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LEVERAGING DIGITAL LEARNING AND WORK-BASED LEARNING TO ENHANCE EMPLOYEE SKILLS IN SMALL AND MEDIUM ENTERPRISES

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Abstract. Small and medium enterprises (SMEs) play a critical role in the European economy, accounting for the majority of businesses and employment opportunities. However, with rapidly changing technology and global competition, it is becoming increasingly important for SMEs to stay competitive. This paper explores the role of digital learning and work-based learning (WBL) in helping European SMEs remain competitive in the 21st century. Digital learning and work-based learning are two of the most innovative and influential approaches to education and training in the 21st century. Both approaches leverage technology and real-world experience to help students and workers acquire the skills they need to succeed in their careers. The paper argues that by leveraging technology and real-world experience, SMEs can upskill their employees and stay ahead of the curve. The paper concludes that a combination of digital learning and work-based learning has the potential to transform the way SMEs approach employee development, allowing them to remain competitive in a rapidly changing business landscape.
This paper utilizes a mixed-methods approach, incorporating both a literature review and the results of a survey, to explore the role of digital learning and work-based learning.

Keywords: digital learning, work-based learning, dual training, blended learning.

JEL Classification: I21, M53, O120.

Introduction

The purpose of this study about digital learning and work-based learning (WBL) in SMEs is to provide insights into the potential of digital technologies to enhance work-based learning in micro and small companies and improve the skills and competencies of their trainees and employees and if this is already used in companies respectively, to illuminate the challenges and advantages.

Small and medium-sized enterprises (SMEs) are the lifeblood of the European economy, with 99.8% of all enterprises in Europe being classified as SMEs and accounting for two-thirds of total employment (European Commission, 2022). SMEs are also responsible for 56% of total turnover and are key drivers of innovation and competitiveness in the regions of the EU (Hervás-Oliver et al., 2021). However, due to their size and entailing resource restrictions, SMEs often face challenges in implementing digital innovations, particularly in the field of work-based learning. A recent study by Horbach and Rammer (2020) found that the lack of skilled labor is a major hindrance to innovation in SMEs. A shortage of vocational skills is even more detrimental to the implementation of necessary innovation projects than a lack of academic skills.

Furthermore, SMEs play a crucial role in the economy and in vocational education. Access to skilled workers and training opportunities is crucial to companies s in order to stay competitive. On the other side Vocational education and training (VET) centers play a critical role in meeting this need (Rodríguez-Soler & Brunet Icart, 2018). They provide employees with the skills and knowledge they need to succeed in the workforce, as well as to help companies stay competitive by providing training programs tailored to their specific needs. The relationship between SMEs and VET centers can be vital for ensuring that workers have the right skills and knowledge for their jobs and that businesses have access to the skilled workers they need to succeed. According to a study by Rodríguez-Soler and Brunet Icart (2018), the relationships between VET centers and SMEs are often weak, but there are several factors that can improve this relationship. For example, the study found that workplace training programs can act as a catalyst for creating

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new relationships between VET centers and SMEs. This highlights the importance of vocational education in creating a skilled workforce to support businesses and also shows that worked-based learning is crucial for vocational education and SMEs. To maintain competitiveness and innovation in particular small companies need the right qualified workforce (Hogeforster, 2014). The demand for flexible learning and blended learning has been growing strongly in recent years (Müller & Mildenberger, 2021). To remain competitive, especially small companies must exploit the full potential of the labor market. Younger generations and women have a strong need for flexibility as a recent study from Lithuania indicated (Ciarniene & Vienazindiene, 2018). This can be met by flexible, digital training models. Digitalizing work base learning is therefore becoming more a necessity than a benefit for the future recruitment of talents.

Given the importance of SMEs in the European economy, it is essential to address these challenges and support the implementation of digital work-based learning in SMEs as a measure to combat the lack of vocationally trained staff. The Baltic Sea region is particularly relevant in this context, as a study by Philipp et al. (2020) found that digitalization is among others the most promising field of growth in the region's blue economy, with cross-national digitalization being a major challenge for SMEs in the region.

This study aims to address these challenges by examining the implementation of digital work-based learning in SMEs, universities, vocational education centers, and business support organizations in Europe and exploring the barriers and opportunities associated with this implementation.

1. Methodology

This paper utilizes a mixed-methods approach, incorporating a literature review and a survey, to explore the role of digital and work-based learning. The combination of the literature review and survey data provides a robust and comprehensive understanding of the role of digital learning and work-based learning in enhancing the competitiveness of European SMEs. The findings of this study will contribute to the body of knowledge in the field and provide valuable insights for SMEs, educators, and policymakers.

1.1. Literature review

The literature review component of this study, below as chapter 2, involved a comprehensive search of academic journals, books, and online sources to identify relevant studies and best practices in the area of digital learning and work-based learning. The literature review synthesized the findings of these studies, providing a comprehensive overview of the current state of the field. It was conducted using a systematic approach. The search strategy involved identifying relevant databases, such as Scopus, Web of Science, and Google Scholar to search for articles and publications related to digital learning and work-based learning.

The articles and publications in the literature review had to be peer-reviewed, published in English, and focused on the relevant topic of digital learning and work-based learning. Articles that were not relevant to the research questions, such as those focused on larger organizations, non-European contexts, or non-peer-reviewed sources, were excluded. The literature review process was rigorous and transparent, following established guidelines for systematic literature reviews. The findings of the literature review provided a comprehensive understanding of the current state of the field. The literature review summarized in chapter 2 on work-based learning and digital learning, was essential for forming the hypothesis and for the development of the survey.

1.2. Survey

In order to explore the implementation of digital work-based learning in SMEs and supporting organizations like universities, a quantitative research approach was used. The data was collected through an online survey, which was distributed to the target population through multiple channels including email, social media, conferences, and online meetings with relevant stakeholders. The survey consisted of both closed and open-ended questions, designed to gather quantitative and qualitative data. The survey is designed to be completed in approximately 5–12 minutes. Small companies usually have low response rates (Newby et al., 2003). Thus, the poll was kept as short as possible, as SMEs in particular find it difficult to answer longer surveys in their very busy day-to-day lives.

The survey consisted of 17 questions and depending on the answers, participants received 9–15 questions, designed to gather information on the implementation of digital work-based learning in SMEs, Universities, vocational training centers, and business support organizations. It was structured in a piped-logic, i.e. participants that have experience in this field received different questions than those without experience (Peytchev et al., 2006). The questions are divided into three categories: 1) demographics, 2) implementation of digital work-based learning, and 3) barriers and opportunities associated with the implementation of digital work-based learning.

The Target group of the questionnaire was SMEs, Business support organizations like chambers, vocational schools, and universities. Demographic questions include information on the respondent's age, gender, education level, and position within the company. This information is used to identify any patterns or trends in the implementation of digital work-based learning in SMEs in the responding organizations.

Implementation of digital work-based learning questions aimed to gather information on the current use of digital work-based learning in the respondent's company. These questions included information on the type of digital learning used, frequency of use, and level of satisfaction with the digital learning experience.

Barriers and opportunities associated with the implementation of digital work-based learning questions aimed to explore the reasons for the implementation or lack of implementation of digital work-based learning. These barriers include a lack of understanding of the technology and course interface, difficulty in following digital content that is often complex and full of jargon, lack of live interaction between students and instructors, and unreliable digital materials (Khanra et al., 2020). These questions, elaborating on the presence of these barriers, included information on the main barriers to implementation, but also the perceived benefits of digital work-based learning, and the level of support from the company for the implementation of digital work-based learning.

The survey data was analyzed using descriptive statistics, The presented figures aim to underline any significant relationships between the variables of digitalization, usage of work-based learning, and familiarity with digital work-based learning. Furthermore, the barriers and opportunities associated with the implementation of digital work-based learning in the responding SMEs and business support organizations were evaluated.

Before evaluation, the collected data were checked for errors to ensure that the data is accurate and usable for analysis. Finally, a report was written summarizing the findings of the survey. The report did include an overview of the research question, the methodology used, the results, and recommendations for addressing the digital learning needs of SMEs. The main findings are part of this publication.

2. Work-based learning and digital learning

Work-based learning and digital learning are two distinct methods of acquiring knowledge and skills that are of particular relevance for SMEs. Work-based learning refers to learning that takes place on the job, through practical experience and interaction with colleagues. This type of learning is typically informal, but can also be structured and guided through apprenticeships, internships, and other programs (Lester & Costley, 2010). On the other hand, digital learning refers to learning that takes place through the use of digital technologies, such as online courses, e-books, and other digital resources (Lin et al., 2017). The outbreak of the Corona pandemic in early 2020 has given a significant boost to the need for digitization in education (Seyffer et al., 2022). This was especially true for on-site training, which is an essential element in work-based learning.

2.1. Work-based learning

Work-based learning is any type of training or education that takes place in a workplace or work-like context where learners can enhance their skills and knowledge via hands-on experience and direct involvement with job activities and difficulties (Cunningham et al., 2004). Work-based learning has its origins in German-language training programs for craftsmen (Graf, 2016). This form of training is often recommended to address youth unemployment and a skills mismatch (Zimmermann et al., 2013). Apprenticeships, internships, on-the-job training, and other forms of experiential learning are examples of this. In recent decades, there has also been an increase in dual training programs in academia. Not only craftsmen (EQF level 4) but also dual bachelor's or master's degrees (EQF level 6) are offered (Lester & Costley, 2010). A classic area in which the interlocking of theory and practice is essential and closely coordinated is the study of medicine (Morris, 2018). However, due to the large number of SMEs and the need for them to provide practical training, it is of great importance for them in particular and all the more surprising that it has not yet been implemented across Europe. It is of special relevance for SMEs that can benefit from this training in a different context as outlined below.

2.1.1. Company needs

Work-based learning can be adapted to the specific needs of the SME, enabling employees to acquire the skills and information necessary to achieve the organization's goals. This can help SMEs to increase their market competitiveness and better meet client requests. The European economy is facing huge challenges due to skills shortages and skills mismatch (Brunello & Wruuck, 2019), which can be remedied by practical education on the spot. Indeed forms of work-based learning, like the German "dual training" are often exported to other countries in recent years (Pilz & Wiemann, 2021).

2.1.2. Building a skilled workforce

Small and medium-sized enterprises typically have limited funds to invest in formal training programs or the recruitment of highly qualified employees. Work-based learning can provide a cost-effective solution to cultivate a skilled workforce by allowing individuals to gain the precise skills and information required to perform their tasks effectively while on the job. The apprentices and students are trained on the spot, in the company that most likely will hire them later full-time. Training your own employees directly, in dealing with your own colleagues, customers and machines is a great advantage. Graduates who have only been trained theoretically or in other companies need a few months of training.

2.1.3. Employee involvement

Workers who have opportunities for work-based learning are more likely to feel valued and invested in their roles, which can increase their job satisfaction and decrease turnover rates. This is particularly crucial for small and medium-sized enterprises, which may struggle to attract and retain talent in a competitive employment market with labor shortages. Staff is more inclined to stay with a company that supports their professional development and provides prospects for progress (Steil et al., 2020). Businesses can also foster a culture of continuous

learning and improvement by upskilling and reskilling their personnel through work-based and digital learning, which can help them recruit and retain top talent.

2.1.4. Learning environment

Work-based learning can contribute to the development of a culture of continuous learning inside the SME by encouraging employees to acquire new skills and accept new challenges, that can be put to action on the spot. This can result in greater innovation, productivity, and corporate growth.

Nevertheless, regardless of these advantages, the implementation of this way of linking theoretical and practical training is not always easy. The introduction of work-based learning methods is not always easy, but it is desirable and beneficial for companies, as a comparison between countries showed (Hogeforster & Wildt, 2020).

2.2. Digital learning

Digital learning is a form of education that utilizes digital technologies and online platforms to facilitate the delivery of educational content (Wheeler, 2012). This learning mode has been gaining popularity in recent years due to its accessibility, flexibility, and convenience. In digital learning, students have the ability to access educational resources and participate in virtual classes from any location with an internet connection. This is especially important in today's globalized job market, where SMEs compete on a global scale for top talents. It enables learners to pursue education regardless of geographic and time constraints. Additionally, digital learning offers a wide range of educational materials, including videos, animations, simulations, and interactive games, which can help students to understand and retain information more effectively (Lin et al., 2017; Sousa et al., 2017). However, despite its many benefits, digital learning also presents some challenges, such as the need for reliable and consistent internet access, ensuring that students or employees have the necessary technology, and addressing the potential for digital distractions (Khanra et al., 2020). Nevertheless, with proper planning and implementation, digital learning has the potential to greatly enhance the educational experience for students and support the development of 21st-century skills.

Digital learning, or the use of technology and digital resources to facilitate educational activities and experiences, has seen a significant increase in recent years. The COVID-19 pandemic has accelerated this trend, with schools and universities around the world quickly shifting to remote learning to maintain the continuity of education (Li & Herd, 2017). Today, digital learning encompasses a wide range of learning experiences, from online courses and virtual classrooms to educational games and simulations. These tools and resources offer a number of benefits, including increased accessibility, flexibility, and affordability.

2.2.1. Adaptability of digital learning into SMEs

Digital learning and E-Learning is not new to SMEs and has been subject to studies for more than 15 years (Paulsen, 2009). Limited resources, such as financial and technological, can be a significant barrier to SMEs seeking to implement digital learning. Major industries create their own digital learning environments, while in particular micro companies need to rely on outside solutions (Tvenge & Martinsen, 2018). In the last years, however, thanks to new ready to use platforms like Moodle, it became easier also for small companies to create digital learning courses for their employees and trainees. Furthermore, a lack of expertise in digital learning can lead to ineffective implementation and poor return on investment. Resistance to change is also a common challenge as employees may be resistant to new technology or changes to their traditional working practices (Chang & Guetl, 2007) Therefore, one key need for SMEs is to identify the most appropriate digital learning solutions for their organizational culture and workforce. This can involve evaluating different platforms and tools, as well as assessing the skills and knowledge required to implement and use these solutions effectively. Additionally, SMEs may need to consider issues such as access to technology, as well as the level of technical support required to ensure that employees can fully engage with digital learning materials (Nachmias & Hubschmid-Vierheilig, 2021).

Another important need is for SMEs to create digital learning experiences that are engaging and interactive, in order to increase knowledge retention and overall effectiveness. This can involve incorporating multimedia elements such as videos, images, and interactive quizzes, as well as creating personalized learning experiences that cater to individual employee needs and preferences and connect the thought content with practical tasks (Chang & Guetl, 2007). Indeed, it is apparent that digital transformation in the SME sector requires organizational competence above all (González-Varona et al., 2021). In addition to the management's stated goal, appropriate structures must therefore be promoted by the management and/or owner, which is often identical for SMEs.

3. Symbiosis of work-based and digital learning

Digital work-based learning offers various advantages that exceed the benefits of traditional work-based learning for SMEs. First, it can be more flexible than traditional training methods, allowing employees to learn at their own pace and on their own schedule. This can be particularly beneficial for SMEs that operate on a tight schedule or have limited resources for training (Bahl & Dietzen, 2019). Another advantage of digital learning is the versatility of learning methods. The same content can be taught simply via a digital document, an interactive quiz, a video, or in virtual reality. Digital content that is presented in a versatile way can therefore also be interesting to attract trainees and students with a short

attention span (Geri et al., 2017). The digital component further lowers the costs of the resources required for learning and training purposes, such as travel expenses, building and maintenance costs, and the need for printed materials (Mukhtar et al., 2020). However, digital work-based learning also includes the usage of new technologies that can simulate practical tasks, e.g., virtual reality welding masks that can simulate welding without material components and far less energy consumed (Karstensen & Lier, 2020). This aspect is especially interesting for SMEs that fear the training could be solely theoretical and without practical benefits to their employees. Considering the scarce resources of many SMEs, more efficient and effective usage of these technologies can contribute to the overall success of the enterprise.

Based on the literature review, the survey conducted was designed to shed light on the hypothesis of whether there is a relationship between a company's continuing education offerings and its knowledge of work-based learning and digital learning. This has been confirmed by the survey.

4. Results of the survey

156 participants have taken part in the survey. Of these, 93 (59.62%) were small and medium enterprises, 27 were universities (17.31%), business support organizations (12.82%), and 13 were vocational schools (8.33%). 3 participants indicated "other" (1.92%). Against the background of this paper, particular reference is made to the SME responses. The responses of the other institutions are used comparatively. Most of the companies were micro and small companies with less than 5 employees (42.39%) or less than 10 employees (29.35%).

4.1. Work-based learning and further training

Queried if the company is educating trainees in a work-based learning environment, 36.17% of companies answered in the affirmative. Interestingly, of those who do not, 39.36% still responded that they would like to, indicating a strong interest in this training model. However, it must be taken into account that the survey on this topic was probably conducted in particular by companies that have at least an affinity with the topic. Accordingly, only 5.62% of SMEs responded that they were not familiar with the topic. Asked if there are opportunities for further training at the workplace, only 11.70% of the companies answered yes, 22.34% stated "yes, but not enough", 30.85% stated "almost not" and quite a high number of 35.11% "not at all" (see Figure 1).

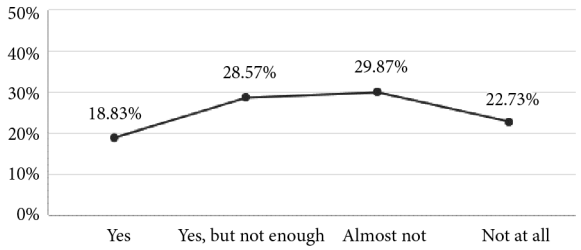

Figure 1. "Are there opportunities for further training at your workplace or is further training supported/encouraged?"

Interestingly, those companies who previously stated they educate in a work-based learning environment have a much higher percentage. In that case, 29.41% of SMEs stated "Yes", 52.94% "Yes, but not enough" and only 2.94% indicated that there are no further education possibilities at all (see Figure 2).

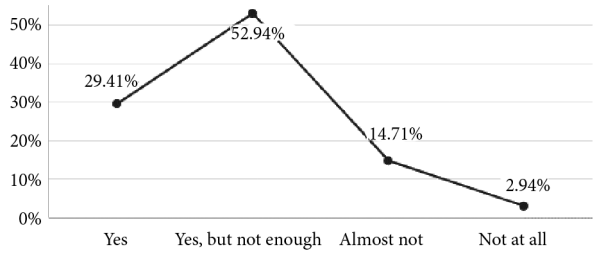

Figure 2. "Are there opportunities for further training at your workplace or is further training supported/encouraged?" filtered only by companies who use WBL

This leads to the conclusion that those who train in the area of WBL provide more opportunities for further training. It should be added that most of the countries applying this model and participating in the survey come from western EU member states such as Denmark, Germany or Austria, while the model is hardly used in member states such as Lithuania, Latvia or Poland.

4.2. Level of digitalization

Asked for the general level of digitalization, this was indicated with an average of 55% from 100%. However, if the results are broken down according to the participants, a clearly differentiated picture emerges. According to the survey, universities indicated their level of digitization at 78%, and companies at 49% on average. Companies with more than 100 employees stated 65% and micro and small companies only 44%. Accordingly, these small companies assume that they have a lot of catching up to do. These results do generally align with the findings of the annual report on European SMEs and indicate that the used sample is comparable to SMEs in Europe (European Commission, 2022).

4.3. Satisfaction with digital WBL

The survey further asked to what extent digital technologies are already being used in the learning programs. 44.57% of the companies stated that they do not use digital technology at all, and 25% that they hardly use it at all (Figure 3).

Comparatively, all universities reported having digital learning programs, only 11.54% to a small extent and 53.84% a lot or very much (Figure 4). As a result, it is not surprising that universities employ digital learning programs far more than SMEs, yet the difference is notable.

Institutions that have experience with digital learning programs are apparently very satisfied with them. Those

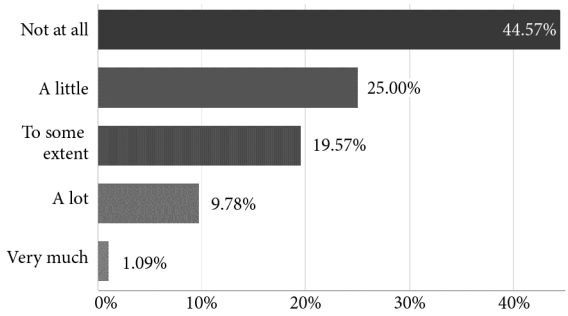

Figure 3. Companies indicating if they are using digital technology in their learning programs

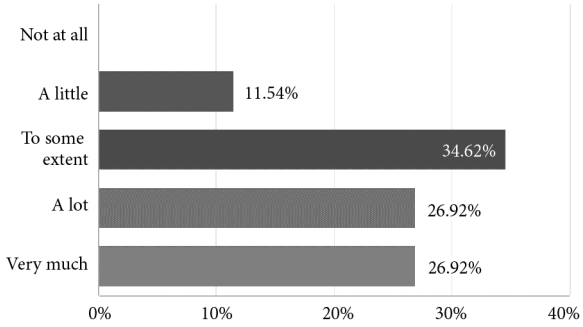

Figure 4. Universities indicate if they are using digital technology in their learning programs

who had stated "To some extent, a lot or very much" were asked about their satisfaction in the following questions. Those survey participants who have already had experience with digital work-based learning see this experience as consistently positive. Thus, 55.22% stated that it is very beneficial and 44.78% partially beneficial. The option that there is no benefit was not selected once. Accordingly, the answers were clear when asked specifically whether the company will continue to use digital work-based learning in the future, which was answered in the affirmative by 92.42%. Only 7.58% selected the answer option "Maybe" and none answered in the negative.

4.4. Hindrances for digital WBL in companies

Of those companies who indicated they are not engaged at all or only a little with digital learning, 65.57 % (Figure 3) had follow-up questions to learn more about the reasons. The possible answers were "Not interesting for our sector", "Not enough information about digital learning", "Willingness of trainees/employees" or "Not enough technical equipment" (Figure 5). Learner willingness hardly played a role, nor did a lack of technical equipment. The predominant statements here were "not interesting for our sector" and "not enough information about digital learning" with 70.24% stating "Yes". These results confirm the findings of Khanra et al. (2020), who identifies a lack of information as a major obstacle to implementing digital learning techniques in SMEs.

The next question reflected the result, which was a kind of control inquiry. When asked about the support needed, SMEs mainly stated that more relevant offers

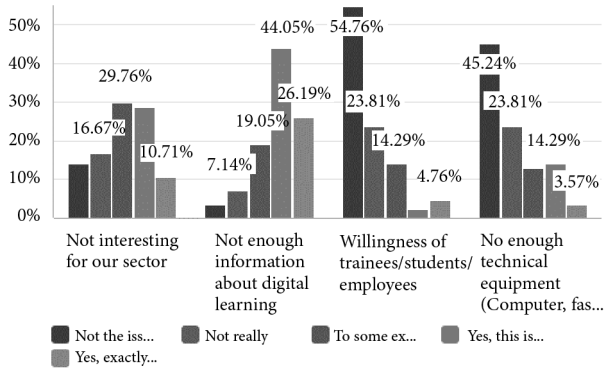

Figure 5. "Why is there no or hardly any digital learning at your workplace" from "Not the issue" to "Yes, exactly the issue"

should be available for their sector (84.13%), followed by more information and guidance in general (36.51%) and 25.40% would like to see financial incentives for better equipment (Figure 6). Therefore, in summary, SMEs feel they do not have enough offerings for their sector and would like more information. It can be assumed that traditional craft companies in particular have a strong need here. This assumption is based on the fact that the present survey was distributed more among chambers of crafts than chambers of commerce, which forwarded it to their member companies. In this respect, it would probably be necessary to conduct a comparable survey on a sector-specific basis. For a carpenter, digital training offers are less obvious at first glance than for a web designer. However, there are also digitally relevant offerings for precisely these areas that are not initially obvious, such as arts and crafts (Nortvig et al., 2020) or even physiotherapy education (Ødegaard et al., 2021).

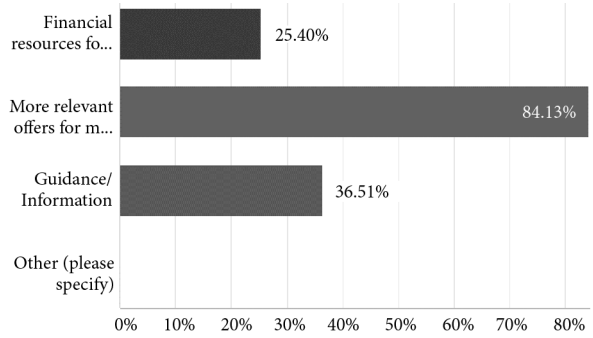

Figure 6. "What kind of support would you need for digital WBL"

4.5. Challenges

Of particular importance was the question of what general challenges exist in the introduction of digital learning. The participants had 5 answer options, with the answer "No Challenge" being awarded 1 point and the maximum challenging 5 points. Choices were "Technical Infrastructure", "Too much focus on theory, no practical learning", "Motivation of students/trainees", "Lack of exchange with teacher" and "missing information/know-how". Overall,

"Too much focus on theory" was selected as the biggest challenge, with 4.07 points or 43.33% of respondents (Figure 7). The technical infrastructure does not seem a challenge anymore, with the lowest results of 1,77 points or 58% that marked "no challenge".

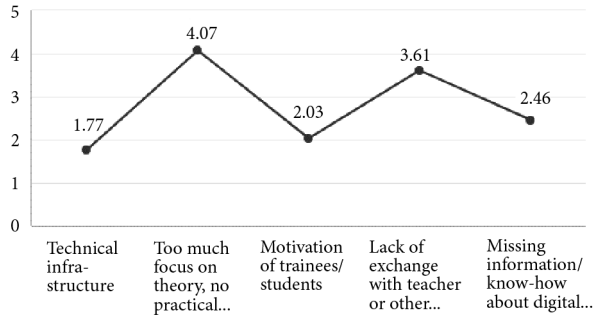

Figure 7. Challenges results by all participants

The results for the private sector were similar, indicating the statement "too much focus on theory, no practical learning" to be the biggest hindrance to getting engaged in digital learning (Figure 8).

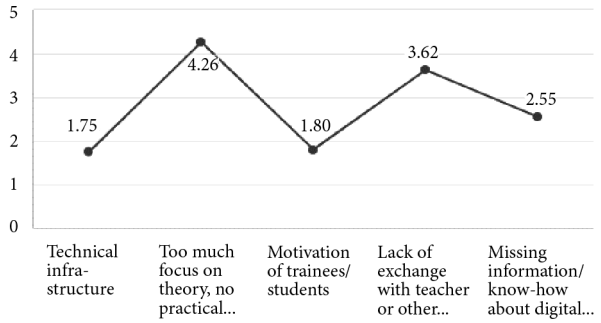

Figure 8. Challenges results for the private sector only

It should be noted that in an evaluation of only the responses by universities, the lack of exchange between students and teachers was seen as the greatest challenge, with 3.52 points.

4.6. Advantages

Finally, participants were asked what they perceived to be the main benefits of digital learning at the workplace. Again, the participants were asked on a scale of 1 (no advantages) to 5 (great advantage). Choices were the following assumptions "Personalized Learning/Free time management", "Saves time and money (less traveling, lower fees", "Information can be easily updated", "Diversity of tools (PC, mobile, VR etc.), "Learned content can be tested directly at work". The total results indicated the biggest advantage to be the last choice, that "learned content can be tested directly at work", with an average of 3.78 points (Figure 9).

Filtered only by universities, the biggest advantage considered by them is the diversity of tools with 4.32 points. Accordingly, the response was clear only from the private sector. Here, the SMEs indicated with a

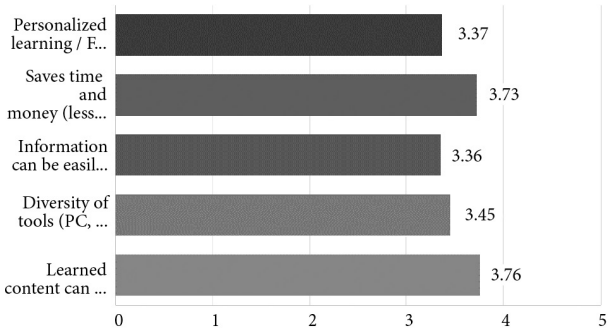

Figure 9. Advantages by all participants

clear majority that the applicability of knowledge in the workplace is most important, with 3.85 points, followed by the next practical consideration, that it saves time and money with 3.60 (Figure 10).

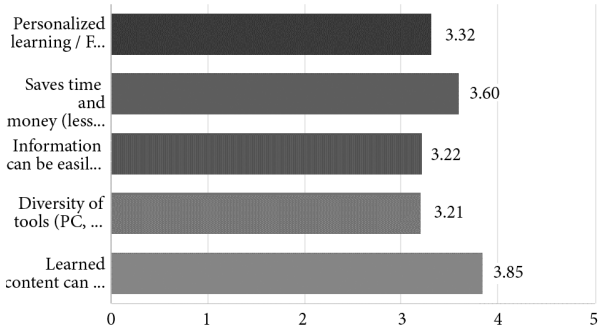

Figure 10. Advantages by companies

Overall, it must be noted that digital learning in the work-based learning area was viewed predominantly positively.

Conclusions

The evaluation of the literature has shown that there are many studies on the topic of work-based learning and, at least in the last 10 years, more studies on digital learning, but hardly any in combination. However, the subsequent survey showed that there are overlaps and a future market interest here.

Work-based learning and digital learning are critical for the success of SMEs in today's fast-paced and highly competitive business climate. SMEs can empower their staff to build new skills, improve job performance, and drive innovation and growth inside the firm by embracing work-based and digital learning. Furthermore, work-based and digital learning can assist SMEs in keeping up with quickly growing technical breakthroughs and being competitive in the marketplace.

The survey revealed that those companies that have a general higher level of digitalization also implement more digital learning. Also, firms, that are engaged in work-based learning, have a higher level of further training, which is not surprising. The result was clear that those who already implement digital learning and work-based learning are satisfied with it. Companies that are

not yet involved in this area are hardly lacking in technical infrastructure, but in sector-specific information. The survey was limited in that it did not ask sector-specific questions, which would have added value and ought to be replicated. When asked about general challenges, companies indicated that they would like to see more references to practical digital training. This is possible, for example, through VR technology. Asked about the advantages, these were clearly emphasized in general, again for the SMEs especially the practical application of importance.

Work-based and digital learning can give SMEs a competitive advantage in terms of personnel acquisition and retention. Overall, work-based and digital learning is a key component of SMEs' long-term success, not merely a nice-to-have. As a result, SMEs should prioritize investing in these types of learning and development to remain competitive and nimble in an ever-changing business landscape.

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