Technological vs. Non-Technological Mindsets: Learning From Mistakes, and Organizational Change Adaptability to Remote Work

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Abstract: The permanent implementation of the change in working methods, e.g., working in the virtual space, is problematic for some employees and, as a result, for management leaders. To explore this issue deeper, this study assumes that mindset type: technological vs. non-technological, may influence the organizational adaptability to change. Moreover, the key interest of this research is how non-technological mindsets adapt to remote work in the long run. Based on the OLS regression (SPSS PROCESS), authors analyze three data sets gathered via the questionnaire distributed using the CAWI method among Polish knowledge workers; the first data set was gathered in December 2019 before the COVID-19 crisis, and the next in 2021 and 2022. Findings revealed that before COVID-19, high intensity of contacts via technology-supported change adaptability only for the IT industry. Results obtained two and three years later exposed that interactions via technology also increased the change adaptability in other sectors. This study confirms that the technological environment can change the employee mindset. Nevertheless, at the same time, the adaptability process can be prolonged and complex even for highly educated knowledge workers' groups. Since there is no development without technology today - patience and long-run perspective thinking are recommended to achieve sustainable growth. It is critical. Adaptation to technology-dominated virtual workspaces must continue, even if this is problematic for non-technological mindsets; abandoning this idea will only make the inevitable transformation longer and more challenging. Collective intelligence creation requires inclusion and patience instead of exclusion of those who face problems or abandonment of change when facing implementation problems rooted in mindsets.

Keywords: Organizational learning, Change adaptability, Organizational intelligence, Learning via technology, Learning from mistakes, Technology adoption, COVID-19, Mindset, Collective intelligence, Tacit knowledge

1. Introduction

Technology today often assists with any form of formal and informal learning. But regarding working places, most of the learning at work happens informally (Swain *et al*., 2021; Lucena Barbosa and Borges-Andrade, 2022). Therefore, this study focuses on informal learning.

In contrast to formal learning, defined as "institutionalized, planned and structured" (Choi and Jacobs 2011, p.241), informal learning is described as mostly an unstructured, empirical, and non-institutionalized process (Eraut, 2004). Employees learn informally primarily by talking, collaborating, or experimenting, e.g., learning by doing that supports tacit knowledge awareness and sharing (Kucharska and Erickson, 2023). Zhou *et al*. (2017) pointed out that technology can effectively support interactions. At the same time, Stahl and Hesse (2006) noted that computer-supported interactions and learning might be perceived as problematic by some groups of employees who struggle to interact through awkward computer interfaces and the constraints of their interpersonal relationships. Even though some years have passed since they presented this observation, this problem might still be actual, e.g., for millennials. Besides, the recent study by Altebarmakian and Alterman (2019) suggests that even some young learners might find the technological learning environment, e.g., online learning via the internet, an uncomfortable form of interaction, and they noted that many social and psychological obstacles that might cause social interaction problems in virtual space. Nevertheless, communication-based information technologies significantly foster intra-organizational interaction in today's progressively digitized work environments (Wickramasinghe and Ramanathan, 2022). Therefore, it is worth verifying how technology-driven interactions and non-technology interactions influence informal learning at work. It matters because the current reality of remote working pushes equally all employees to work and learn via technology. So, this study explores how technological and non-technological mindsets adapt to new, technology-dominated reality in the long run. The knowledge from this study may support the inclusion of all employees with technological and non-technological mindsets in technology-dominated workplaces.

So bearing in mind that technology is perceived as a driver of change (Papageorgiou and Demetriou, 2019) this study aims to explore if the technology-mediated interactions support the relationship of informal organizational learning from mistakes component of culture with change adaptability among employees with technological and non-technological mindsets - dynamically. Formulating this aim, we were inspired by Papageorgiou and Demetriou (2019), who suggested that learning and information technology can change the human mindset. Moreover, recently, Klamar *et al*. (2022) noted that employee mindset matters for learning from errors. Technological mindsets are also seen as open-minded. Therefore, the idea of this study is to explore how the technological working environment affects mindsets (technological and non-technological). Specifically, the question is: How do employees with a "technological mindset" and employees without it adapt to changes thanks to accepting mistakes as a potential source of learning when cooperating via technology? The answer matters, mainly that the COVID-19 crisis pushed organizations to work remotely and communicate via technology at a much higher level of intensity than ever before (Järvelä and Rosé, 2020). Therefore, so far, mostly perceived as informal –learning from mistakes via technology interactions is worth investigating more in-depth. If informal learning via technology at work occurs, it can be considered a symptom of smooth adaptability to new working conditions.

2. Literature Overview and Hypotheses Formulation

Organizational learning and change adaptability (organizational intelligence)

Feuerstein et al. (1979) defined "intelligence" as the ability to adapt to change. Following these researchers, the organizational capacity to adapt to change is seen as its intelligence. Since the organization is a network of people, organizational intelligence is a collective issue. Thus, collective intelligence developed in the organization reflects its ability to adapt. Change is a characteristic of the current economy. Therefore organizations need to adapt to the changes to survive and grow (Griffin et al., 2004). The key challenge today is to create such conditions at work that people can learn and change not individually but collectively (Kucharska and Bedford, 2023a,b). Organizational learning and change are interconnected (Watad, 2019). When people learn together, their perceptions change because their collective knowledge increases. However, it is a complex, challenging, multidimensional process determined by organizational systems and particular employees' cognitive and behavioral responses shaped often by their learning abilities (Borges and Quintas, 2020). Moreover, Goswami (2019) noted that organizations must continuously evolve and adapt to changes in today's aggressive and complex business environment. It is why this study focuses on how the relationship between the learning culture component of mistakes acceptance and change adaptability evolved in the technology-dominated workspace. As claimed in the introduction section, it matters because the current reality of remote working pushes all employees equally to work and learn via technology. So, this study aims to explore how technological and non-technological mindsets adapt to new, technology-dominated reality in the long run, to understand this process better and, thanks to this, to support better its inevitable implementation among all employees with technological and non-technological mindsets. Learning from mistakes at work requires a specific safety climate. It is why the mistakes acceptance component of learning culture is implemented for this research.

Mistakes acceptance component of learning culture and change adaptability

Previous studies proved that developing "mistakes acceptance" component of the learning culture fosters a higher level of organizational ability to learn and adapt (Thomas and Brown, 2011; Kucharska and Bedford, 2020). Moreover, Maes and Van Hootegem's (2019) model of change assumes that the reflection from a mistake (understood as input to the organizational system) can trigger change. Therefore, based on the above literature review about learning from mistakes, the following hypothesis has been formulated:

> *H1: The acceptance of mistakes component of learning culture positively influences adaptability to change (organizational intelligence).*

Technology-driven human interactions

Most studies about technology-driven human interactions focus on e-learning and other dedicated learning programs, applications, and actions (e.g., Hayes and Graham, 2019). The present study does not focus on formal learning via technology-dedicated applications; instead, it focuses on informal, everyday learning processes via the acceptance of mistakes made by average individuals at work. It is because we assume that the developed mistakes acceptance component of learning culture at work is critical for adaptability by securing a safe feeling that supports adaptability to new conditions. Informal learning mainly occurs in active meetings (Treasure-Jones et al., 2019). Zhou et al. (2017) noted that technology could effectively assist interactions. This study examines how people adapt to workplaces where interaction via technology, e.g., social software, becomes increasingly intensive. Therefore, technology is a factor that in the given theoretical model (Figure 1) moderates the relationship between the acceptance of mistakes component of culture and organizational adaptability to change in new working conditions.

Moreover, Ringberg et al. (2019) proved that innovation results from change and depends as much on mindsets as technology. They describe technological and managerial mindset transformations through a matrix of incremental, radical (technology and mindsets) innovations that result from constant evaluation of inevitable change. Based on Ringberg et al. (2019) and Shamsuddoha and Woodside (2022), this study assumes that technological and non-technological mindsets matter for change adaptability.

Technological and non-technological mindsets in the context of industry

Statista.com (2019) noted that industries such as finance and IT dominate among those industries where employees most frequently work remotely. So, communication via technology may be related to the industry. Technology is perceived as a driver of change (Huda, 2019). Moreover, people who use technology are more likely to be open-minded (Kmieciak, 2019). Therefore, they might be probably more ready than others to learn and adapt to changes. But, at the same time, Campana and Agarwal (2019) found that low-technology environments are not a barrier to learning. So, it is worth verifying how technology-driven mindsets and non-technology mindsets react to adapt to changes thanks to technology-mediated interactions at work. Is there any difference? If yes, how may it affect organizations? Is it affected by industry? Answering these questions is the aim of this study. It matters to understand the adaptability processes better and, thanks to this support, organize the inclusion of all employees with technological and non-technological mindsets in technology-dominated workplaces.

Moderated Moderation

IT competency differs across industries (Kucharska and Erickson, 2019). Brougham and Haar (2018) noted that higher usage of smart technology negatively affects employees' well-being and interactions in the service sector. Fukuzawa and Cahn (2019) said that the influence of technology on learning effectiveness might depend on the overall environmental context. Hence, it is worth exploring how industry affects change adaptability via acceptance of mistakes in working conditions characterized by intensive technology-driven employee interactions. The current investigation aims to verify how the technological mindset (IT industry) and non - technological (represented by other industries) affect mistakes acceptance as a source of learning influence on change adaptability. Based on this, the following hypothesis has been proposed:

> *H2: Industry moderates the moderated intensity of interactions via technology relation between mistakes acceptance and change adaptability.*

Summing up, the industry is included in the study as a factor that might moderate technology usage at work and, next together, moderate adaptability to change, driven by learning via accepting mistakes. Therefore, the examined in this study effect of learning via accepting mistakes on adaptability to change is doubly moderated (moderated moderation). Figure 1 presents the whole idea of the study graphically.

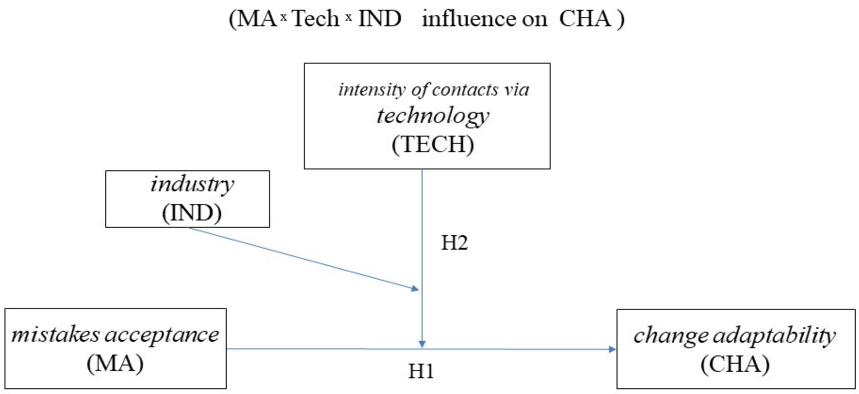


Figure 1: Theoretical model

3. Methodology

This study applies PROCESS macro, an OLS regression, to analyze dynamically the explored in the previous section relations. To do so, three data sets were gathered via the questionnaire distributed using the CAWI method among Polish knowledge workers; the first data set was gathered in December 2019 before the COVID-19 crisis, and the next in 2021 and 2022.

Samples

To achieve the study's aims, a sample comprising 380 (gathered in December 2019) and 321 (gathered in September 2021), and 323 (gathered in December 2022) cases were employed. Respondents were recruited among Polish employees working in knowledge-driven organizations across industries via a research panel conducted partially by answeo.com (this enabled to invite of the same group of respondents with hope for their participation) and partially by the snowball sampling method. Interviewing knowledge workers and managers is always problematic due to their limited availability.

Therefore, the snowball method of data collection based on a network of recommendations was included to secure the sample quota in December 2022nd. Besides, in 2019 and 2021, questions were asked to the same panel of respondents, but respondents answered voluntarily (there was no control of who responded and who did not), so all samples differ. All samples (2019/2021/2022) were represented mostly by men (60%/70%/50%), aged 18-24 (15%/16%/20%), 25–34 (43%/45%/40%), 35–44 (23%/20%/20%), 45–54 (15%/10%/10%), 55–74 (3%/9%/10%), >75 (1%/0%/0%); working in small (25%/20%/20%), medium (31%/35%/30%), big (21%/20%/30%) and large (23%/25%/20%) companies; in the IT industry (30%/39%/41%), sales (12%/8%/9%), finance (11%/15%/10%), and production (10%/7%/5%), service (10%/12%/15%), education (8%/12%/20%), construction (7%/5%/0%), healthcare (4%/2%/0%), logistics (3%/5%/0%), and other (3%/3%/0%) industries. All respondents were highly educated and represented the knowledge workers' group (declared by the qualification question). For the study purpose, it was crucial to examine those who are focused on knowledge and want to learn.

Measures

Mistakes acceptance and change adaptability were measured using scales adapted from Kucharska and Bedford's (2020) study. Appendix 1 presents the statements as well as scales and reliabilities. Respondents reacted to statements using a 7-point Likert scale; the next scale reliabilities were assessed (Cronbach's α>.83), and composite variables were developed. The intensity of interactions via technology was measured using a 3-point ordinal scale (1-low, 2-medium, 3-high). Dummy variables were used to operationalize the next intensity and industry variables (e.g., 1-IT, 0-other). Industry influence was analyzed for the IT industry concerning the remnant part of the sample named "other." The total variance of the sample was extracted at the 72%/78%/78% level, and a Kaiser-Meyer-Olkin (KMO) test of the sample's adequacy at the 0.81/0.83/0.84 level confirmed the sample's good quality (Hair *et al*., 2010). Further, a Harman single-factor test (Podsakoff and Organ, 1986) was run, and the 35%/36%/32% result confirmed there was no bias. Data were obtained from November to December 2019, in September 2021, and in December 2022.

Analytical procedure

After the positive sample and scales assessment, composite variables were created to analyze the hypothesized relations using the PROCESS procedure for SPSS Version 3.4 (Hayes, 2018). It started: first with the assessment of the focal for this study relation between mistakes acceptance on change adaptability. Next, the significance of the expected moderated effects of industry (IND) on the intensity of interactions via technology (TECH) was verified. Finally, doubly-moderated effects were included in the last stage of the examination. Namely, the moderated by industry effect of intensity of interactions via technology on the relation between mistakes acceptance (MA) and change adaptability (CHA) was assessed and presented in Figure 2. These effects are more in-depth, investigated, and discussed in the next sections.

4. Results

Figure 2 and Table 1 present a summary of the obtained moderated effects on the focal relation between the acceptance of mistakes and adaptability to change. Significant effects were noted for moderation by the intensity of interactions via technology and industry for all data sets (2019, 2021and 2022).

Table 1: Hypotheses verification

	R	R-sq	MSE	F	df1	df2	p
2019	.2940	.0865	1.1253	5.0290	7.0000	372.0000	.0000
2021	.3640	.1325	1.4662	7.4821	7.0000	343.0000	.0000
2022	.3560	.1225	1.3682	7.2823	7.0000	313.0000	.0000

Regression Models Summary

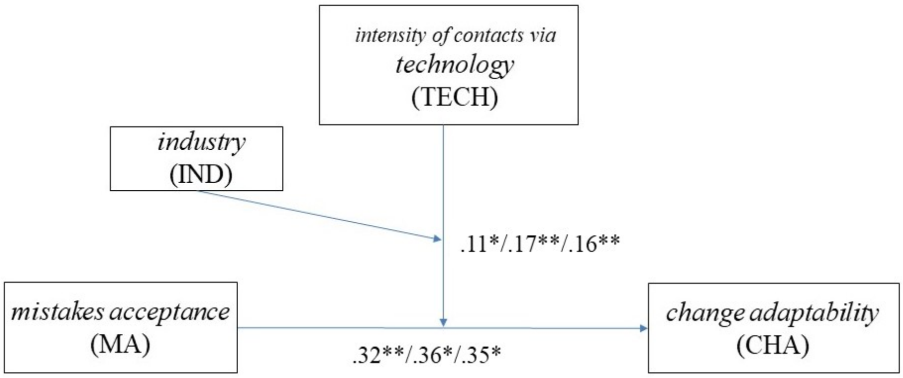
Hypothesis	**β**	**t-value**	**p-value**	**Hypothesis verification**

H1 (MA -> CHA)	.34/.36/.35	3.37/2.18/2.17	***/*/*	Supported/Supported/ Supported
H2 effect of TECH moderated by IND moderation on MA -> CHA (IND x TECH x MA)	.11/.17/.16	2.11/2.90/2.89	*/**/**	Supported/Supported/ Supported

Note: n= 380/321/323 (2019/2021/2022) * p < .05 ** p < .01 ***p < .001

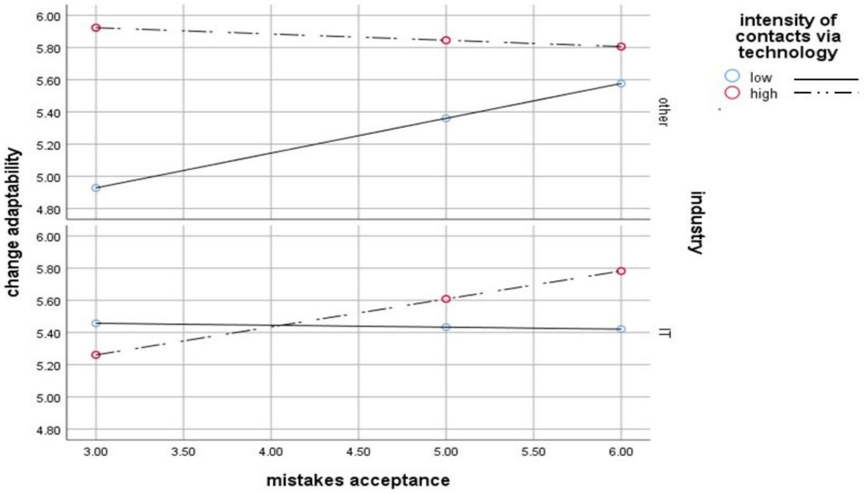
It is worth highlighting that for the first analysis (2019) - the overall observed change adaptability is higher for those employees who use technology for regular interactions on a high level than for those who use it on a low level. However, when the same relation is analyzed and divided into two groups: the IT industry group and the group 'others' (see Figure 3a), the opposite (positive) effect is observed for IT. For the sample gathered in 2019, this effect is positive only for the IT industry. For other sectors, the negative impact is noted. Hence, based on the 2019 sample, it can be concluded that industry matters when it comes to leveraging the "adaptability to change" driven by "mistakes acceptance" thanks to technology-driven human interactions. Nevertheless, results obtained based on the samples gathered in 2021 and 2022 exposed that interactions via technology also increased the change adaptability in industries other than IT (Figure 3b).

(MA x Tech x IND influence on CHA)

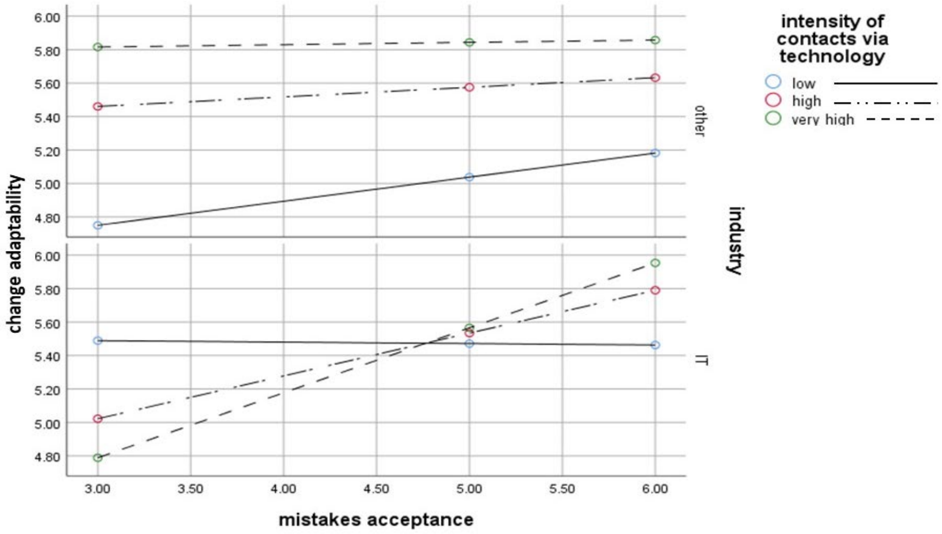


Notes: n = 380/321/323 (2019/2021/2022) * p < .05, ** p < .01, *** p < .001; based on the output from PROCESS Procedure for SPSS Version 3.4; all results are not standardized; level of confidence for all confidence intervals in output: 95.

Figure 2: Results



A) 2019



B) 2021

Note: A)2019 n = 380; IT = 114 (30% of the total sample); other n = 266; level of confidence for all confidence intervals in output: 95; all results are not standardized. B) 2021 n = 321; IT = 125 (39% of the total sample); other n = 196; level of confidence for all confidence intervals in output: 95; all results are not standardized. Results obtained for 2022 are very similar to those obtained in 2021; therefore, they have not been repeated in the visualization given below.

Figure 3: Intensity of interactions via technology, mistakes acceptance and change adaptability: IT industry vs. other industries A) 2019 (before COVID-19), B) 2021.

5. Discussion

Presented research showed that informal learning from mistakes lets organizations adapt better to changes when the whole organizational system is consistent (H2). This direct effect is weaker when inconsistent, as is observed (Figure 2) in the results obtained for the 2021 sample (H1). Technology usage was harshly pushed into human interactions at work by the COVID-19 pandemic. As a result, in 2019, communication at work was not as broadly technology-dominated as in 2021 and 2022. So, the observed earlier consistency has been violated.

Specifically, it is visible, based on results obtained for the 2019 sample – that the employees with technological mindsets learn from mistakes and adapt to changes in technology-supported conditions, and employees with non-technological mindsets do it in non-technological working conditions do equally well.

So, the alignment of mindset and learning conditions meaning to obtain the best learning effects from informal learning is clear. At the same time, the observations of results obtained based on the 2021 and 2022 samples are different. Namely, it is still observed that "low-intensity interactions via technology" for "others" are equally effective for change adaptability driven by informal learning from mistakes observed for the IT "high-intensity interactions via technology." But at the same time, for "high" and "very high" intensity, this relation is also positive for the group "others." For 2019 data – for this relation, the negative effect is noted. It suggests that the long-lasting (in this case, three years) change in environmental conditions leads to mindset evolution. However, the observed evolution is not spectacular, but it confirms the technology's power to drive the change of mindset. Discussing the broader technology factor, it is worth recalling Hoe's (2019) study, which stressed the need for digital learning ecosystem development. Namely, the current digitalization era forces digital learning culture. On the contrary, Brougham and Haar (2018) noted that higher usage of smart technology in the service sector leads to lower organizational commitment and career satisfaction, as well as higher cynicism and depression among employees. This shows that technology is perceived differently by people working in different industries and representing different mindsets. So indeed, it is confirmed by the observed in this study cohesion of the "technological mindset" and "working conditions" represented by the IT industry in sample 2019, and it is even stronger in sample 2021 (Figure 3a-b) and differs from other sectors. Besides, Papageorgiou and Demetriou (2019) suggested that learning and information technology can change the human mindset. This study confirms it.

6. Practical Implications

The identified critical challenges for learning organizations today based on the current study are first, the creation of internal mechanisms supporting a safe environment for learning; second, the development of effective communication methods between "technological mindsets" and "non-technological," especially in the context of a sensitive issue of mistakes at work. For a “non-technological” mindset, this usually tricky communication can be made even more problematic by the tech environment itself. The formal implementation of a constant learning culture, including the acceptance of mistakes component, might be critical when an employee's mindset and working environment are not entirely coherent. Besides, since the COVID-19 pandemic harshly pushed the technology to human interactions at work, transformational leaders' support for informal learning may be critical for the broadly evolutionary expansion process of the "new reality" of a technology-supported working environment in all industries other than only leading IT.

Moreover, a multidisciplinary approach to tasks composed of different mindsets can perform better than mono-mindsets (Prestes Joly *et al*., 2019). Therefore, consistent, e.g., technological or non-technological workplaces, is not realistic and not an optimal solution for ambitious organizations. So, a formal learning policy via mistakes and authentic learning culture seems to be inevitable for aspiring and genuinely learning organizations. Therefore, in light of all the above, the direct implication of this research is that organizations need to think about their future working strategy in a long-run perspective. For example, if they decide to work remotely, they need to be ready for a very long adaptation process of those who used to work face-to-face, which may lead temporarily to the decreased performance of some groups of employees; they should not give up this strategy just because of facing difficulties that, in light of the given study - inevitable. Non-technological mindsets just need more time to adapt to technological workplaces. Contextual learning from everyday experiences at work (including mistakes), coming from e.g., “learning by doing” or “learning via interactions,” are sources of tacit knowledge that significantly impacts performance, especially innovativeness (Kucharska and Erickson, 2023). In such a context, organizations with virtual and technological workspace-dominated space of work aims must be ready so that the innovation performance of the non-technological mindset can temporarily decrease. The temptation to give up and go back to "normal" to sustain a performance level is an illusion. The prospect of giving up and returning to "normality" to maintain the level of productivity organizations used to expose before the forced period of functioning in the virtual workspace can be a waste of time only. It is because the hyperdynamic business environment is hyperdynamic exactly, thanks to technology. So, technological working space is inevitable.

The study exposed that the permanent implementation of the change is problematic even in the group of knowledge workers. So, good management practice requires long-run perspective attention to successful implementation, especially those changes that oppose employees' mindsets. It is critical. Adaptation to technology-dominated virtual workspaces must continue, even if this is problematic for non-technological mindsets; abandoning this idea will only make the inevitable transformation longer and more challenging. Collective intelligence creation requires inclusion and patience instead of exclusion of those who face problems or abandonment of change when facing implementation problems rooted in mindsets.

This study confirms that the technological environment can change the employee mindset. Nevertheless, at the same time, it exposes that the adaptability process can be prolonged and complex even for highly educated knowledge workers groups. Since there is no development without technology today - patience and long-run perspective thinking are recommended to sustain company growth.

Tacit knowledge implications for leaders

The relatively big challenge in the new reality of remote work is tacit knowledge sharing—social distancing may cause trouble with trust in employee-employer relations and among workmates. The trust supports tacit knowledge sharing that is vital for organizational intelligence activation (Kucharska and Bedford, 2023b). So, to avoid such tacit knowledge flow blocking, the technology supporting remote work should be developed in a way enabling bonding and organizational inclusion building. Kucharska's and Erickons' (2023b) recent study exposed that regarding IT competency composed of the infrastructure, knowledge, and operations dimensions for the IT industry, infrastructure and operations are the most critical. For other industries, it is the infrastructure, operations, and knowledge dimensions of the IT competency that matters for tacit knowledge sharing. So, for IT- mindsets, the problem of "how to use technology" is not crucial. Supporting remote-work software functionality that fosters bonding and inclusion to maintain engagement, knowledge sharing, and co-creation among workmates is critical in such a case. Tools availability and managerial directions regarding organizing (working methods) are critical for tacit knowledge sharing in IT. Whereas for non-technological oriented mindsets, first the issue of "how to use" technology (the IT-knowledge dimension) and following working methods (IT-operations dimension) are critical for tacit knowledge sharing – often gained by non-formal learning, also from mistakes as we wrote in this paper.

In light of all the above, the implications for leaders are clear: non-IT mindset-dominated workers need more support to adapt to technology-dominated workplaces. So, instead of giving up and returning to "normality," leaders should put more effort into organizing workplaces fitted to the new reality and supporting non-technological mindset-dominated employees in adaptability to technological tools by making them "human friendly". The quality of the software shadowing remote work that focuses more on bonding and inclusion to maintain work engagement, knowledge sharing, and co-creation among workmates than on algorithmic management assessing employee performance indicators (KPIs) can be the solution to build trust, such vital for tacit knowledge sharing at work for both- technological and non-technological mindsets.

Besides, Choi et al. (2019) noted that technological or cultural environmental misfits might motivate employees to acquire new skills and adapt to changes. Still, Bligh et al. (2018) proved that leaders might destroy the positive employee mindset for learning from errors. Therefore, informal learning from mistakes may be problematic when environmental misfit occurs, and leaders do not support employees.

7. Limitations and Further Research

The main limitation of this study is that it focuses on informal and probably subconscious training via acceptance of mistakes to adaptability to change. The obtained low R-sq=0.0865/0.1325 can be explained by the fact that informal organizational learning, especially from mistakes, is subliminal. Besides, the results of this study were based on a Polish sample; therefore, further national studies are needed. Furthermore, the presented comparison results are based on samples from the same panel, but they are not perfectly identical. Results based on the experimental group would definitely be much more reliable. Furthermore, a pandemic situation is presented here as an environmental change context that triggers essential changes in working conditions (technology-supported interactions expansion). It is not shown or considered here as a factor directly influencing learning attitudes. So, the pandemic influence on learning attitudes requires different studies. Besides, the "acceptance of mistakes" component of learning culture is used here as a proxy for learning from mistakes. Naturally, it is not the same to accept something as a potential source of learning and learn from it. Still, following Mezirow (1995), it is contradictory to learn from mistakes and ignore them as a source of learning simultaneously. It is assumed, then, that acceptance is an essential pre-step in facilitating learning from mistakes. Therefore, in this context, the applied proxy seems to be justified.

8. Conclusion

Study findings exposed that the permanent implementation of the change in working methods (e.g., working in the virtual space) is problematic even in the group of knowledge workers. So, good management practice requires long-run perspective attention to implement any change in working methods perfectly, especially those changes that oppose employees' mindsets. This study exposed that even if those employees are seen as "intelligent," they may face problems with change adaptability if the change is firmly out of their mindsets. This is probably because attitudes and habits strongly influence our behavior regardless of our level of intelligence (but this should be verified by further studies). Furthermore, the dynamic approach presented in this study exposes that the implementation changes that root far from mindsets may take longer than if the mindset and the changing character are in line. Therefore, this dynamic approach justifies the long-run perspective of the change implementation: change implementation takes time and requires patience. Fixed to quick success mindsets can easily lead to failure of any change implementation today, especially those which are rooted in mindset technological vs. non-technological.

Adaptation to technology-dominated virtual workspaces must continue, even if this is problematic for non-technological mindsets; abandoning this idea will only make the inevitable transformation longer and more challenging. Collective intelligence creation requires inclusion and patience instead of exclusion of those who face problems or abandonment of change when facing implementation problems rooted in mindsets.

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Appendix 1: Scales and Their Reliabilities

Scales	mean/SD (composite v.)	Reliability
"Mistakes acceptance" dimension of constant learning culture (MA) **people know that mistakes are a learning consequence and tolerate them to a certain point** **most people freely declare mistakes** **we discuss problems openly without blaming** **mistakes are tolerated and treated as learning opportunities**	*5.13/1.42 **4.99/1.56 ***4.89/1.47	*Cronbach's α = .85 ** Cronbach's α = .83 *** Cronbach's α = .84
Personal change adaptability (CHA) **I am flexible to changes** **I can adjust to changes** **I adapt to changes easily** **I am used to changes**	*5.67/1.1 **5.87/1.49 ***5.75/1.51	*Cronbach's α = .88 ** Cronbach's α = .86 *** Cronbach's α = .86

Note: * 2019; ** 2021; ***2022; scales source Kucharska and Bedford, (2020)