Mind the Gap: Investigating the Transfer of Digital Capabilities from the Classroom to the Business in SMEs

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Abstract:

Objectives: Digital transformation is critical for business productivity, innovation, and growth (BEIS, 2019; OECD, 2021). However, SMEs often lag behind larger firms in digital adoption (OECD, 2021). Learning factories, designed to improve digital capabilities, are one approach to addressing this gap. These spaces focus on teaching specific technologies and the strategic aspects of digitalization. Despite their popularity, there is limited research on their practical impact, particularly in SMEs. Our study explores how participants in learning factories embed their digital learning within their organizations, examining both the barriers and enablers to this process. While much scholarship focuses on individual learning, we investigate the relational dynamics that support digital transformation in SMEs.

Prior Work: Learning factories are often grounded in an acquisitionist view of learning (Elkjaer, 2004), assuming that individuals can transfer their newly acquired skills throughout the organization, thereby fostering digital transformation. However, this view overlooks the relational nature of organizational learning. There is evidence in the organizational learning literature to suggest that digital transformation cannot be achieved solely through individual capability development, as organizational learning is more than the sum of individual knowledge (Argote and Miron-Spektor, 2011). Recent research highlights the importance of relational factors, such as a digital mindset and leadership skills, in enabling digital transformation (Nadkarni and Prugl, 2021; Hanelt et al., 2021). Our study argues that focusing on these relational dynamics provides valuable insights for digital transformation in SMEs.

Approach: We conducted qualitative research with 77 SME practitioners who attended learning factory programs. Participants engaged in group reflection sessions using LEGO Serious Play®, reflecting on their organization's digital transformation and identifying barriers and enablers. Three months after the program, semi-structured interviews were conducted to assess whether and how participants applied their learning within their organizations.

Results: Our findings reveal that digital transformation in SMEs is not just a technical challenge but a relational one. Practitioners who engaged others in their organization and built support for digitalization were more successful in applying their learning. Those who created opportunities to showcase their digital skills in ways that resonated with different audiences facilitated the integration of new capabilities. Relational embeddedness, trust, and collaboration enabled these practitioners to access resources and feedback necessary for successful digital transformation. Confidence and self-efficacy also played a key role in scaling digital capabilities from the individual to the organizational level.

Implications and Value: Our research highlights the importance of relational dynamics in digital transformation, contributing to the literature by linking individual digital learning to organizational-level transformation. The study provides insights for designing learning factory programs and has practical and policy implications for supporting SMEs in their digital journeys.

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Introduction

Digital transformation is widely recognized as a game changer for businesses and economies. At the organizational level it stimulates productivity, innovation and growth (BEIS, 2019; OECD, 2021), which, in turn, has important economic benefits nationally and globally. Despite the importance of digital transformation, it is well-evidenced that small and medium enterprises (SMEs) tend to lag in digital adoption, behind larger firms (OECD, 2021). A survey of 803 SMEs, undertaken for the Department for Business Innovation & Skills in 2015, found that only one in five SMEs reported that their ability to use digital technologies is 'good' (BIS, 2015).

Learning factories have emerged as a popular policy initiative to address the capability deficit by improving digital capabilities of SME practitioners (OECD, 2021). For example, the UK's Department for Science, Innovation and Technology has made £6.4 millions of grant funding available to help small and medium-sized enterprises pay for AI-related skills training (DSIT, 2024). This is in addition to other popular UK funding schemes, like 'Skills Bootcamps' and 'Help to Grow' that are run with a financial backing of £550 millions, that are aimed at supporting SMEs with digital adoption. Similar learning factories are offered by the private sector as well, like Mastercard's Strive UK program to connect SMEs with the right digital technology and skills by providing free training.

Learning factories are digital or physical learning spaces focused on training skills and competences for specific technologies, strategic aspects of digitalization, and overall benefits of technology. However, learning factories are often based on the assumption that participants will transfer their individual learning throughout their company to build organizational digital capabilities. This outlook comes from an acquisitionist perspective, which emphasizes the role of individuals' cognitive capacities to acquire relevant capabilities (DiBella et 1996). With an over-emphasis on individual learning and capability development, learning factories are portraying organizations as a collection of atomized individuals possessing knowledge that is just waiting to be linked together (Marshall, 2008). However, a more recent paradigm in organizational learning sees capability development as a social process. The central issue of learning and capability development is not an individual accomplishment relating to knowledge and skill acquisition and accumulation, but rather how organizational practices give rise to learning (Lipshitz et al., 2002). We argue, therefore, that digital transformation relies not only on acquiring digital capabilities at the individual level; it also relies heavily on the complex task of developing the right social and institutional context within the company to support capability knowledge creation, knowledge distribution, and knowledge interpretation. Despite this recognition, to date, little attention is paid to the social, political, and cultural contexts of SMEs that impact transformation of that individual learning into organizational capabilities. Drawing on an empirical study that utilized Lego Serious Play as the main research method, this paper investigates the experience of SME practitioners as they attempt to anchor digital capabilities gained through learning factories in their organizations.

Theoretical Background

Digital technologies have significantly transformed the way businesses are created, grown and sustained (Urbano et al., 2024). The current economic conditions have demanded that businesses embark on a digital transformation journey to improve their performance through technological capabilities (Heredia et al., 2022). Digital transformation has enabled companies to reduce costs, increase revenues and improve efficiency (Peng and Tao, 2022). Through digital processes, companies have also been able to become more resilient (Belitski et al., 2021), trigger innovation (Ferreira et al., 2024) and transform their business models (Correani et al., 2020). Indeed, a strong digital strategy is found to positively impact business market interactions and growth potential (Urbano et al., 2024). To achieve these benefits, it is necessary to nurture certain capabilities at the organizational and operational levels (Eller et al., 2020). However, there is evidence that highlights that SMEs remain at a disadvantage in developing these capabilities (Li et al., 2018). Therefore, the requirements for digital transformation are different in SMEs regarding competences and training.

Digital transformation is frequently emphasized as being especially difficult for SMEs as they may lack digital expertise and can experience constrained resources for large investments in their development (Jung et al., 2021). Despite the COVID-19 induced acceleration in digital transformation, pre-COVID barriers to SME digital transformation, including cultural barriers and lack of digital awareness and skills, still persist (OECD, 2021). For example, Li et al. (2018) in their study of SMEs that used Alibaba's e-commerce learning factory found that there were other factors beyond individual level skills and knowledge that affected digital transformation. These included managerial social capital

development, building a competent and diversified e-commerce team, and promoting an organizational culture that facilitates sharing and learning within and across the company.

Such barriers threaten the important organizational and economic benefits that accrue from digital adoption and transformation, as SMEs and entrepreneurs play a significant role in driving economic growth (Audretsch and Keilbach, 2008). The OECD (2021: 15) asserts that 'the SME digital gap has proved to weigh down on productivity and to increase inequalities among people, firms and places'. To address the challenges of digital transformation, there has been an exponential growth in policy initiatives to help SMEs with the financial and capability deficits that prevent them from undertaking digital transformation (OECD, 2021). However, it is still not clear whether the knowledge in adopting digital technologies is enacted by a person or a system, and whether this knowledge originates inside or outside the firm (Ferreira et al., 2024).

Learning factory style programs aimed at enhancing digital capabilities in SMEs are widespread. Learning factories started in the late 80's and early 90's and since then they have targeted various audiences like students, leaders and engineers. They were originally designed for the engineering sector but were more widely spread to facilitate teaching and learning in a practice-oriented format (Reining and Kauffeld, 2022). More recently, learning factories have been more established in the literature and industry to address challenges regarding innovation transfer, application of field research and education (Tisch and Matternich, 2017). The purpose of learning factories beyond developing a technological or organizational innovation is to develop a diversity of capabilities through training (Abele et al., 2015). They have been considered a learning system happening outside the firm where knowledge can be originated from problem-solving, experiential and/or situated learning (Tisch and Matternich, 2017) and can be seen as an alternative for SMEs to acquire digital capabilities.

However, learning factories are often based on a narrow definition of capability development that rests upon an acquisitionist perspective of learning (Elkjaer, 2004). The effectiveness of learning depends on the learner's ability to modify their environment in relation to the knowledge acquired in the learning factory and the intended objective in their companies (Tisch and Matternich, 2017). From this perspective, it is assumed that participants of learning factories will transfer their individual learning throughout their company to build organizational digital capabilities, acting as 'agents' for organizational learning and capability development (Friedman et al., 2005). With this over-emphasis on individuals' cognitive capacities to acquire relevant capabilities (DiBella et al., 1996), learning factories are portraying organizations as a collection of atomized individuals possessing knowledge that is just waiting to be linked together (Marshall, 2008). However, it is still unknown how the training in learning factories lead to actual competence development of the participant or to learning success in the 'real world' (Reining and Kauffeld, 2022). The impact of teaching methods require further examination as there are still questions whether these teaching methods are the most effective in stimulating improvements and change in the firms of participants (Tvenge et al., 2016). Digital transformation cannot be achieved by focusing on individual capability development, since organizational learning is not simply the sum of the learning of individuals within an organization (Argote and Miron-Spektor, 2011). Therefore, a relational lens is required to broaden understanding of the development of digital transformation capabilities in SMEs.

Whilst it is true that the digital skills gap amongst SME practitioners is, to some extent, hindering the identification of digital solutions and their adoption (Garzoni et al., 2020; Li et al., 2018), the value of adopting a relational perspective is also supported by recent research that points towards barriers and enablers that do not relate to specific competencies and capabilities individuals possess in using digital tools, platforms, and technologies. For example, a digital mindset which is defined as an individual's attitude, approach, and set of beliefs regarding the use of digital technology (Nadkarni and Prugl, 2021), as well as some broader leadership skills that relate to awareness, acceleration and harmonization of digital technologies (Hanelt et al., 2021). There are calls for research to focus more on the relational aspect of digital transformation from a social constructivist view where a collective negotiation between the firm's situation and digital application is examined (Reuter and Floyd, 2023). In this paper, we therefore argue that attending more closely to the relational embeddedness of individual within their organization offers new insights into fostering digital transformation of SMEs. Digital capability development in SMEs cannot be fully understood and supported without using social, political, and cultural lenses to study how digital capabilities acquired at the individual level in learning factories are transferred to the organizational level (Urbano et al., 2024). There has been little systematic analysis or evaluation of the interconnectivity between different levels of digital capability development, particularly in SMEs where business practitioners participate in programs delivered by learning factories.

Methodology

There is growing interest in management and organization studies in the use of participators visual methods for research that enable participants enable research participants to express themselves visually, such as asking them to create an artefact, draw or take photographs (Davison et al., 2012; Vince and Warren, 2012). Inspired by the work of Gauntlett (2007), we adopted the Lego Serious Play (LSP) methodology as a research tool, which is now used across a range of disciplines (McCusker, 2020; Rainford, 2020; Wengel et al., 2019). Our use of LSP is theoretically informed by material engagement theory (Malafouris and Renfrew, 2010; Malafouris, 2013) which posits that the cognitive processes are brought forth through the relational engagement of brains, bodies, and things. From this perspective, new materialities bring about new modes of thinking and create novel relations and understanding of the world (Knappett and Malafouris, 2008). According to Malafouris (2020), in fact, 'we think "with" and "through" things, not simply "about" things' (p. 3), and, therefore, describe human thinking as '*thinging*', to emphasize the active participation of thing in human cognitive life.

Gauntlett (2007) highlights how LSP enables participants to externalize complex, abstract thoughts through tangible, visual models, fostering insights that may remain hidden in traditional 'question and answer' methods. By engaging with material objects, LSP allows participants to move beyond the limitations of text and verbal expression, facilitating deeper reflection as they physically construct models and let thoughts surface in an emergent manner. This hands-on process bridges abstract thought and concrete action, granting researchers access to otherwise intangible aspects of participants' perceptions and experiences. The method also promotes critical and collaborative dialogue, supporting both individual and collective sensemaking in a co-creative, exploratory environment. The method is also argued to be empowering for the participants since they have a creative opportunity to express and explore something as part of the research process (Gauntlett and Holzwarth, 2006).

Sample and data collection

We have recruited 77 SME practitioners attending learning factory style programs delivered by three universities in Northwest and Southwest of England. The location the research has been conducted present important theoretical contribution in relation to digital capability development as a research context. The region where the two Northwest universities are located is below the UK average for productivity and productivity growth (Zymek and Jones, 2020) and is identified as a region that would benefit from digital transformation (Pulsant, 2021) given the positive correlation between digital capabilities and productivity growth (OECD, 2021). On the other hand, the city where the Southwest university is located is above the UK average for both productivity and productivity growth (Zymek and Jones, 2020) with an economy built on creative media, technology, electronics and aerospace engineering industries; and saw an increase in economic and labor market growth in software, IT and digital, surpassing growth elsewhere in England (WECA, 2021). The differing contexts provided by each region makes the choice of research sites significant, since they provide an opportunity to gain understanding of how the wider context, including business and labor market conditions and characteristics and skills of the working-age population, can influence the organizational anchoring of digital capabilities gained through learning factories.

Participants were drawn from five cohorts of three different learning factory-style programs that featured digital transformation and digital skills as a core feature of their structure and contents. During the program, participants took part in a group reflection session facilitated by LSP which involved Lego model-building activities to reflect on their organization's digital transformation, and individually experienced barriers and enablers to this. Specifically, after a few short Lego familiarization exercises that aimed to get participants use Lego models for metaphorical thinking participants were progressively asked to build three individual models: (1) representing themselves as a digital-maker, and then positioning themselves in their own organizational contexts that featured (2) experienced and/or perceived enablers and (3) barriers. To structure the reflection and debrief, we used the 'build-talk-build-talk' structure (Boden et al., 2019) that got participants to elicit verbal data as they talk through their models and what it represents. To encourage participants to flesh out deeper reflections and more nuanced comments, we have inquired into position, color, form, symbols chosen by making simple observation statements and probing into participants' thought processes (Boden et al., 2019).

Models were photographed, and their individual presentations and wider group discussions were video recorded and fully transcribed. Three months after the program, participants were invited to a semi-structured interview where they reflected on their learning from the program, and whether and to what extent they were able to transfer this learning to their organization. Interviews were audio recorded and fully transcribed.

Data analysis

In analyzing the data, we drew from Shortt and Warren's (2019) approach to visual analysis and combined dialogical and archaeological analysis in a three-tiered process. The dialogical analysis involved thematic coding of the transcripts of the individual presentations and wider group discussions (Saldaña, 2013). We have used descriptive coding (Saldaña, 2013) at this stage to summarize the primary topic of a passage within the data. This resulted in an inventory of topics, like 'strategic direction', 'team support', 'getting everyone on board', 'resistance'.

The second iteration began with an 'archaeological recognition' that the Lego models have a 'sedimented social meaning' signified through their visual. During archaeological analysis, we employed symbolic and compositional viewing (Shortt and Warren, 2019) and paid attention to the Lego figures participants chose as metaphors, what they have foregrounded or placed in the background, as well as to their compositional choices around layout and perspective. With symbolic viewing we began to see similarities and differences, for example, when we noticed participants commonly visualized themselves as a 'beacon of digitalization' who is 'on a mission' 'driving the change' and 'championing digitalization' when we when we spotted the compositional changes they made when they placed themselves on the steering wheel of a raft or another vehicle, often choosing bigger or more equipped Lego figurines to differentiate themselves from the other figurines in their models. Other important material signifiers that emerged through symbolic viewing were the materials they have used, for example solid brick structures to represent 'structure and organization' (or an absence of these to represent 'fragility and vulnerability') or connectors to represent 'team relations'.

Once we generated the first order codes through dialogical and archaeological analysis, we proceeded to pattern coding and developed 'meta-codes' (Saldaña, 2013, p. 209) to pull the first codes together into 'more meaningful and parsimonious unit of analysis' (Miles and Huberman, 1994, p. 69). For example, descriptive codes including 'destination', 'destination which is hard to get to', 'changing goal posts', 'goal alignment', 'strategic direction' were grouped under the theme 'goal orientation' to categorize the data based on thematic or conceptual similarity. The emerging analysis was corroborated and extended with the thematic analysis of the interview data.

Findings

The hero's journey

The analysis of the Lego models highlights a clear sense of personal agency. Rather than portraying digital transformation as a technical task, participants felt the sense of being able to do something meaningful in response to digitalization trends. The recurring imagery of participants portraying themselves as heroes on a journey, signals that they perceive themselves not as passive recipients of digital trends but as active, empowered drivers of transformation within their organizations. This sense of agency is reflected in their self-representations in the models below – holding symbols like torches, beams of light, or flags.

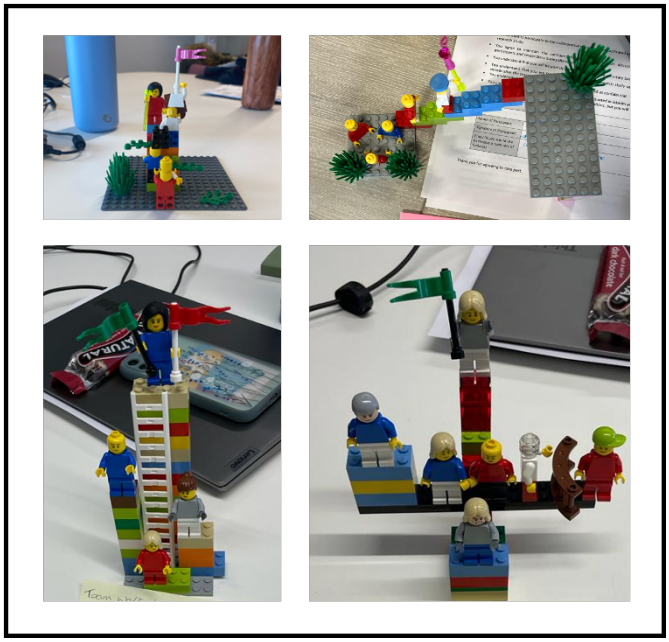

Figure 1. Participants' self-representation as active drivers of digital transformation

This journey entailed hardship and persistence, including considerable obstacles and impediments in an organizational context characterized by a range of challenges. Participants found themselves in situations where they were blindsided; in the models the destination was sometimes obscured and was hidden behind a wall or a shield. In their narratives the hero had to find ways to avoid injury or loss, whilst remaining engaged in their ultimate goal.

Figure 2. Visual representation of obstacles and jeopardy in digital transformation

The analysis of the Lego models pointed towards the role of incremental progress as an enabler. Several models visualized digital transformation as a stepwise process that symbolized gradual progression towards an ultimate goal depicted by flags, jewels or a treasure chest. In reflecting on their models, participants described how breaking down digital transformation initiatives into smaller, manageable steps fostered a sense of achievement and kept momentum going. Clear milestones provided participants with the structure and focus needed to make steady, measurable improvements in their organization's digital capabilities. Yet, in reality, they often faced an organizational context that was characterized with a lack of strategic direction and goal alignment and with changing goalposts. They reported feeling lost or frustrated and described the journey as daunting, leading to a lack of momentum and, in some cases, abandonment of new digital practices altogether.

Participant descriptions pointed towards the role of learning factories in building agency and confidence in this journey. Many of our participants found themselves in job roles that unexpectedly required them to develop and apply digital skills. While the job roles they were assigned to did not in themselves give meaningful agency, they certainly provided a context within which the participants discovered agency. Yet, this context also made them realize that they lacked the required skills and knowledge to act on the felt sense of agency. This individual skills gap often resulted in feelings of uncertainty and hesitation, particularly when they were thrust into tasks without structured support.

> *'When I joined the company, I was just purely going to events and doing business development for a couple of days a week. And then it became clear that nobody had kind of taken ownership of their social media. So that then became part of my job. And then I started looking at the website and then that came became part of my job. But I had no formal training though, no qualifications. I was just winging it really… I don't like to do something and not know. I don't like that kind of fluffy grey area. And some people are really good at ignoring the grey and just focusing on, I'm doing this. I need to know. I just didn't feel confident in my own abilities on that. And I just felt like I really needed a skill set to be able to go and say, "right, I've got this". And for my own self-confidence, because my confidence had drained away quite a lot. That was my motivation for joining the course.'*
> (Participant 4, Interview)

The skills and knowledge received in the learning factories were, in this regard, instrumental for equipping participants with technical know-how and practical, hands-on experience. Acquisition of technical knowledge came with a psychological shift as well. They felt more confident and competent

in applying what they had learned, which increased their sense of agency when they went back to their own organization.

> *'I just wanted to get more knowledge and then hopefully come out of it with a qualification as well, because I'd feel far more confident in my abilities knowing that I've done the course and then I've got a qualification from it… Not only I feel more confident in what I'm doing and what I'm talking about and but, in regards to me actually doing the course, my immediate line manager and the chief officer sort of get it more when they appreciate that I've done it and they feel more confidence in me.'* (Participant 3, Interview)

Multiple orientations and the emergence of the relational

When encouraged to place themselves into a wider organizational context replete with barriers and enablers participants quickly recognized the simplicity, and perhaps, naivety of the heroic representation of the journey to digital transformation. Here the analysis of the models suggests that digital transformation in SMEs is experienced not only as a technical and technological challenge but also a relational one. One participant summarized the barriers to digital transformation, as follows:

> *'When other people are getting in the way, that integration isn't happening… lazy team members, prickly relationships, not enough time with the manager and the champion, not being able to get to them. And skeletons in the closet represent the old way of doing things. Just getting in the way, stalling progress in general. It's quite interesting that all the barriers are people; human aspects… It's all about people and relations.'* (Model 1.4, Debrief)

This quote is emblematic of a core theme that emerged during the research: the notion that digital transformation is not solely about overcoming technical hurdles, such as integrating new software or upgrading infrastructure, but is inherently intertwined with human dynamics. Participants frequently cited interpersonal conflicts, such as difficult relationships, lack of buy-in from key stakeholders, and resistance to change, as significant obstacles.

Within this context, participants recognized the importance of engaging others in their organization and building a platform of support for digitalization, not only with their superiors but also their peers across the organization. The visual imagery of connectors and bridges in the Lego models reflected on the value of connecting with others confidently. When this did not happen, progress was obstructed due to dysfunctional relational dynamics, represented by disconnections, broken bridges and fragile structures.

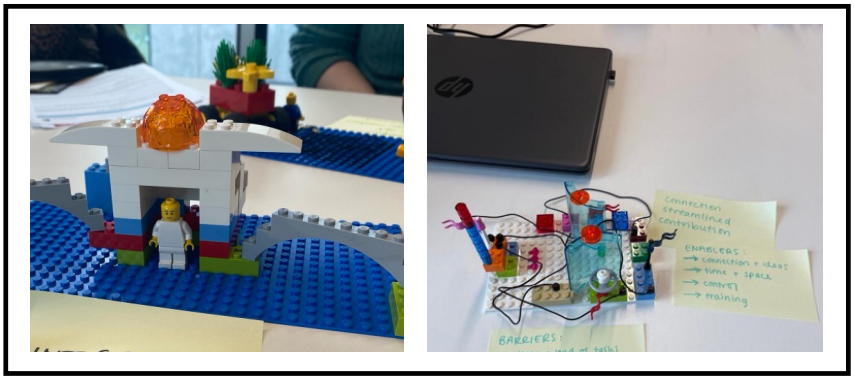

Figure 3. The theme of connections and harmony in the participants' models

Participants talked about the value of creating appropriate opportunities and venues to talk about and showcase their digital skills. Those who did this in a way that different audiences could hear and appreciate it, facilitated the organizational anchoring of new digital capabilities they gained through the learning factories. When this did not happen, breakdown and disintegration happened – people distanced themselves from the change and got off board, different perspectives and multiple paths emerged.

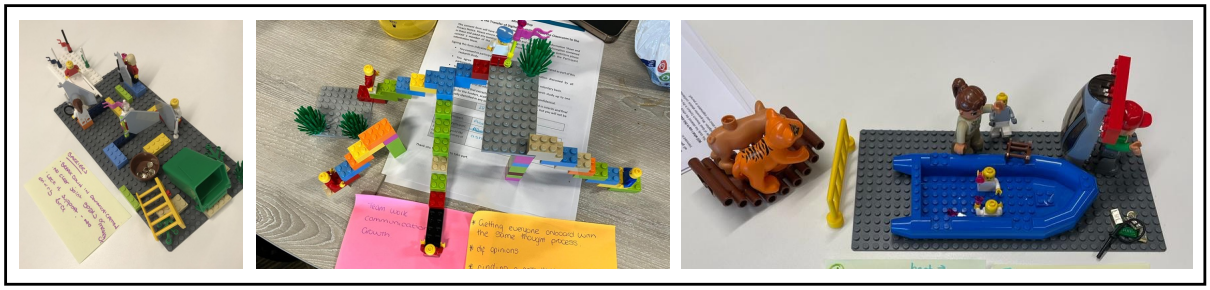

Figure 4. Participants' representations of disintegration in digital transformation journey

The models pointed towards the importance of relational embeddedness within the organization to foster a broader organizational acceptance and integration of participants' newly-acquired individual digital capabilities. Building trusting and collaborative relationships was seen as crucial to bringing others on board and enabling their team's support and input in applying and experimenting with new digital tools and approaches. Relational embeddedness allowed participants to rely on social and human capital to acquire information, resources, feedback and insight in experimenting, executing and integrating new digital products and processes within their organization. But perhaps more importantly it was seen as instrumental for gaining credibility and legitimacy to drive their digital projects forward, so that their superiors and peers appreciated and supported what they were trying to achieve.

> *'Trying to get them to understand and actually do it, because obviously they're so busy they almost don't see the benefit of it. And it's like pulling teeth trying to get stuff like that, and that's one of the biggest stresses that I have in my job is trying to get stuff from other people, it's very difficult… But I can now communicate better because I can explain why we're doing these things and how it works... the fact that I've gone and done this course has made them see it differently, because it's just about people's priorities and before I was very much in the background obviously.*' (Model 2.5, Debrief)

Participants also reflected on the importance of integrating new digital skills with existing systems and processes within their organizations. This integration was perceived to be crucial for overcoming resistance, friction and disruption, and for blending new digital processes with existing organizational systems and practices. Relational embeddedness allowed participants to be more aware of opportunities and frictions with respect to the technical integration of new tools with legacy systems but also insight into how to align 'physical' and 'digital' business units. As such, applying the digital skills and knowledge acquired from learning factories to the organization required an ability to recognize areas of synergy and friction and reconciling differences.

Discussion

In exploring the barriers and enablers experienced by SME practitioners in applying digital skills acquired from learning factories, we have identified five key dimensions that significantly influence the organizational anchoring of individual-level capabilities: Agency, Destination, Association, Progress and Tapestry (ADAPT). Each of these dimensions are interconnected, and success in digital transformation requires attention to all five to achieve meaningful and lasting change.

Firstly, our findings underscore the importance of agency – the ability of practitioners to act meaningfully within the context of digital transformation (Ballard, 2005). This reflects the desire and perception the research participants showed in relation to themselves as active drivers of digital transformation in their firms. Agency involves not only gaining technical skills but also understanding how to leverage these skills effectively within the organization with confidence and competence. Agency may be particularly important, nuanced, and complex when considering digital transformation within the SME context. SMEs are, by definition, comprised of a relatively small number of individuals. This means that, when compared to their counterparts in large organizations, SME practitioners are likely to have a higher level of involvement in shaping their firm and their behaviors may well have a more profound impact on the organization (Saridakis et al., 2013). On the one hand, this could favor digital transformation by increasing the scope for, and impact of, agency amongst those driving digital transformation initiatives in SMEs. On the other hand, it could mean that those within the firm opposed to digitalization have high levels of agency that they can enact themselves to disrupt digital transformation. Indeed, participants in our study regularly referred to lack of buy in and resistance to change from other practitioners as barriers to digital transformation. SME leaders could play an important role here. Typically, such leaders have substantial agency in determining the strategic

direction of their firms (Leitch et al., 2013) since, when compared to leaders in large organizations, they are less likely to be under the influence of wide and diverse leadership teams or shareholder demands. Therefore, SME leaders could be integral by either enacting their own agency to drive digital transformation, or by creating an organizational environment in which pro-digital practitioners in the organization can enact their agency to drive digitalization. Conversely, SME leaders who are unconvinced about digital transformation may hinder progress of digital champions in their firm, as demonstrated by lack of buy-in from key stakeholders being a key barrier to digital transformation identified in our study. Whilst such anti-digitalization leaders could constrain the agency of digital champions, the agency dimension of the ADAPT model proposes that digital champions must still endeavor to enact agency, where they can, by leveraging their digital know-how, and the competence and confidence that such know-how drives. We found that learning factory programs can play an important facilitating role here. Learning is a key antecedent of self-efficacy beliefs (McGee et al, 2009) and, as such, by improving technical know-how of pro-digital practitioners, learning factories can improve the digital self-efficacy of these practitioners. This is helpful, since digital self-efficacy has been shown to an important enabler of digital transformation in SMEs (Malodia et al., 2023). Digital self-efficacy could enhance digital champions' sense of agency in driving digital transformation through initiatives aimed at increasing their own relational embeddedness and the showcasing of their digital skills to others in their firm.

Second, clarity of goals and objectives in the digital transformation journey helps practitioners and organizations understand the destination of their digital initiatives. Participants in our study were, however, regularly unclear about, and unable to see, the digital transformation destination in their firms. The destination dimension of the ADAPT model therefore involves setting clear, actionable milestones and aligning digital efforts with broader organizational objectives. This resonates with our research participants, who espoused that planning clear milestones gives structure and focus on the path towards digital transformation. The destination dimension also reflects the notion that a well-articulated destination ensures that digital transformation efforts are purposeful, and that progress can be effectively measured and managed. The destination dimension clearly emphasizes the important enabling role that formal planning and strategizing plays in digital transformation. Yet formal planning and strategizing around digital transformation could be particularly challenging for SMEs, which may explain the lack of strategic direction and changing goalposts often experienced by our study's participants. Formal strategic planning is often more difficult in smaller firms because, due to their smaller headcount, practitioners in these firms are often more time poor than those in larger firms. For example, Gerhes et al (2016) note that larger SMEs, when compared to micro-enterprises, have a greater number of human resources to fulfil day-to-day tasks, enabling certain individuals – typically those higher up in the organizational hierarchy – to have more time to devote to formal strategic planning. This dynamic of greater time abundance available for strategic planning is likely to be even more evident in large firms. Since time abundance amongst key practitioners is an important antecedent of the initiation of strategic planning (Harris and Ogbonna, 2006), large firms are therefore well positioned to undertake the strategic planning required to enable digital transformation. Conversely, it is commonly recognized that practitioners, including leaders, in smaller firms often struggle to find time to step back from the day-to-day operations of their organization to engage in formal strategic planning (Kevill et al., 2021; Volery et al., 2015). This was reflected in a number of our research participants bemoaning a lack of time amongst key stakeholders in their organizations and highlighting this as a barrier to digitalization through, for example, limiting these stakeholders' opportunities to reflect on potential benefits of digital transformation. The aforementioned limited opportunities to undertake formal strategic planning likely lowers SME practitioners' familiarity with formal planning, which may lead these firms to have weaker formal planning capabilities than large firms that have more experience in this domain. This, in turn, could be a substantial hinderance to digitalization in SMEs, since our findings demonstrate the importance of objectives and milestones in enabling digital transformation. Whilst the destination dimension of the ADAPT model may be difficult to practice in SMEs though, any realized enactment of formal planning could also be particularly beneficial and advantageous for these organizations. It is well known that SMEs often have much simpler structures than large firms (Messeghem, 2003), which enables greater agility and faster decision making. As such, where SME practitioners manage to undertake at least some formal strategic planning around digitalization, such planning may be implemented more speedily and therefore have a quicker and greater impact on digital transformation than it might in large firms.

Thirdly, the relational and collaborative aspects of digital transformation point towards the importance of association. Association, in the ADAPT model, stresses the importance of engaging with others across the organization. This is since successful organizational anchoring of individual-level digital capabilities in SMEs requires strong relationships with superiors, peers, and subordinates.

Indeed, our study found that SME practitioners who create supportive networks within their firms are better positioned to overcome resistance from others when they try to apply the digital skills gained from the learning factories back into their organization. The relatively small headcount of SMEs may act as a mixed blessing here. The small size of the firm may facilitate familiarization between members and provide more opportunities for close and strong bonds to develop within the team (Tsai et al., 2007). This might be less typical in large firms, which are more commonly characterized by greater distance and depersonalization. Here, smallness could act as an asset for SMEs by enabling relational embeddedness of digital champions. According to our findings, relational embeddedness provides champions with credibility and legitimacy, and also assists them in acquiring information, resources, feedback and insights that are helpful for driving digital transformation initiatives in their firms. However, the limited headcount in SMEs could also be a possible liability, escalating the likelihood, impact and prominence of conflicts between members of the firm (Tsai et al., 2007). This is important, since our research participants often identified interpersonal conflicts and difficult relationships as substantial barriers to digital transformation in their organizations. This double-edged sword of a small talent pool in SMEs very much links with the agency dimension of the ADAPT model. This is since the potential for heightened agency amongst SME practitioners, when compared to practitioners in large organizations, means these individuals likely have more influence to act favorably towards, and enable, digital transformation where strong relationships with those driving digitalization engender buy-in. Conversely, where individuals have conflictual and damaged relationships with pro-digital practitioners, they may leverage their agency to demonstrate disengagement with, and to resist, digital transformation. In other words, the potentially high levels of agency amongst SME practitioners could well enhance the impact relational dynamics have on digital transformation in SMEs. What this emphasizes, therefore, is that whilst association is likely to be important in firms of all sizes, the ability for digital champions to cultivate strong, trusting, and collaborative relationships is particularly crucial for realizing digital transformation in SMEs.

Fourth, the vision of a clear destination and the development of digital transformation milestones that result from effectively enacting formal planning as part of the destination dimension of the ADAPT model, are to be supported with a sense of progress. Our findings identified incremental progress as an enabler of digital transformation and, as such, the progress dimension captures how practitioners who set and achieve small, measurable goals can build momentum and maintain motivation. This dimension reflects the need for regular progress reviews to enable reflection and capture achievements to date. Similar to the above-mentioned difficulties in enacting the destination dimension, the time scarcity SME practitioners often face could make it challenging for them to step away from day-to-day operations to reflect and undertake systematic progress reviews (Kevill et al., 2021; Volery et al., 2015). Where they are able to create some space for this though, then capturing achievements through these reviews does not only maintain motivation of the digital champion but can also enhance motivation and buy-in amongst the wider team. In this respect, the limited number of people in SMEs can become advantageous since there is closer proximity and more frequent interactions between members than in large firms (Lefebvre, 2024). As such, communicating achievements and progress throughout the firm is likely more straightforward. The progress dimension also outlines how reflections on progress should allow for adjustments and improvements along the path toward digital transformation. This is important since it has been argued that formal planning, which forms part of the destination dimension, can potentially lead to static strategies and can encourage inflexibility (Wolf and Floyd, 2017) in how digital transformation is to be achieved. The agility associated with their typically simple and malleable structures and procedures is a key advantage of SMEs (Messeghem, 2003). As such, the progress dimension of the ADAPT model implores SME practitioners to maintain this advantage by integrating flexibility and emergent planning with the formal planning encouraged through the destination dimension.

Finally, relational embeddedness achieved through the implementation of the association dimension of the ADAPT model also sensitizes practitioners to the wider tapestry of existing organizational systems, processes and practices. This is valuable, since participants in our study highlighted the importance of integrating the new with the existing for achieving synergies and overcoming resistance and disruption in the path toward digital transformation in SMEs. The tapestry dimension therefore calls for a consideration of how digital champions' newly acquired digital capabilities can be embedded into the fabric of the existing digital capability set of the SME. As such, this dimension reflects the concept of digital harmonization (Hanelt et al., 2021). Part of the tapestry dimension involves considering the integration of new technologies with existing technologies in the SME. In this respect, the financial limitations that characterize many SMEs become salient. Jung et al (2021) argue that digital transformation can be particularly challenging for SMEs given that their limited financial resources can constrain investments in new technology. Aligned with this, a number of our

research participants raised limited finances as a sizeable barrier for achieving digital transformation in their firms. In addition to this, we also propose that financial considerations could underpin deliberations about the integration of new and existing technology as part of the tapestry dimension of the ADAPT model. From a financial perspective, replacing existing technology in an SME may be difficult. Therefore, any new technologies purchased may well need to integrate with and work alongside SMEs' current technologies or legacy systems. This may be less likely in large firms that can leverage their greater financial resources to replace existing technologies if needed with those technologies that work more seamlessly and effectively alongside the new technologies purchased. In other words, limited finances in SMEs may elevate the importance of the tapestry dimension in decision making processes related to investments in new technologies. This is since path dependence, which contends that 'where a firm can go is a function of its current position and the paths ahead' (Teece et al., 1997: 522), would suggest that when SME practitioners consider new technological investments, their choices of which technologies to purchase may be limited not only by the cost of those new technologies, but also by considerations of which new technologies would integrate most smoothly with the firm's existing technologies that they cannot afford to replace. This narrowing of viable new technology options subsequently constrains the potential directions in which digital transformation can develop. Whilst limited finances may constrain new technology options in this way, once suitable technologies are purchased it is likely that integrating them into the tapestry of the firm may be more straightforward than it would be in large enterprises, due to the simpler infrastructures typically found in SMEs (Messeghem, 2003). Therefore, the digital harmonization captured through the tapestry dimension of the ADAPT model is important for both SMEs and large firms, but we argue that it is likely to have different nuances and play different roles in each. For example, our preceding discussions suggest that in the case of technology itself, and of course technological integration forms only one part of the considerations involved in the tapestry dimension, the focus is likely to be more on new technology investment choices in SMEs and more on post-purchase infrastructural integration in large firms.

Conclusion

Our research illuminates the interplay between technological competencies and relational dynamics in the context of digital transformation within SMEs. By recognizing the power of relationships, our findings contribute to the literature by extending understanding of the micro-foundations that enable digital transformation in SMEs (Matarazzo et al., 2021; Scuotto et al., 2021) through a level of analysis that connects digital transformation at the individual level to the organizational level (Dąbrowska et al., 2022). In this paper, we highlight that digital transformation requires more than technical competence; it involves fostering a psychological shift within the learning factories that empowers individuals to return to their organizations with increased confidence and a sense of purpose. Our findings reveal that participants, through the learning factory, gain a clear sense of personal agency, perceiving themselves as proactive drivers of digital change. This sense of agency is paramount within the SME context where practitioners play a pivotal role in shaping and enacting strategic digital initiatives. Informed by the ADAPT model, the agency of SME practitioners is multi-faceted and deeply intertwined with a leaders own personal motivations and strategic vision. The structured and reflective nature of LSP method, designed to collect data, provided SME practitioners with the much needed space to move beyond day-to-day operational tasks and to instead focus on long-term strategic goals.

Our findings also indicate that digital transformation within SMEs is not merely a technical issue, but also a challenge rooted in relational dynamics. For successful digital transformation, pro-digital practitioners must not only be passionate about digitalization but also must be capable of conveying this vision to gain buy in from key stakeholders. In this regard, practitioners who actively involve others and cultivate support for digitalization demonstrate greater success in translating their learning into practice. Engagement, skill development and human capital are fundamental therefore to establishing credibility and legitimacy in digital projects. Consequently, our findings have practical and policy implications, informing the design and development of digital transformation programs that can effectively support SME leaders in navigating the complexities of the digital age.

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