IO 1 A 7 – Competency Matrix and Policy Recommendations Report

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1. Introduction and Methodology

The objective of the IO 1 of DigiVET has been to identify main competencies needed for the support of digital learning in small SMEs. The matrix will be derived from original research (surveying SMEs and trainers) and internationally validated good practices for an international audience, which have been only available in the national languages up to now.

The analysis conducted in the preparation of the project has revealed that training institutions and SMEs are not confident about which competencies are needed to support digital learning. A combination of technical skills in media design must be combined with a high level of critical media competence and consultancy and coaching skills.

The synthesis of the national and international literature on the methodologies of work-based learning in SMEs in general and on how digital media like audio, video, interactive documents and graphics, which is being presented in this report, includes pointers to the competencies required for digital coaches will be derived from the most advanced international practices and is being validated by original research with the target group of experts of digital learning and company-based learning coaching as well as in-company trainers. This research has been done through expert focus groups and a survey of these groups. The result is highly transferable to all training and coaching institutions that support learning in SMEs.

The matrix of competences presented can be used by any organisation for designing programmes of formal and/or informal learning, leading to an increase in the provision of programmes.

The individual steps of development have been:
- A1: Elaborate methodological guide and instruments for data collection
- A2: Analysis of literature and related secondary data
- A3: Set up of focus groups of five key informants in each partner country/region and conducting focus group meetings
- A4: Identification of six good practices of using digital media for work-based learning in each country, in-depth description of two good practices selected by the partners resulting from commonly agreed criteria to identify the competences used in these good practices
- A5: Analysis of practices development of a preliminary matrix of competences used by actors in these practices
- A6. Survey of 10 SMEs and 10 trainers/coaches in each partner country (140 overall) on the importance and actual development of the competencies of coaches for digital

learning which have been identified in the desk research. Validation and prioritisation of the most important and least developed competences (all partners 20.03.-15.04.20)

- A7: Development of the final competences matrix. A synthesis report including the contributions mentioned above, including the definition of a competences matrix, which will be appropriate for use in any training or consultancy organisation working with SMEs as well as for the staff responsible for learning and development in the SMEs themselves

Results of Step 2 Literature Survey

The partners have elaborated comprehensive national reports on the state of digital learning in SMEs in their countries, which have been synthesized in a 57 p. report "IO 1 A 2– Synthesis of Desk Research," which is available on the website of the project. The report includes chapters on the general situation and understanding of media competences and digital learning in SMEs, based on a review of findings of academic studies and empirical reports.

The report also describes how governments and institutions try to stimulate the uptake of digital learning competences in state initiatives in the partner countries.

Another chapter focuses on common practices.

These chapters will be used mostly in the second part of this report, where policy recommendations on fostering digital learning in SMEs will be presented.

For the purpose of the first part, the matrix of competences, we summarise the findings of the IO 1 – A 2 report on competences for digital learning, which could be identified in literature and studying of good practices. These informed the further steps in the project.

IO 1 – A 2 Conclusion on Competences

In the scope of the initial literature review, the partners have been asked for an assessment of the discussion about the most important competences, which are regarded in the national discussion as being essential for advancing the development and use of digital learning technologies in SMEs. The reports show a wide diversity of insights, ranging from a focus on general overarching competences to support holistic development of learning systems in SMEs to lists of quite technical skills, which are necessary for developing digital media for learning in SMEs.

UK

The evidence available on SMEs suggest that advocates of digital learning in businesses will need to have political competence so that they can convince senior managers to accept training and prove its value. Advocates need the ability to promote positive attitudes to digital media use. They will also need competence in designing learning interventions that will fit with the

resources available within and in the SME and be directly relevant to the work done in their SME. Although focused on higher education, the Digital Teaching Professional Frameworks is also useful in highlighting competencies for the use of digital media in SMEs and how they might be structured.

The framework highlights the need for competency in: planning (setting of strategy, selection of appropriate resources / techniques for the context and learning objectives, development of a learning programme); development of digital skills (the development of trainer and trainee skills to support the creation and use of digital media and technologies); design and development of resources (adaptation and creation of digital resources); assessment (the measurement learning and broader impact to support evaluation).

AT

According to the report from Austria, the questions which are the most important competences (knowledge, skills and attitudes) that SMEs need to have in order to implement digital learning in their company cannot be answered so clearly. The proposals for competence models are almost as numerous as the projects on the topic.

The partner therefore proposes to focus on the overarching general competences, which are needed to support "learning in the enterprise.".One of these is the model of Future Work Skills 2020, which was developed by a research team from the Institute for the Future (IFTT) and the University of Phoenix.

Based on drivers for change, 10 competences have been highlighted.

"1. Sense-making: While routine tasks - whether in production or in the service sector - are increasingly performed by machines, there is a growing need for skills that provide insights through higher levels of thinking and that are relevant for making decisions. These "sense-giving abilities" are therefore critical thinking.
2. Social Intelligence: Social intelligence, i.e., the assessment of feelings and moods and an appropriate response to them, has always been a core skill of people who need to work collaboratively and build trust…
3. Novel & Adaptive Thinking: The ability to react to unexpected situations, i.e,. to develop solutions and answers away from routine and rule-based circumstances, is becoming more important in both high- and low-skilled jobs. Colloquially one could also speak of "common sense".
4. Cross-cultural competence: The ability to adapt to changing circumstances and to grasp new contexts and react to them is also becoming more important. This does not only concern spatial changes in a globalised world...
5. Computational Thinking: With rapidly growing amounts of data, the need to extract meaningful information from these, to translate it into abstract terms and to understand data-based reasoning ….
6. New-media literacy: Media formats such as video or podcasts will increasingly find their way into the everyday working world. In the future it will not only be important to be able to "read" and judge such content critically (as we do today with crouched texts), but also to produce it ourselves. ...
7. Transdisciplinarity: The tasks of the future will require transdisciplinary approaches due to their complexity. However, it will not be sufficient to bring together only specialists from different disciplines. Rather, experts who speak the languages of various disciplines will be in demand. This requires the willingness of the individual to learn far beyond formal education.

8. Design Mindset: It will be increasingly important to recognise and adapt different ways of thinking that are necessary for individual tasks. Professionals are increasingly expected to be able to adapt to their working environments in order to improve their ability to perform various tasks.

9. Cognitive Load Management: It will be of crucial importance to intercept the cognitive "overload", i.e. to have the ability to differentiate and filter information. In other words, the distinction between the important and the unimportant is becoming more demanding and important. …

10. Virtual Collaboration: Connective technologies make it easier to collaborate, share ideas and work efficiently despite physical separation. But they also require a set of new competencies." (AT, p. 18 f.)

The partner concludes: "The Coaches and trainers who want to support SMEs in acquiring the necessary skills need not only sound technical knowhow, but above all foresight, a comprehensive understanding of how learning in companies will change and the openness to face these changes themselves. In the future, company training will have to deal with many new roles: For example, there will be a need for experts in (competency) diagnostics who, in conjunction with the desire for personalised learning environments and learning paths, will be able to meet the higher requirements for (competency) diagnostics upstream of the learning/development process.

Curating digital learning materials becomes important due to the increasing availability of digital learning materials available online: Open Educational Resources (OER), MOOCs, YouTube videos, TED lectures etc. Curating appropriate materials could be placed on an equal footing with designing and developing learning materials. Viewing, selecting, compiling and making available open or available learning materials thus becomes a new area of competence for those responsible for education." (AT, p. 19)

The partner points out, quoting results of the "New Digital Skills Conference," that the technical skills will be the more manageable, compared to the more fundamental learning change competences and mindsets: "Methodological, social and personal skills are thus gaining in importance more than ever before." (https://newdigitalskills.at/ (AT, p. 20)

SI

According to the Slovenian report, the key competences needed for implementation of e-learning initiatives are especially the following:

- Knowledge and ability to critically use ICT
- Ability to communicate and collaborate remotely
- Ability to search, collect, process, critically evaluate data, information and concepts

- Ability to create, update, publish materials
- Ability to plan, execute, evaluate lessons using ICT

A particularity of the discussion in Slovenia is that "for most users, digital capability stops at the level of operational skills and lacks information, let alone strategic skills, and neglects the security and ethics issues of users of information services and tools."

The report acknowledges the need for more general media competency in a "knowledge society," as the Internet is nowadays used as an information resource for educational purposes by most of the young population and the computer is becoming a major tool of casual learning in Slovenia.

Therefore teacher training for this new role must consider an increasing role of the teacher as a facilitator of independent learning of the learner. The report warns that "ad hoc and partial teacher training in individual projects cannot produce long-term and comprehensive results in teacher training for a knowledge-based society."

The strategy of introducing e-learning programs must consider the financial, personnel and organizational aspects, which requires an appropriate management approach (innovation management).

In reality today programs of digital learning and/or learning ICT are not sustainable, because they are not considered by management as an integral part of the organization's strategy. (SI, p. 10)

RO

The report from Romania concludes from the literature in Romania the competences to follow:
- information and data literacy,
- communication and collaboration,
- digital content creation,
- safety and
- problem solving

According to the partners in a company situation should be added:
- ability to use Microsoft package
- ability to use digital devices
- internet user skills related to information and data literacy: browsing, searching and filtering information and digital content; managing data, information and digital content
- internet user skills related to communication and collaboration: interacting through digital technologies, sharing through digital technologies, collaborating through digital technologies, managing digital identity
- ability to use Internet services (e.g. online transactions)
- ability to use open educational resources (OER) for professional development
- ability to develop media digital content using specific software
- ability to work in social media (e.g. Facebook campaigns)
….

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In case of learning facilitators for media digital competences, the partner adds:
- pedagogical skills
- problem – solving skills
- ability to use digital technologies for enhancing the effectiveness of teaching intervention for offering timely and targeted guidance and assistance, for enabling learners to use digital technologies as part of collaborative assignments and for enabling learners to plan, monitor and reflect on self-learning
- ability to analyze information from digital environment, interpret and critically assess the credibility of it
- ability to develop open educational resources (OER), incorporating learning activities which require learners to express themselves through digital means or to transfer technological knowledge creatively to new situations. (RO, p. 5)

DE

In Germany the results of more than 260 pilot projects on the topic have created a rich pool of individual tools, solutions and good practices. That these practices have not yet been widely adopted shows that an active effort must be made to support companies in taking up this innovation.

The pilot project "CoDiClust" has developed an approach of active consulting of companies through a service unit within the cluster of the Cluster organization of the Bavarian Sensors Technology companies. In this cluster "Coaches for digital learning" support in-company "navigators for digital learning to act as internal consultants in the field and to develop roadmaps for introducing digital learning.

The curriculum for the initial training of these navigators considers the state of the discussion on digital media competencies in the scientific community and can therefore be used as a starting point for the discussion within the DigiVet project. As the project has shown, a development of technical skills is not sufficient for effectively promoting the use of digital media, but coaching and competences in organizational development are also required. The competencies are:

Being able to understand and apply basic theories and didactics of DL
- Theories of learning: the navigators (n) are able to critically evaluate the existing learning system in their company
- Instructional Design: the n. are able to improve the didactical design of existing learning material and to design new material
- Motivation and attention: the n understand factors of motivation and are able to motivate users and to design learning arrangements in a motivating way
- Self-regulated learning: The n are able to arrange learning in a way that encourages and supports the self-directedness and self-responsibility of learners

Understanding learning in a company context

- Group dynamics and learning in groups: the n are aware of positive and negative dynamics in learning groups and act accordingly
- Learning in the in-company context: the n are able to analyse the in company learning and training arrangements, understand and support working at and near to the work-place and are able to use the current state of the art in the field

Multimedia
- Theories of multimedia learning: the n are able to use theories of multimedia learning to design state of the art arrangements and material
- Formats of multimedia learning: the n are aware of the options and are able to select the appropriate ones

- Structuring content: the n are able to structure content appropriately based on didactical theory
- Multimedia design: n are able to produce use friendly multimedia learning material

Understand and apply digital communication and gamification of learning
- Computer-supported collaborative learning: n are aware of the most commonly used tools and are able to select technologies and scenarios of use
- Communication & interaction in social media: n are aware of the particularities of communication in social media and are able to consult on the use in the company context and to design strategies for company social media use

Being aware and able to apply relevant legislation
- Data protection: n are aware of the most important rules and apply them
- Data security: n are aware of the most important rules and apply them
- IPR and copyright: n are aware of the most important rules and apply them
- Open Educational Resources: n know and use OER and are able to label and present own OER appropriately

Being able to understand and support communication
- Common management of digital media: n re able to produce, store and present DLM in a systematic and user friendly way
- Knowledge management and Wikis: n are aware of principles of km and are able to organise company knowledge accordingly
- Communication by Audio/Video/Webinar: n are able to use and guide the use of audio/video/web based communication tools
- Learning Communities: n understand LC and are able to support in-company and trans-company learning communities

Being able to plan and produce digital media
- Explainer Videos: n conceptualise and produce own explainer videos
- Explainer Audios: n conceptualise and produce own explainer audios
- Photography: n produce learning system relevant professional photos
- Digital graphics and layout: n are able to produce user friendly graphics, info-graphics and layout
- Digital text: n conceptualise and produce electronic text and are able to apply user adapted language

Being able to conceptualise and implement digital learning environments
- Digital learning environments: n know and have experience in digital learning environments
- Creating and implementing digital learning scenarios: n are able to conceptualise and select DLS
- Creating and integrating content: n are able to select, design and integrate content adapted to the user group needs

(adapted from: Project CoDiClust: Mannhardt/Mayer/Krauss: Curriculum Lotsen für digitales Lernen (IHK), Regensburg 2018))

TR

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From the report for Turkey some fields of competence can be deduced from the wider discussion.

- following technological developments
- technology transfer
- adapt information technologies to internal processes
- knowing and applying new working systems and new ways of obtaining information

(TR, p. 28)

Based on the above, the partner proposes the main fields of competence, from which individual competences can be derived.

- Overarching general competences
- Understanding of change trends and implied attitudes in SME
- Learning in a company context
- General media competence
- Digital communication
- Legislation
- Support planning and production of digital media
- Conceptualise and implement digital learning environments

This matrix suggested has been used for validation by the focus groups and in the coaches and company´s survey.

The IO 1 – A 2 report concluded this list of competences for trainers for digital learning in SME:

Overarching general competences	Professional engagement Positive attitude Keen to learn and interact with a variety of people and stakeholders General coaching and learning support competences Sense-making Social intelligence Novel & adaptive thinking Cross-cultural competence Foreign languages Digital leadership Knowledge and ability to critically use general ICT Ethics of ICT application
Understanding of change trends and implied attitudes in SME	Openness and willingness to change Combination of expertise, process knowledge and "common sense" Understanding a social, communicative and dynamic corporate culture Interpersonal communication competence Basic knowledge in handling data Networking capability Understanding main trends of general digitalisation of SMEs
Learning in a company context	Financial, GRD OD framework and implications of digital learning: Know system of initial and further training, informal learning and non-formal performance support in the company Assessment of learning needs and learning results of various groups Conceptualising potential learning pathways Facilitation of workplace learning skills (process facilitation) Insights in andragogy vs pedagogy (how does learning of adults differ from learning of young people in education): the n is aware of the differences between learning styles of adults vs youth and can design appropriate learning and performance support aids

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	Evaluation of digital learning outcomes Curation of information
General Media Competence	Ability to search, collect, process and critically evaluate data, information and concepts
Digital Communication	Understand and apply digital communication Computer-supported collaborative learning Game-based learning Communication & Interaction in Social media Know social software messaging, chat, for a podcast, digital games, blogs, wikis, social networks
Legislation Being aware and able to apply relevant legislation	Data protection: Data security: IPR and copyright: Open educational resources: Initial and further training legislation Legislation on stakeholder involvement on company level (e.g. by work councils) Health protection Protection of the environment
Support Planning and production of digital media	Theories of multimedia learning: the n are able to use theories of multimedia learning to design state of the art arrangements and material Formats of multimedia learning: the n are aware of the options and are able to select the appropriate ones Structuring content: the n are able to structure content appropriately based on didactical theory Multimedia design: n are able to produce use friendly multimedia learning material Explainer videos: Explainer audios: Photography: Digital graphics and layout: Digital text: Proficiency in tools like Adobe Connect, Web CT, Moodle
Conceptualize and implement digital learning environments	Digital learning environments: Creating and implementing digital learning scenarios: Creating and integrating content: Ability to plan, execute, evaluate lessons in DLE

This general result of the review of the national academic and project literature has been used as material for a discussion of the same aspects in national focus groups with experts on digital learning in all partner countries.

The results of this first step of empirical research will be summarised in the next chapter.

Results of Step 3 Focus Group Research

The aim of this activity has been to include the hands-on knowledge of the best regionally available experts from relevant stakeholders.

Also, the focus group expanded the network for dissemination and exploitation of the results.

The research is based on findings of activity 2.

Methodology: In-depth interviews with 5 stakeholders per country.

These included: People knowledgeable about the current and desirable practice of learning with digital media in SME

Facilitating the meetings, the partners:

- Presented the project
- Discussed the findings of the initial report
- Discussed local/regional situation/needs and resources
- Identified potential cooperators
- Discussed good practices for the support of DL in SMEs

The duration of each meeting was a minimum of 60 min as expected. The discussion has been documented on an online template provided by ISOB prior to the start of the activity.

The full results of the activity, in particular the list of the experts involved along with their professional profiles, is available in the working paper ""DigiVET_IO1_A3_FocusGroup_Synthesis" on the website of the project.

The FG, next to discussing other aspects, like validation of the A 2 result, institutional framework and policies to foster digital learning, already used the methodology of contrasting the perceived importance of the respective competence with the perceived degree to which this competence is already developed, which has also been later used in the survey.

The results follow.

Which competences in the field of digital media do typical SME already have (shown by common proficient use of the medium)?

- Most companies are proficient in the use of the standard office software
- Recently the pandemic has motivated a wider use of collaborative software as the MS Office 365 package, incl. tools like teams for in company communication
- Within general IT competences, the setting up of websites, video and image processing competences are common, but no specific, conceptional DM competences

	UK	AT	SI	RO	DE	TR	PT
3 a) which competences in the field of digital media do typical SMEs already have (shown by common proficient use of the medium),	a) updating (and maybe for some) the setting up of a web site	H: SME struggle with using distant communication in pandemic B: Overall low level of use and awareness. Individual cases of onboarding videos (9) L: A lot has happened in the last two years in the use of various communication tools, e.g. MS Office 365 Teams, Trello, Skype, etc.	technical know-how and for internal communication. They don't have competence to lead the company, conduct the processes, estimate the market through the use of applications and databases. Competencies listed in the research ..are all very. I think many of our businesses use them	IT skills are common, but no specific DM skills. Respondents did not separate these.		image, sound and video Websites, e-mail communication, internet usage	SME use the usual office programmes, incl E Mail Quite good at marketing and social media

Which one´s do you perceive as lacking?

- Key is a conceptual understanding of the potential and use of DM
- Next to that conceptual skills for the technical use of DE is lacking, like scripting, efficient shooting, etc
- Technical mastery of tools like Office365, where the options are not used
- Organisational capacity to guide and follow a persistent process of OD to embed the use of DM

Erasmus+

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- For content production the skill of transforming experiential knowledge and perception of company specific processes into a viable instruction is lacking

	UK	AT	SIs	RO	DE	TR	PT
3 b) Which ones do you perceive as lacking?	Storyboarding How to demonstrate – screen capture / animation / someone videoing the presenter Being succinct when putting a message across How to assess learning.	B: Lack of mature learning concepts overall (9) Focus on individual measures Complexity of filming instructional videos, e.g. video on roommaking for non-German speakers turns out to be highly complex in understanding the process and scripting! Mastering a solid didactic concept is key! (B, p. 6)) Showing complex work processes without language and not over or underchallenging the learners. Transforming		Specific DM skills	Embedding technical initiatives in the organisation Communication of initiatives Organising persistence	online education, e-meeting, e-seminar in digital media LMS: They cannot use media platforms efficiently due to lack of information. Application of ERP software, recording and reporting of R&D design studies, documentation that will ensure the reflection of the gained experience on the company culture, lack of detailed user and service manual studies, lack of documentation in foreign languages	Office 365 Videos, image, dissemination OD to make better use of the tools they already have

		experiential knowledge and theoretical knowledge to viable instruction (p. 7) J: We have all the tech, equipment and also would have a lot of topics for videos, but in practice we communicate by Email					

Erasmus+

In conclusion, the general result of the discussion of the focus group is:

- Most companies are proficient in the use of the standard office software
- Recently the pandemic has motivated a wider use of collaborative software as the MS Office 365 package, including tools like teams for in company communication
- Within general IT competences, the setting up of websites, video and image processing competences are common, but no specific, conceptional DM competences

The experts perceive as lacking:

- Key is a conceptual understanding of the potential and use of DM
- Next to that conceptual skills for the technical use of DE is lacking, like scripting, efficient shooting, etc
- Technical mastery of tools like Office365, where the options are not used
- Organisational capacity to guide and follow a persistent process of OD to embed the use of DM
- For content production the skill of transforming experiential knowledge and perception of company specific processes into a viable instruction is lacking

Results of Step 4 Good Practices

Based on findings in the literature review and focus group research the partners have suggested that some good practices could be presented for some of the partner countries.

These are being presented in the annex to this report.

Other partners reported that currently no practices could be identified that they would select to be highlighted as good or best practice.

Therefore the partners decided to gradually complement this collection of good practices along the duration of the project.

Concerning the competencies and recommendations for policy development, the analysis of the good practices mostly went into the focus group discussions and has been discussed there (see ch. On Step 3).

The good practices examples which are documented at this point highlight competences of in company trainers and coaches like:

PT case 5: Being able to solve complex problems, have critical thinking and a good dose of creativity, together with high technical competence to redefine the way the organization of work, business, processes in general are carried out, redesigning the value chain and causing profound changes in the companies' own business model and in creating value for the market. T: Promotion of the adoption of pedagogical strategies that involve the trainees as active participants in SME, leading them to develop metacognitive skills (learning to learn) and to assume a constructive attitude regarding their self-realization capacity for lifelong learning, making them become increasingly autonomous and able to interact with group responsibility. PT case 4: E: Creation of innovative learning and training environments where customized technological tools and mediating tools are facilitators of the interaction between trainees and trainers where they interact at any time from anywhere (facilitator of new virtual learning contexts).

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T: Design new learning scenarios and new pedagogical relationships.

PT case 3: T: Knowledge in the use of digital resources, creation of differentiating and interactive content in video, audio, photography, regular practice in resources generation, knowledge about the training pedagogical process, knowledge about the use of distance training platforms and its resources, collaborative teamwork.
PT case 2: Digital transformation, capacity to develop solutions and tools that facilitate the challenges arising from digital change in companies, cybersecurity, information on preventive measures to be taken by company managers, artificial intelligence, development of informational/training videos
PT case 1: Fundamental skills in the respective training area (industrial mechanics, car mechatronics, electronics and automation, IT). Also the social and behavioural skills such as: troubleshooting, critical thinking, creativity, flexibility, task management, emotional intelligence, project management, pedagogical skills and in addition technical competences in the project area of expertise.

A full set of good practices is also available from Germany:

The mentioned competences also affirm what has been identified in the Focus Groups as well

as literature study. The competences include:

DE case 6: General HRD and OD skills, media competency, incl basic media production, awareness of legal regulations, awareness of relevant developments within the SME, collaborative attitude within and among companies and with multi-disciplinary partners
DE case 5: Competence to make explicit learning challenges in work situations through verbalisation
Media competency, learning community, non directive process facilitation, competence to encourage the learners and to support the process by providing methodologies for reflection like "competency cards" which allow the learners to reflect the learnings and gains in competency.
DE case 4: Good proficiency in digital skills, attitude of self-directed learning, willingness to collaborate in learning, lingual competence, self-expression and presentation skills, mastery of technology, understanding of learning systems and informal ways apprentices actually learn (communities, social media), media competence
Supporting self-organization while guiding the self-organization within the given framework

DE case 3: Good proficiency in digital skills, attitude of self directed learning, willingness to collaborate in learning, mastery of technology, understanding of learning systems and informal ways apprentices actually learn (communities, social media)

DE case 2: Web 2.0 internet sources, facilitation, self-directed and self-organized attitude, informal and non-formal learning, documentation some of the previously informal learning activities, facilitation, learner support , understanding of learning and training processes in SMEs, proficiency in using the learning platform, understanding of the system of actors, facilitation skills

DE case 1: Planning of work and learning processes, analysis of learning system, proficiency in using digital learning platforms. Basic production of video, audio, pictures

Understanding of the system of actors, facilitation skills.

Overall, an analysis of the competences that have been critical parts of the good practices that the partners have identified confirm the results of the literature analysis and the focus groups.

Again the message is that technical competences alone are not enough.

Fostering digital learning in SMEs requires foremost the ability to organize learning in SMEs, facilitation skills and the ability to motivate learners.

Digital learning cannot be understood as just applying some digital gadgets, but needs a solid organization of in company learning, planning and systematization and strengthening the self-organisation dimension of learning. To this end the digital tools must be used, digital tools are no end in themselves but a means.

Result of Step 5: Preliminary Matrix

Based on the results of Step 2-4, the partners decided in July 2020 on the preliminary matrix of competences. Primarily, due to the delays caused by the COVID pandemic, these were to be used in the development of the draft handbook for coaches. Secondly, they were to be validated by the ongoing empirical study of in-company trainers and coaches of SMEs. The matrix has been suggested to the partners by the IO lead and discussed by all partners. The resulting consensus was:

Understanding of change trends and implied attitudes in SMEs:
- Being able to communicate about digital learning across the business
- Combination of expertise, process knowledge and "common sense" regarding planning and implementing appropriate training in the SMEs
- Understanding main trends of digitalisation in SMEs

Planning and production of digital media
- Theories and formats of multimedia learning
- The ability to design and produce instructional videos of an appropriate quality
- General multimedia design andhe rules of designing these (DOs and DON'Ts)
- The ability to design and produce virtual/augmented reality systems of an appropriate quality
- The ability to set up and facilitate digital learning management systems (LMS like Moodle, etc.)
- The ability to design and produce instructional audio of an appropriate quality
- The ability to plan and produce writing (e.g. copy, text, titles, captions) for digital media of an appropriate quality
- The ability to design and produce graphics and documents (e.g. infographics) of an appropriate quality
- The ability to produce photography of an appropriate quality

Learning in a company context
- The ability to evaluate the outcomes of digital learning
- The ability to facilitate digital learning in the workplace
- The ability to develop learning pathways
- The ability to develop digital learning that takes account of the preferences of different groups (e.g. adults vs youth)
- Financial and organisational framework and implications of digital learning
- Knowing the system of initial and further training, informal learning and non-formal performance support in the company
- The ability to assess the learning needs of various groups

General Media Competence and Digital Communication
- Ability to search, collect, process and critically evaluate data, information and concepts
- Understand and being able to apply (general) digital communication (like social media and messenger services like WhatsApp, Signal, teleconferencing like Zoom… etc.)
- Being able to use social software (e.g. messaging, YouTube, chat, fora, podcasts, Digital games, blogs, wikis, social networks) for learning purposes

Being aware and able to apply relevant legislation
- The ability to implement learning systems that meet the requirements of data protection and data security regulations
- How to respect IPR and copyright when designing digital learning materials
- Health protection (physical and mental)
- Legislation on stakeholder involvement on company level (e.g. by work councils/Unions)
- Initial and further training legislation

Transversal competences for designing and implementing workplace learning in SMEs
- Being able to provide learning experiences that are appropriate for people from different cultures
- The ability to take account of a variety of stakeholders' needs
- Having skills for coaching and supporting learning in the workplace
- Social intelligence
- The willingness and ability to learn and change

These competences already served as an orientation for the development of the handbook IO 2.

The priorities for development, i.e., identifying which of these are the most important and least developed, would be done by a survey of incompany trainers and consultants of SMEs in each partner country.

The results are the topic of the next chapter.

Results of Step 6 Survey of Companies and Trainers

The specific aim of step 6 has been to validate the prior findings from the perspective of practitioners and to prioritise the learning program and learning material focus.

The application foresees 10 SME and 10 coaches respondents in each country.

A pragmatic method of selection could be used. According to the instructions given in step A 1 the partners should send out surveys to companies and coaches that have an initial interest in expanding the use of digital learning media and coaches with initial interest and competences in either the coaching or technology learning design element of coaching digital learning.

Respondents could be invited through referrals from competent organizations, including the partners´ organizations.

Methodology: Data collection online, online survey

Method of data collection:

The partners could refer the respondents

- to the online version of the survey which has been provided in English or
- provided a paper questionnaire (in the partner language) to the respondent, collect the questionnaire and insert the data in the online survey or
- Interview the respondent face to face or by telecommunication (phone, Skype) and document the answers and insert data in the online survey (open question answers to be translated to English by the partner).

For pragmatic reasons of achieving a high rate of responses within a very limited period of time and limited resources the partners have been free to use whatever seems most appropriate.

The questionnaire has been developed based on the results of A 2 to A 4. The content has been drafted by the IO lead and has been discussed in particular with UoG and been approved by all partners.

The competences that have been the base of the questionnaire development have been described in the above chapter on the preliminary matrix of competences.

The methodology to be used is to have the experts and practitioners assess to which degree they think each of these competences is IMPORTANT. This would be done on a 5-point Lickert scale.

In a second dimension the experts and SME practitioners would be asked to assess to which degree these competencies are already DEVELOPED among their employees.

This result would allow us to prioritise the teaching of competencies.

Those which were rated as the most important, but least developed will be those to be prioritised for the training within the project.

Depending on the results, theoretically some of the competences would be rated as less important. These would not be chosen for training in any case.

Those important but also well developed would be reflected and appreciated, be included in initial training, but not be a priority for the further training.

The experts and practitioners would also be asked to suggest additional content for training.

In order to validate the results derived from the methodology described above, the experts and practitioners would be asked to rate the priorities alternative through a direct question on which three topics should be included in a training programme in any case.

In order to validate corresponding obstacles for digital learning in SMEs, the respondents were asked to rank a list of obstacles that have been identified through the literature analysis and focus group research.

Finally the respondents would be asked to suggest additional content and contribute any other suggestions.

The resulting questionnaire is documented in the annex of the full analysis of the survey result in the working paper "DigiVET_IO1_A4_Companyandtrainersurvey_V1".

The online version of the questionnaire has been hosted on the webspace of IO lead ISOB.

The planned result of the exercise would be:

- Ranking matrix of competencies (needed vs. developed): the matrix will identify those competencies which are rated by the respondents as the most important, but least developed ones
- list of obstacles: which are the subjective and objective obstacles to using more digital media in in-company learning
- list of support priorities: what kind of support do the respondents need

…to support the training programme development.

The foreseen duration of the exercise had to be extended substantially, as the COVID pandemic during 2020 and 2021 forced companies and experts to reprioritise. Therefore the outreach proved to be challenging. The partners therefore decided in April 2020 to build the development of the handbook and learning programme on the results of A 2 to A 5 and to use the results of the survey for a validation of the programme and to focus on presenting a transferable matrix that has been validated from multiple perspectives. Despite the challenges, the partners succeeded to involve more than 100 respondents, trainers and practitioners from SMEs in the survey. Statistics on respondents and their regional, educational and activity background are documented in the annex of the long version of the IO 1-A6 working paper.

Results of Survey

The experts and SME practitioners found only slight differences in the importance of the overarching groups of competences, learning in a company context and general media competences being the most important.

This can be taken as a validation of the preselection of topics and competences, derived from the A 2-A4.

The differences in the average rating of the development of competences among employees is much greater, ranging between 4,46 and 2,69, transversal competences being the highest rated and planning and production of media the lowest.

As a consequence, the difference between importance and development is the greatest for the general competences of "Understanding of change trends and implied attitudes in SMEs," "Planning and production of digital media" and "Learning in a company context."

These need to be prioritized in a training programme.

Transversal competences for workplace learning are ranked as even more important, but here the current competencies are considered to be very good as well.

We will focus the discussion of the sub-competences on the three most important fields, therefore, while also briefly documenting the results for the others, with a view on some competences where the importance or gap in competence development is particularly significant.

Ranking of Groups of Competences
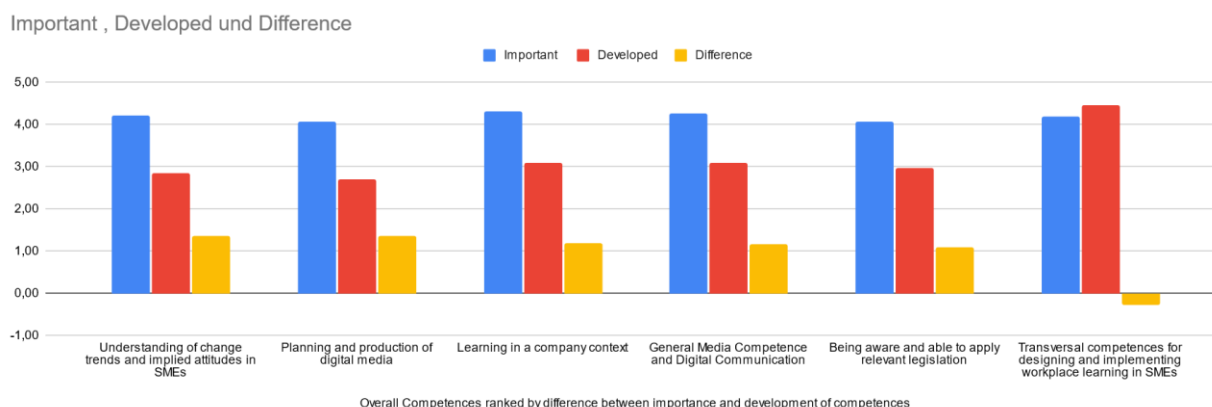
Important , Developed und Difference

■ Important   ■ Developed   ■ Difference

Overall Competences ranked by difference between importance and development of competences

Overall Competences ranked by difference between importance and development of competences			
	Important	Developed	Difference
Understanding of change trends and implied attitudes in SMEs	4,22	2,85	1,37
Planning and production of digital media	4,06	2,69	1,37
Learning in a company context	4,30	3,10	1,20
General media competence and digital communication	4,27	3,10	1,17
Being aware and able to apply relevant legislation	4,07	2,98	1,09
Transversal competences for designing and implementing workplace learning in SMEs	4,18	4,46	-0,28

Means. N= 100 to 105

Specific Competences within the Groups of Competences

Competence field "Understanding of change trends and implied attitudes in SMEs"

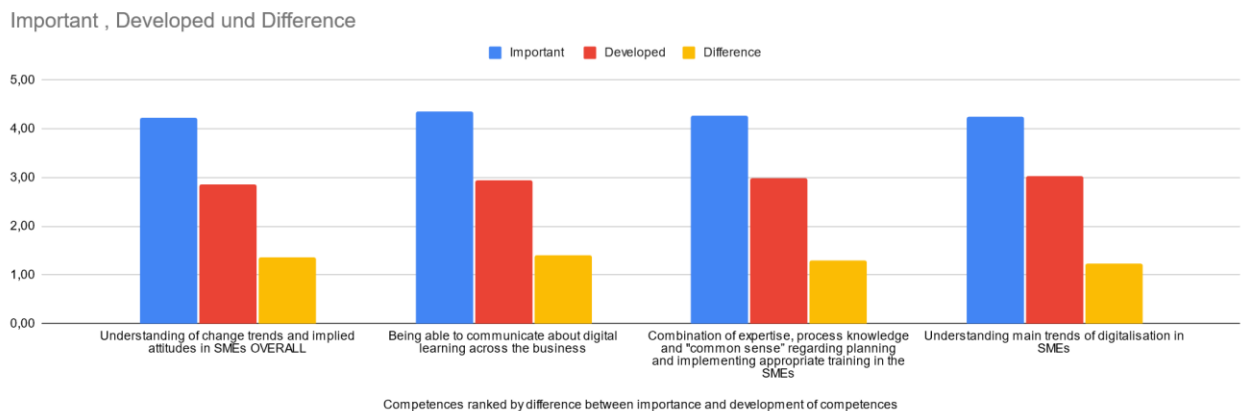The rating of importance and development of the sub-competences of

● Being able to communicate about digital learning across the business

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- Combination of expertise, process knowledge and "common sense" regarding planning and implementing appropriate training in the SMEs
- Understanding main trends of digitalisation in SMEs

…is remarkably consistent. Importance oscillated around a value of 4,3 for importance and 3 for development. Therefore there is a gap of 1.3 points for all three sub-competences. Process knowledge, planning of training and communication about digital learning must be core parts of a training programme.

Important , Developed und Difference

Competences ranked by difference between importance and development of competences

Competences ranked by difference between importance and development of competences	Important	Developed	Difference
Understanding of change trends and implied attitudes in SMEs **OVERALL**	4,22	2,85	1,37
Being able to communicate about digital learning across the business	4,35	2,94	1,41
Combination of expertise, process knowledge and "common sense" regarding planning and implementing appropriate training in the SMEs	4,27	2,98	1,29
Understanding main trends of digitalisation in SMEs	4,25	3,02	1,23

Means. N= 100 to 105

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IO 1 – A 7 Competency Matrix and Policy Recommendations

Competence Field "Planning and production of digital media"

"Planning and production of digital media" is the most differentiated field, covering the sub-competences of

- Theories and formats of multimedia learning
- The ability to design and produce instructional videos of an appropriate quality
- General multimedia design and he rules of designing these (DOs and DON'Ts)
- The ability to design and produce virtual/augmented reality systems of an appropriate quality
- The ability to set up and facilitate digital learning management systems (LMS like Moodle, etc.)
- The ability to design and produce instructional audio of an appropriate quality
- The ability to plan and produce writing (e.g. copy, text, titles, captions) for digital media of an appropriate quality
- The ability to design and produce graphics and documents (e.g. infographics) of an appropriate quality
- The ability to produce photography of an appropriate quality

Again, the pre-selection of competences is validated. All competences are rated at a importance of at least 3,5. And most above 4. The relatively advanced and new competence of "design and produce virtual/augmented reality systems" is the only competence with a moderate rating regarding importance. All others need to be developed in all cases.

Ranked by difference between importance and actual development, the newer and more multimedial competences are prioritized.

The highest priority (1.41 difference) is
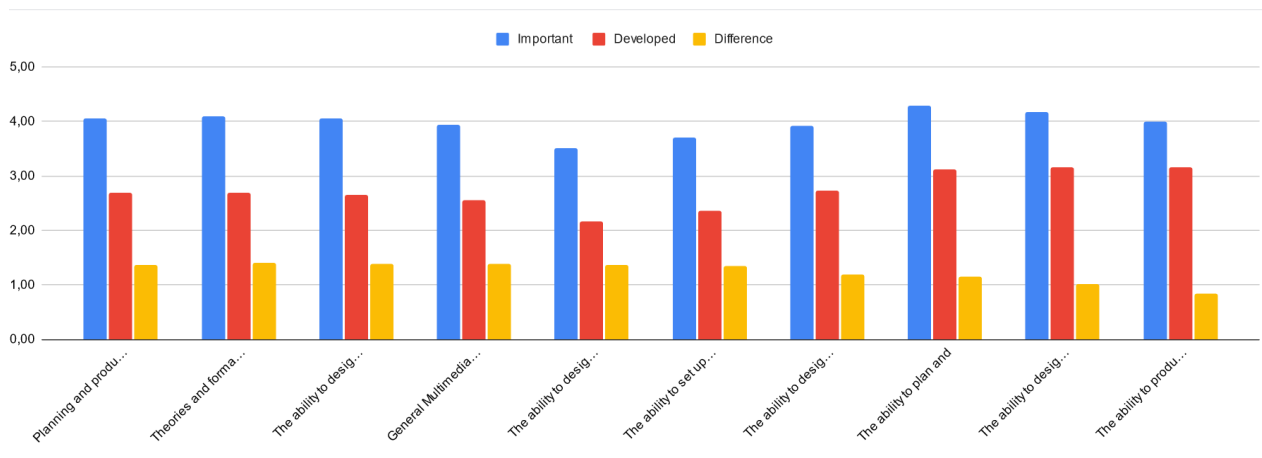
- Theories and formats of multimedia learning

Obviously a need for an overview of technologies and approaches of digital learning, of tools and software, good practices and the like is strongly felt.

Erasmus+

Next to that, with only insignificant differences, the experts and practitioners feel that the competences of ….

- The ability to design and produce instructional videos of an appropriate quality
- General multimedia design and the rules of designing these (DOs and DON'Ts)
- The ability to set up and facilitate digital learning management systems (LMS like Moodle, etc.)

…need to be developed. Learning about virtual reality systems should be included where the importance is appreciated to a higher degree.

Competences ranked by difference between importance and development of competences			
	Important	Developed	Difference
Planning and production of digital media **OVERALL**	4,06	2,69	1,37
Theories and formats of multimedia learning	4,10	2,69	1,41
The ability to design and produce instructional videos of an appropriate quality	4,05	2,66	1,39
General Multimedia design The rules of designing these (DOs and DON'Ts)	3,93	2,55	1,38
The ability to design and produce virtual/augmented reality systems of an appropriate quality	3,52	2,16	1,36

The ability to set up and facilitate digital learning management systems (LMS like Moodle, etc.)	3,7	2,36	1,34
The ability to design and produce instructional audio of an appropriate quality	3,92	2,73	1,19
The ability to plan and produce writing (e.g. copy, text, titles, captions) for digital media of an appropriate quality	4,29	3,13	1,16
The ability to design and produce graphics and documents (e.g. infographics) of an appropriate quality	4,18	3,16	1,02
The ability to produce photography of an appropriate quality	4	3,16	0,84

Means. N= 100 to 105

Competence field "Learning in a Company Context"

Again, the selection of the sub-competences is being affirmed at a very consistent level. Neither the importance (which is rated at levels at or slightly above 4) nor development (rated just below 3) shows significant differences between the sub competences.

As there is a gap between the importance and development between 1,09 and 1,33 all of the sub-competences should be developed. The following competences stand out:

- The ability to evaluate the outcomes of digital learning
- The ability to facilitate digital learning in the workplace
- The ability to develop learning pathways

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IO 1 – A 7 Competency Matrix and Policy Recommendations

Important , Developed und Difference
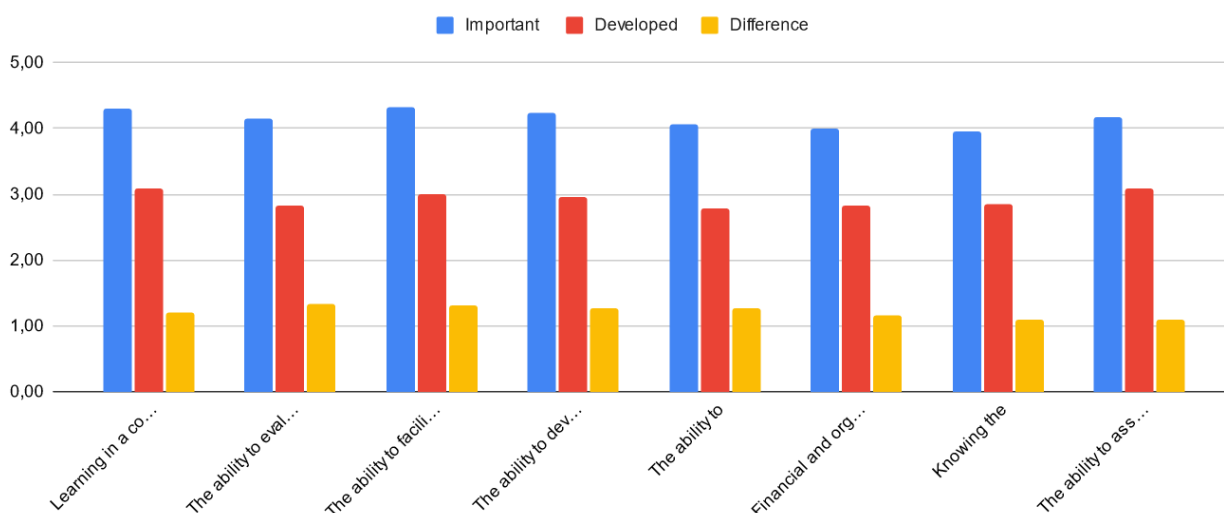
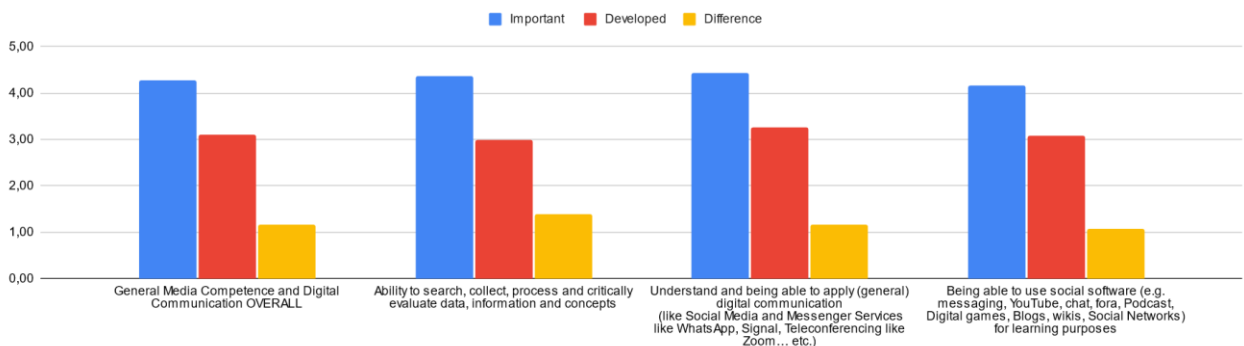| Competences ranked by difference between importance and development of competences	Important	Developed	Difference
Learning in a company context **OVERALL**	4,30	3,10	1,20
The ability to evaluate the outcomes of digital learning	4,16	2,83	1,33
The ability to facilitate digital learning in the workplace	4,32	3,01	1,31
The ability to develop learning pathways	4,24	2,96	1,28
The ability to develop digital learning that takes account of the preferences of different groups (e.g. adults vs youth)	4,06	2,79	1,27
Financial and organisational framework and implications of digital learning	3,99	2,83	1,16
Knowing the system of initial and further training, informal learning and non-formal performance support in the company	3,95	2,85	1,10
The ability to assess the learning needs of various groups	4,17	3,08	1,09

Means. N= 100 to 105

General Media Competence and Digital Communication

The less prioritised field of general media competences also shows a quite homogeneous picture.

Closing the remaining gap between importance and actual development in all sub-competences is desirable, but not of high priority.

The „Ability to search, collect, process and critically evaluate data, information and concepts" has the second highest importance and the greatest gap between importance and development. General critical media competences therefore are considered as important as in-company learning.

Important , Developed und Difference

Competences ranked by difference between importance and development of competences			
	Important	Developed	Difference
General Media Competence and Digital Communication **OVERALL**	4,27	3,10	1,17
Ability to search, collect, process and critically evaluate data, information and concepts	4,37	2,99	1,38
Understand and being able to apply (general) digital communication (like social media and messenger services like WhatsApp, Signal, teleconferencing like Zoom… etc.)	4,44	3,27	1,17

| Being able to use social software (e.g. messaging, YouTube, chat, fora, podcast, digital games, blogs, wikis, social networks) for learning purposes	4,17	3,09	1,08

Means. N= 100 to 105

Competence field "Being aware and able to apply relevant legislation"

No particular sub-competences stand out in this field, which is ranked remarkably high in importance, but obviously the actual development of competences is also considered as quite sufficient.

Important , Developed und Difference
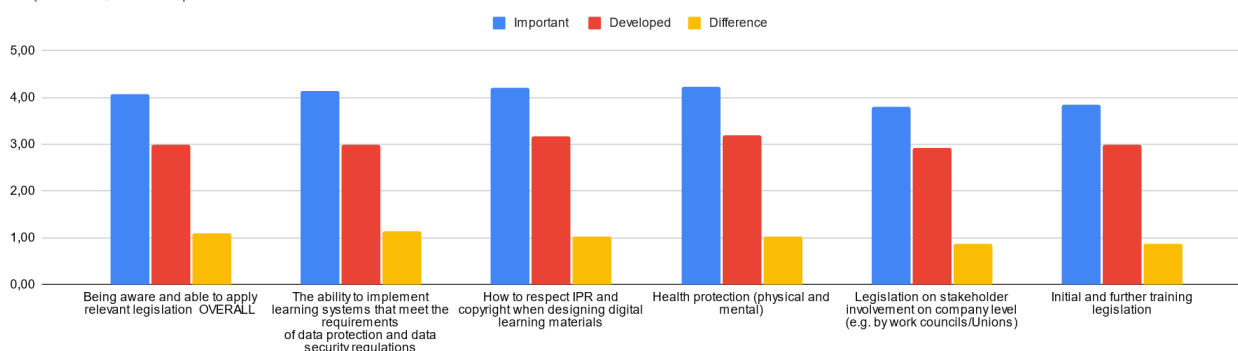
Competences ranked by difference between importance and development of competences			
	Important	Developed	Difference
Being aware and able to apply relevant legislation **OVERALL**	4,07	2,98	1,09
The ability to implement learning systems that meet the requirements of data protection and data security regulations	4,14	2,99	1,15
How to respect IPR and copyright when designing digital learning materials	4,21	3,17	1,04

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|			
Health protection (physical and mental)	4,23	3,20	1,03
Legislation on stakeholder involvement on company level (e.g. by work councils/unions)	3,80	2,92	0,88
Initial and further training legislation	3,85	2,99	0,86

Means. N= 100 to 105

Competence Field "Transversal competences for designing and implementing workplace learning in SMEs"

Transversal competences are considered as very important for learning, with "social intelligence" standing out at with a 4,31 average rating. While experts and practitioners are confident that overall this overarching competence is well developed, in all sub-competences, however, there are slight gaps.

The largest of these is the ability "to provide learning experiences that are

appropriate for people from different cultures." This assessment is consistent with the result of the literature study as well as focus group discussions: the larger migrant population among company employees requires new approaches in in company learning and developing digital learning methodologies to address this need is very important.

Important , Developed und Difference
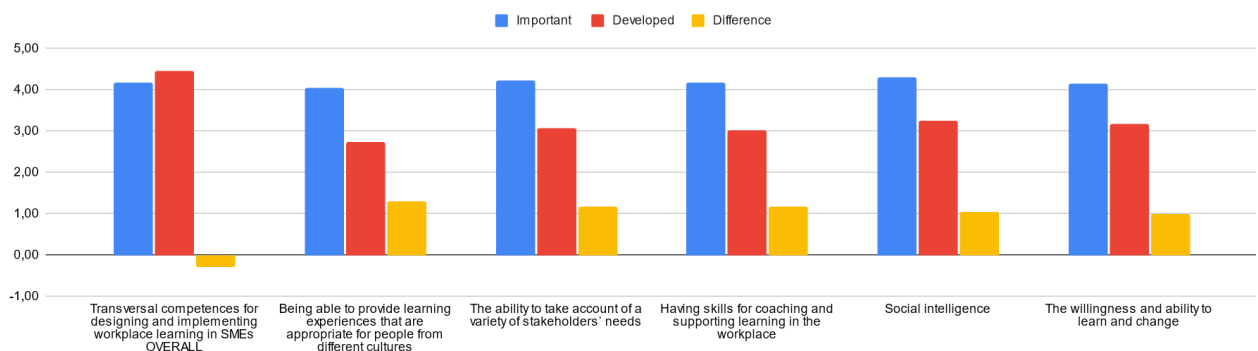
| Competences ranked by difference between importance and development of competences			
	Important	Developed	Difference
Transversal competences for designing and implementing workplace learning in SMEs **OVERALL**	4,18	4,46	-0,28
Being able to provide learning experiences that are appropriate for people from different cultures	4,05	2,74	1,31
The ability to take account of a variety of stakeholders' needs	4,22	3,06	1,16
Having skills for coaching and supporting learning in the workplace	4,18	3,02	1,16
Social intelligence	4,31	3,26	1,05
The willingness and ability to learn and change	4,16	3,18	0,98

Means. N= 100 to 105

Ranking of Obstacles to Digital Learning

There are no very significant differences in the assessment of obstacles to digital learning in companies. Among these, resistance from employees and trainers is least important. A lack of general competences for digital learning is more important.

Ranking of Obstacles to Digital Learning in SME
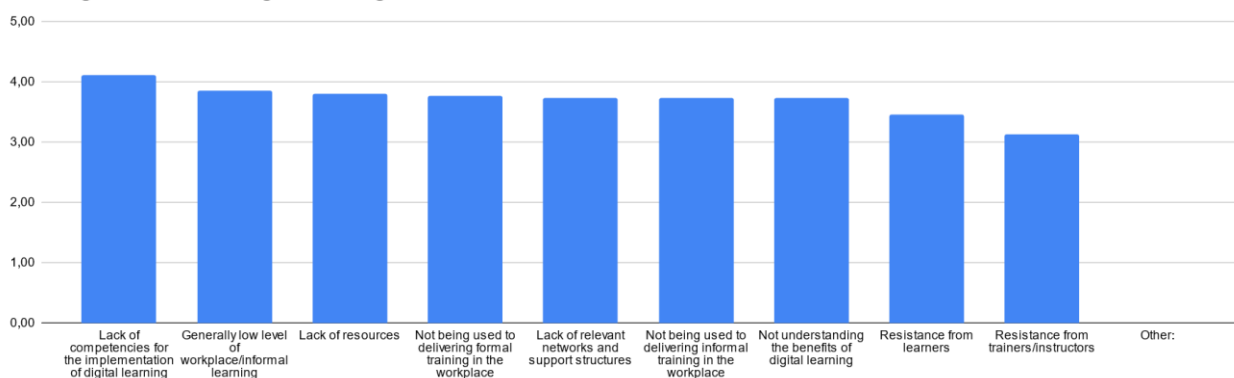
Means. N= 100 to 105

Suggestions for Additional Content

In order to validate the results of the closed questions part of the survey, but also to give the opportunity to add aspects that may not have been considered in the literature or focus group research, the respondents have been asked to suggest content that they would like to see in a training in any case.

Multiple statements affirm that a comprehensive program is needed.

Also the respondents suggest that the programme should be easy to use.

Multiple respondents express their interest in good practices and inspiration from the partner countries. Other statements are less clear and no other foci can be identified.

The individual suggestions follow.

8. Which other content of a training programme would you like to see?

- Best practices, Netzwerken (Austausch, Beispiele, Erfahrungen – „Blick über den Tellerrand"), Joint-Venture (networking, exchange of experiences, widening the horizon..)
- Cost and efficiency assessment of digital planning and applications.
- Criteria and field of application, financial and moral contribution to the program makers and implementers, its validity, contribution to society and the system, and renewable language and other communication technology that can be understood by every segment.
- Generally, all kinds of training deficiencies are observed in job applications and those who start to work. Professional qualifications challenge us the most.
- Good practices from countries
- Health and safety at work
- I expect it to be interesting and engaging.
- I think that SMEs should be in cooperation and integration with the government as required by the workplace and legal legislation; like the relevant ministries, directorates, etc. I also think universities must be a part of this.

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- It is necessary to remove the obstacles to digital media programming and education and it should be taught as a lecture and shown in practice from secondary education.
- It seems to be already a huge programme.
- It should have the ability to internalize education with its applications.
- Learning by doing and experiencing.
- learning culture, strategic and project management
- Marketing and sales through digital media, brand positioning, advertising to increase brand awareness and optimization with the understanding of performance marketing. Measuring the use and effectiveness of influencer / blogger / vlogger / YouTuber etc. on the interactive promotion side.
- Media to make workplace inductions quicker and more effective
- Learning in a company context GOOD PRACTICES.
- perfect tutorials
- Project planning and implementation of digital learning environments.
- Quick accessible media used by new employees
- Self-improvement.
- Social media digital communication.
- The educational content of the program should be comprehensive.
- The training program's being simple to understand and easy to learn.
- There should be content that contributes to the individual's self-knowledge and development.
- Überführung klassischer Lernformate zu digitalen Lernformaten (how to transfer „classical" forms of leraning to digital format)

The opportunity for additional comments has been quite used by some respondents, who confirmed their interest in the programme.

The individual statements follow.

9. Any other comments or suggestions?

- a good mix of digital analog learning (blended)
- Digital data collection stations are still being established in our company and we are at the stage of informing the employees.
- Digital marketing, which will lead to e-trade and e-export, should be given as an academic education with its all sub-headings and even it should be a department at the undergraduate level. For the development of e-commerce and especially e-export, it is necessary to improve the design-production-digital skills and logistics aspects (cargo costs) such as shipping.
- I would like to be informed about the developments and survey results. I wish you convenience and success. Thank you.
- Creating and developing content for digital learning is very important. Recently, training from sites such as internet udemy has increased.
- Programm ausbauen, da für KMU und Big Player gleich wichtig und v.a. oftmals sehr sinnvoll einsetzbar (Expand the programme, as it is equally important for big companies and SME)
- Trainings that will ensure the continuity of personal development and professional knowledge skills in the related branch, and to renewing them at certain periods by also following the current trends.

- When developing training programs, it must be taken into account that staff must understand why do they have to learn certain thingStaff learn most effectively when studying things that have immediate applicabilityStaff learn more effectively by experimenting
- will we will be able to use the same media for office based learning and warehouse / active role based learning ?

3. Conclusion, Competency Matrix and Policy Recommendations

Competency Matrix

Overall, based on the DigiVET research methodology, which in three steps narrowed down the range of potential competencies which are relevant for digital learning in SMEs, the following short list of competencies resulted:

Selected competences ranked by difference between importance and development of competences
Planning and production of digital media OVERALL
● Theories and formats of multimedia learning
● The ability to design and produce instructional videos of an appropriate quality
● General Multimedia design - The rules of designing these (DOs and DON'Ts)
● The ability to design and produce virtual/augmented reality systems of an appropriate quality
● The ability to set up and facilitate digital learning management systems (LMS like Moodle, etc.)
Learning in a company context OVERALL
● The ability to evaluate the outcomes of digital learning
● The ability to facilitate digital learning in the workplace
● The ability to develop learning pathways
● The ability to develop digital learning that takes account of the preferences of different groups (e.g. adults vs youth)
General Media Competence and Digital Communication OVERALL
● Ability to search, collect, process and critically evaluate data, information and concepts
Being aware and able to apply relevant legislation OVERALL
● The ability to implement learning systems that meet the requirements of data protection and data security regulations
Transversal competences for designing and implementing workplace learning in SMEs OVERALL

● Being able to provide learning experiences that are appropriate for people from different cultures

The research methodology has made a point of not extending the list of competences, but to narrow it down to the most important ones with an eye on developing a feasible and effective programme for developing digital learning in SMEs.

The content of the individual competencies is partly being detailed in the literature research and focus groups.

As the survey research has been based on the preliminary matrix and has mostly confirmed this matrix, adding a prioritisation and focus, the development of IO 2, training handbook for coaches, could be based on this matrix of competences.

Therefore at this point the project has already developed didactic material that fleshes out the content of each of these competences.

The details of this can be found in the training handbook for coaches.

Some points of how these competences have been addressed are being described below, along the contents of the coaches handbook and the content of IO 3 and IO 4 (in *italics*):

Planning and production of digital media OVERALL
● Theories and formats of multimedia learning – *overview of forms of in-company learning and how to find digital means of supporting these forms (IO 2) Overview collection of digital tools and methodologies (IO 3)*
● The ability to design and produce instructional videos of an appropriate quality – *comprehensive instructions for media production and referrals to additional tutorials on media production (IO 2 and IO 3)*
● General Multimedia design - The rules of designing these (DOs and DON'Ts) *comprehensive instructions for media production and referrals to additional tutorials on media production (IO 2 and IO 3)*
● The ability to design and produce virtual/augmented reality systems of an appropriate quality – *to be complemented to the current state of IO 3 and IO 4*

● The ability to set up and facilitate digital learning management systems (LMS like Moodle, etc.) – *addressed in IO 3*
Learning in a company context OVERALL
● The ability to evaluate the outcomes of digital learning - *comprehensive system of initiating, facilitating and evaluating digital learning in SMEs in IO 2 (Digital Learning Canvas)*
● The ability to facilitate digital learning in the workplace *comprehensive system of initiating, facilitating and evaluating digital learning in SMEs in IO 2 (Digital Learning Canvas)*
● The ability to develop learning pathways *comprehensive system of initiating, facilitating and evaluating digital learning in SMEs in IO 2 (Digital Learning Canvas) - focus on planning individual pathways, in particular for learners with low prior qualifications*
● The ability to develop digital learning that takes account of the preferences of different groups (e.g. adults vs youth) – *see above, considering also the needs of groups like non-speakers of a country's mainstream language*
General Media Competence and Digital Communication OVERALL
● Ability to search, collect, process and critically evaluate data, information and concepts *- to be complemented to the system in IO 4*
Being aware and able to apply relevant legislation OVERALL
● The ability to implement learning systems that meet the requirements of data protection and data security regulations ● *- to be complemented to the system in IO 4*
Transversal competences for designing and implementing workplace learning in SMEs OVERALL
● Being able to provide learning experiences that are appropriate for people from different cultures   - *Strong focus of coach handbook, as it focuses on individualized learning to needs of specific groups*

Policy Recommendations

In order to improve the framework conditions for using digital media in VET, a number of recommendations for shaping policies on local, national and European levels can be given, based on the findings of the literature review and the empirical study (case studies, focus groups and the survey). Next to policy recommendations for state policymakers (government on different levels) we include recommendations for the organisational and institutional policy level, as these play an important role in shaping the framework conditions for digital learning in companies.

Organisational Level:

Develop a digital learning strategy. In contrast to the indiscriminate application of individual technical tools, organisations and companies need to analyse the training needs of their members, plan the improvement of their implicit or their documented learning systems.

Organisations need to identify the target groups of learning, identify those who are currently excluded from vocational training.

Organisations need to relate options of digital learning to the individual training needs of all of the heterogeneous groups of learners.

The target groups of learning should participate in the identification of their learning needs as well as in the planning of learning goals and evaluation of learning outcomes.

Organisations should set up long-term, mid-term and short-term plans for implementing such learning, e.g., in the format of learning roadmaps.

These strategic plans should balance top-down strategic initiatives with exploring and encouraging bottom-up initiatives (e.g., ways of professional communication and knowledge sharing that are popular among the employees).

IO 1 – A 7 Competency Matrix and Policy Recommendations

In order to take care of this strategic mission, a new professional profile of digital learning navigators, professional pedagogues or similar profiles have been used in many successful good practice cases.

This function should not be identified with IT specialists, but includes aspects of organisational development, personnel development, vocational tutoring and individual coaching. A gradual building of competence along the overall extended matrix that has been developed in DigiVET on an advanced to expert level is recommended for these experts.

Organisations and the digital learning experts within the organisations are recommended to build a strategic support system. Such a system can consist of relevant institutions, like business support organisations, clusters, training providers, researchers and specialised consultancies, as far as these are open to a cooperation on equal terms and common learning.

Institutional Level:

- Relevant institutions such as chambers, training providers, cluster organisations, unions and other related institutions (depending on the national setting) are recommended to adopt the topic of digital learning means much more.

- The rich knowledge about good practices in SMEs, professional profiles, recommendations for organizational development of companies and technologies have not yet been transformed into adequate support offers that can be easily accessed by SMEs of various sizes.

- In particular the needs of the lower qualified learners, migrants and other non-traditional groups of learners have not been sufficiently addressed in a company learning context, but mostly been "delegated" to quite formal classroom style training by training providers.

- Companies and support organisations are recommended to develop integrated learning strategies for such groups which use the workplace and the company context as the premier place of learning in order to avoid the common theory/practice gap/trap of traditional learning approaches.

- Digital learning offers unique opportunities for this, as it allows for a high level of individualised learning, overcoming language barriers, learning independent of time and place, social support and other advantages. Empowering the learners to use such offers needs individual attention, motivation and coaching however. Institutions need to develop their own capacities to support such innovative training approaches.

- In particular traditional training providers need to turn around to a more individualised and company based approach and qualify their own staff accordingly.

- Such a support system can rarely be built by one institution alone. Institutional policies therefore must put cooperation and collaboration up front. Networking between traditional organisations like chambers, innovative pedagogical research and consultancy, unions and other organisations must prepare such collaboration, in contrast to just adding providers of classroom learning and training, which is currently mostly used by already privileged parts of the company staff.

- Such collaboration can be strongly supported by local policy.

Local Level:

As a result of the literature review and the empirical study, for the local level it can be recommended:

- Policymakers need to care for the local base of human resources, which are the base of a conductive economic and social development. Gaps in education and training are reflected in exclusion of parts of the population, shortages of personpower for desirable innovative businesses and an overall downward spiral which is most immediately felt on the local level.

- While the local level of government in the partner countries has quite different responsibilities and also material means, in all cases local policy makers can use their position to set the right agenda, make contacts between the relevant actors and urge a professional strategy for using the opportunities of digital learning.

- A particular opportunity is to support companies and relevant institutions to use the relevant support programmes (financial and consultancy support, development projects, research and other). Many of these have high potential but at first sight appear to be hard to use for small and micro businesses with a limited capacity for developing applications, studying calls and administering projects.

- Local business support units are recommended to set up a dedicated digital transformation unit with the mission to reflect the mega trend of digitalisation for the local context, map the support opportunities, develop and support a local agenda for digital transformation that has an eye on including all of the citizens, including those with less opportunities and higher vulnerabilities. As the local government has a responsibility for all of its citizens, it is also in the position and responsibility to connect improbable partners of cooperation, such as innovative start-up companies, unions, NGOs and "new" social initiatives and businesses, etc. The opportunities of such open innovation systems are by far underused.

- On a concrete level, the local government and the local community can foster the overall digital competence of their citizens of different age, origin and education by building and

supporting alternative learning environments like "STEM labs," and hack spaces in school initiatives for using digital media, digital media education offers in community centres, adult education centres, self-governed youth centres and others, where digital skills and organisational creativity, persistence and resilience can be built.

● Agenda setting, coordination and encouragement by local governments can go a long way providing a friendly environment for the better utilisation of digital learning technologies and methodologies even where the material means of this level of government are limited.

National Level:

● Digital competences are a topic for the overall education system. The COVID crisis has revealed a disastrous overall picture in this regard in partner countries like Germany. In spite of brave individual efforts by educators, the overall system proved to be completely underprepared for digital delivery of digital education. This was particularly true for the more vulnerable parts of society such as migrants and families with lower formal education levels. The same was true for adult education, social work and other informal forms of education.

● This overall poor state of digital preparedness and a persistent digital divide among the population is a very negative precondition for digital learning in companies.

● This increases the responsibility of the companies, as work for most of the population above the obligatory school age is an almost exclusive learning opportunity.

● Nevertheless national policy needs to implement a much more energetic and targeted policy to build basic digital skills in the population.

- Portraying digitalisation as more of a threat, being highly complex, being only for the "nerds," and only taking place in shiny high tech environments can even be counterproductive, as it increases fears and reluctance within the population.

- National digital skills policy in its communication dimension is recommended to highlight very down-to-earth practical examples of how digital media like instructional videos, virtual communication, self production of media, etc. can be mastered by all citizens and can in fact be a pathway to individual advancement and the development of own talents. Communication should be from practitioner to practitioner wherever possible.

- Public campaigns to fund the use of digital learning in companies, which already exist in most partner countries, should highlight and in fact fund particularly those initiatives which are designed to also take along the less academically qualified, older or more traditional parts of the population and company staff.

- Participation of unions, informal employee groups and informal citizen initiatives should be highlighted.

- Initiatives of informal learning in the social context, such as neighbourhoods, NGOs, citizen initiatives, etc., should be encouraged and funded.

- Funding of initiatives within companies should be conditional on including aspects of including all groups of employees and facilitating individual job chances.

- In some of the partner countries, large-scale action research programmes, funded by the national state, have advanced the conceptual knowledge on using digital learning in companies. Such initiatives are recommended to be promoted in all countries.

- However, national policymakers should commit much more to also use the results of such programmes for reforming the regular systems of education and initial and further vocational training and for designing the conditionality of the regular programmes for the support of adult learning, like those supported by the ESF, but also by, e.g., national employment services, chambers and the relevant government organisations.

- The national government needs to walk the talk. In most of the partner countries the level of digital learning within the government organisations is not on par with the best private company initiatives. Here the government can lead by example. This applies particularly to using digital systems that are accessible, easy to understand, simple and adaptable.

- The experience of interaction with government agencies can go a long way in forming the perception of what digitalisation means for the "user experience" of ordinary people. This general perception is a critical factor for the openness or resistance of company staff vs digital learning.

- Small companies do not have the material means to cover the content of basic vocational learning by self-produced digital learning material. It would be a huge contribution by national governments if all curricula and qualification profiles that are available on the national level would be mirrored by digitalised didactical material, which is produced to the highest level, but in a format that is OER, adaptable by each user. Such a national investment would be modest in comparison with many other parts of state expenditure, but could give digital learning a huge boost.

- Such a universally accessible resource would be particularly important for all "latecomers" to the system, such as school dropouts, migrants and those who change their professional pathway during their career.

- Next to the content of such learning, the programme should also be reflected and certified in terms of the methodological skills of digital learning as laid out in this report as well as, in a more general context, the overall European DigiComp framework.

- In order to improve the institutional framework for the use of digital media, national funds and programmes should encourage local and regional cooperation of relevant actors, industry clusters, networks "learning regions", regional development pacts and the like and make the competent addressing of digital learning opportunities a condition of funding.

European Level:

- The European Union should continue to encourage and fund initiatives to build those competences which are described in the European Framework of Digital Competences.

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- International exchange and mobility of actors in the field, like digital learning navigators/coaches/trainers, should be encouraged and more boldly funded.

- In particular examples of well working digital learning systems should be encouraged to share their experiences.

- All such initiatives should be encouraged to more boldly establish English as a working language and to also present their initiatives in English in order to facilitate international mobility of experts and practitioners.

- Among the suggested six fields of competence for digital learning that have been suggested as a result of the literature review and focus group research…

    - understanding of change trends and implied attitudes in SMEs
    - planning and production of digital media
    - learning in a company context

    …stand out as having the largest difference between importance and actual development of the field of competence.

- These should be focused in the further calls for the Erasmus+ programme, as targeted and state of the art didactical OERs in these fields should be produced and mainstreamed.

- The conditionality of the ESF programme should continue to highlight the importance of digital learning in companies and make funding conditional on setting up institutional and company policies for introducing digital learning at the workplace.