacher shares the screen of a tablet and his or her voice in a live stream” (ibid., p. 181). Moreover, the communication between the teacher and the student is 1:1. Learners can either be present and actively interact with each other in the classroom or be connected online or learn online from home, but without any digital interaction (cf. ibid.).

*DISK 2*

The second interaction stage is based on the first DISK 1 – level. The interactive communication within the face-to-face setting remains. At this level, the teacher can stream the lessons via different platforms and communicate with the students. But also, communication via chat is possible, for example (cf. ibid., p. 182).

*DISK 3*

The implementation stage of interaction level 3 (DISK 3) expands the DISK 2 – level, because communication between learners is now possible at this level via video or text chat and/ or voice (cf. ibid.). Additionally, Beutner / Pechuel explain that “the idea from a teacher-centred concept to one that focuses on the learners” (ibid.).

*DISK 4*

DISK 4 combines all levels and is an extension to DISK 3 – level. At this level, communication between online learners and learners in the classroom is possible. Learning processes are clearly in focus (cf. ibid.).

Summarised, from a technical point of view, the DISK approach forms the basic component for the guideline concept.

**3C-Model – Kerres / De Witt (2003)**

The development of the 3C-Model model is based on approaches of hybrid learning arrangements, which "involve the combination of different didactic methods [...] and media presentation and communication formats [...]" (Kerres 2005, p. 163).

Basically, the 3C-Model consists of three basic components: *Communication, Content, Construction* (cf. Kerres / De Witt 2003, p. 109). Kerres / De Witt summarised these components as follows:

“- a *content* component that makes learning material available to a learner

- a *communication* component that offers interpersonal exchange between learners or learners and tutors and

- a *constructive* component that facilitates and guides individual as well as cooperative learning activities to actively operate on learning tasks (or assignments) with different degrees of complexity (from multiple-choice to projects or problem based learning)” (ibid.).

*Content*

On the occasion of the first component *conten*t the provision of learning materials for the learners is intended (cf. Kerres 2005, p. 169). These should stimulate "cognitive and motivational-emotional processes [...]" (ibid.). Special attention is paid to this element in the medial or technological transfer of knowledge and content (cf. Kerres / De Witt 2003, p. 105). This knowledge is the requirement for further communicative or constructive learning activities. In addition, the authors recommend presenting other information or matters via this chosen media channel (cf. ibid.).

*Communication*

The *communication* component focuses on an interactive exchange between all participants in a virtual learning environment (cf. Kerres 2005, p. 169). Against this background, interaction can take place between peers or between teachers and learners, in individual conversations or within groups (cf. ibid.). Kerres and De Witt see this component as necessary if the acquired repertoire has a certain degree of complexity, in which theoretical contexts are not only theoretical contexts can not only be deepened, but also linked to other issues. Furthermore, the learners should be able to develop their own position in group discussions (cf. Kerres / De Witt 2003, p. 105).

*Construction*

The c*onstruction* component completes the 3C frame model. Within this dimension, the focus is on "both individual and cooperative learning activities" (Kerres 2005, p. 169). It is important to design these learning activities in this way, that a representative solution results from them, for example in the form of a written elaboration (cf. ibid.). This component is used when transfer of knowledge content is required, which is primarily refer to processual rather than declarative knowledge (cf. Kerres / De Witt 2003, p. 105).

## Development of guideline concept for teachers

The concretisation is about a detailed planning and preparation of the framework of the concept. The choice of media is assigned and adapted to the didactic structure described above.

*Definition of the teaching objectives*

The first steps is to define the teaching objectives. This is an important instrument for planning and controlling teaching units and forms the basis for the evaluation of teaching processes. For example, Bloom's taxonomy serves as an orientation for the formulation of tasks and teaching objectives (cf. Krathwohl / Bloom / Masia 1978).

*Preparation of the didactic contents*

In addition to the rough didactic structure of a blended learning approach, the selection and preparation of concrete learning content is of central importance. The transfer of content to e-learning must be adapted accordingly (cf. Kerres / De Witt 2003).

*Media choice and methodology*

When choosing the media, the results of the preceding aspects must be taken into account. An important principle of design-oriented media didactics is that media and methods cannot be equated. It is true that the two factors influence each other; certain methods suggest certain media and, conversely, certain media are particularly well suited to specific methods. Nevertheless, there are many combinations of these two elements and the choice of media and methods can also be adapted to the needs of learners and teachers. Therefore, requirements for the medium result from the specification of the intended goals and the analysis of further parameters of the didactic field (cf. Kerres 2018, p. 129).

Additionally Howe specify six potential categories *"Making information and content available", "Visualising, animating and simulating", "Communicating and cooperating", "Structuring and systematising", "Diagnosing and testing*" and *"Reflecting*" (cf. Howe 2013, p. 1).

Making information and content available: Traditionally, information and content are mostly conveyed through print media such as textbooks, which can now be transferred into digital form such as mails, podcasts or educational videos. Content can be researched, shared, stored and accessed as needed (cf. ibid., pp. 5-6).

Visualising, animating and simulating: Work tasks and process sequences can be abstracted with the help of graphics, videos and animations and are suitable for illustrating complex procedures of work processes and objects. Effects and experimental design can be additionally supported by simulations such as virtual reality (cf. ibid., pp. 6-7).

Communicating and cooperating: Forums, chats or blogs are communication channels in which participants can coordinate with each other and work on tasks together. In addition, whiteboards can be used to jointly edit and add content. Other coordination media include group diaries, to-do lists, project management systems, etc. (cf. ibid., pp. 7-8).

Structuring and systematising: Simple programmes for spreadsheets, presentations or text documentation can be used to structure information. Mind-mapping tools and keyword systems are also useful for collating different materials and can be helpful in the thematic subdivision of subject content (cf. ibid., pp. 8-9).

Diagnosing and testing: Test media such as digital single- or multiple-choice tests or open-ended questions can be used to conduct an initial needs analysis or continuous learning status checks. Another possibility are classroom response systems, where participants anonymously give an answer to an assignment and send it to a server where the results can be immediately evaluated and presented virtually (cf. ibid., pp. 9-11).

Reflecting: The creation of portfolios by the learners can help them to reflect on the course of their learning process so far by constantly making new links to older materials when documenting their work. In addition, self-assessment of their own competences is possible through questioning (cf. ibid., pp. 11-12).

From a pedagogical-didactic perspective, Howe points out that “with the help of the categories presented, teachers and trainers […] differentiate existing e-learning offerings such as learning software, web-based training, learning platforms, etc. in terms of their quality and scope for designing be able to assess vocational training processes. But the other way round, it is also possible to reflect on the extent to which one's own e-learning arrangements already use the diverse possibilities of digital media and the Internet” (ibid, p. 12). Against this background, teachers should ask themselves the following guiding questions: "Which categories are currently the main focus and which categories have been thought about less or not at all so far?" (ibid.).

## Recommendations for teachers

Based on the above, the following design principles can be identified.

*1. Definition of the technical framework conditions*

At the beginning, a classroom session should take place to inform the learners about organisational framework conditions, the course sequence or the content planning. In addition, the technological basics and modes of operation should be explained in order to prepare everyone involved for the blended learning programme. Getting to know each other and the teacher builds initial contacts and increases motivation.

*2. Planning of a blended learning concept*

A blended learning concept should be created in an interdisciplinary way and be uniform and coordinated for all courses. A cooperation of participants from different areas such as vocational school, companies and learning programmers is therefore necessary to control the course of the project. For this purpose, it is helpful to introduce a project management which takes over tasks such as planning, monitoring and evaluating the project situation.

*3. Securing the digital infrastructure*

The digital infrastructure should be ensured at schools. Every teacher and learner should have access to the used digital media. In addition, it is helpful to have a technical contact person on site in case of technical problems.

*4. Structuring of online and face-to-face phases*

The two units should not be completely separated from each other, but rather complement or cohere. For example, content from the online phase can be repeated, summarised, deepened or practised within the classroom event. As a result, the classroom units must also be made more interactive.

*5. User-friendly presentation of the contents*

Access to e-learning materials should be clear and user-friendly. Learning platforms should be permanently updated and maintained with new content and users should not be overwhelmed with too much or confusing content. overloaded. Improving the general handling with the learning management system leads to a higher application of the users.

*6*. *Weighing up the workload with the content*

Due to the online phases that have been introduced, students have to organise themselves to some extent in terms of time and content, which is why it is important to adapt the learning effort. Teachers can quickly underestimate the time and effort required for individual content and not include it in their planning.

*7. Observation and evaluation of learning outcomes*

The evaluation and observation of learning outcomes through regular self-tests or control tasks, especially from the self-study phases, are important in order to adapt further content or methods. In addition, it also serves to give students feedback on their learning process and motivates them to achieve new teaching objectives.

*8. Feedback culture*

Feedback and suggestions from students as well as teachers can help to improve the course design and motivate learners. Opportunities to do this should be introduced regularly.

*9. Design of the communication processes*

Interaction with each other should not be lost through e-learning, but should be promoted through collaborative learning. In addition, care should be taken not to neglect communication, especially in the self-learning phases, and also to stimulate exchange among learners on questions and problem solving.

*10. Fostering of digital competence*

Teachers should familiarise themselves with the use of media before starting blended learning and be supported in various ways by contact persons or with tutorials to introduce them to the various functions of the e-learning systems. Further education and training can also be helpful to improve media competences.

Finally, from the concept it follows that blended learning offers numerous opportunities and possibilities through the use of diverse methods to design lessons. Various competences can be promoted through action-oriented tasks and cooperative learning. Classroom settings often cannot sufficiently establish action contexts, which makes the transfer into practice more difficult. Blended learning requires a high degree of willingness to change on the part of providers and participants.

Therefore, the guideline concept offers a first approach to facing the changes, caused by the digital transformation as well as the COVID 19 – pandemic.

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