



FH MÜNSTER
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ENTREPRENEURSHIP IN A DIGITALIZATION ERA



The next generation of entrepreneurs maneuvering
venture creation processes under the influence of
digital technologies

Digital and entrepreneurial competencies | Venture creation process

A scientific whitepaper of the Science-to-Business Marketing Research
Centre of FH Münster University of Applied Sciences

Science Marketing

Science-to-Business Marketing Research Centre

„In every process of the venture creation, technology plays a role.“

- An expert's answer to the question of how digital technologies are impacting the venture creation process.



ABOUT US

This scientific whitepaper was prepared by the participants of the research seminar at the FH Münster University of Applied Sciences under supervision of research associate, Judith Helmer, und supported by the graduate assistants, Selin Kozat and Leonie Pöter, from the Science-to-Business Marketing Research Centre.

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INTRODUCTION

Relevance and focus of the study

As digitalization and the Internet continue to reshape our world, technological entrepreneurship has become increasingly vital. Recent developments in technology highlight the need for a comprehensive review and evolution of digital entrepreneurship (Giones & Brem, 2017). Giants like Google, Microsoft, Facebook, and Apple have revolutionized communication and business practices, leveraging artificial intelligence to transform processes and decision-making (Kraus et al., 2018).

In the evolving paradigm of global dynamics, the transition from a VUCA, characterized by Volatility, Unpredictability, Complexity, and Ambiguity, has given way to a BANI World (Le Roux & Sutton, 2022). The latter term, characterized by Brittle, Anxiety, Non-Linearity, and Incomprehensible, was notably articulated by the anthropologist and futurologist Jamais Cascio in the context of the COVID-19 pandemic's systems disruptions (Le Roux & Sutton, 2022). Moreover, the COVID-19 crisis acted as a catalyst for digital transformation, leading to a quantum leap in digitization (McKinsey Insights, 2020; Initiative D21 e.V., & Kantar Health GmbH, 2021).

Entrepreneurship thrives when individuals seize opportunities and transform ideas into cultural, financial, or social capital for society (Mccallum et al., 2018). With the existence of digital technologies and the numerous ways to integrate technology and entrepreneurship, traditional boundaries seem less limiting, creating new avenues and opportunities for entrepreneurial endeavors (Nambisan, 2017; Giones & Brem, 2017).

The process of starting a business can take different forms, but certain fundamental stages can be identified (Helmer et al., 2021). Successfully navigating these stages requires specific entrepreneurial competencies. Two current models - [EntreComp](#), which lays the foundation for entrepreneurial competencies, and [DigComp](#), which highlights different competencies related to the use of digital technologies - provide different frameworks (Bacigalupo et al., 2016; Vuorikari, 2022). However, empirical studies exploring the link between these models, and consequently the impact of digital technologies on entrepreneurial competencies in the [venture creation process](#) are currently lacking in the literature.



In light of this research gap, the present paper adopts an exploratory research method, drawing insights from semi-structured expert interviews to investigate the influence of digital technologies on the venture creation process and the link between digital and entrepreneurial competencies. The overarching research question guiding this investigation is thus:

[How does the use of digital technologies influence the skills of entrepreneurs in their venture creation process?](#)





Foundations on digital competencies

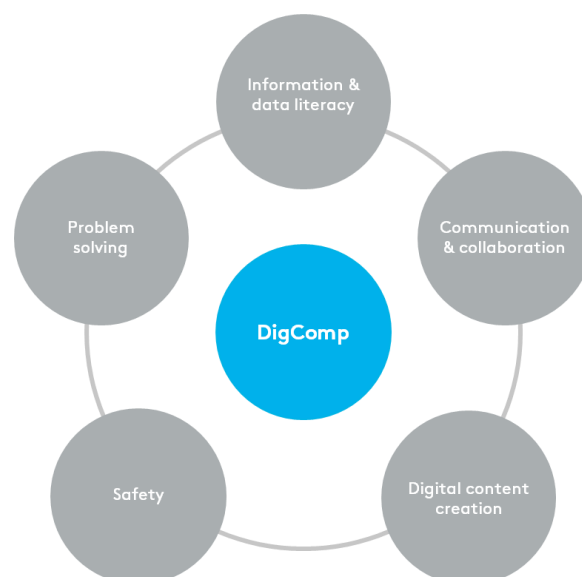
Digitization transforms the properties of technologies and affects technology entrepreneurship and entrepreneurial processes (Giones & Brem, 2017). The path of the digital process has challenged the traditional concept in which a single individual assumed all venture-related risks and resource gathering (Garcez et al., 2022). Due to low marginal cost of development of digital technologies, digital technologies permeates entrepreneurial practices, which calls for precise exploration of the implications (Nambisan et al., 2019).

This paper considers digital technologies by Bharadwaj et al. (2013), which includes hardware, software, and global connectivity (e.g., the Internet and mobile networks) – optimizing business infrastructure for the lower cost/performance of the digital epoch (von Briel et al., 2018). In a changing civilization, Internet competencies emerge as a vital asset due to increasing data dependency (van Deursen & van Dijk, 2011). Competence is a vision that contains numerous applications, and models of entrepreneurial competence are leveled in these different methods to and ideas of the concept of competence (Mitchelmore & Rowley, 2010).

DIGCOMP

Digital competencies are the cluster of knowledge, skills, attitudes and techniques for using information and digital media to achieve tasks, solve issues, communicate, manage data, cooperate, develop, and share content (Mattar et al., 2022). These competencies are becoming fundamental for modern citizens (van Laar et al., 2017). The framework of DigComp consists of digital competencies that involve the secure, essential, and responsible usage of DT for studying, professional use, and community participation (Vuorikari et al., 2022). It encompasses several areas that are shown in figure 1:

Figure 1: Framework of DigComp



Source: Own illustration based on Vuorikari et al. (2022)



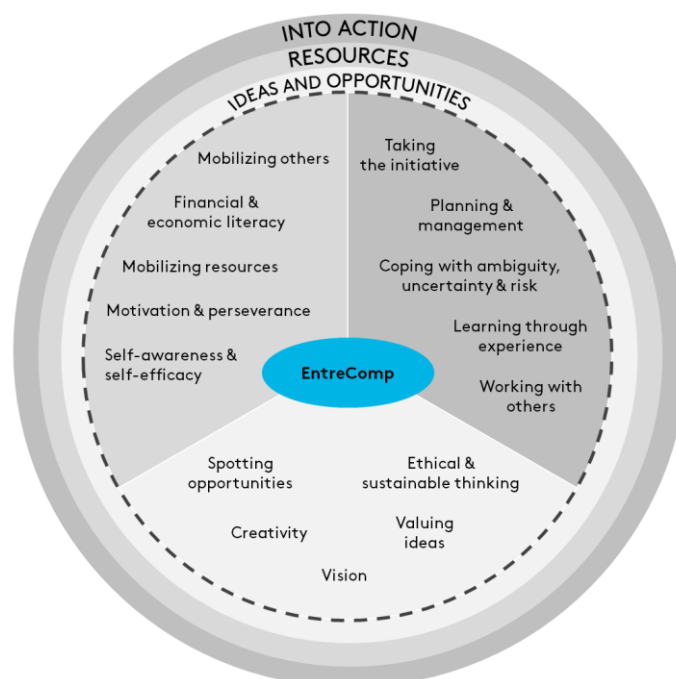
ENTRECOMP

The convergence of entrepreneurship and digital technologies is creating a new breed of entrepreneurs who are adept at using digital technologies and the Internet to drive venture development (Elia et al., 2020; von Briel et al., 2018). Since the knowledge of entrepreneurs is essential for the creation and development of new ventures, a better understanding of what entrepreneurs do would greatly benefit the growing discipline of entrepreneurship (Mueller et al., 2012).

Entrepreneurial competencies drive value creating in the start-up process by combining digital competencies to effectively establish new ventures (Mitchelmore & Rowley, 2010). By integrating and applying digital technologies, ideas can be transformed into valuable outcomes (Vuorikari et al., 2022). Founded to create a standard reference framework for entrepreneurship, EntreComp embody success characteristics that are aligned with future career expectations (Seikkula-Leino et al., 2021). It supports active community participation, effective management of personal and professional life, and value-creating initiatives (Bacigalupo et al., 2016). EntreComp elucidates the essence of entrepreneurship and provides a progressive model of learning outcomes that can boost teaching both within and beyond the globe of traditional education (Mccallum et al., 2018).

The EntreComp wheel provides a concise overview of related competencies, supporting the development of entrepreneurial skills and mindsets for practical application and making it useful for creating new training or adapting learning materials and assessments (Mccallum et al., 2018). It consists of following three interrelated competency areas (see figure 2): Ideas and opportunities, resources, and into action – with five competencies in each area (Seikkula-Leino et al., 2021).

Figure 2: Framework of EntreComp



Source: Own illustration based on Vuorikari et al. (2022)

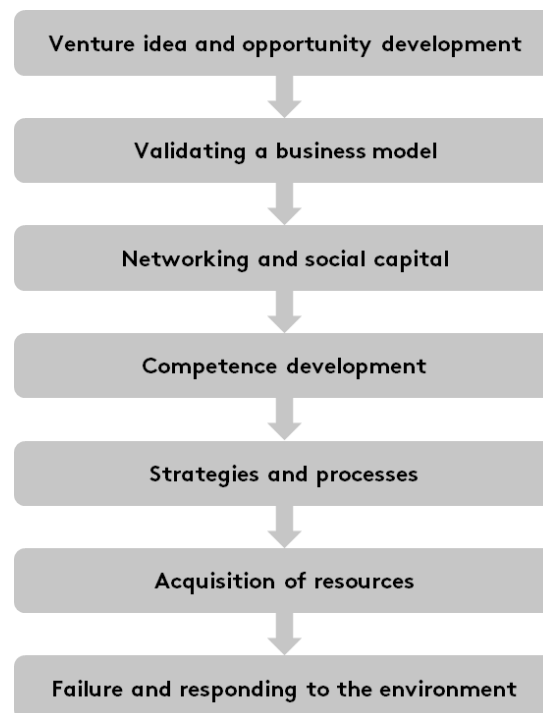


VENTURE CREATION PROCESS

Throughout the start-up process, the entrepreneur's initial inspiration drives the essential stages of launching a new venture (Mazzarol & Reboud, 2020).

The venture creation process provide several essential guides and steps that are applicable to all start-ups, regardless of their business type or market (Parra et al., 2022). It consists of the following stages that are shown in figure 3 (Davidsson & Gruenhagen, 2021; Amao-Taiwo, 2019):

Figure 3: Venture creation process



Source: Own illustration based on Davidsson & Gruenhagen (2021); Amao-Taiwo (2019)

Most successful start-ups do not apply standard plan preparation; pushing entrepreneurs to formulate formal documented business plans before starting may only hinder progress (Mazzarol & Reboud, 2020). Start-up and growth entrepreneurs focus their activities on three essential processes: However, start-up entrepreneurs in particular need more time resources for environmental scanning, while later-stage entrepreneurs spend significantly more time on business development (Mueller et al., 2012).



METHODOLOGICAL DETAILS OF THE STUDY

The goal of this study was to expand the existing knowledge on the competencies an entrepreneur needs during the venture creation process in today's digital era. Especially the following three questions were investigated:

- 1 How do digital technologies influence entrepreneurs during the venture creation process?
- 2 How do digital technologies impact the necessary skillset of an entrepreneur?
- 3 How is the influence of digital technologies evaluated by entrepreneurs?

Furthermore, this study seeks to use the practical knowledge gained to propose a framework that creates a link between the digital competence framework and entrepreneurship competence framework and can be used by current and future entrepreneurs to be informed about necessary competencies during the venture creation process in today's digital world.

SAMPLING

The target population has been founders, co-founders, and entrepreneurs who have founded a startup in the near past. Therefore, the criteria for the sample were as follows:

- Potential interviewees must have founded at least one start-up within the last five years.
- They must know digital technology and understand them at least at a basic level.

The criteria exclude information on the size of the company and previous academic career as is not of interest to our research question. Sampling was done through an internet search and acquaintances, as well as identifying suitable entrepreneurs for our research.

RESEARCH PROCESS

● INTERVIEW PREPARATION

Preparation of a standardized interview guideline that contains predefined and formulated questions, open-ended questions and narrative prompts aimed at generating as much expert knowledge as possible.

● INTERVIEW CONDUCTION AND DATA COLLECTION

9 interviews were conducted with entrepreneurs from different sectors and recorded via the video conferencing platform Zoom. The interviews took place from October 22 to November 22.

● DATA ANALYSIS

The interviews were analyzed with the data software MAXQDA. During the systematic coding process, data-driven in vivo codes and theory-driven a priori codes were used, while the following two-order data analysis was consistent with thematic analysis based on grounded theory (Saunders et al., 2016, Gioia et al., 2013).



October 22 – November 22



9 entrepreneurial experts



9 sectors

- Project management
- Consultancy
- Live advertising
- Gastronomy
- Online marketing
- Manufacturing
- E-commerce
- Clothing
- Real estate

The most important results of the study are presented on the following pages. First, the influence of digital technology on the venture creation process will be investigated, followed by the link to EntreComp.



FINDINGS

Digital technology in the venture creation process

PERCEPTION OF DIGITAL TECHNOLOGY

GENERAL PERCEPTION OF DIGITAL TECHNOLOGY

Both entrepreneurs with nondigital and digital business models were selected as interviewees, because the latter might have a strong connection to digital technology due to their business model. Regardless of this heterogeneous group, the interviews revealed that all entrepreneurs use digital technology in various ways.

To be able to identify a given level at which digital technology is used, the interviewees were asked about their use of digital technology as private individuals and entrepreneurs. In order to describe their digital skills, the experts mainly explained digital technology and their usage, rather than giving specific descriptions of a skill level. Thus, the use of digital technology has been considered a digital skill, and the latter is not further differentiated into skill levels or the like.

INFLUENCE OF DIGITAL TECHNOLOGY ON THE VENTURE CREATION PROCESS

Insight 1: "In every process of venture creation, technology plays a role."

Digital technology has shown to be **useful in every step** of the venture creation process with a versatile and extensive influence or at least are seen as a useful tool - across industries and business models. At least seven companies used digital technology in every step, and all entrepreneurs use it in at least six stages of the venture creation process. The following **tools** were **used the most**:



In general, digital technology is perceived to act as enabling and supportive of the venture creation process. It simplifies processes and procedures and can increase a venture's efficiency. Furthermore, it can help with saving resources throughout the process.

The following [providers of digital technology](#) appeared to be especially important during the venture creation process:



Sample responses from participants:

"In general, I believe that technologies make the whole venture creation process, i.e., the hurdles of building or testing a company in the first place, as well as discarding a business model, easier."

"The internet and all the facets and technologies that go with it offer a huge pool of possibilities for finding ideas."

"I think we live in a super digital, networked world. For which digital solutions are needed and therefore, of course, also digital competencies."



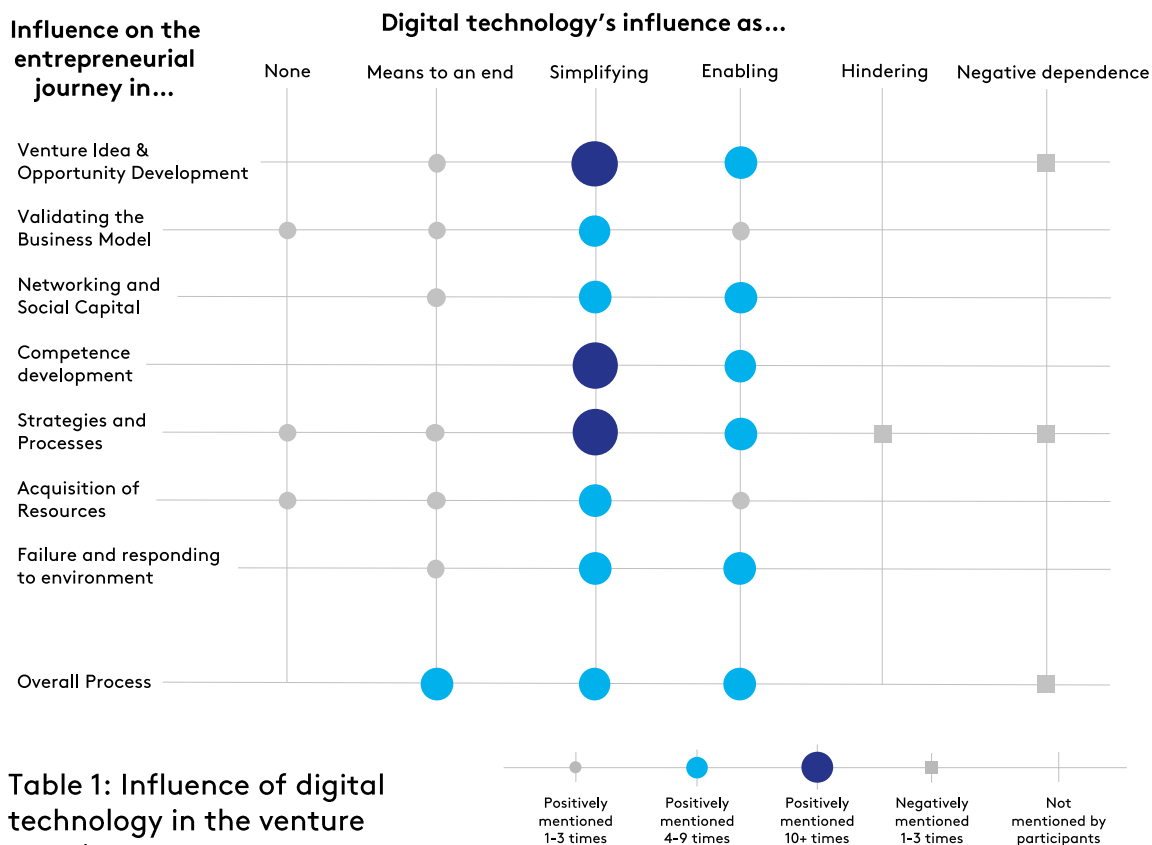
FINDINGS

Digital technology in the venture creation process

INFLUENCE OF DIGITAL TECHNOLOGY

The perception of digital technologies' influence appears to vary greatly, from no influence to more or less strong positive presence to even having a negative impact. The figure below illustrates the perceived influence digital technologies have in every step of the venture creation process and on the following page, you can find more detailed insights.

The following applies to the graphic: the bigger and darker the circle, the more interviewees mentioned the specific level of influence for the distinct process step. "Total" here represents statements that could not be assigned to a specific process step but relate to the overall process. For instance: the simplifying influence of digital technology has been mentioned quite often for all process steps.



When looking at the different perceived levels of influence shown in the figure, it is noticeable that some of the participants perceived digital technologies as having **no relevant influence** on their venture creation process at all. For instance when discussing strategies, „recording or developing them there with paper and pencil or blackboard and pen or window pane and pen“ (Interview VIII) was mentioned as the preferred method over using digital tools, while one of the experts stated: „The main part of how we get our money is that we work ourselves. So I'm not entirely sure whether digital technologies (...) help us here“ (Interview VII).

For others, „technology plays a role in every venture creation process, but still, technology is usually just a **means to an end**“ (Interview I). Here, processes were perceived as „clearly linked to digital technologies“ and „in general (...) always digital“ while „the strategic is more supported by it“ (Interview I). **Simplification** of the venture creation process through digital technology was mentioned most by the participants. In networking, „it is a help (...) because it opens so many windows to be quick to reach as many people as possible“ (Interview VI) and as for opportunity development, „technologies are a huge enabler and make this very easy, also automate a lot and make the whole thing scalable“ (Interview I).

And some experts even saw digital technologies playing an **enabling** role in their venture creation. Looking at the venture idea, one participant stated: „As soon as my idea is just in my head, I cannot work with it. It's nothing. But I need to use digital tools to make it become reality, to show it to others, and also to be professional“ (Interview VI, Pos. 69). Validating the business model is described as greatly influenced, as „nowadays we actually have many methods and digital tools that actually make it possible to do things in a very lean way (...). This means you can test models very quickly and very easily but also reject them. without having wasted a lot of resources“ (Interview I).

Still, the presence of digital technology is not only seen as positive in venture creation, but sometimes is perceived as a **hindrance** for strategies and processes, as „it can also sometimes lead to people becoming more one-sided and then digital media being overrated“ (Interview VIII) or people being so used to the digital availability of information and digital processes that they can no longer cope with unadapted processes (Interview IV).

Finally, some of the experts even described a compulsion to use digital technologies, „because otherwise you would need far too much time, this information, which is now available through digital technologies, i.e. the Internet, apps and so on and so forth, you get it so quickly and at short notice that you wouldn't be able to do it without it“ (Interview II). That indicates a possible **negative dependence** on technologies, because at some point technology not working can lead to, people not being able to work, or as one of the interviewees summed it up: „without the digital technologies our startup definitely would not work“ (Interview VII).

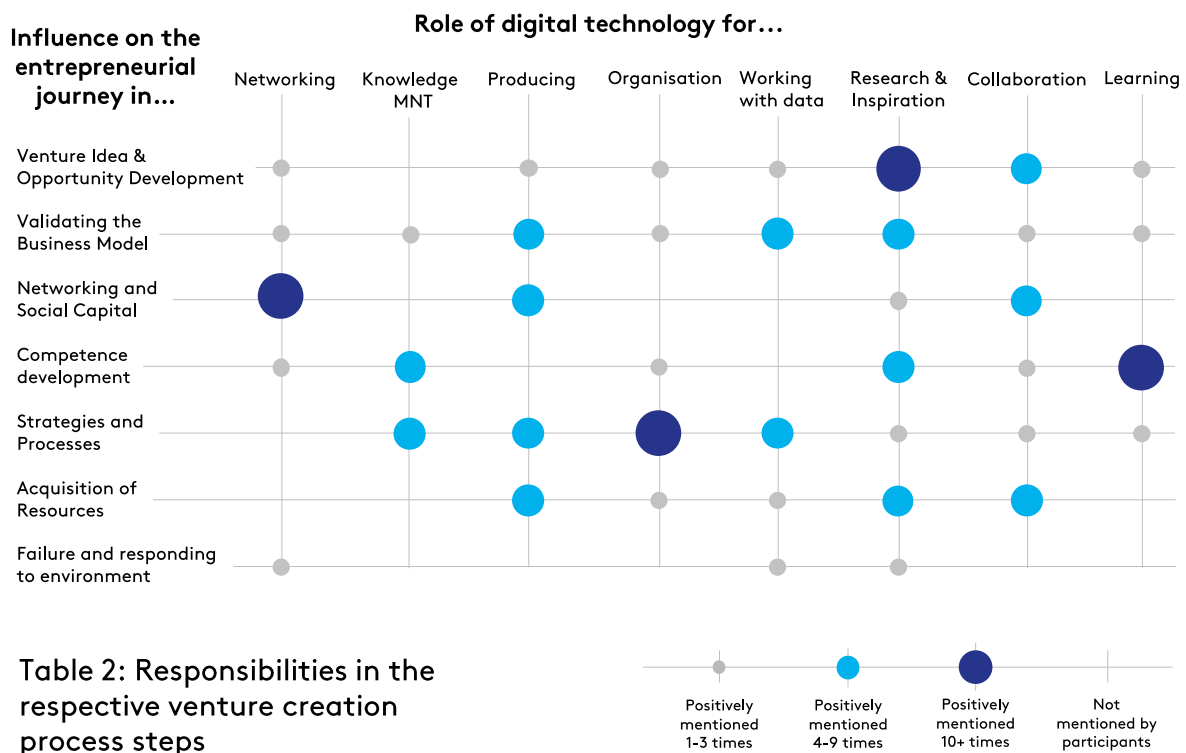


FINDINGS

What do the experts say?

ROLES OF DIGITAL TECHNOLOGY

Beyond the level of influence, digital technology was shown to play various roles in the venture creation process. The figure below illustrates the different roles that emerged in the interviews and the frequency with which they were mentioned for the respective process steps. Firstly, digital technology appeared to contribute to **networking**, helping to connect with people such as potential employees or customers. It also is a factor in **knowledge management**, supporting companies in making knowledge accessible company-wide. The **producing** role of digital technology refers to its part in content creation, marketing measures or presentations. Furthermore, digital technology was named relevant for the **organisation** of a business and its processes. **Working with data** is another aspect where digital technology was mentioned and describes its role in collecting or analysing big amounts of data. The involvement in gathering information is summarized under **research and inspiration**, while **collaboration** refers to digital technology taking part in people being able to work together. Finally, the category of **learning** refers to digital technology being a tool involved in the building of knowledge and skills.



LINK BETWEEN ENTRECOMP AND DIGITAL TECHNOLOGY

Insight 2: Digital technology acts as a catalyst that makes it possible to exercise certain entrepreneurial competencies at a more intensive level.

None of the interviewees stated that digital skills are among the top 3 entrepreneurial skills. However, the responses show that the influence of digital technology on entrepreneurial skills is nevertheless very strong. In general, the following insights on the link between EntreComp and digital skills appeared:



The majority perceives the influence as positive.



However, they also perceived a high dependence on digital skills and indispensability of digital technology to entrepreneurial competencies.

2/3

of the interviewees link the success of their company to digital technology, assuming it makes scaling successful.



Internet and social media are described as positive influences in many places as well.



Still, digital possibilities are not described as a substitute for entrepreneurial competencies but seen as a catalyst or support.



However, digital technology comes with possible constraints, e.g., competitors having better digital skills, leading to a competitive disadvantage.

Thus, digital technologies can be understood as an additional layer or toolbox in the context of the EntreComp wheel. In their versatility, they permeate the entire daily work routine and touch and influence almost all competencies of entrepreneurs. Especially with the volatility, unpredictability, complexity, and ambiguity of today's world, digital technology can offer a competitive advantage over others who rely solely on their entrepreneurial skills by giving “a time advantage that the other one can't catch up” (Interview II) when it comes to adapting to changing market dynamics. However, if you want to leverage this additional toolbox, digital technology must be mastered with competence as well.

Looking at the specific competencies included in the EntreComp model, there were several for whom digital technology was mentioned as only having a positive influence offering inspiration, support and more efficiency. In the area ‘resources’, those were ‘mobilizing others’, ‘mobilizing resources’ and ‘motivation and perseverance’. For ‘ideas and opportunities’, the ability of ‘spotting opportunities’ appeared to be solely positively influenced. The same goes for the ‘into action’ competencies ‘planning and management’ and ‘working with others’.



FINDINGS

What do experts say?

ROLES OF DIGITAL TECHNOLOGY

Below, you will find more detailed insights on the influence of digital technology on the three individual areas of EntreComp.

INTO ACTION

‘Learning through experience’ is described by many entrepreneurs, offering the possibility of expanding the wealth of experience through digital networks and learning from the mistakes of others. Additionally, experience "can be better quantified and qualified" (Interview VIII), so "that you can relate to the data" (Interview VII).

Entrepreneurs also perceive a strong positive influence of digital technology in the competence ‘Planning & Management’, where it supports everyday work and structuring. For ‘Working with others’, it is stated that "through digital capabilities, you are free to move around and are not excluded from certain levels or forms of communication" (Interview VIII) and that this level is "without tools again unfeasible" (Interview II).

RESOURCES

Digital networks are especially relevant here, as for half of the respondents, ‘mobilizing resources or others’ works via digital tools, but particularly via networks. Another influence can be seen in the area of ‘motivation and perseverance’: 1/3 of the interviewees consider social media - especially influencers - to be a major motivation source. The latter is also relevant in the competence ‘self-awareness & efficiency’ for one interviewee, whereas another says that digital technology and entrepreneurial skills are "completely decoupled" (Interview VIII) here.

IDEAS AND OPPORTUNITIES

For many entrepreneurs the competence ‘creativity’ is characterized by inspiration from people in online networks or digital sources of information. The same is stated regarding the competence ‘spotting opportunities’ – 2/3 stated that they felt positively influenced by digital sources of information and inspiration.



A LOOK INTO THE FUTURE



Overall, **digital technologies** are described as a **means to an end** and a **supportive tool** that helps entrepreneurs maneuver through the venture creation process and 'make life easier'. To use this type of support, the tool **must be mastered with competencies**, which can be overwhelming given the wide range of providers and intended uses. Also, in contrast to the existing literature, respondents perceive digital technology as a (high) **cost factor**.



The **influence of digital technology** is **predominantly** perceived as **positive** in all three areas of EntreComp, as it has efficiency-enhancing, supporting and inspiring effects according to the respondents. It emerges, that the **entrepreneurial competencies** perceived as **most important** are **most influenced** by digital technologies.



Particularly **strong added values** from digital technology and the presence of digital capabilities emerge for entrepreneurial competencies **in the EntreComp areas of "Resources" and "Into Action"**. Digital tools and platforms are seen an important source of internal and external communication and can be used to make planning and management processes more efficient.



However, there also appears to be a **certain dependency on digital technology**, where EntreComp is constrained without digital capabilities in today's digital world.



It remains to be clarified whether the influence of digital technology on individual entrepreneurial competencies is evaluated as a help or a limitation by entrepreneurs. This would require further research to specifically ask about the negative influences of digital technology on the venture creation process and entrepreneurial competencies. Additionally, future research could explore the relationship between the level of digital competencies and the perception and classification of digital technology as a challenge or support.

Sample response from participants:

"Technology is a means to an end. The idea the competence to analyze and interpret data is of course, independent of technology."



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