DIGITAL LEARNING IN SMALL AND MEDIUM-SIZED ENTERPRISES: IS IT A VALID ALTERNATIVE TO TRADITIONAL TRAINING?

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Abstract

This paper will first try to analyse the available literature on digital learning in Small and Medium-Sized Enterprises (SMEs). It will then propose approaches that address the SME-specific challenges and demands, including the financial difficulties that SME owner-managers encounter in the organisation and provision of training for their staff, identified in this literature.

SMEs currently make up 99% of European businesses. They provide two thirds of private sector jobs and contribute to more than half of the total added value created by businesses in the EU. This notwithstanding, learning and particularly digital learning, are under-researched. The little research that exists is also more often concerned with the owner-managers' rather than the employees' needs and demands. However, the scant investigations in digital learning – defined in this paper as that self-directed learning that happens through online means – in SMEs in Europe and beyond do offer some important considerations. With its flexibility and accessibility, digital learning can assist SME employees who cannot abandon their job to follow on-campus education or training initiatives, while also coping with family and social responsibilities. The literature also indicates that digital learning is a valid, if not better, social constructivist educational alternative compared to traditional face-to-face teaching and learning provision. Various investigations have also proved that digital learning, if done well, can create thriving communities of inquiry actively involving adult learners and educators in the educational process. This can however be achieved through a good learning design process that applies, for example, advanced interactive methods that develop highly engaging learning experiences and allow simulated practice of work processes. When applied properly, digital learning often provides substantial cost benefits including less time spent on training and scalability.

However, the development and implementation of digital learning programs typically requires an upfront investment which might become an obstacle for smaller SMEs that often have limited resources and budgets for staff training. The paper will also review how costs typically emerge in digital learning development projects and offer recommendations on how SMEs can find more economical ways to develop digital learning.

Keywords: digital learning, SMEs, adult and vocational education, social constructivism.

1 INTRODUCTION

The roots of corporate digital learning extend to the 1970s when the first forms of computer-based training (CBT) were implemented in the aviation sector (see figure 1) [1]. Airline pilot training providers were early adopters of digital learning. By the early 2000s, the emergence of the Internet as a mainstream and household medium continued to boost online distance learning creating the first big demand and 'hype' of Learning Management Systems (LMSs). The technological revolution continued undeterred [2], driving the knowledge-based economy and causing tremendous changes in the workplace [3],[4] and educational institutions, particularly universities [5]. The advocates of self-directed and non-facilitated digital learning predicted that, by the end of this decade, there will be 'an era of renewed workplace participation and worker empowerment because they allow for any-time education and anywhere-access to knowledge' [6]. Today, in many large corporate enterprises, the preferred way of running training – for staff, partners and clients – is digital self-directed learning. It has become 'the new normal' [7]

Even the financial crisis in 2007/08 did not stop this development. Since the crisis, the ability to design and apply learning in innovative ways for enhanced performance and sustainable operation in the changed operating environment, is seen as being critical for new companies [8]. More recently,

corporate digital learning has found new and more sustainable forms for the design, development and implementation of online programmes.
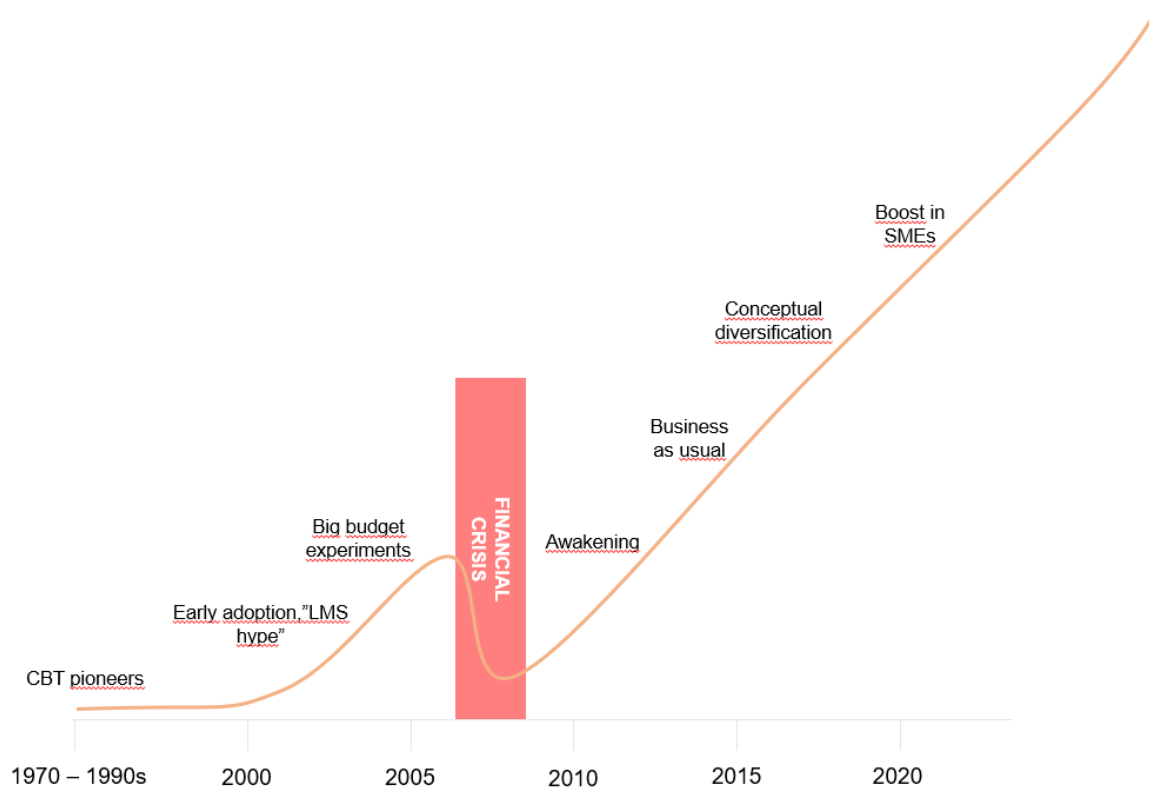

Figure 1. The rise of digital learning in corporate sector.

Small and Medium-Sized Enterprises (SMEs), however, are still struggling with digital learning and its implementation [9]. The challenges of SMEs to implement digital learning were noted recently by EASME, The European Executive Agency for SMEs, which launched an initiative to identify the digital learning needs of SMEs and create effective solutions [10]. Reasons for these specific challenges in SMEs are many. According to recent studies, corporate training managers are not happy with how they are able to provide training opportunities to their employees in the changed working society [11]. During the survey carried out by Context Learning (Finland) [12] in 2011 a group of corporate learning managers assessed their readiness to implement digital learning. The interviews revealed many unanswered questions relating to general implementation matters, practical arrangements to run digital courses, technical issues and, most importantly, the financial aspects of digital learning delivery [13]. Later in 2013, the same themes emerged when surveying international corporations in Ireland to assess the status of digital learning in corporate sector [14].

Nolan and Garavan [15], identified another barrier in the implementation of training, including digital training, in SMEs. Through their review of research on human resource development (HRD) in SMEs, they note that "studies do not address employees' perceptions and responses to HR practices" and quantitative investigations "often stopped at the owner-managers rather than the employers". Johnson and Devins [16], in their review of studies on training in SMEs in the UK, also found that the existing research, which is mainly survey-based, "do(es) not take sufficient account of the informal, flexible nature of much workforce development that takes place in small organisations". There is, consequently, a lack of a theory about employee learning, and particularly digital learning, in the unique context of these businesses that is required to develop and implement successful learning programmes online [17].

However, the economic challenges faced in many countries over the recent years are creating more and more pressure to develop cost-efficient learning programs. Financial challenges that slow the uptake of digital learning in SMEs were consequently highlighted during the EASME Expert workshop in Genova in June 2018 [10]. Experts agreed that SMEs have bigger financial limitations than other

enterprises as their resources are often more limited and SMEs are not able to fully utilize the scale benefits of digital learning.

The understanding of the "economics of learning" is thereby critical for all organizations. These issues have emerged repeatedly in literature over the years [18], [19]. Indeed, it is important to critically analyse the costs involved in the design & development of digital learning. It is also important to assess how such investments generate learner value and eventually produce concrete benefits for the company. It is the aim of this paper to establish a deeper understanding of these matters with a specific focus on SMEs in order to establish whether or not digital learning is indeed a valid alternative to SMEs as many authors today are claiming.

2 THE CRITICAL ELEMENTS OF VALUE GENERATION IN DIGITAL LEARNING DESIGN & DELIVERY

After its initial emergence, digital learning has often been under criticism regarding its ability to provide real value for learners, particularly because of its lack of social and teaching presence. For years, comparisons between the quality of learning in the classroom and digital learning (also referred to as "e-learning", "computer-based learning" or "web-based learning") were made with varied and often vague arguments. Apparently, much of this criticism emerged because digital learning at its early age was far too technology-focused with a lack of focus on the learners, their real needs and aspirations, and the learning outcomes. Today, digital learning is generally known to be able to provide at least similar and many times even better outcomes than classroom training when designed properly [20], [21], [22], [23].

The literature also indicates that adult learners, particularly workers, are joining distance online learning programmes for continuous job-related development in greater numbers, and the market for e-learning, in Europe, is growing rapidly. This, the literature suggests, is happening because e-learning is helping adult learners cope with workplace, family and social commitments.

Knowing these facts alone, however, is not enough for companies that implement effective digital learning solutions. It is essential to understand how good learning is related to issues like talent acquisition, employee commitment and retention, productivity and scalability of training. In this paper digital learning is understood as multimedia-based, interactive on-line learning, primarily designed for self-study purposes.

A review of literature and online sources that touch the issue of value generation revealed 3 key interrelated and interdependent phases that are critical for effective digital learning programme development.

2.1.1 Design & Development

The 'Design & Development phase' includes issues of advanced digital learning design to ensure the training program meets its objectives. The process must start with the identification and evaluation of the key stakeholders' needs, including the owners, employees and, if necessary, the community. These must include, but should not be limited to, the business objectives that the program aims to support. Other concerns, such as employability and active aging (particularly if older workers are involved) should also be considered. With this knowledge, the instructional designer must select the appropriate pedagogical methods to achieve desired outcomes. To help learning designers understand and identify which methods to use when constructing courses, Bruce *et al* [12] have implemented a model to align the "Types of Learning Interventions with Desired Learning Outcomes" adapted from Bloom's Taxonomy.

| Types of Learning Intervention | vs. | Desired Learning Outcome |

Types of Learning Intervention

5) Advanced Interactive Methods

4) Interactive/Active Richmedia-Based Learning Content

3) Engaging, Action Learning Content

2) Multimedia-Based Content

1) Notification/Reading

MOTIVATION

Create
Evaluate
Analyze
Apply
Understand
Remember

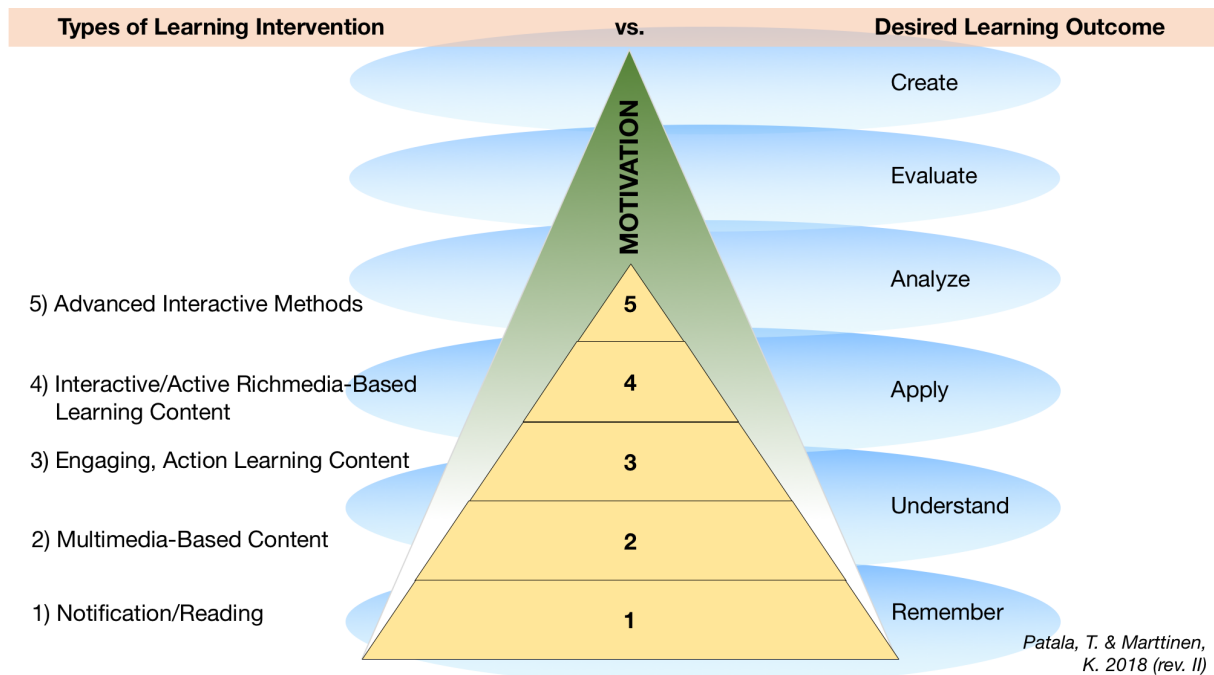*Patala, T. & Marttinen, K. 2018 (rev. II)*

Figure 2. Types of Learning Interventions with Desired Learning Outcomes

Issues of learner engagement, interest and motivation are central in learning design and should be addressed properly [24]. A learner with high internal motivation is likely to learn any topic within his/her field of interest with less effort and to achieve better learning results than learners with low motivation (particularly if their motivation is extrinsic). Especially in workplace settings, course designers should not assume that participants are always motivated and willing to learn. Learning is very seldom the highest priority for employees alongside the range of other responsibilities they carry, particularly in small enterprises. Although a learning outcome might be strategically important to all employees it might not have the same significance to different employees. This is, however, a critical point of consideration for learning designers. Motivation can be integrated within the learning process by applying the right, engaging methods (such as storytelling, simulations and game-based learning activities). In workplace-based learning contextuality and situatedness should also be considered as key design principles to ensure that learners will engage fully with the learning task [25], [26].

The design and development of digital training programs however requires an upfront investment which is often substantially higher compared to classroom training. To ensure the outcome is pedagogically sound it is recommended to use dedicated experts in design and delivery. For most companies, and particularly for SMEs who often do not employ professional trainers or digital learning designers, this means using outsourced services.

2.1.2 Running & Administration

The 'Running & Administration phase' includes approaches that allow effective registration, time and settings for studying, follow-up on training progress, testing, certification and post-training follow-up. The literature indicates that these functions, in non-self-study programmes, are carried out by an online educator. Most studies indeed conclude that (i) online programmes must be imbued with social constructivist learning concepts and use text-based asynchronous discussions as the main learning approach; and (ii) the online educator must play a very important and central role in the effectiveness of digital learning [27], [28], [29]. Many authors also argue that successful digital programmes require a strong "teaching presence" that is defined as "the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" [30]. Garrison also notes that a correct and sustained teaching presence in digital learning is "a significant determinant of student satisfaction, perceived learning, and a sense of community" [5].

Many authors also argue that the unique characteristics of the virtual learning dimension can also create obstacles to the learners, particularly in terms of social presence which many deem important for establishing a community of learning which increases cognitive involvement and reduces the sense of

isolation that learners on all forms of distance learning suffer from. The same authors argue that the presence of an adult educator is central in maintaining social presence.

However, can the ever-increasing sophistication in automation 'substitute' the online educator? Unfortunately, there is scant scientific research to provide a rigorous answer to this question. Examples of good practice do however indicate that by using technologically-sophisticated course management and delivery platforms many of a teacher's actions can indeed be automated [20]. Proof is slowly emerging, particularly from providers, that the technology (for example, augmented reality and simulations) and methods available for self-directed learning in the online dimension can provide effective learning experiences that are as efficient as non-online experiences. These self-directed learning tasks can also be integrated within teacher-led constructivist online or face-to-face courses, thereby reducing the normal costs of such courses which are usually teacher-intensive.

Yet, the implementation of such systems often requires an upfront set-up cost and licenses that run on monthly/annual basis. However, the payback is a significant decrease in administration work which turns into substantial cost savings over time.

The greatest single scalability benefit of digital learning is the possibility to significantly reduce study time. According to a Brandon Hall Group study a decrease of 40-60% can be achieved by digital learning in corporate settings compared to classroom training [31].

2.1.3   Usability & Accessibility

Usability and accessibility of digital learning programs have become key issues for learners in terms of job satisfaction, engagement, support for productivity and active democratic participation. In today´s working life the mobile smartphone is a standard equipment for most employees and it has become the preferred access point for work-based learning. Studies show that mobile learning, particularly when delivered on a micro-modular structure, has some specific advantages. Mobile learners are better motivated to study compared to when using a computer, they achieve better learning outcomes and they are willing to learn more [31], [32], [33], [34]. Mobility provides seamless, continuous access to learning which is known to make employees more connected to their roles, thereby increasing belongingness, retention and productivity [5].

3   CASE STUDY: THE DIGITAL ONBOARDING PROGRAM

This section introduces a case example, where a company operating in electronics manufacturing industry replaces a classroom-based onboarding program with a digital program. Through the transition it gains substantial benefits and savings.

3.1   Background

The company employs 200 new employees every year. Until last year new employees have been taken to classroom-based onboarding training lasting one day (8 hours) at the company headquarters. Due to the limitations of classroom training some employees have not been able to participate in the training on time and there are also some that have not completed the training at all. The decision to develop and implement a digital onboarding program was made by the management to allow for more flexible training and to provide an equal opportunity for all new employees to participate in the training on time.

3.2   Program development and implementation

After reviewing potential options to replace the old training program, a decision was made to develop a custom program with the help of a dedicated digital learning service provider. Simultaneously, a cloud-based training management system was to be implemented to allow for more efficient training administration and follow-up. The plan was to produce a series of small online study modules which would be available 24/7 to all employees. 3 hours of self-study material replaced the full day training program which was previously delivered in a classroom. The following table describes the key principles of digital learning implementation and the estimated value/impact that was generated.

Element/Phase	Activity carried out	Value/Impact generated	%	€
Design & Development	Outsourcing the development of online modules to dedicated service provider, ensuring high quality and "fit-for-purpose" of the training	Total investment of 22540 = increase of 14300 compared to classroom training	+ 310%	Direct savings in training development & delivery **15620 €** (-28,3%)
Running & Administration	75% of training administration tasks were replaced by automated administration (registrations, follow-up on training progress, testing, certification, post-training follow-up)	Decrease of 880 in running & administration cost (5840 >> 4960)	− 15%	
	Study time reduced from 8 (classroom) to 3 (online) hours	Reduction of 1000 training hours (1600 >> 600)	− 329%	
Usability & Accessibility	High-end onboarding program is provided to all employees on demand with full mobile support and additional resources and opportunities for continuous learning	Increase of 52% in staff retention (85% >> 92,8%) = 15,6 employees more retained every year	52%	Indirect savings due to increased retention **299 520 €**
		Improved time to productivity	Up to 60%	**???**

Table 1. Activities of digital learning implementation and value/impact generated

The calculation was made by using actual cost averages (e.g. wage) and the *Return on Investment calculator* [36] developed to compare costs of different training options (classroom, online, blended). As the table shows, a substantially higher up-front investment is required to design and develop the new digital learning program and to implement the follow-up system. Savings are generated from less time and resources spent on course administration and, most importantly, massive study time reduction. This factor makes the greatest single impact on the return on training investment and when the number of participants increases, savings increase nearly exponentially. The possibility to access the program via mobile device anytime, anywhere means that all new and existing employees can now participate the program and engage with company policies, practices and information relevant to their working role. There is access to additional, continuous learning resources, which should foster engagement and commitment towards the employer, and their colleagues. Before the launch of the program the staff turnover rate among new employees was 15% and there were challenges in productivity. Based on a number of case studies the expected increase in staff retention and productivity due to better access to high-quality training can generate multiple financial returns and increase the overall quality of operations. Precise calculation of these benefits is, however, very difficult. To be able to provide exact figures, all other factors that may impact the return on training investment, should be isolated.

4 CONCLUSIONS

The findings of the case study [36] reported above suggest that, if a digital learning programme has the key elements mentioned earlier in Section 2 of this paper, a number of benefits can be achieved. These include

- Time-efficiency: reductions in time used for administrating and studying courses frees up resources for other tasks and saves money.
- Employee engagement: better employee engagement decreases staff turnover and generates substantial cost-savings when less employees leave the company. Engagement has very positive impact on productivity as well.
- Productivity: carefully targeted training to all employees with continuous learning opportunities increases productivity substantially. Every Euro spent on high-quality training brings multiple returns.

- Staff retention: acquiring and maintaining skilled workforce is increasingly difficult in today's highly competitive labour market. The most efficient way to keep retention rates high is by providing on-going training opportunities for staff.
- Cost-efficiency: digital learning can bring massive cost-savings, but they realize to the company's benefit only when training is carefully targeted and high in quality. A comprehensive digital learning strategy and application of learning design principles in course development can help SMEs achieve scale benefits.

These benefits achievable by digital learning are most often applicable to SME companies as they are for larger companies. There are some limitations, however, including cost-efficiency and scalability. Digital learning often requires a larger upfront investment than in instructor-led classroom learning provision. With smaller target audience scalability benefits and financial returns are more difficult to achieve. In the case example introduced in section 3 of this paper, the overall cost of digital training program is greater if there are less than 96 participants to the program. With more participants and when the program is repeated, however, the cost-efficiency ratio increases very fast. This means that SME companies should carefully prioritize in which areas and how they apply digital learning and where other methods, such as face-to-face or educator-led online programs, are used. Scalability does not have to limit to internal staff training, however. By developing programs that are accessible to partners and clients as well (e.g. product and service training) it's possible to achieve greater cost benefits. Another solution might be the pooling of resources from SMEs within the same economic sectors and/or providing the same services.

The findings also indicate that there are other advantages in using technologically-sophisticated course management and delivery platforms. Some of an educators' actions, including testing and motivation, can indeed be automated. However, further and more in-depth research is required in this area.

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