



DEAL WITH DIGITAL WBL



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DEAL WITH DIGITAL WBL

102.2 Blueprint for VET trainers' development of digital competences to design, deliver, evaluate and certificate blended courses

Preliminary Version

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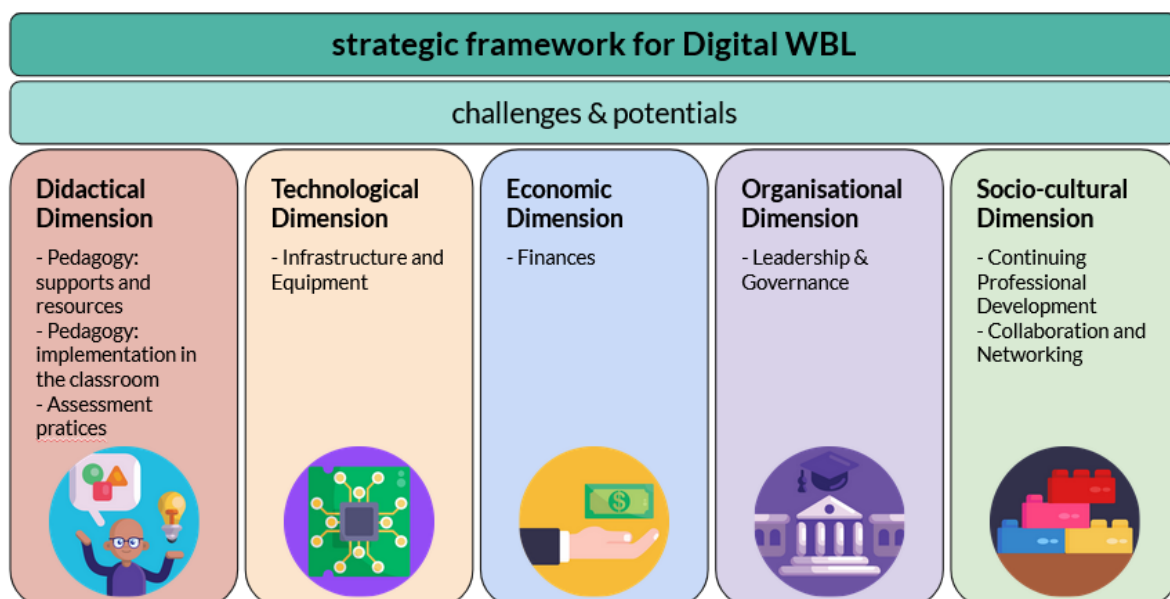
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Executive Summary

This comprehensive blueprint provides a roadmap for institutions to navigate the transformative landscape of Digital Work-Based Learning and to prepare learners for the future.

Introduction: This report outlines a strategic approach to advance Digital Work-Based Learning (WBL) in vocational education and training (VET) and related educational contexts. Developed within the Erasmus+ project DEAL with Digital Work-Based Learning, the blueprint addresses the evolving landscape of digitalization in work and applied learning environments, especially accelerated by the Covid-19 pandemic.

Blueprint Overview: The blueprint, a culmination of extensive research and consultations among eight European partners, identifies potentials and challenges in designing a Digital WBL environment. It offers recommendations across five dimensions and eight sub-dimensions, emphasizing the importance of supporting educators with competences, conditions, and infrastructures. The blueprint's creation involved state-of-the-art research, extensive stakeholder consultations, online meetings, discussions, and continuous refinement. It is designed as a living



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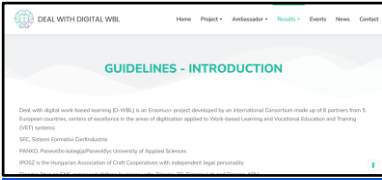
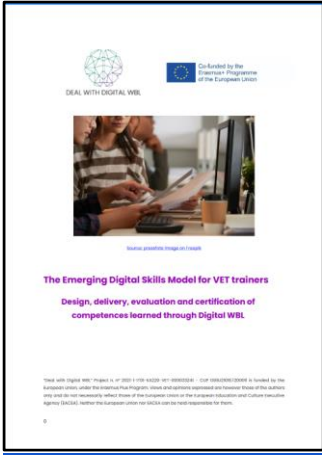
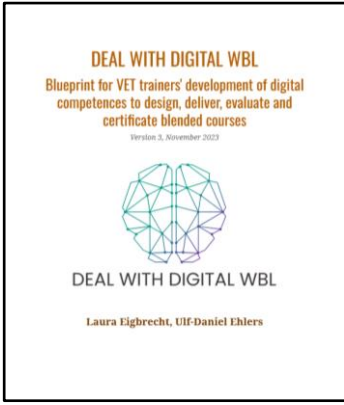
document, evolving through ongoing consultations and events within the DEAL with Digital WBL initiative.

Conclusion and Call for Action: The blueprint serves as a practical guide for educational designers, institutional leaders, professionals, teachers, trainers, and learners. It encourages a participatory approach for institutions to assess their readiness for Digital WBL, initiate dialogues, form operative groups, and envision long-term strategies. An online training system and toolkit are being developed to assist educators in integrating Digital WBL into their practices.



Resource Navigator

Where to find what? Here is a short overview of resources developed so far within the DEAL with Digital WBL initiative:

<p>Would you like to learn more about the pedagogical foundation and guidelines for Digital WBL?</p> 	<p>Would you like to learn about the competences needed to provide Digital WBL?</p> 	<p>Would you like to learn about potentials, challenges and framework conditions of Digital WBL for institutions?</p> 
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Introduction

The following report presents a strategic approach to promote Digital Work-Based Learning in VET (vocational education and training) and other applied and practice-related educational contexts such as dual study programmes and learning on the job. It has been created within the DEAL with Digital Work-Based Learning initiative, an Erasmus+ project.

The digitalization of work, learning and living environments has already been an ongoing process for many years, while developments and trends were accelerated during the Covid 19 pandemic. In the future, learners' working, living and learning contexts will be even more strongly permeated by digital media and work processes. In order for them to become autonomous learners ready to take advantage of the potential of digital tools and environments, their learning environments need to prepare them to thrive in digital and hybrid environments (Bundesinstitut für Berufsbildung, 2023, p. 202). Moreover, digitalisation brings a lot of potential to positively transform learning experiences and even to overcome obstacles and barriers to participate in the learning process. In order to take advantage of these potentials, the Digital Work-Based Learning approach presents a vision where teachers and trainers rethink and reevaluate their teaching approaches under the light of these developments - and not only have the competences for it, but can work and thrive in an environment which supports them in it and holds the ideal framework conditions.

With this Blueprint, we identify the potentials and challenges and the strategic domains to take into account in order to design a learning environment for Digital Work-Based Learning by providing recommendations according to different design dimensions and categories. They are based, amongst others, on previous research results within the initiative. These results can be consulted in the reference documents featuring the pedagogical Digital WBL concept ([Guidelines for Designing Digital WBL & Remote Experiential Activity](#)) and the competence framework for VET teachers and trainers ([The Emerging Digital Skills Model for VET trainers](#)).

The initiative has the ambition to develop teachers' and trainers' competences to design, deliver and evaluate practical learning experiences in virtual and hybrid environments through the use of innovative pedagogies and digital tools and to support institutions in creating suitable framework conditions to do so.

The project consortium consists of 8 partners from 5 European countries, centres of excellence in the areas of digitisation applied to Work-Based Learning and Vocational Education and Training (VET) systems:

- SFC, Sistemi Formativi Confindustria
- PANKO, Panevėžio kolegija/Panevėžys University of Applied Sciences
- IPOSZ, the Hungarian Association of Craft Cooperatives with Independent Legal Personality
- Dinamo 3d, an SME composed of three business units: Dinamo 3D, Dinamo Lab and Dinamo ADV
- CIS, Scuola per la Gestione d'impresa
- UOC, the Universitat Oberta de Catalunya
- DHBW, Baden-Wuerttemberg Cooperative State University
- Hanse-Parlament, Network for Small and Medium Enterprises

The DEAL with Digital Work-Based Learning (DEAL with WBL) initiative sets out **to promote good practice in digitally enhanced applied and work-based learning settings**. For this, the blueprint is embedded in a project logic to build upon the results and bring them into practice. In the first step of the initiative, "[Guidelines for Designing Digital WBL & Remote Experiential Activity](#)" have been developed that serve as a basis for the pedagogical approach underlying the competence framework subsequently developed, addressing the question of how to bring this pedagogical approach into practice in different training contexts. For this, teachers and trainers need to acquire specific competences as described in the framework, but they also need conditions and infrastructures allowing them to design stimulating Digital Work-Based Learning environments. This more strategic level will be taken into account in this Blueprint. In order to support teachers and trainers on their journey to promote Digital Work-Based Learning in their teaching and training, an online training system is currently being developed and will be provided and piloted on an online platform in a next step, accompanied by a toolkit to promote Digital Work-Based Learning on the basis of the resources that have been developed.

The blueprint proposed presented in this report has been designed in a multi-step research process, coordinated by the DHBW research team, in the following research steps:

- April 2022 - October 2022: state-of-the-art research on pedagogical

foundations, competence frameworks and relevant reports

- October 2022 – March 2023: extensive stakeholder consultations in all partner institutions and during an international on-site event
- 17 May 2023 – international online consultation meeting presenting general structure of the Blueprint and discussing several topics
- May 2023 – August 2023: further discussion and elaboration of the first draft of the Blueprint and consultation of complementary resources
- September 2023: internal revision process
- October 2023: external presentation of the Blueprint

These steps will be described more thoroughly in the upcoming sections. Moreover, the Blueprint is being conceived as a living and growing document which is inviting all interested stakeholders to discuss and provide feedback on it. It will be used, discussed, revised in the next steps of the DEAL with Digital WBL initiative, for example during the piloting of the developed training resources. It will be validated in a final stakeholder consultation and presented in Multiplier events in the final phase of the DEAL with Digital WBL initiative.

As an Erasmus+-funded initiative, DEAL with Digital WBL is in line with European Union priorities such as the [Digital Education Action Plan](#), focussing mostly on Priority 1, Action 5: Digital transformation plans for education and training institutions and Priority 2, Action 7: Common guidelines for teachers and educators to foster digital literacy and tackle disinformation through education and training, the [European Skills Agenda](#).

The aim of this Blueprint is to provide a concise, practice-oriented and accessible document with practical recommendations for all involved in the Digital WBL process: mostly educational designers, institutional leaders, professionals in institutional infrastructure, professional training, but also teachers, trainers and learners themselves.

Background of the Report

What is Digital Work-Based Learning (Digital WBL)?

We define Digital Work-Based Learning as the digital support, provision and/or enhancement of practical experiences in a vocational context for knowledge and skills development as well as integration of theory and practice. It integrates a learning approach based on practical experience with the use of digital solutions to support the implementation of hands-on learning experiences.

With many potential benefits for learners, employers, and society as a whole, Digital Work-Based Learning is a rapidly growing area of education, offering a flexible, accessible, and cost-effective way to develop and enhance skills and knowledge in a variety of fields. It is characterised by the use of digital technologies to support work-based activities, such as simulations, games, and virtual environments, which allow learners to gain practical experience in a safe and controlled setting, and by access to a wide range of resources, including online courses, webinars, and other digital learning materials, which can be tailored to their specific needs and interests. The potentials of Digital Work-Based Learning are numerous, and so are the challenges. Both of them will be addressed in this Blueprint.

State of Research

The Competence Framework is rooted in the project’s pedagogical approach as described in the [Guidelines for Designing Digital WBL & Remote Experiential Activity](#), based on literature reviews and focus group sessions. These guidelines have been followed up by a Competence Framework ([The Emerging Digital Skills Model for VET trainers](#)) and, together, both represent the theoretical background to our research. They are complemented by an analysis of several documents on (Digital) Work-Based Learning.

The [Guidelines for Designing Digital WBL & Remote Experiential Activity](#) are based on a literature review, stakeholder consultations and key components for online teaching as established by previous research by the authoring team. The report gives guidance and orientation to educational stakeholders to design and reflect on Digital Work-Based Learning practices by providing good practices, an assessment tool and a framework consisting of five components and 17 elements that a good Digital Work-Based Learning practice should incorporate (Table 1).

Table 1 - 5 components and 17 elements of a Digital WBL good practice

COMPETENCES IN D-WBL FOR VET	SOFT SKILLS
	HARD SKILLS
	BALANCE BETWEEN SOFT AND HARD
	DIGITAL COMPETENCE
	USEFUL SKILLS FOR ALL INVOLVED
TEACHING-LEARNING METHODOLOGIES	COLLABORATIVE / TEAMWORK
	BASED ON ACTIVE METHODOLOGIES
	MEANINGFUL CONNECTED TO REALITY ACTIVITIES
INTERACTION - NETWORKED COMMUNITY	SKILLS DETECTION AND INTEGRATION
	WORKPLACE DIGITALIZACION STATE

	MENTORING AND COMMUNICATION
CONTENT AND RESOURCES	VARIETY OF TOOLS AND FORMATS
	LEARNING OBJECTIVES AND CONTEXT
	AVAILABILITY AND REPLICABILITY
ASSESSMENT	COMPETENCE-BASED ASSESSMENT
	FORMATIVE ASSESSMENT: 360° FEEDBACK
	PLANIFICATION AND TRANSPARENCY

These components and elements have constituted the pedagogical foundation for designing the Digital WBL competence framework. They give orientation as to how a good practice in Digital WBL should look like - and the Competence Framework presents the competences that teachers or trainers need in order to realise them.

The DEAL with Digital WBL Competence Framework ([The Emerging Digital Skills Model for VET trainers](#), Figure 1) goes beyond other frameworks in its specificity to Work-Based Learning. Existing frameworks (DigCompEdu, DigCompOrg, Competence Meta-model for Digital education competences by EdDiCo initiative, The Digital Competence Wheel, DiKoLAN Framework) have been analysed to identify aspects which are especially important to guide learners at the workplace to arrive at a vision of autonomous learners ready to navigate in digital environments for their own learning pathways.

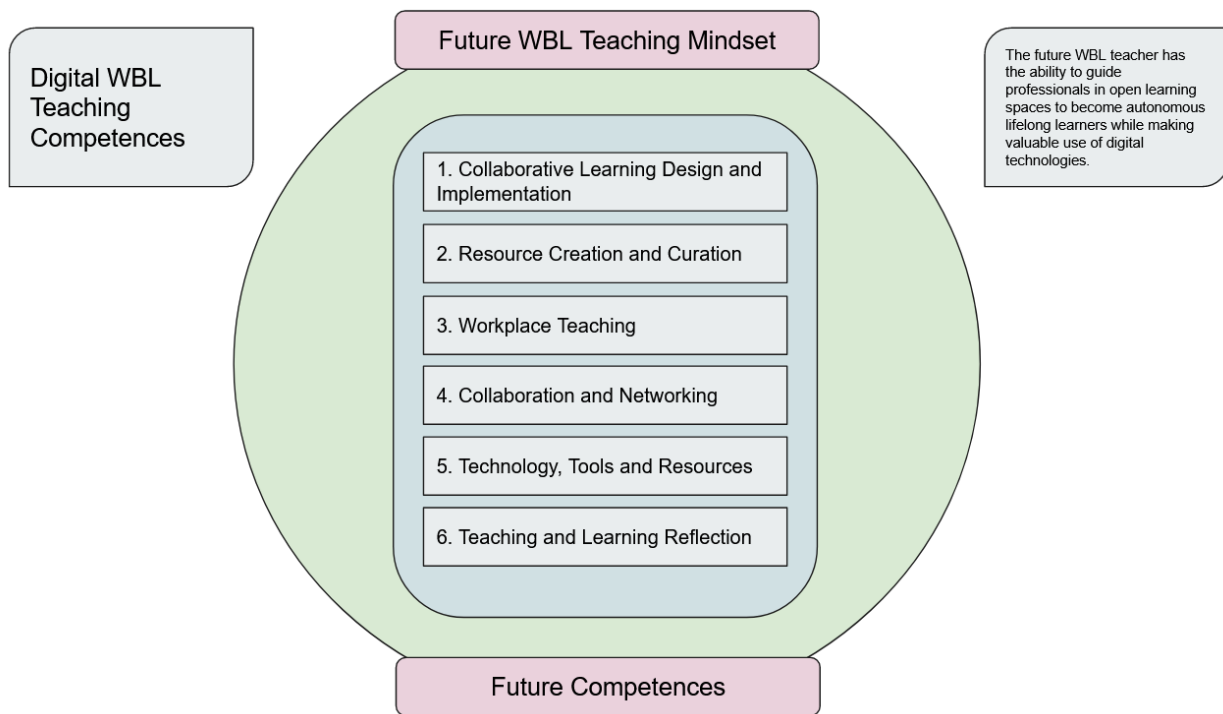


Figure 1: DEAL with Digital WBL Competence Framework

To design the competence framework, a bottom-up approach was taken, i.e. starting from the specific needs and challenges of teachers in order to organise, develop and manage virtual work-based learning spaces. It has been developed in a multi-step, qualitative approach, integrating diverse perspectives. For developing the framework and also this Blueprint, the Digital WBL Ambassador Programme was set up, serving as a training and research programme. It builds on three guiding principles relevant in the DEAL with Digital WBL initiative: Digital Transformation, new concepts of teaching and learning, and workplace learning.

These three guiding principles can be described as follows:

- The **Digital Transformation** is affecting all domains of living, working and learning and thus asks to rethink our teaching approaches
- We thus must rethink our teaching and learning approaches and develop **new concepts of teaching and learning**
- The initiative sets out to identify the relevant contexts to design, deliver and evaluate teaching and learning practices in vocational educational contexts related to **workplace learning, practice-oriented, dual and work-based learning**

In the framework, Future Competences (or Future Skills) and a Future WBL Teaching mindset serve as the foundation and background for the six Core Competences of the Digital WBL Teaching Competences Framework.

The six Core Competences can be described as follows:

1. **Collaborative Learning Design and Implementation** - Design engaging, learner-centred and collaborative Digital WBL Learning and Assessment Settings and to guide learners in their learning process in Digital WBL spaces
2. **Resource Creation and Curation** - Design, adapt, edit, exchange and share learning materials and resources aligned with learners' needs in Digital WBL contexts and relevant to practice contexts
3. **Workplace Teaching** - Create learning experiences that reflect practice- or work-based contexts and to guide learners to create their open learning environment at the workplace
4. **Collaboration and Networking** - Collaborate with other stakeholders in education in order to realise successful Digital WBL experiences for learners
5. **Technology, Tools and Resources** - Learn about, choose, use, adapt and stay updated on appropriate tools for Digital WBL experiences while reflecting the technical conditions and security aspects
6. **Teaching and Learning Reflection** - Be reflective of societal developments, trends and challenges and other conditions when designing Digital WBL experiences and interacting with learners

As the main target groups of the competence framework, VET teachers and trainers, In-company trainers and Peers have been identified as playing a vital role in helping students to acquire the skills and knowledge they need to succeed in their chosen career paths and especially to guide them in their learning pathways.

Now, we are proposing this blueprint to outline the framework conditions for successful implementation.

Research Methodology

In order to design this Blueprint, a dynamic and participatory research process has been designed. It includes bottom-up as well as top-down elements by using both quantitative data as collected with an online assessment tool and qualitative data as collected in many workshops and consultations. This way, indicative qualitative data was used to make sense of quantitative data, to complement it and relate it to real-life challenges in Digital WBL. Throughout its development, the Blueprint has been co-designed with the project consortium and teachers and trainers in VET education, involving stakeholders and experts in an exploration, validation and co-creation research process. In order to engage teachers, trainers and Digital WBL experts in the research process, the Digital WBL Ambassador Programme was set up.

The Digital WBL Ambassador Programme

The aim of the research process concerning the DEAL with Digital WBL Competence Framework as well as the Blueprint was to design them in a co-creative process with teachers, trainers and other relevant stakeholders. In order to involve them in our research initiative, a programme has been set up: the Digital WBL Ambassador Programme, serving as a research, but also training programme, motivating participants to not only learn new practices and approaches, but also to motivate others to connect and innovate together as ambassadors. In the workshops within the programme, interested stakeholders, mostly teachers and trainers in schools, universities and companies were invited to join monthly thematic workshops, mostly held online, where they got to know, presented and discussed different practices, tools and scenarios of Digital Work-Based Learning. The aim was to inspire and motivate participants, but also to discuss what would be needed in order to employ them in terms of framework conditions. The Ambassador Programme took place mostly with each partner in their national language in order to allow easy accessibility for teachers to join them, involving their institutional networks.

Altogether, 19 workshops were held by seven partners in different countries and languages and featured many topics such as more general discussions about Digital WBL tools, scenarios and good practices, competence needs, discipline-specific applications, or the role of Artificial intelligence and immersive media, complemented by an international workshop open to all partners' Ambassadors.

Another workshop was held on May 17 under the title “Success conditions and solutions for Future Digital WBL scenarios” and focused specifically on discussing the first research results and outlines of the Blueprint, of discussing challenges and areas of the Blueprint assessed as especially relevant to participants. The topic areas were identified based on the DigCompEdu and DigCompOrg frameworks and on the analysis of the Digital WBL Ambassador Programme discussions. In the workshop, participants were asked to discuss relevant stakeholders, challenges and possible solutions and good practices in order to overcome these challenges according to the topics chosen. Based on participants’ interests, the following topics were covered:

- Leadership & Governance
- Pedagogy: supports and resources
- Continuing Professional Development

The workshops were also used to gather information on competence needs and framework conditions to promote good Digital WBL practice. For this, a documentation table was set up in which the workshop organisers and moderators were asked to document the workshop inputs and discussions according to the following categories:

- Focus Subject: Competences/Skills
- Challenges and Training needs
- Potentials
- (Good) Practices
- Any other business

In addition to the workshop and the qualitative content analysis of their documentation, a quantitative component was added to the research process: the [SELFIE for work-based learning](#) (**SELFIE WBL**) tool, designed for schools and companies in the VET sector to assess their state of development in the fields of digital technologies and teaching, training and learning in a work-based learning context, including strengths and weaknesses or, in other words, areas of development and expertise. The tool itself is mostly based on the DigCompOrg framework (Figure 2), the European Framework for Digitally Competent Educational Organisations, and also informed by DigCompEdu, and adapted to work-based learning contexts (cf. Hippe et al., 2021). Each partner was asked to set up the SELFIE WBL tool in their own language and send it to participating ambassadors and other

persons within the project. Participants were able to assign themselves to the following target groups: School Leaders, Teachers, In-Company, Students. Some additional questions (full list of questions: see Annex A) were provided to adapt the basic questionnaire to the DEAL with Digital WBL project needs; it was also discussed and decided beforehand which ones of the optional statements should be included in the survey (list of optional statements: see Annex B). This way, a quantitative dataset was created, informing the research on the Blueprint by allowing for partners' institutions' reflection, by inviting participants of the survey to reflect on the covered subjects and getting a first overview of framework conditions for Digital WBL related to each partner's institutional network. The results were also used several times as discussion catalysts within the workshops of the Digital WBL Ambassador Programme. However, the dataset has its limits as the time and scope of the survey was very different across institutions due to contextual factors. The partner UOC provided a larger dataset from a VET school within its network, thus providing a larger dataset, but without the specific adaptations such as additional questions.

The analysis of the results of the SELFIE WBL survey will be reflected in the main part of this Blueprint and can be accessed in Annex C.

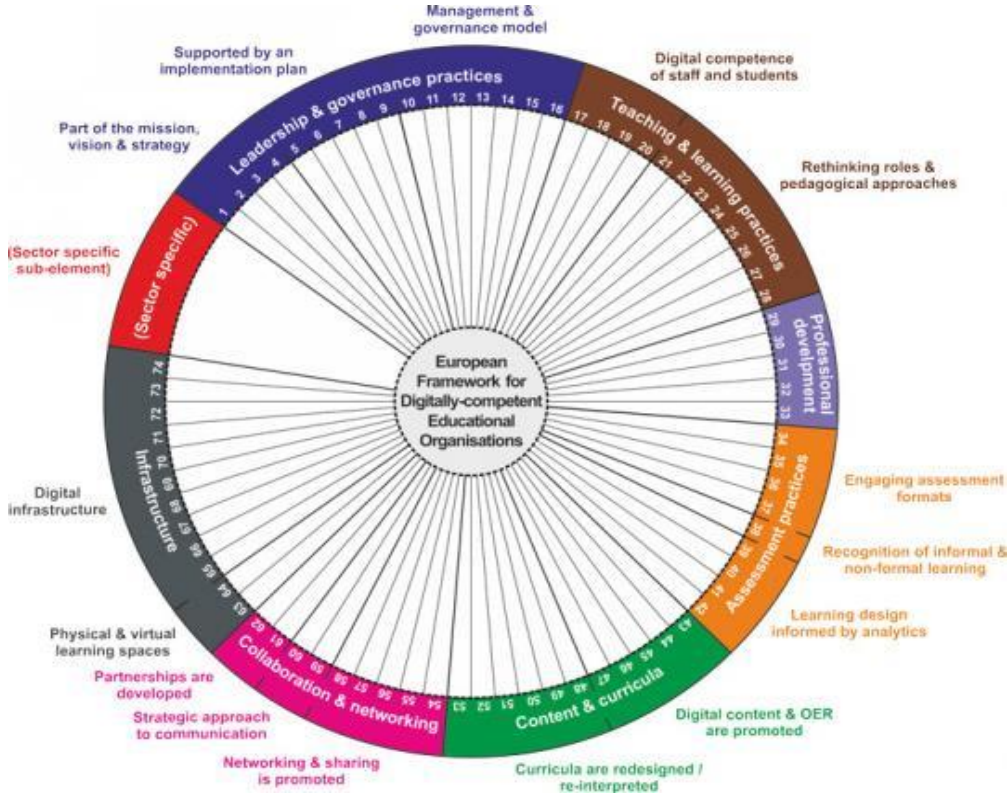


Figure 2: DigCompOrg Framework, displaying the main categories covered by SELFIE WBL

From Workshop Outcomes to Blueprint

As mentioned, the workshops held within the Ambassador programme were documented in a Documentation table and analysed in an inductive content analysis according to Kuckartz (2018) for identifying categories related to a) relevant competences for VET teachers and trainers, informing the competence framework, and b) potentials, challenges and framework conditions needed in order to promote Digital WBL, informing this Blueprint. This mostly inductively collected information was complemented by the DigCompOrg and DigCompEdu frameworks and the quantitative data collected by the SELFIE survey, to organise and enhance the collected information. In order to draw on preliminary research on (Digital) Work-Based Learning and Teaching competences, several reports and publications on these topics were identified and analysed, for example:

- vWBL Project Consortium (2021): Guide for VET teachers to virtual WBL (https://www.vwbl.eu/sites/vwbl/files/attachments/2021-08/vWBL_Guide_EN.pdf)
- Monteirto, DC4Work (2018): Work-Based Learning in a Digital Age. Study on training needs and trends of the Tourism and Trade sector (https://www.dc4work.eu/fileadmin/user_upload/dc4work/0_uebergreifen_d/Work-Based_Learning_in_a_digital_age-Final_Report.pdf)
- Development Asia (2018): Work-Based Learning for Skills Development (<https://development.asia/explainer/work-based-learning-skills-development>)
- Bahl, Dietzen (2019): Work-based Learning as a Pathway to Competence-based Education (<https://www.bibb.de/dienst/publikationen/de/9861>)

The categories that emerged in the analysis of the described documents could mostly be attributed to the categories as presented in the SELFIE WBL tool, based on the DigCompOrg framework¹. However, several important sub-categories and main categories emerged in our research that had not been in the DigCompOrg framework but are relevant for the Digital WBL context:

¹ DigCompOrg has been further developed for SELFIE WBL, introducing or reintroducing the areas “Pedagogy: supports and resources”, “Pedagogy: implementation in the classroom” and “Student digital competence” (Hippe et al., 2021).

- **main categories:**
 - Finances
 - Long-Term Funding
 - Accessible Funding Opportunities
- **sub-categories:**
 - Pedagogy: supports and resources
 - Awareness for a new Digital WBL pedagogy is promoted
 - Experimenting is encouraged: Teachers have time and space to try out new tools, technology and methods and also to fail
 - Pedagogy: implementation in the classroom
 - An engaging, but empathetic pedagogical approach is employed
 - Awareness for student well-being, needs and challenges is promoted
 - Infrastructure and Equipment
 - The digital infrastructure is planned and managed and known by teachers, trainers and learners
 - Infrastructure and equipment are easily accessible for teachers, trainers and learners
 - Leadership & Governance (Practices)
 - There is strong leadership on trends and topics such as AI in education and sustainability
 - The specific local and disciplinary educational and professional ecosystems and contexts are considered
 - Continuing Professional Development
 - Learning and training opportunities are provided to educational stakeholders
 - Teachers and trainers have time and space to experiment and reflect on Digital WBL experiences
 - Collaboration and Networking
 - Collaboration activities are also encouraged on an international level
 - Networking and collaboration are easily and digitally accessible

These categories and topics were proposed and sent to the project partners for review and comment in a reviewing table whose comments were taken into

account in the next steps of the process. They were adapted, merged and integrated for the Blueprint framework.

Designing a strategic framework for Digital WBL

While the research conducted within this initiative is original, we can build on previous research done in the field of digital educational innovation in order to organise our findings and draw conclusions and recommendations from them. Importantly, the research of Seufert and Eulers (2005) and Bates and Sangrà (2011) support this Blueprint.

Seufert and Euler: A Concise Model for Educational Innovation

In a thorough case study research initiative on implementation strategies of eLearning as an innovation in Higher Education, **Seufert and Euler** (2005) have established a theoretical orientation framework for attaining sustainable eLearning innovation in higher education. The authors have identified factors that positively influence the sustainable implementation of eLearning as an innovation. As Digital Work-Based Learning can also be conceived as an innovation in digital learning and the aim is to make it wide-spread and sustainable, not insular and short-term, this model can serve as an orientation for structuring our findings and formulating recommendations. It identifies five fields of design for designing sustainable eLearning solutions in Higher Education which will provide the main structure of this Blueprint:

- Didactical Dimension/Didactics
 - e.g.: curricular integration
- Technological Dimension/Technology
 - e.g. technological support, technical infrastructure
- Economical Dimension/Economics
 - e.g. financing technical infrastructure, cooperating with external providers
- Organisational Dimension/Organisation
 - e.g. organisational support structure and responsibilities
- Socio-cultural Dimension/Culture
 - e.g. network development, competence development and training, incentives, acceptance promotion

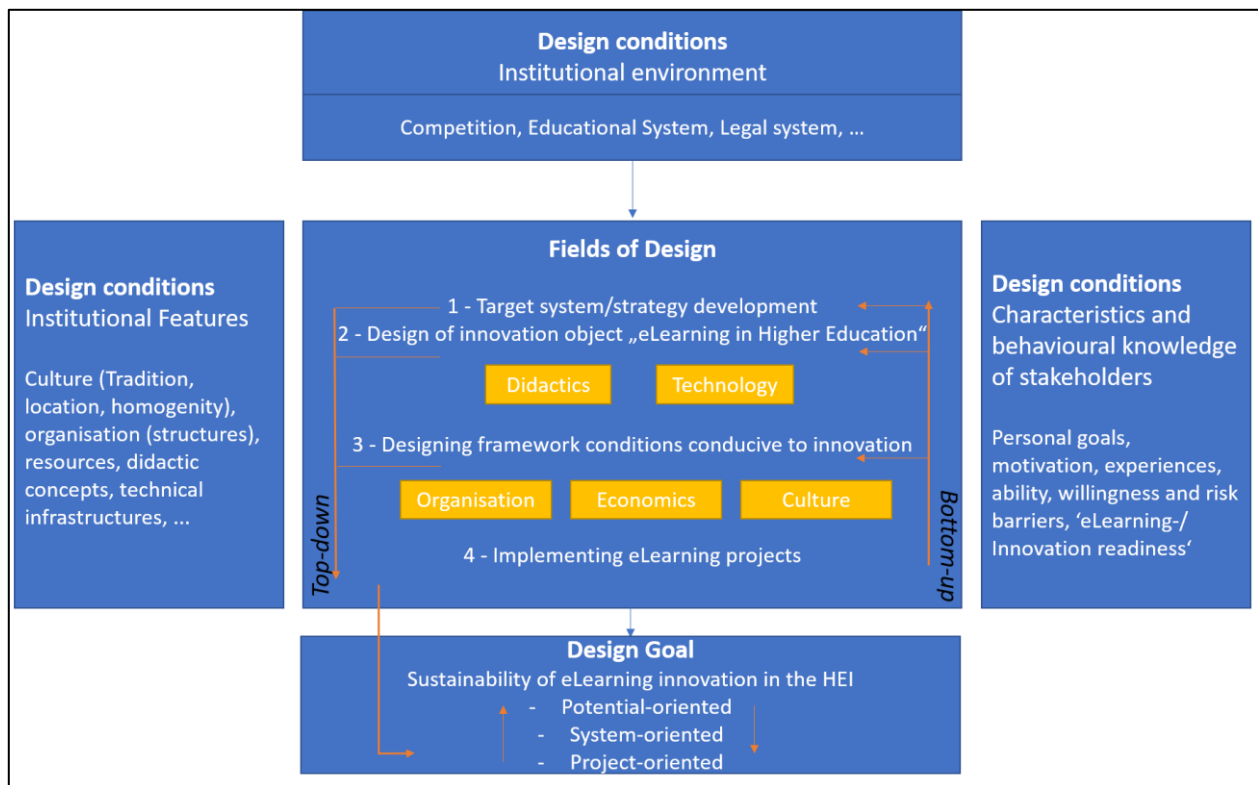


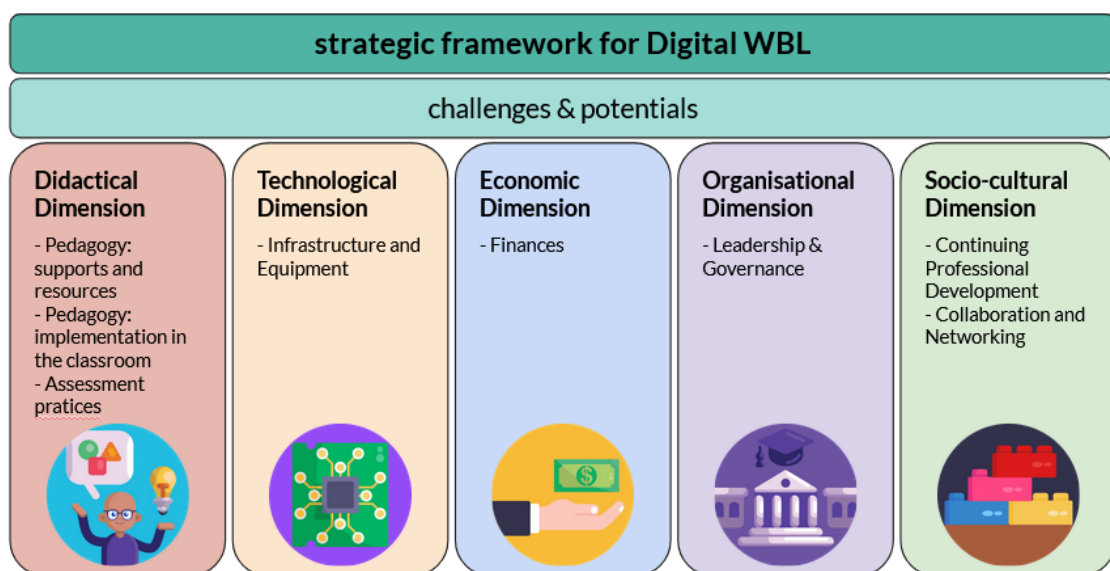
Figure 3: Design domains for sustainable eLearning solutions as an innovation in Higher Education Institutions (translated according to Seufert & Euler, 2005, p. 75)

Bates and Sangrà: Strategic Recommendations for Educational Transformation

Our analysis can also draw on several resources on work-based learning and digital work-based learning for contextualising the research and recommendations. One resource consulted for formulating strategic recommendations is the volume “Managing Technology in Higher Education: Strategies for Transforming Teaching and Learning” by Tony Bates and Albert Sangrà (2011) as it provides strategies and actions for supporting the “integration of technology” (p. xix) into educational institutional activities, thus also meeting the scope and mission of this Blueprint. The research is also based on an analysis of case studies of postsecondary educational institutions in Europe and North America and presents a strategic approach. Within our framework, the consolidated recommendations will be adapted to the categories and needs identified in our own research.

The authors would also like to refer to the results of the Digi-HE² initiative, an international initiative focusing on supporting universities in “strategic approaches to digital learning”, providing indicators and self-assessments on digital innovation in educational institutions, for example in a comprehensive report on institutional self-assessment instruments concerning digital education ([Volungevičienė et al., 2021](#)).

DEAL with Digital WBL Blueprint



icons: flaticon by Dighital

The following part constitutes the main part of the document, starting with an overview of potentials, challenges and practices in Digital WBL and then focussing on the main areas of discussion as presented in the DigCompOrg framework and enhanced by our own research, restructured according to the main categories as proposed by Seufert and Euler (2005).

² See <https://eua.eu/resources/projects/772-digi-he.html> for more information.

Sketching Digital Work-Based Learning in Practice

The workshops conducted within the Digital WBL Ambassador Programme gave all the participants as well as the project team the opportunity to get a more concrete idea and insights into the actual practice and scope of Digital Work-Based Learning in applied educational contexts and its relevance. Thus, they also served for all participants to share a common understanding of Digital WBL, going beyond a definition and into concrete practice.

The following **practices, technologies and forms of Digital WBL** were named, presented and discussed within the workshops (Table 2):

Table 2- Practices, technologies and forms of Digital WBL

Digital WBL domain, tool, practice	Details and examples
Artificial Intelligence	<ul style="list-style-type: none"> - e.g. Chat GPT - could serve as learning tutors (chatbots)
Immersive Media	<ul style="list-style-type: none"> - e.g. Augmented Reality, Virtual Reality, Mixed Reality - e.g. for practising, socially interacting or accessing something otherwise unavailable - virtual classroom - eye tracking with VR lenses - remote maintenance scenarios - medical training with VR - suits, gloves, etc. to enhance experiences - avatars to be present in virtual spaces
Videos	<ul style="list-style-type: none"> - (animated) video case studies - 360° camera videos - explanatory videos - insights into practice settings in theory phases
Online/blended training formats	<ul style="list-style-type: none"> - webinars, MOOCs and related training formats - online challenges and projects - digital excursions - online exhibitions - online career fair - hybrid consultation settings - breakout rooms and chats for discussions in online formats - digital communication platforms

	- 'cookinar'
Simulations	- simulation-based training
Tools for enhancing teaching and learning	- digital tools for enhancing on-site learning, e.g. voting apps/audience response/quiz apps and tools - organisational tools to help learners structure individual learning processes
ePortfolio	- documenting and reflecting practice experiences
Virtual constructors	
Remote maintenance	
Digital Game-Based Learning, Gamification	- e.g. role-playing game
Open Educational Resources/OER	
Learning Analytics, Machine Learning	
FabLab/Maker Space	
Wearable technology	- personalizing learning experiences
Robotics, Automation	- assistance in experiments, simulations
Internet of Things	- creating smart learning spaces with connected infrastructure

The relevance of Digital Work-Based Learning has already been explained above, for example in preparing learners for today's and tomorrow's working and learning environments. Digital Work-Based Learning has a lot of **potentials** and advantages that were discussed in the workshops and are being summarised in Table 3:

Table 3 - Potentials of Digital WBL

Domain	Description
General Advantages of Digital Work-Based Learning	<ul style="list-style-type: none"> - fast and 'easy' training opportunities - adaptability to different training and professional contexts - saving time - saving money/training costs

	<ul style="list-style-type: none"> - increasing productivity - new possibilities in digital and hybrid settings
Accessibility	<ul style="list-style-type: none"> - better accessibility to education, e.g. by overcoming mobility challenges for learners with physical impairments and by providing resources across (national, institutional) borders (e.g. OER) - Other target groups can be reached: people in rural areas, with mobility impairments, who prefer digital social interaction to on-site social interaction, who don't have institutional access, who face language barriers ... - allowing for insights which would not be accessible or time-consuming, expensive, dangerous otherwise (e.g. via VR) - Accessibility 24/7, e.g. ChatGPT/chatbots, digital training resources
Active, Flexible and Engaging Learning Experiences	<ul style="list-style-type: none"> - facilitating more personalised, flexible and engaging learning experiences - facilitating integration of theory and practice - facilitating challenge- and problem-based learning - facilitating coaching settings - stimulating (educational) innovation - support learners in their individual learning processes by providing tools for organizing, structuring, etc. - supporting learning processes (e.g. using AI tools for creative impulses in the writing process) - stimulus to rethink and innovate in teaching and learning
Collaboration and Social Learning	<ul style="list-style-type: none"> - promoting learners' collaboration - sharing practice experiences in a more accessible and experienceable way - interaction possibilities in remote settings (e.g. social VR) - improve learners' competences and confidence (e.g. in simulation-based training) - possibility for a more immersive and engaging educational experience, e.g. by involving more human senses
Learning Outcomes and Analysis	<ul style="list-style-type: none"> - tracking and analysing learning activities - training with real-time feedback - deeper understanding of learning contents - documentation and repetition of learning outcomes - possibility of less biased feedback

Safety and Sustainability	<ul style="list-style-type: none"> - practising and learning in safe settings, preparing to successfully act in real-life settings - avoiding dangerous situations - hygiene and health aspects, e.g. in the health sector: protecting vulnerable groups from infections - sustainable learning opportunities, e.g. by avoiding emissions caused by transport
Technology Advancements	<ul style="list-style-type: none"> - making digitalization and educational opportunities available to all - further development of technology on VR, AR, simulation, ... - learning experiences independent from personal assistance

However, these potentials are not automatically being exploited in Digital Work-Based Learning. On the contrary, Digital Work-Based Learning settings equally bring many **challenges** that need to be addressed and which are summarised in Table 4.

Table 4 - Challenges of Digital WBL

Domain	Description
Adaptation and Implementation	<ul style="list-style-type: none"> - awareness for Digital WBL solutions and their relevance is not high - teachers and educational stakeholders have difficulty in adapting to Digital WBL - high support (staff) need - culture of collaboration and sharing is needed, but not promoted by all - roles of teachers and learners are changing in Digital WBL - static curricula do not always allow experimentation and new educational settings - educators do not have enough time and space to try out new Digital WBL scenarios - tendency to hold on to well-known teaching and learning practices rather than innovate - need for self-discipline; risk of overuse of digital media - age- or gender-based self-perceptions and biases towards the use of digital technologies
Accessibility	<ul style="list-style-type: none"> - new methods and technology are not accessible and usable for all teachers and learners and not intuitive

	<ul style="list-style-type: none"> - students' digital competences may be higher than teachers': barrier to try out new solutions - not all technologies are inclusive for all learners (e.g. VR and AR in case of eyesight problems) - electricity and internet connection are necessary: no Digital WBL in case of bad internet connection - Perceived overload of tools can reduce acceptance
Technology and Privacy	<ul style="list-style-type: none"> - high costs of new software and hardware - Limited funding opportunities - technical challenges (internet, hardware, audio, etc.) - privacy rights and data security - technical dependence on specific platforms - technical solutions still under development - country-specific regulations - suitable digital infrastructure must be ensured
Integration of Digital Tools in Work-Based Learning	<ul style="list-style-type: none"> - challenge to determine if digital tools are needed/useful for a specific learning setting - or not - challenge to assess the quality of digital resources - diversity of tools makes it difficult to stay up-to-date and to decide which ones are useful and relevant - high maintenance needs in employing digital technology may detract the focus from teaching: seamlessness of Digital WBL - availability of context-specific applications and resources and challenge to adapt them - challenges for assessment: authoring and originality of content can be questioned in times of AI/ChatGPT
Training Needs	<ul style="list-style-type: none"> - (continuous) training courses for teachers are needed, but also for in-company trainers and professionals - training and awareness for integrating theory and practice in Digital WBL - regular training on pedagogy and didactics and training on tools and technology - also users and learners need to be trained how to use new tools and make the best use of them in their learning settings


Note: In the SELFIE WBL survey, main factors inhibiting the use of technology in schools and companies were also assessed (e.g. digital equipment, lack of time of teachers and trainers, low digital competence, difficulties in engaging students), as well as positive factors affecting the use of blended learning (e.g. collaboration), cf. Annex C.

Framework Conditions and Recommendations for Successful Digital Work-Based Learning

The following part will be structured according to the strategic dimensions as proposed by Seufert & Euler (2005), within which you will find the main topics structured according to the DigCompOrg categories and the ones added within our own research process. Each chapter will shortly outline the main topics and formulate recommendations, backed up by good practices, quotes, illustrative cases and evidence, drawn from our research within the Digital WBL Ambassador programme, our previous research and the analysis of the available resources at hand.

1. Didactical Dimension/Didactics

This dimension comprises all areas and elements which are directly related to the teaching and learning experiences happening on site, in the school and at the workplace or in hybrid and remote scenarios.

strategic framework for Digital WBL	
challenges & potentials	
<p>Didactical Dimension</p> <ul style="list-style-type: none"> - Pedagogy: supports and resources - Pedagogy: implementation in the classroom - Assessment practices 	<p>This dimension comprises all areas and elements which are directly related to the teaching and learning experiences happening on site, in the school and at the workplace or in hybrid and remote scenarios.</p> <p>Pedagogy: supports and resources</p> <ul style="list-style-type: none"> - Digital Competence is promoted, benchmarked and assessed - A rethinking of roles and pedagogical approaches takes place - Awareness for a new Digital WBL pedagogy is promoted - Experimenting is encouraged: Teachers have time and space to try out new tools, technology and methods and also to fail <p>Pedagogy: implementation in the classroom</p> <ul style="list-style-type: none"> - Digital Content and OER are widely promoted and used - Curricula are redesigned or re-interpreted to reflect the pedagogical possibilities afforded by digital technologies - An engaging, but empathetic pedagogical approach is employed - Awareness for student well-being, needs and challenges <p>Assessment practices</p> <ul style="list-style-type: none"> - Assessment Formats are engaging and motivating - Informal and Non-Formal Learning are recognised, especially in Work-Based Learning settings - Learning Design is Informed by Analytics

icons: flaticon by Dighital

*Note: This area has been identified as a comparatively **strongly developed** one in the SELFIE WBL survey, cf. Annex C, with room for development in linking learning activities to work-based challenges and in using digital technologies to harmonise teaching and learning objectives. Teachers rated their confidence in using technology higher for the aim of preparing lessons than for communication, class teaching and providing feedback. "Pedagogy: Supports and Resources" is assessed more strongly*

than “Pedagogy: Implementation in the Classroom” and “Assessment Practices”, with lower ratings for the groups of school leaders and teachers. The lowest ratings and thus remarkable points of development have been assigned to the following aspects: Open educational resources, cross-cultural projects, feedback to other students, co-design assessment, using data to improve learning (lowest rating). Student digital competence was rated comparably high, with the lowest ratings in responsible behaviour and creating digital content and high ratings for items related to in-company activities (cf. Annex A & C).

1.1 Pedagogy: supports and resources

This area describes the pedagogical background of the Digital WBL experience which goes together with an openness towards new approaches in teaching and learning together in Digital WBL.

DigCompOrg identifies the following important topics to ensure suitable framework conditions³:

Digital Competence is promoted, benchmarked and assessed

This holds true both for students and teachers or trainers and includes topics of safety and risks in digital environments. For more information on the specific competences for teachers and trainers in Digital WBL environments, please refer to the DEAL with Digital WBL Competence Framework ([The Emerging Digital Skills Model for VET trainers](#)). More general critical thinking and Future Skills should also be encouraged (cf. vWBL Project Consortium, 2021, p. 62). However, awareness for the relevance of Digital Competence should also be promoted on a leadership level in companies and educational institutions (see 4.1, cf. Monteirto, 2018, p. 33).

A rethinking of roles and pedagogical approaches takes place

This concerns both teachers, trainers and other educational professionals, but also learners: learners are taking a more active role in their individual learning process while teaching persons facilitate this process and guide learners in it by also promoting peer-learning and collaboration between learners.

³ Note that SELFIE WBL names “Student digital competence” as a separate area whereas this is integrated into the other categories in DigCompOrg. In this report, we consider competence-related framework conditions in the “Pedagogy: supports and resources” area.

With this Digital WBL initiative, we add the following topics:

Awareness for a new Digital WBL pedagogy is promoted

There is a consensus that it is not only about the tools, but also about pedagogical considerations in Digital WBL: a good Digital WBL design is one that considers learners as active, reflective and critical creators of their own learning pathways while tools and technology shall enhance these experiences according to the learners' individual and professional contexts and preferences. Creating awareness for these possibilities and potentials and involving learners in the process are crucial.

Experimenting is encouraged: Teachers have time and space to try out new tools, technology and methods and also to fail

In many discussions, it became clear that educational professionals would try out new tools and methods if they had more time for this and for their professional development. But, as importantly, they need to have the space not only to try and to explore, but also to fail in this – if possible, in co-creative processes with the learners. This should be supported by educational structures and institutions – accompanied by a positive way to deal with errors that will likely emerge in the process.

Recommendations:

- Design and communicate a didactical mission statement for Digital WBL (cf. Seufert & Euler, 2005, p. 57).
- When (re)designing programmes and curricula, consider Digital WBL and promoting the relevant competences in the design process by providing a pedagogical vision and funding opportunities (cf. Bates & Sangrà, 2011, xxi).
- When (re)designing programmes and curricula, consider hybrid settings and take the different needs of participants into account (cf. Bates & Sangrà, 2011, xxiv).
- Always consider and reflect on the quality of didactic settings in Digital WBL and reflect on how this setting brings an added value to the learning experience (cf. Seufert & Euler, 2005, p. 57).
- Invite educators to experiment and use cooperative evaluation and review methods (cf. Bates & Sangrà, 2011, xxiv) to support them in further developing their Digital WBL approaches.

- Find incentives to motivate and encourage educators to innovate and experiment and value their efforts (cf. Bates & Sangrà, 2011, xxvi).
- Reflect on your role in relation to learners as a workplace trainer, a teacher at the educational institution, a fellow learner or worker, etc. Recommended reading: Harris, 2019.

1.2 Pedagogy: implementation in the classroom

This area describes the teaching and learning practices actually taking place in practice, in the classroom or at the workplace – the actual implementation of Digital Work-Based Learning.

*Note: This area has been identified as a comparatively **averagely developed** one in the SELFIE WBL survey, cf. Annex C.*

DigCompOrg identifies the following important topics to ensure suitable framework conditions⁴:

Digital Content and OER are widely promoted and used

Learners and educators are encouraged to use Open Educational Resources, but also to create them in the learning process while learning about licences and intellectual property. Learning resources and tools are easily accessible for all learners (cf. vWBL Project Consortium, 2021, p. 62). For this, it is necessary to promote knowledge about OER and their use to raise acceptance (cf. Ebner et al., 2015; Ladwig, 2022).

Curricula are redesigned or re-interpreted to reflect the pedagogical possibilities afforded by digital technologies

Here, digital technologies are used to enhance and rethink learning experiences and their structure, leading to an appropriate mix of on-site, hybrid and online

⁴ Note that SELFIE WBL names “Student digital competence” as a separate area whereas this is integrated into the other categories in DigCompOrg. In this report, we consider competence-related framework conditions in the “Pedagogy: supports and resources” area.

settings – and to include practice-relevant contents and challenges. According to a survey with VET teachers, Digital WBL settings should be “closely connected with practice” (cf. vWBL Project Consortium, 2021, p. 56).

With this Digital WBL initiative, we add the following topics:

An engaging, but empathetic pedagogical approach is employed

Tools and methods in Digital WBL are employed and decided for or against in order to make the learning experience more engaging – by taking account of the individual learning conditions, practice contexts, experiences and demands of the learners in the learning process as well as their individual interests and motivations. For this, personalised feedback and participation opportunities are included in didactical considerations and designs. This also means that the possibilities to adapt Digital WBL experiences to learners’ special needs are critically explored and taken into account.

Awareness for student well-being, needs and challenges

Educators consider student well-being, needs and challenges when designing and implementing educational experiences by means of student participation, co-creation and collecting feedback – also supported by digital technology. Concerning well-being, different kinds should be taken into account such as physical, social and emotional well-being (Albrecht & Veall, 2014).

Recommendations:

- Use and acquire tools and platforms to facilitate creating digital resources such as instructional videos, etc. (such as Powtoon, Canva, ...). However, verify if the licensing modules satisfy your needs and usages.
- Promote the use and creation of OER

Good Practices:

- Serious games such as [Fligby](#) can provide new engaging learning approaches.
- Digital e-portfolios can support documenting and reflecting on learning experiences and their transfer from practice to theory and vice versa, such as developed by the initiative [DIRK Dual](#).
- Explore the potentials of simulated VR environments in preparing for

practice emergency cases, such as in health care, as described [here](#).

- Explore training resources for students and trainees according to different platforms, e.g. on [eCademy](#).

1.3 Assessment Practices

This area describes the ways in which teaching and learning are integrated with assessment approaches and the way they are suitable in the context of Digital WBL.

*Note: This area has been identified as a comparatively **weakly developed** one in the SELFIE WBL survey, cf. Annex C.*

DigCompOrg identifies the following important topics to ensure suitable framework conditions:

Assessment Formats are engaging and motivating

This means that summative assessment (evaluate student learning as a conclusion of a certain period) may be an option, but that formative (in-process evaluations), self- and peer-assessments are promoted in order to support student learning within the actual learning process. This can (and should) also take applied forms relevant to the actual practice contexts, e.g. by including feedback by peers that work in the same practice context.

Informal and Non-Formal Learning are recognised, especially in Work-Based Learning settings⁵

In Work-Based Learning settings, a lot of the learning processes take place on-site during practical experiences while there is no formal assessment setting to it. Especially in these contexts, it is thus important to value and recognize learning activities outside of formal settings - which can also be facilitated by digital technology, such with an e-portfolio tool or self-study resources.

Learning Design is Informed by Analytics

⁵ This area has been enhanced for the Digital WBL initiative in comparison to DigCompOrg.

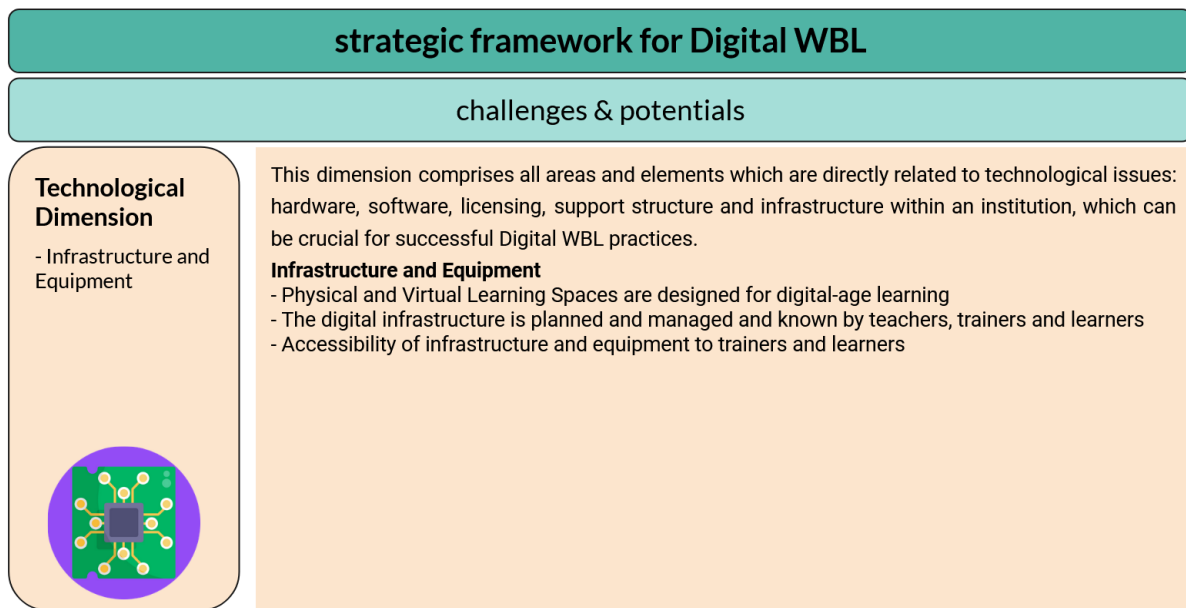
Digital technology allows for learning about students' learning processes, for providing feedback and for making use of this information in order to improve their learning conditions - this being possible during and not after a course has taken place, or during a practice phase in Digital WBL settings. This can be facilitated, for example, by an online Learning Management System which collects information - but of course in line with students' and teachers' needs, consent and a good reason to do so.

Good Practices:

- The [ASCOT+](#) research and transfer initiative, funded by the German Federal Ministry of Education and Research, aimed at developing and testing digital learning and assessment tools for learners' competences in VET education.
- The [eCampus Handwerk](#) is a digital cross-site learning and assessment platform in the skilled crafts and trades sector, accessible to learners, educators and examiners (website in German), facilitating learning and examining at different learning sites.

2. Technological Dimension/Technology

This dimension comprises all areas and elements which are directly related to technological issues: hardware, software, licensing, support structure and infrastructure within an institution, which can be crucial for successful Digital WBL practices.



icons: flaticon by Dighital

*Note: This area has been identified as a comparatively **strongly developed** one in the SELFIE WBL survey. The lowest ratings were received for the following items: database of training opportunities, digital divide, simulation, physical spaces, cf. Annex C.*

2.1 Infrastructure and Equipment

In Digital WBL, the technological dimension mainly relates to infrastructure and equipment for Digital WBL.

DigCompOrg identifies the following important topics to ensure suitable framework conditions:

Physical and Virtual Learning Spaces are designed for digital-age learning

This means, on the one hand, that physical learning spaces allow for hybrid and online learning, but also for technologically-enhanced learning on-site, or on the job - and, on the other hand, that virtual learning spaces can be adapted to different educational and professional contexts and meet the learners' demands. In this area, it is important to know that learners in Work-Based Learning contexts

learn in different places, at different times and with different peers, teachers and tutors – so all these spaces need to be considered. The impact on the learners' learning experiences are critically reflected.

The digital infrastructure is planned and managed and known by teachers, trainers and learners⁶

Digital infrastructure is a crucial point for Digital Work-Based Learning. Not only should software and hardware be up-to-date and in a technical state where they are ready-to-use, including valid licences and reliable platforms (cf. Seufert & Euler, 2005, p. 61), but they also need to be known and found by both educators and learners who would like to integrate them into their Digital WBL practices. Moreover, this is also the case for companies where the available technical equipment might be different to that of the educational institution altogether – and also the personally disposable technical devices available to learners.

With this Digital WBL initiative, we add the following topic:

Accessibility of infrastructure and equipment to trainers and learners

It is not only important to dispose of tools, hard- and software, but also that they are easily accessible for educators and learners both in the educational institution and the workplace – starting from an easily accessible place to borrow equipment or an up-to-date database on where to find what, including easy-to-use guides and manuals, support measures and the possibility of learning how to use the equipment and seek for support while using it. Thus, the fear of using expensive hardware and thus being discouraged to use it can be reduced.

Recommendations:

- Set up and establish (a) department(s) for the access to technical infrastructure and easy support for educators and learners (cf. Bates & Sangrà, 2011, xxiii).
- Make this department visible and easily accessible location- and timewise to all educational stakeholders.
- Provide support opportunities on-site and remotely to learners and

⁶ This area has been enhanced for the Digital WBL initiative in comparison to DigCompOrg.

educators.

- Where possible, opt for easily accessible soft- and hardware with user-friendly interfaces and a general good usability. Take this aspect into account when making technology-related decisions.

Good Practices:

- Authoring tools to facilitate developing resources for Digital WBL

3. Economic Dimension/Economics

This dimension comprises all areas and elements which are directly related to financial aspects such as financing new hardware, software and licences, training and maintenance of infrastructure to promote Digital Work-Based Learning.

Note: This area has not been assessed in the SELFIE WBL survey as it is not included in the tool and the underlying framework.



icons: flaticon by Dighital

3.1 Finances

In this report, we focus on Finances as an area for Digital Work-Based Learning within the Economical Dimension.

With this Digital WBL initiative, we suggest the following topics⁷:

Long-Term Funding

⁷ In DigCompOrg, financial issues are to be found under Leadership and Governance Practices. As it emerged as one crucial area during workshop discussions, it is separately focussed on within our framework.

For promoting Digital WBL both in educational institutions and at the workplace, it is important to have reliable and long-term funding opportunities to be able to provide the suitable infrastructure, spaces and training for a successful promotion of Digital WBL.

Accessible Funding Opportunities

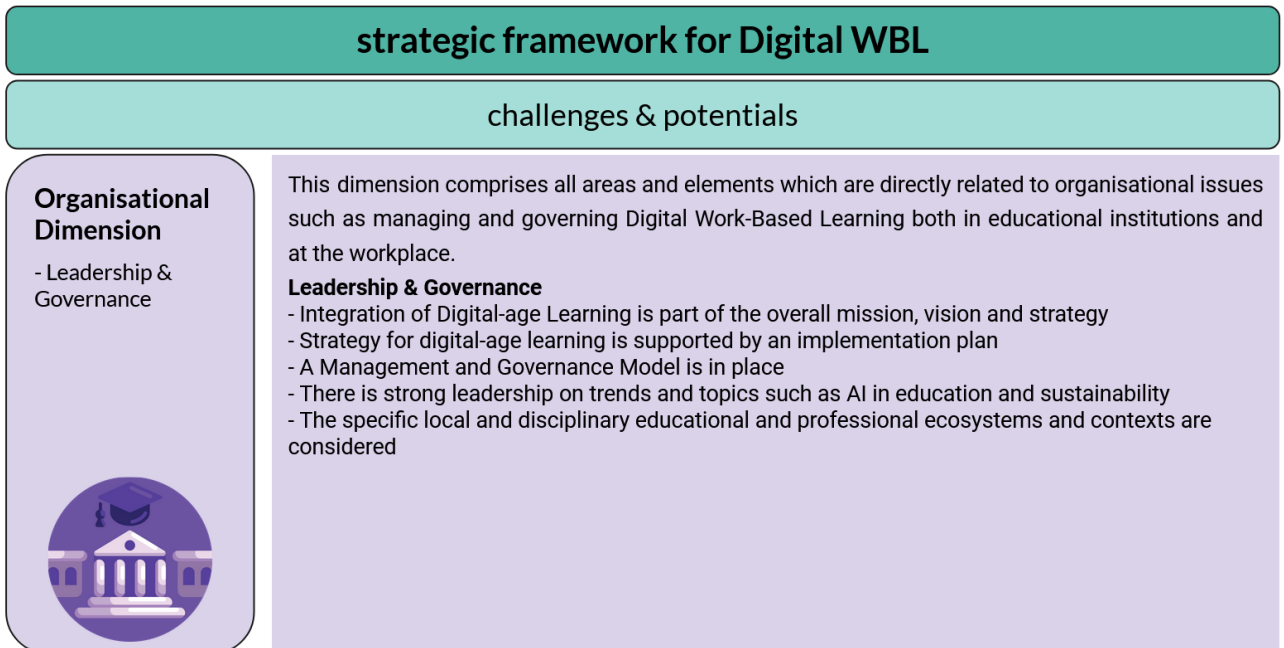
For initiatives, educators and learners to be able to try out and innovate on Digital WBL practices, it is necessary to access more short-term or project-oriented funding opportunities that can be adapted flexibly to dynamic financial needs in the field of Digital WBL, both in the educational institution and at the workplace.

Recommendations:

- When evaluating the costs of Digital WBL, reconsider adapting reporting methods to consider not only the costs of technology, but also consider the impact due to new teaching and learning approaches, hybrid scenarios, etc. (cf. Bates & Sangrà, 2011, xxv).
- Provide sufficient funding for not only cheap, but also accessible technological solutions with a good usability and of good, long-lasting quality and traceable origin of the used resources and consider these aspects in calculations. This will be necessary to make Digital WBL solutions sustainable.

4. Organisational Dimension/Organisation

This dimension comprises all areas and elements which are directly related to organisational issues such as managing and governing Digital Work-Based Learning both in educational institutions and at the workplace. Digital WBL affects organisational development on different levels and dimensions (cf. Seufert & Euler, 2005, p. 53).



icons: flaticon by Dighital

*Note: This area has been identified as a comparatively **weakly developed** one in the SELFIE WBL survey, with the lowest ratings in time to explore digital teaching, involving companies in strategy, and digital strategy, cf. Annex C.*

4.1 Leadership & Governance (Practices)

In this report, the Organisational Dimension is reflected in the Leadership & Governance area of DigCompOrg.

DigCompOrg identifies the following important topics to ensure suitable framework conditions:

Integration of Digital-age Learning is part of the overall mission, vision and strategy

The potential of Digital WBL for all parts of learners' learning processes and also organisational development is clearly communicated and also reflected in strategic considerations both in educational institutions and in companies. Digitalisation is considered as an issue of organisational development and understood as something which implies systemic change and change management. A digital culture is promoted (cf. vWBL Project Consortium, 2021, p. 58). This also strongly relates to the Socio-cultural dimension of this framework as described in the following section.

Strategy for digital-age learning is supported by an implementation plan

There is not only a strategy, but also a concrete plan on how to implement Digital WBL considering barriers and enablers as well as different stakeholders' perspectives and needs concerning Digital WBL, meaning especially learners and educators in the educational institutions and companies, including the cooperation of both learning spaces.

A Management and Governance Model is in place

It is necessary to assign responsibilities and roles in management and operative implementation in Digital WBL, both in educational institutions and companies and in cooperative settings. This can also be assured by initiating projects and trainings and evaluating outcomes. This is closely related to financial aspects by not only distributing responsibilities and staff, but also budgets.

With this Digital WBL initiative, we suggest the following topics:

There is strong leadership on trends and topics such as AI in education and sustainability

Digital WBL is a dynamic field, changing and transforming working and learning landscapes, and it is deeply intertwined with other scientific and societal developments, such as the change brought by the further development of Artificial Intelligence and questions relating to the sustainability of technology and educational settings based on the climate crisis. It is important to provide guidance to learners and educators in this field in order to support them in navigating the dynamic field and to be able to make sound educational decisions. This includes developing protocols for the ethical and barrier-free integration of digital technologies.

The specific local and disciplinary educational and professional ecosystems and contexts are considered

There is no one way to do Digital Work-Based Learning, and the tools, good practices and methods at hand vary according to the professional and educational field as well as contextual factors that may be different across institutions, regions and countries. It is important to consider and address these when designing Digital WBL settings.

Examples:

- The use of Virtual Reality in anatomic educational settings allows access to spaces otherwise inaccessible, which is a function that may be more evident in medical learning contexts than, for example, in pedagogy classes.
- A software cannot be used within an educational institution due to the data protection policy which is not compatible with the software provided.

Recommendations:

- Strategic change needs promoters and advocates (cf. Seufert & Euler, 2005, p. 53) - identify and connect with them. Consider how to increase user acceptance and promote a "digital culture" (cf. Monteiro, 2018, p. 45).
- Make innovation in Digital WBL as well as in educational technology a priority by funding, evaluating and rewarding it (cf. Bates & Sangrà, 2011, xx).
- Mandate a committee to develop goals and strategies for educational technology and Digital WBL on a long term and keep track of the efforts and performance (cf. Bates & Sangrà, 2011, xx-xxi), and to make operative decisions related to Digital WBL.
- Include relevant educational stakeholders in the committee such as teachers and trainers, students, in-company experts, educational designers to promote a collaborative approach.
- Identify existing structures and processes which you could and should involve in the processes of organisational development towards Digital WBL (cf. Seufert & Euler, 2005, p. 66).
- Promote Digital WBL Leadership with executives promoting Digital WBL and the transformation of teaching and learning in statements, but also decision-making, and guide them in it (cf. Bates & Sangrà, 2011, xxi).
- Establish a governance structure related to all issues concerning Digital WBL, such as technology decisions and maintenance (cf. Bates & Sangrà, 2011, xxi).

- Provide Digital WBL and educational technology-related orientation programmes to managers and administrators to provide them with the necessary information to make sound decisions on Digital WBL and educational technology within their field of responsibility (cf. Bates & Sangrà, 2011, xxvi).
- On the government and policy level, develop strategic priorities and strategies for educational technology and Digital WBL (cf. Bates & Sangrà, 2011, xxvi).
- On the government and policy level, provide funding opportunities for educational technology and Digital WBL (cf. Bates & Sangrà, 2011, xxvi).
- On the government and policy level, include training on educational technology and Digital WBL in all guidelines and policies for training programmes of teachers and educators, but also of other professions potentially relevant for workplace learning (cf. Bates & Sangrà, 2011, xxvi).
- Answer and communicate the following questions: What are the compelling reasons for making a change in the direction of the organisation, and why make it now? What might happen if we continued with our current trajectory? What can Digital WBL bring to the table? (workshop discussion within the Digital WBL Ambassador programme)
- Make sustainability an assessment criterion or a point of discussion for and against Digital WBL decisions and funding opportunities
- Use institutional self-assessment tools concerning digital education such as SELFIE WBL in order to engage stakeholders in the process and to identify strengths and weaknesses.

Good Practices:

- A range of institutional self-assessment instruments concerning digital education can be found in [Volungevičienė et al., 2021](#).
- The SELFIE WBL tool can be accessed [here](#).
- Find information on how to set up guidelines for “Digital Competencies promoters” in SMEs in Monteirto, 2018, p. 45.
- The vWBL initiative established a framework to support teachers “to simulate experience in VET digital training” (cf. vWBL Project Consortium, 2021, p. 62), including Key Components (Teaching and learning; Content and resources; Assessment; Teachers’ professional development; Equipment and connection) and Enabling Factors (Policy; Management; Collaboration/Partnership).

5. Socio-cultural Dimension/Culture

This dimension comprises all areas and elements which are related to social and cultural dynamics and developments within and across the institutions and stakeholders involved in Digital Work-Based Learning.

*Note: Continuing Professional Development has been identified as a comparatively **averagely developed** one in the SELFIE WBL survey, with a strong rating in professional collaboration with the help of digital tools (cf. Annex A & C) and lowest ratings in CPD needs and opportunities. Collaboration and Networking has been identified as a comparatively **weakly developed** one in the SELFIE WBL survey, with lowest ratings in progress review and partnerships, cf. Annex C.*



icons: flaticon by Dighital

5.1 Continuing Professional Development

This area describes the ways in which educational professionals are motivated and supported in their continuing professional development in the domain of Digital Work-Based learning within and across institutions.

With this Digital WBL initiative, we suggest the following topics:

Learning and training opportunities are provided to educational stakeholders

Educational stakeholders, especially teachers and trainers, but also learners and educational designers are provided an attractive, easily accessible, flexible and engaging programme of training opportunities both to promote Digital WBL in WBL

settings and individual professional development. In Digital WBL settings, training opportunities should also motivate trainers to integrate theory and practice in their educational designs. They are also designed to help trainers stay up-to-date with the technological and pedagogical possibilities at hand and adapted to trainers' individual speed, knowledge and experiences. They are offered in various formats such as on-site and hybrid trainings, in longer and shorter formats, and in online or self-paced formats to meet learners' needs.

Teachers and trainers have time and space to experiment and reflect on Digital WBL experiences

In the discussions, this aspect emerged as a crucial one: often, educators lack the time to learn about and try out new Digital WBL tools and methods. They need time, space and trust for it - also failing in their experiments. Moreover, they need opportunities to share and reflect on these experiences to learn from them and enhance their Digital WBL teaching practices. This way, implementing innovation in day-to-day work is strongly encouraged while also considering teachers' and trainers' well-being and challenges facing the many changes brought about.

Recommendations:

- Provide regular training in new teaching and learning pedagogy and Digital WBL to all educators with regular teaching commitments (cf. Bates & Sangrà, 2011, xxv).
- Design and realise assessments of trainers' and teachers' competences concerning Digital Work-Based Learning (cf. Monteiro, 2018, p. 45).
- Provide training opportunities in different accessible formats according to different needs and interests, e.g. as digital micro-modules integrated into a learning platform, on-site trainings, digital lunch breaks for sharing good practices, etc.
- Establish train-the-trainer concepts to spread expertise.

Good Practices:

- The freely accessible digital [Handbook on Digital Reality in Vocational Education \(DR in VET\)](#) is an online handbook, including many photos of Digital Reality examples, and hands-on guidelines in order to "get familiar with digital reality tools and systems". AN understandable language and many visualisations make it easily accessible to different audiences.
- The [DC4WORK](#) initiative has identified good practices "focused on the

improvement of digital competencies at the workplace, in general, and in SMEs” (cf. Monteirto, 2018, p. 35 ff.).

5.2 Collaboration and Networking

This area describes the ways in which stakeholders in Digital WBL engage in activities and processes with each other internally and externally, within and beyond institutional boundaries – and joining stakeholders from theory and practice in the Digital WBL learning experience. This includes mentors, teachers and learners (cf. vWBL Project Consortium, 2021, p. 62).

DigCompOrg identifies the following important topics to ensure suitable framework conditions:

Networking, sharing & collaboration is promoted

Educational stakeholders are encouraged and supported to engage in networks, to share resources and to collaborate in teaching and learning processes. For example, there are platforms and trainings or even rewards for educational professionals to exchange on their educational practices, or Learning Circles for teachers to learn about and try out tools and practices and to inspire each other. Also, students are encouraged to engage in professional peer networks and to facilitate the integration of theory and practice in the Digital WBL experiences.

Teachers and trainers are part of a supportive professional community

Teachers and trainers are motivated to share, learn and experiment with other educational professionals in a supportive setting, taking their and others’ well-being into account, establishing a sharing culture to profit from resources and train fellow educators in innovative Digital WBL tools and methods. A supportive community is important to sustainably integrate Digital WBL into educational practices. Thus, teachers and trainers can engage in a supportive community of Digital WBL change agents (cf. Seufert & Euler, 2005, p. 70).

A strategic approach is taken to communication

Organisations communicate internally and externally about Digital WBL tools, methods and training opportunities, addressing and encouraging all educational stakeholders and also ensuring the exchange between theory and practice organisations (cf. vWBL Project Consortium, 2021, p. 55 f.).

Partnerships are developed

Partnerships with external stakeholders are encouraged with students and educators, but also researchers, for example with other organisations sharing Good Practices, tools and methods in Digital WBL. This also involves experts and companies in educational technology as well as employer organisations, chambers, and other educational institutions, and cooperation on the European level (cf. vWBL Project Consortium, 2021, p. 57).

With this Digital WBL initiative, we suggest the following topics:

Collaboration activities are also encouraged on an international level

Collaboration activities go beyond the directly involved institutions, for example on an international and European level, in line with support initiatives, funding and policies, to harmonise the institutional approaches with larger contexts and take advantage of the available resources and networks.

Networking and collaboration are easily and digitally accessible

The possibilities of digital technology are also used for networking and collaborating in hybrid and digital settings, allowing for better flexibility and accessibility. Easily accessible tools to store and share tips, tools and collective knowledge can support trainers in jointly progressing towards a practice of Digital WBL.

Recommendations:

- Set up platforms and events to share Digital WBL good practices, how-to guides and scenarios and make them visible within the educational community.
 - Make it easy for trainers to add their own practices and scenarios to these collections.
- Organise events that support the networking of educators willing to share and support each other in designing Digital WBL practices.
- Promote peer learning and intergenerational learning concerning Digital Competence and Digital WBL (cf. Monteirto, 2018, p. 33).
- Don't hesitate to share success stories – and also stories of failure, and learnings from them. Design formats and workshops to support trainers in doing so.

- Use available and suitable communication tools and channels to spread knowledge and practices in Digital WBL and to communicate offers and opportunities (cf. Seufert & Euler, 2005, p. 70).

Good Practices:

- The **Digital WBL Ambassador Programme** brings together teachers and educational stakeholders to share and discuss good practices, often in digital format (DEAL with Digital WBL project).
- **Teacher Learning Circles** can be adopted to different educational contexts and include different stakeholders: https://chemonics.com/wp-content/uploads/2017/10/Education_TechBrief_Systems.pdf, <https://chemonics.com/blog/teacher-learning-circles-a-locally-owned-complement-to-coaching/>
- Website collecting and sharing simulators for different professions: learnvirtual.eu
- Website showcasing [simulators and integrators](#), provided by the DRinVET initiative.
- [Learning platform](#) of the Education and Training Foundation

Conclusion: How to Digital WBL-ready your institution

This Blueprint represents a significant step forward in the promotion of Digital Work-Based Learning (WBL) within vocational education and training and related educational contexts. It has been developed as part of the DEAL with Digital Work-Based Learning initiative, an Erasmus+ project aimed at fostering good practices in digitally enhanced applied and work-based learning environments.

The Blueprint identifies both potentials and challenges in designing a learning environment for Digital WBL and provides recommendations across various design categories. These recommendations are based on extensive research and consultations conducted by the project consortium, involving partners from multiple European countries. It emphasises the need to support teachers and trainers in promoting Digital WBL by providing them with the necessary competences, conditions, and infrastructures. An online training system and toolkit are currently in development to assist educators in integrating Digital WBL into their teaching and training practices.

Importantly, this Blueprint is not a static document; it is designed to evolve and grow with the input of stakeholders. It will continue to be refined and validated through ongoing consultations and events in the DEAL with Digital WBL initiative. It shall offer a practical and accessible resource for educational designers, institutional leaders, professionals, teachers, trainers, and learners, guiding them towards the effective implementation of Digital Work-Based Learning. In this way, we welcome all constructive feedback on its development. By embracing the recommendations and principles outlined in this document, we can better prepare our learners for a future where digital and hybrid environments play an increasingly significant role in work, learning, and life.

In order to **bring this Blueprint into life** in your educational context, be it a school, university or company, we suggest the following steps:

- Have a look at the general outline of the Blueprint, the areas and topics addressed. Where do you think your institution is performing well, where less well? Where do you see some expertise and where is the need for further development? Which challenges are prominent in your educational context and which potentials seem most important to you? Which areas would you like to focus on?

- In a next step, you may open a participatory dialogue on these subjects, e.g. by organising workshops and discussion rounds on the framework or specific areas to promote discussion and constructive dialogue. You may also decide to set up a SELFIE WBL survey to see which domains are evaluated in what way by participants.
- Look for colleagues and the suitable networks to make change and transformation happen. Who should you talk to, who is in charge and who is motivated to move forward with you?
- Keep the participatory dialogue going, maybe form an operative group. Decide which area(s) you would like to focus on and write a position paper to consolidate your position.
- Envision a long-term strategy, but also start right now: what are the next steps you can take? Agree on some operative activities for the next weeks (e.g. by setting five SMART goals that you agree on).
- Start the journey towards the future of education with Digital WBL!

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Annex A – SELFIE WBL additional questions

1. I use digital technologies to tailor my teaching to the course's learning objectives.
2. I set digital learning activities which are meaningful and connected to work-based challenges.
3. I use assessment as part of competence-based learning.
4. Our school leaders ensure that students develop their transversal skills across subjects.
5. In our school, students are incited to reflect on subject-specific and transversal skills involved in a workplace and to integrate them.
6. In my opinion, students should also develop digital competence related to Artificial Intelligence.
7. In my opinion, students should also develop green digital competences related to sustainability.
8. Professional collaboration: To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experiences and collaboratively innovating pedagogic practices
9. Reflective practice: To individually and collectively reflect on, critically assess and actively develop one's own digital pedagogical practice and that of one's educational community
10. Digital problem solving: To incorporate learning activities, assignments and assessments which require learners to identify and solve technical problems, or to transfer technological knowledge creatively to new situations

Annex B – SELFIE WBL optional statements

- Leadership
 - Time to explore digital teaching
- Collaboration and Networking:
 - Synergies for Blended Learning
- Infrastructure and Equipment
 - Digital divide: measures to identify challenges
 - Digital divide: support to address challenges
 - Bring your own device
 - Physical spaces
 - Online libraries/repositories
 - Simulation
- Pedagogy: Supports and Resources
 - Open educational resources
- Assessment Practices
 - Digital assessment
 - Documenting learning
 - Using data to improve learning
 - Valuing skills developed outside school
- Student Digital Competence
 - Digital skills across subjects
 - Solving technical problems
 - Solving technical problems in company
 - Skills for vocational qualification
 - Skills for vocational qualification in company

Annex C – Analysis of SELFIE WBL results

Simple SELFIE WBL analysis

Featuring the datasets of SFC, CIS, DHBW and PANKO and displaying the simple averages. Comparably “strong” areas/expertise areas are marked in green, average in yellow and comparably “weak” areas/areas of development are marked in red. Results have been used within workshops as discussion catalysts.

	SFC	CIS	DHBW	PANKO	Overall/simple \bar{x} across institutions without including shares
Participants	In-Company: 27	Teachers: 8	School Leaders: 1 Teachers: 7 In-Company: 1	School Leaders: 2 Teachers: 13 Students: 5	64 — 3 School Leaders 28 Teachers 28 In-Company 5 Students
B Collaboration and Networking	4,3	2,8	3,3 3,4 2,7	3,7 3,9 4,0	3,51
C Infrastructure and Equipment	4,1	3,4	3,4 3,5 3,7	4,2 4,3 4,7	3,91
D Continuing Professional Development	4,1	3,1	2,8 3,6 4,5	4,3 3,8 NA	3,74
E Pedagogy: Supports and Resources	4,1	3,4	2,8 4,0 5,0	4,3 4,0 4,6	4,03

F Pedagogy: Implementation in the Classroom	4,3	3,1	3,2 3,5 4,5	3,8 4,0 3,9	3,79
G Assessment Practices	4,1	2,7	3,1 3,2 4,3	4,3 3,9 3,7	3,66
H Student Digital Competence	4,4	3,4	4,2 3,4 4,5	4,1 3,9 3,9	3,98
Extra Question 1	4,5	3,6	3,8 4,0	/	3,98
Extra Question 2	4,5	3,4	4,0 4,0	/	3,98
Extra Question 3	4,4	3,0	5,0 3,2	/	4,13
Extra Question 4	4,2	3,4	5,0 4,0 5,0	/	4,32
Extra Question 5	4,3	3,7	5,0 3,7 5,0	/	4,34
Extra Question 6	4,4	4,0	5,0 4,0	/	4,35

Extra Question 7	4,4	4,3	5,0 4,5 4	/	4,44
Extra Question 8	4,5	3,7	4,2 4,0	/	4,1
Extra Question 9	4,6	3,8	4,0 4,0	/	4,1
Extra Question 10	4,5	3,9	3,8 4,0	/	4,05
Teacher Responses – Confidence in Using Technology					
Confid. preparing lessons	3,8	3,9	3,9 5,0	4,4	4,2
Confid. class teaching	/	3,5	4,1	4,2	3,93
Confid. feedback support	3,9	3,3	4,0 4,0	4,3	3,9
Confid. Communication	4,0	3,6	4,0	4,3	3,98
Percentage of time	3,2	2,4	3,3 5,0	4,2	3,62
Adoption of technology	2,7	2,6	3,0 3,0 3,0	4,0 2,8	3,01 → early adopter

Inhibiting Factors TOP	insufficient digital equipment, internet connection, working space restrictions, lack of time trainers	low dig. comp. teachers, technical support	insuff. digital equipment, lack time teachers/trainers, limited technical support, low digital competence teachers, students working space restrictions	?	digital equipment, lack of time teachers/trainers, low digital competence teachers
negative factors top	limited student access digital devices, trainers lacking time, difficulties engaging students	teachers lacking time, difficulties engaging students, low digital competence families, difficulties supporting families	teachers lacking time, difficulties engaging students, teachers lacking time to provide feedback	lack of time teachers, lack of funding, digital equipment	lack of time teachers, difficulties engaging students
positive factors top	access online resources, company collaborations		experience use virtual environments, professional development, teachers collaborate	?	collaboration

Average Responses for Each Group Across Partners (out of 5):

After receiving more datasets of project partners, another more comprehensive analysis of results was executed.

Featuring the Datasets of SFC, CIS, DHBW, PANKO, HP and UOC

Dataset UOC: from a VET school within the UOC institutional network

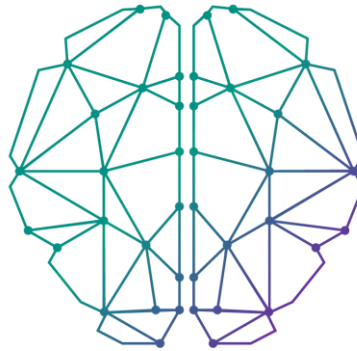
	School Leaders	Teachers	Students	In-company	Overall/ø
A Leadership	3,4	3,4	NA	3,15	3,32
B Collaboration and Networking	3,67	3,4	4	3,4	3,62
C Infrastructure and Equipment	3,8	3,9	4,7	4,4	4,2
D Continuing Professional Development	3,55	3,7	NA	4,3	3,85
E Pedagogy: Supports and Resources	3,6	4	4,6	4,55	4,19
F Pedagogy: Implementation in the Classroom	3,5	3,75	3,9	4,4	3,89
G Assessment Practices	3,7	3,55	3,7	4,2	3,79
H Student Digital Competence	4,15	3,65	3,9	4,45	4,04
A. Leadership					
Digital Strategy	3,5	3,6	NA	NA	3,35
Strategy Development with Teachers	3,75	3,47	NA	NA	3,62
New ways of teaching	3,5	3,57	NA	NA	3,53
Time to explore digital teaching	2 (one response)	2,8 (one response)	NA	3,4	2,73

Involving companies in strategy	3,25	3,17	NA	2,9	3,10
B. Collaborating and Networking					
Progress Review	2,75	3,03	NA	NA	2,89
Discussion on the use of technology	4	3,53	4	NA	3,84
Partnerships	3,125	3,43	NA	NA	3,28
Synergies for Blended Learning	3	3,7	NA	3,35	3,35
Communication	4	3,1	NA	3,55	3,55
Organization of alternance	4	2,9	NA	3,65	3,52
C. Infrastructure and Equipment					
Infrastructures	4,25	3,83	NA	4,55	4,21
Digital devices for teaching	4,25	3,7	NA	4,25	4,07
Internet Access (in company)	4,5	4,43	5	4,5	4,61
Technical support (in company)	3,5	3,8	4,4	4,6	4,075
Data protection	3,75	3,83	NA	4,6	4,06
Digital devices for learning (in company)	4,75	3,3	5	4,05	4,275
Database of training opportunities	2,75	3,07	4,2	NA	3,34

Digital divide: measures to identify challenges	1	3	NA	4	2,67
Digital divide: support to address challenges	3	3	NA	3,5	3,17
Bring your own device	5	4,7	NA	2,65	4,12
Online libraries / repositories	4	4	NA	3	3,67
Simulation	3	2,8	NA	3	2,93
Physical spaces	3	3,2	NA	NA	3,1
D. Continuing Professional Development					
CPD Needs	3,25	3,35	NA	NA	3,3
Participating in CPD	4,25	3,8	NA	4,2	4,08
Sharing experiences	3,5	3,63	NA	4,55	3,89
CPD Opportunities	3	3,4	NA	NA	3,2
E. Pedagogy: Supports and Resources					
Online educational resources	3,5	3,93	NA	4,55	3,99
Creating digital resources	3,25	3,58	NA	4,55	3,79
Using visual learning environments	3,75	3,77	4,6	4,1	4,05
Communicating with the school communities	4	4	NA	NA	4

Open educational resources	2	3,8	NA	NA	2,9
F. Pedagogy: Implementation in the classroom					
Tailoring to students' needs in school (in company)	2,5	3,3	4,2	4,15	3,53
Fostering creativity	3,25	3,47	4	4,3	3,75
Engaging students	4	3,83	4,2	NA	4,01
Student collaboration	4 ,25	3,6	3,4	NA	3,75
Cross-cultural projects	3	3,43	3,5	NA	3,31
Work experiences	NA	NA	NA	4,7	4,7
G. Assessment Practices					
Assessing skills (in company)	4	3,07	4,4	4,55	3,99
Timely Feedback (in company)	3,5	3,67	3,4	4,5	3,77
Self-reflection on learning	3,5	3,43	4,2	NA	3,71
Feedback to other students	3,5	3,33	2,8	NA	3,21
Co-design of assessment	3	2,75	NA	3,1	2,95
Digital Assessment	3	3,6	NA	NA	3,3
Documenting learning	4	2,5	NA	4,6	3,7

Using data to improve learning	3	1,6	NA	NA	2,3
Valuing skills developed outside of school	3	4,2	NA	NA	3,6
H. Student Digital Competence					
Safe behaviour (in company)	3,5	3,23	4	4,65	3,85
Responsible behaviour	3,25	3,27	3,8	NA	3,44
Checking quality of information (in company)	4	3,7	4	4,3	4
Giving credit to other's work	4,25	3,47	3,8	NA	3,84
Creating digital content	4,25	3,47	3,3	NA	3,67
Learning to communicate (in company)	5	3,97	4,2	4,75	4,48
Digital skills across subjects	4	3,8	NA	NA	3,9
Solving technical problems (in company)	5	3,2	NA	3,65	3,95
Skills for vocational qualification (in company)	5	3,7	NA	4,65	4,45



DEAL WITH DIGITAL WBL



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