

Internationalization and innovation orientation as factors of employee learning and development adaptation during Covid-19: Evidence from Polish SMEs

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ABSTRACT

Objective: The driving aim of this study is to test whether small and medium-sized enterprises (SMEs) with a higher level of internationalization and innovation orientation were able to adapt their training and development activities during Covid-19 quicker and better than others. With no or very few studies investigating employee learning and development adaptation in SMEs, we address an important research gap.

Research Design & Methods: We tested the hypothesized relationships on a sample of 214 Polish SMEs. Data was collected using the computer-assisted telephone interview (CATI) method. The logit model and ordered probit model were employed to analyse the data.

Findings: While the results clearly indicate that innovation orientation had an impact on the adaptation of training and development for Polish SMEs during the first year of the Covid-19 pandemic, internationalization did not exhibit any significant impact on the number of training sessions conducted during the first year of Covid-19. However, the existence of prior experience with online technologies may have moderated the relationship between internationalization and adaptation of learning and development.

Implications & Recommendations: To become quick adapters, SMEs should develop an innovation orientation, implement online learning practices and foster mutual learning within the organization, and take every opportunity to learn from external partners.

Contribution & Value Added: With this study, we contribute to the body of knowledge investigating SME adaptation during Covid-19. This research implies that innovation orientation can positively influence how firms adapt their training and development in times of crisis. This pioneering contribution is an important piece of the puzzle of what might determine the competitive advantage of some SMEs over others in years to come.

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INTRODUCTION

The years 2020-2022 will be remembered as a shakedown for all organizations, which were put to a test in their adaptability and resilience. The Covid-19 pandemic created an unprecedented, complex, and hyper-challenging environment for managers who needed to ensure the continuity of their companies and help their employees to cope with this extraordinary crisis. The unanticipated and sudden switch to work from home posed huge challenges for HR managers and functions; learning and training programs were oftentimes halted, remote work disconnected people from each other, and increased employee stress and burnout (Gabriel & Aguinis, 2022). As organizations of all sizes and across industry types experienced significant revenue drops and budget cuts, they

faced monumental talent management challenges including hiring freezes and layoffs, salary freezes, cancelled bonuses and pay reductions (Kaur & Shah, 2021).

Training and development in turbulent times are essential, people need additional support and access to both knowledge and skills necessary to function effectively in times of crisis. Upskilling the workforce was oftentimes a matter of survival. In the life-long learning culture, learning cannot cease, which was extremely difficult for many organizations. In total, 46% of organizations halted or reduced their employee development programs in 2020 (Degreed State of Skills Report, 2020).

Businesses have put much effort to modify and adapt business practices to pandemic realities and we know that this process was pursued differently by different companies. Academic literature on Covid-19 within its various management areas displays evidence that it was a highly complex process, differentiated across sectors and firm types (Kwiatkowski & Szymańska, 2022; Arlindo, Nunes, Aires, & Pimenta, 2021; Margherita & Heikkilä, 2021; García-Madurga, Grilló-Méndez, & Morte-Nadal, 2021; Ivanov, 2021; Androniceanu, 2021). Existing studies identified several critical issues for training and development during the pandemic: insufficient employee digital skills, low adoption of e-learning by firms and universities (Głodowska *et al.*, 2022), screen fatigue, stress and burnout (Krugiełka & Kostrzewa-Demczuk, 2021; Aguinis & Burgi-Tian, 2021; Hamouche, 2021; Mihalca *et al.*, 2021; Androniceanu & Marton, 2021). Yet, although much has been reported on training and development during Covid-19, these studies focus on larger firms and global corporations. On the other hand, there are several studies assessing the impact of Covid on SMEs, but these do not focus on training and development practices, but rather on broader business-related issues (*e.g.* Juergensen, Guimón, & Narula, 2020; Marcazzan, Campagnolo, & Gianecchini, 2022; Halmai, 2022; Bagh, Khan, Fenyves, & Olah, 2023; Teja Kusuma *et al.*, 2022).

Hence, we identify a gap in our growing body of knowledge on Covid-19 adaptation strategies; we do not know much about how and with what success small and medium enterprises adapted their training and development practices during the Covid-19 pandemic. Taking the importance of training and development of the workforce, identified as a key driver of business performance, we need to know more about training and development within this vital sector, during the Covid pandemic. These studies are necessary to develop an effective crisis management framework within human resource management for the future.

This study addresses the broad question, important to reflect on after over two years of Covid reality: which companies were able to adapt their training and development programs better than others to lock-down mode? Existing studies reveal two factors that played a role in SME resilience during Covid-19 – learning from the prior crisis (Haneberg, 2021) and digital transformation (Klein & Todesco, 2021). With this study we intend to address factors that are more nuanced, not so obvious, yet suggested by prior research as potential drivers of positive change - internationalization and innovation orientation. Hence the driving aim of this study is to test whether SMEs with a higher level of internationalization and innovation orientation were able to adapt their training and development activities quicker and better than others. We tested these relationships on a sample of 214 Polish SMEs.

The main contribution of this study lies in broadening our understanding of adaptation and agility of SME learning and training activities in times of crisis and extreme turbulence. It provides evidence that internationalization and innovation performance play a role in the pace and scope of process adaptation to new and unforeseen circumstances. This way, we offer an important contribution to SME organizational learning theory. A better understanding of the full spectrum of factors that impact SME adaptation processes to business viability threats can inform future SME strategies. The article will continue with hypothesis development and then lay out the methodology. Results will be presented and discussed in light of existing literature. We will conclude with closing remarks, research limitations, and suggested future research.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Adaptation of Employee Learning and Development

The need to develop human resources as the most valuable capital possessed by an organization has become prevalent in business management, affecting various performance areas from employee retention (Cascio, 2014; Alrazehi & Amirah, 2020) to firm growth (Kotey & Sheridan, 2004; Lok, Cheng, & Choong, 2021). In this context, continuous professional development of employees that covers formal, nonformal, and informal education, retraining and upskilling through in-company training and self-education is a vital part of any business organization and must be incorporated into a systematic and formal system within the firm (Tan & Antonio, 2022). In times of unexpected and turbulent disruption, such as the Covid-19 pandemic, human resources development has become more important than ever; people need to redefine, upgrade and/or modify their skills to meet completely new requirements. And they need to do this immediately. To meet this challenge companies were forced to transfer their training and development activities from physical training spaces and face-to-face contact to the online environment. Not all firms had the capacity to do so. Reports which emerged during the Covid-19 pandemic indicate that 46% of employees worldwide faced with the dramatic reduction in upskilling and reskilling opportunities provided by their employers and 55% of employees experienced that as a decrease in confidence level in their skills and an increase in their stress levels (De-greed Report, 2020). This paints a tragic picture. Through 23 in-depth interviews with experienced HR managers in Poland (carried out in 2020), Krugiełka and Kostrzewa-Demczuk (2021) established that companies were adapting their HR development practices during Covid-19 at very different levels. According to their research, in some companies, the development area has completely ceased to exist due to layoffs, reduced budgets, and the termination of contracts with trainers. Other organizations were investing in remote tools and forms of employee development, starting a time of unprecedented rapid development of digital transformation in their HRD practices.

The SMEs have severely suffered because of the pandemic reality. Klein and Todesco (2020) pose that SMEs are more vulnerable to the current pandemic crisis than larger firms. Their scarcity of financial resources and gaps in specialized knowledge make it difficult for them to respond to the challenges posed by the Covid-19 crisis. Klein and Todesco identify the following characteristics of SMEs which impact this vulnerability: the lack of human resources, limited managerial capacity (procedures, techniques and tools), limited capital resources and knowledge management. This is echoed by Eggers (2020), who – based on a meta-analysis of 69 articles that studied SMEs in previous crises – concludes that they face a liability of smallness and of newness. The smaller the firm the fewer resources it typically controls, which makes it more vulnerable to internal and external events, such as a critical employee quitting his/her job, a decline in financing options, a reduction of demand due to a competitor entering the market, or a crisis hitting the global economy (Karas & Režňáková, 2021). Additionally, new organizations suffer a greater risk of failure than older organizations, because they lack established business models, depend on weak business relationships, and have low levels of legitimacy. However, the literature indicates that given their smaller size, SMEs tend to be rather flexible when opportunities or threats arise in their environment; the smaller the organization, the closer the decision-makers are to their customers and other stakeholders (Eggers, Hansen, & Davis, 2012).

Keeping in mind that survival, resilience, and adaptation of SMEs is a fragile process which can go two ways, we seek to explore two potential factors that may have had an impact on how well SMEs adapted their training and development during the Covid-19 pandemic – internationalization and innovation orientation.

Internationalization

Some studies revealed the significance of individuals' human capital on the internationalisation of SMEs (Mozas-Moral *et al.*, 2016; Pickernell *et al.*, 2016). International activities of firms require appropriate resources and competencies and human capital appears to be an important resource that impacts the identification and exploitation of international opportunities (Buzavaite & Korsakiene, 2019;

Virglerova *et al.*, 2021; Ključnikov *et al.*, 2022a; Ključnikov *et al.*, 2022b). Furthermore, scholars claim that internationalisation is a learning-intensive process (Fletcher & Prashantham, 2011) as a firm's capability to learn is vital to support speedy decision-making. These firms learn from both internal and external sources; they must analyse what they are capable of, identify the gaps in their knowledge, and learn to fill in these gaps quickly to take advantage of international opportunities (Autio, Sapienza, & Almeida, 2000). On the other hand, they learn from their international encounters, about specific markets, products and business practices, which, in time, yields accumulated experience gained from operating in the international environment (Eriksson, Majkga°rd, & Sharma, 1997). Firms' ability to 'recognize the value of new external information, assimilate it, and apply it to commercial ends' is referred to as absorptive capacity (Cohen & Levinthal, 1990). The SMEs that successfully operate on international markets are likely to have this absorptive capacity well developed.

It is important to take note of all kinds of knowledge exchange. Authors agree that internationalising organisations assimilate both explicit and tacit knowledge (Fletcher & Prashantham, 2011; Sapienza, Autio, George, & Zahra, 2006). While explicit knowledge is codified and reasonably easy to access, tacit knowledge is embedded in individuals and cannot easily be expressed explicitly or codified in written form. And yet it is tacit knowledge that sometimes carries the most valuable information of know-how, know-who, and know-where, and can be accessed only through direct interactions and personal relationships (Nonaka & Toyama, 2015). These personal relationships with outside partners would seem to be critical in times of sudden turbulence and crisis when firms have no time to prepare, plan and execute, but must rather rely on each other and seek advice, help, and support from their partners.

The assumption that internationalized SMEs would know more, have better-developed learning capabilities and possess broader access to tacit knowledge through their international relationships, is well illustrated by network theory. The network approach rests on the assumption that the networks in which firms are embedded determine the information, knowledge, and resources they can access (Adler & Kwon, 2002; Clarysse, Wright, Bruneel, & Mahajan, 2014). Networks are critical for learning in socio-constructivist approaches, especially in the context of entrepreneurship. Firms develop new ideas and new practices by recombining dispersed bits of incomplete knowledge that are spread across people, places and times, in novel ways that serve to create new value. This process is conditioned by the number of knowledge pools with which the entrepreneur is directly connected (Jack, 2005). Access to knowledge pools, interaction, and exchange appears to be at the heart of organizational learning and adaptation. It is fair to assume that firms operating on international markets have access to more diverse knowledge pools than those whose operations are limited to the domestic market. Therefore, knowledge sharing can be orchestrated on a wider scale for internationalized firms, resulting in potentially higher exposure to diverse knowledge pools where knowledge can be exchanged and developed. These criteria may have played an important role when firms were faced with unprecedented challenges during the Covid-19 pandemic. We hence hypothesize that:

- H1:** The SMEs with international operations adapted their training and development practices more quickly than those operating solely on the domestic market.

Innovation Orientation

Literature on innovative SMEs recognizes HR competencies as a factor facilitating the innovation process (Loufrani-Fedida & Aldebert, 2020). Innovative SMEs are those exhibiting an innovation orientation, which consists of both openness to innovation, intention to innovate, and innovation behaviours (Siguaw, Simpson, & Enz, 2006; Littunen *et al.*, 2021). Innovation processes require innovation competence, such as creativity and many others, which can be trained and developed over time. Many SME owners and managers are aware of how important it is to develop these competencies within their critical workforce. Hero, Lindfors, and Taatila (2017) conducted a meta-analysis of individual innovation competence factors and found six upper categories: personal characteristics (sense of humour, motivation, takes initiative, goal orientation, self-management, ability to perform well under pressure), future orientation (creative visioning, alertness to new opportunities, pro-activeness, risk-taking ability), creative-thinking competencies (creativity, inventiveness, ability to acquire rapidly cognitive

competences, analytical thinking), social competences (cooperation, teamwork, interpersonal management, ability to create partnerships, networking, communication, negotiation, active listening, brokering), project management competences (planning, ability to use time efficiently, leadership), content knowledge and making competences (knowledge of other fields or disciplines). The majority of the above competencies come in very handy in times of turbulence and sudden change. The development of these features forms effective managerial systems including human resource management (Lulewicz-Sas *et al.*, 2022) and social capital management (Mishchuk *et al.*, 2022). For example, during the Covid-19 pandemic future orientation, creativity, and cooperation were the competence that may have been decisive in how quickly and how well firms adapt to the new realities and how resilient they are. Research indicates that the firms that adapted best leveraged their organizational capability to improvise and solve new problems by recombining already existing resources (Machaczka & Stopa, 2022; Marcazzan *et al.*, 2022; Montenero & Cazorzi, 2022). They are efficient also in meeting the changing consumers' interests influenced by pandemic circumstances (Rybackowska *et al.*, 2021).

Because of the unpredictable nature of innovation which arises from informal collaboration across and beyond the firm and through designated creativity teams, uncertainty is embedded in the organizational outcomes of innovating SMEs (Shipton, Budhwar, Sparrow, & Brown, 2017). Innovation professionals and the firms they work for rely on exploring new ideas, experimentation and testing, and oftentimes failure. Innovation is a learning journey teaching us how to adapt. Therefore, we claim that the specific types of competence that innovative SMEs' employees possess and their familiarity with uncertainty is why these firms adapted more quickly to pandemic realities. We hence hypothesize that:

- H2:** The SMEs with an innovation orientation adapted their training and development practices more quickly than those without innovation orientation.

RESEARCH METHODOLOGY

To verify the hypotheses, we used data collected through a nationwide survey of enterprises. The main aim of that survey was to determine the impact of the business environment and the institutional support system on the functioning of enterprises in Poland during the first year of the Covid-19 pandemic. For the purpose of this research survey, we extracted responses regarding internationalization, innovation orientation, employee training, and development adaptation submitted by SMEs. The survey was carried out in November 2021 using the CATI method. Ultimately, 214 small and medium-sized enterprises participated in the survey.

The dependant variable in this study was the adaptation of training and development within the company. To gain deeper insight into the adaptation practices we measured it in terms of quantity (D1) and form (D2-D7). Firm internationalization was measured by a single item (I1) which enabled us to split the sample into two subgroups: firms which trade their goods and services solely domestically and those that trade also or solely abroad. Innovation orientation was measured by having a framework for developing innovation development and implementation (I2), openness to innovation (I3), and actual innovation behaviours (I4-I7). One of the items (I7) used reverse phrasing for control purposes. The description of the dependent and independent variables is provided in Table 1.

An ordered probit model was employed in the study to investigate the changes in the number of training sessions conducted in the company last year (compared to the period before the Covid-19 pandemic – D1). The probability that the variable (ordinal variable) takes a particular value is specified with the use of the standardised normal distribution function in the following manner (Greene, 2008):

$$\begin{aligned}
 P(Y = 1) &= \Phi(\beta'x + \beta_1) \\
 P(Y = 2) &= \Phi(\beta'x + \beta_2) - \Phi(\beta'x + \beta_1) \\
 &\vdots \\
 P(Y = j) &= 1 - \Phi(\beta'x + \beta_{j-1})
 \end{aligned}
 \tag{1}$$

where:

$\beta_1, \dots, \beta_{j-1}$ - estimated constants;

Φ - the distribution function of the standard normal distribution;
 β' - the vector of estimated parameters;
 x - the vector of independent variables.

Table 1. Analysed variables

Variable code	Description	Value
Dependent variables		
D1	Training and development adaptation during Covid-19.	1 = we conducted much less training than usual; 5 = we conducted much more training than usual
D2	We suspended all training (we did not conduct training during the pandemic).	1= Yes, 0= No
D3	We partially abstained from training and carried out limited training at the company's headquarters.	1= Yes, 0= No
D4	We partially abstained from training and carried out limited training online.	1= Yes, 0= No
D5	We partially abstained from training and learn from each other within the company.	1= Yes, 0= No
D6	We did not conduct online training before the pandemic but tried to adapt quickly and managed to conduct online training during the pandemic.	1= Yes, 0= No
D7	Even before the pandemic, the training was partially online, so we expanded the number and scope of online training.	1= Yes, 0= No
Independent variables		
I1	Internationalization: Do you sell your products and services abroad?	1 = foreign customers; 0 = local or domestic customers
I2	We have a framework for developing innovation starting from the idea submission phase.	1= Yes, 0= No
I3	We are open to innovation.	1= Yes, 0= No
I4	We limit ourselves to imitating solutions introduced by competitors.	1= Yes, 0= No
I5	We buy out innovative enterprises to gain access to innovation.	1= Yes, 0= No
I6	We gain access to innovation through cooperation with external entities.	1= Yes, 0= No
I7	We do not have a strategy for implementing innovation.	1= Yes, 0= No

Source: own study.

The parameters of the model are estimated using the maximum likelihood. The positive value of the particular β parameter for the adequate independent variable x (with increasing values) increases the probability of the occurrence of the first value of dependent variable Y and reduces the probability of the occurrence of the last value j . In the case of the middle values of the dependent variable, the changes in the probability of the occurrence of these values are not unequivocal. It is impossible to determine (having the estimated parameter) in which direction the change of the probability goes in these classes. We can unequivocally interpret the parameters concerning the first and last class.

In the case of dependent variables was dichotomous (it assumes two values: $Y = 1$ or $Y = 0$), a logit model was used (D2-D7). Depending on certain factors (x_j), in this model, probability can be interpreted as a value of the distribution function described with the following formula (Maddala & Lahiri, 2009):

$$P(Y = 1) = \frac{\exp(\alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_k X_k)}{1 + \exp(\alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_k X_k)} \quad (2)$$

where:

Y - dummy dependent variable;

X_1, \dots, X_k - explanatory variables;

$\alpha_0, \dots, \alpha_k$ - model parameters.

The parameters of the logit model are most often obtained using maximum likelihood estimation (MLE) by maximizing the logarithm of the probability function relative to the model parameters by means of iterative numerical procedures.

RESULTS AND DISCUSSION

In this study, Polish small and medium-sized enterprises were analysed, meaning those employing between 10 and 249 people. According to the survey, a minority of companies (16.17%) conducted more training during the year than before the pandemic (D1). While 38.72% conducted fewer training sessions and in 45.11% of the surveyed companies the pandemic did not affect the number of training sessions conducted. Regarding the training activities during the pandemic, most surveyed companies partially suspended training but tried to conduct the necessary ones online (D4 – 66.80%), or the employees tried to help each other and learn from each other within the company (D5 – 62.24%). A large group of companies (D6 – 55.6%) indicated that despite the lack of online training before the pandemic, they adapted quickly and managed to conduct many online training sessions during the pandemic. The online training offered before the pandemic was extended (D7) by 20.33% of the surveyed enterprises. Trainings were partially suspended by 43.15% of companies, carrying out the necessary training at the company's premises (D3). Only a few companies stopped training during the pandemic (D2 – 14.94%).

Table 2. Sample characteristics

Variable	%	Variable	%	Variable	%
D1.1	17.02	D2	14.94	I1	21.99
D1.2	21.70	D3	43.15	I2	20.33
D1.3	45.11	D4	66.80	I3	54.36
D1.4	9.79	D5	62.24	I4	14.11
D1.5	6.38	D6	55.60	I5	7.05
–	–	D7	20.33	I6	11.20
–	–	–	–	I7	34.85

Source: own study.

Nearly 4/5 of the firms included in the sample directed their offer exclusively to regional or domestic customers, and 22% only to foreign customers or both domestic and foreign customers (I1). Regarding innovation orientation, openness to innovation was indicated by the majority of firms (I3 – 54.36%). However, regarding the innovative behaviours of the surveyed enterprises, 20.33% (I2) had a framework for developing innovation in place, starting from the idea submission phase, while 34.85% of enterprises did not have an innovation implementation strategy (I7). To gain access to innovation (I5) 7.05% of companies bought out innovative enterprises, 11.20% gained access to innovation through cooperation with external entities (I6) but 14.11% limited innovation to imitating solutions introduced by competitors (I4).

The relationship between training adaptation during a pandemic in relation to internationalization and innovation orientation was then investigated. Statistically significant relationships confirmed by the chi-square test of independence and measured with Cramér's *V* correlation coefficient are presented in Table 3.

The results (Table 3) suggest that openness to innovation (I3) had a statistically significant impact on the overall number of training and development activities carried out during the Covid-19 pandemic – D1 (0.2020; $p < 0.1$). Openness to innovation (I3) and internationalization (I1) had a statistically significant impact on the quick adaptation of training and the number of training sessions conducted during the pandemic – D6. Furthermore, internationalization (I1) and access to innovation through external cooperation (I6) had a statistically significant impact (0.2456; $p < 0.01$) on mutual learning and learning from others during the Covid-19 pandemic (D5). Lack of strategy for implementing innovation (I7) had a statistically significant impact (0.1885; $p < 0.05$) on halting training in the company (D2), suggesting that firms without an

innovation strategy have suspended their training during Covid-19. Another noticeable statistically significant relationship was observed for the firms which declared having a framework for developing innovation (I2) – they have carried out their most necessary training sessions on company grounds – D3 (0.1501; $p < 0.1$). On the other hand, we observed a statistically significant relationship between carrying necessary training sessions online (D4) and firms copying innovation from the competition – I4 (0.1736; $p < 0.05$).

Table 3. Correlation matrix (Cramér's V correlation coefficient)

Specification	I1	I2	I3	I4	I6	I7
D1	–	–	0.2020*	–	–	–
D2	–	–	–	–	–	0.1885**
D3	–	0.1501*	–	–	–	–
D4	–	–	–	0.1736**	–	–
D5	0.2456***	–	–	–	0.1428*	–
D6	0.2529***	–	0.1709**	–	–	–

* – $p < 0.1$; ** – $p < 0.05$; *** – $p < 0.01$.

Source: own study.

The next phase of analysis was to build on the implied relationships confirmed by the chi-square test and further test the impact of internationalization and innovation orientation on training and development adaptation during Covid-19 in terms of the number of training sessions conducted (D1) using the ordered probit model (Table 4).

Table 4. Estimation results of ordered probit model for training and development adaptation during Covid-19 (D1)

Specification	Coef.	Standard error	Wald statistics	p-value
Constatnt 1	-0.712	0.204	12.151	0.000
Constatnt 2	-0.030	0.200	0.023	0.881
Constatnt 3	1.275	0.212	36.293	0.000
Constatnt 4	1.828	0.230	63.382	0.000
I1	0.250	0.173	2.084	0.149
I2	-0.426	0.192	4.927	0.026
I3	-0.114	0.168	0.461	0.497
I4	-0.256	0.212	1.450	0.228
I5	-0.261	0.282	0.857	0.354
I6	-0.347	0.229	2.303	0.129
I7	-0.221	0.194	1.294	0.255
Model fitting				
AIC	667.34			
Log(likelihood ratio)	-322.67			

Source: own study.

The results of the parameter estimation of the ordered probit model (Table 4) indicated a significant impact of having a framework for developing innovation on the probability of providing more training than usual. However, no significant impact was recorded for internationalization (Table 4).

Further analysis continued with testing for relationships between the independent variables and forms of training (D2-D7). The results of the parameter estimations for the logit models for selected training activities during Covid-19 are presented in Table 5. Although the values of the pseudo-R2 coefficient – which in the case of the estimated models were not high – were acceptable in the case of these types of models when applied to individual data (Gruszczyński, 2012). The lack of significance returned by the Hosmer-Lemeshow test (in each of the models) allows us to conclude that the observed and predicted values were sufficiently close. It may therefore be assumed that the models represented a good fit with the actual data.

Table 5. Estimation results of the logit model

Specification	D3		D4		D5		D6		D7	
	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value
Constant	-0.342 (0.384)	0.374	0.758 (0.397)	0.056	-0.476 (0.513)	0.496	0.340 (0.438)	0.374	-1.074 (0.460)	0.020
I1	0.478 (0.337)	0.156	-0.302 (0.346)	0.383	0.152 (0.182)	0.422	-1.158 (0.343)	0.001	0.709 (0.137)	0.057
I2	-0.894 (0.387)	0.021	0.124 (0.393)	0.752	-0.106 (0.387)	0.776	-0.385 (0.375)	0.339	-0.190 (0.443)	0.668
I3	0.429 (0.331)	0.195	0.162 (0.341)	0.636	0.671 (0.342)	0.049	0.551 (0.327)	0.093	-0.348 (0.399)	0.383
I4	-0.434 (0.418)	0.299	-0.930 (0.410)	0.023	0.259 (0.434)	0.561	-0.329 (0.418)	0.430	-0.155 (0.502)	0.757
I5	-0.095 (0.574)	0.869	-0.405 (0.570)	0.477	0.895 (0.631)	0.157	0.153 (0.569)	0.788	-0.050 (0.632)	0.937
I6	0.063 (0.441)	0.887	0.566 (0.504)	0.261	1.249 (0.538)	0.022	0.220 (0.456)	0.630	0.428 (0.484)	0.376
I7	-0.023 (0.376)	0.951	0.141 (0.540)	0.722	0.620 (0.395)	0.124	-0.082 (0.383)	0.830	-0.800 (0.488)	0.101
Model fitting										
AIC	328.69		306.53		316.44		318.38		248.51	
Nagelkerk R^2	0.0618		0.0525		0.0629		0.1194		0.0558	
Log(likelihood ratio)	-156.35		-145.26		-150.22		-151.19		-116.25	
Hosmer Lemeshow	6.158		3.792		4.675		0.6517		1.6551	
Test	$p = 0.2911$		$p = 0.5797$		$p = 0.5862$		$p = 0.9855$		$p = 0.8945$	

Standard errors are presented in parentheses.

Source: own study.

Several relationships implied by the chi-square test were confirmed. The results of the parameter estimations for the logit models indicated that companies having a framework for developing innovation (D3) were less likely to abstain training and development activities (I2). Companies which limited their innovation orientation to imitating solutions introduced by competition (I4) were less likely to carry out training online (D4).

The companies which were more likely to substitute part of their training with mutual learning (D5) were those that were open to innovation (I3) and those which gained access to innovation through cooperation with external entities (I6).

The probability of quick adaptation and switching to online training sessions (D6) was greater for those companies which were open to innovation (I3) and lesser for those which sold their goods and services abroad (I1). However, the probability of extending already existing online training sessions during the pandemic (D7) was greater for companies which sold their goods and services abroad (I1).

The above results confirmed our second hypothesis and indicated that innovation orientation had a positive impact on the adaptation of training and development practices within Polish small and medium companies during the first year of the Covid-19 pandemic. The results of the parameter estimations for the logit models suggest that openness to innovation, having a framework for developing innovation and gaining access to innovation through cooperation with external entities were the three factors that influenced the speed and scope of adaptation processes in small and medium firms during the first year of Covid-19 pandemic. Copying innovation of competitors and firm buy-outs are innovation behaviours which did not impact adaptation, which might be explained by prior findings suggesting that imitation of innovation does not reflect a truly innovative culture and innovation orientation of a given firm (Naranjo-Valencia *et al.*, 2011).

True innovation orientation and pioneering original innovation development imply organizational commitment and having an innovation framework implies having a set of procedures to exercise this

commitment. This finding falls in line with prior research which indicated that organisational commitment activated by the frequency of company activities and their level of formalisation are strongly inter-related with firm reaction strategies (Marcazzan *et al.*, 2022). Preparedness to adapt to unforeseen circumstances is therefore determined by the procedures and practices in place, embedded into the DNA of a company. The SMEs with an innovation orientation, a working framework for developing innovation, and a practice of cooperating with external partners may exhibit a natural tendency to proactively react to unforeseen circumstances such as the consequences of pandemic outbreak in 2020.

While innovation orientation clearly positively impacts adaptation of training and development within SMEs, the impact of internationalization is not that clear. The results deliver somewhat mixed implications. Statistically significant relationships confirmed by the chi-square test of independence and measured with Cramér's *V* correlation coefficient include internationalization and (i) quick adaptation of training, (ii) the number of training sessions conducted during the pandemic, as well as (iii) mutual learning and learning from others during the Covid-19 pandemic. However, the results of the parameter estimation of the ordered probit model indicated no statistically significant impact of internationalization on the probability of providing more training than usual. This relationship is only true for those firms which already delivered training sessions online prior to the pandemic and after its outbreak increased their number. These results suggest that the existence of prior experience with online technologies may have moderated the relationship between internationalization and adaptation of training and development during the first year of the pandemic. Early adoption of online learning technologies usually determines the development of online training programs in firms as recently hinted by prior research (Żur & Friedl, 2021); the first step is always the most difficult for firms; the initial adoption of online learning usually leads to a sharp adoption curve. Additionally, as Coetzer *et al.* (2022) have found in a study dedicated to distinctive characteristics of small businesses which affect employee learning, SME owners value physical and social proximity to employees as it creates the potential to facilitate learning through direct provision of immediate feedback and guidance.

The findings of this study present valuable contribution to the research on SMEs adaptability in times of crisis. This stream of research is extremely important considering the harsh realities of the VUCA (volatile, uncertain, complex, and ambiguous) environment we live in with its extreme effects, either ecological, health and/or economic consequences. The SMEs adaptability to challenging and unpredictable circumstances is a unique area of research, as SMEs are not small versions of large firms. They are more vulnerable than larger organisations to shocks because of their relative shortcomings regarding technological, managerial and human capabilities, lower diversification opportunities, and a strong dependence on a few customers and suppliers (Marcazzan *et al.*, 2022). In Europe, SMEs account for 99% of all businesses, between 50 and 60% of value added, and 67% of private sector employment (OECD, 2021), so their adaptation and resilience are critical to the economy. Adaptation capabilities will very likely determine the survival and success of SMEs in the years to come and new shocks to hit.

Researchers agree that companies obtain and maintain their competitive advantage through their ability to renew and integrate their competencies and develop new ones (Teece, Pisano, & Shuen, 1997; Zahra & George, 2002). Therefore, continuity of training and development programs in times of crisis is critical. This research is novel as it is the first study to provide evidence that innovation orientation can positively influence how firms adapt their training and development in times of crisis.

The practical implications of this research encourage SMEs to develop an innovation orientation to implement lasting learning practices across the organization which will be shock-free. Furthermore, managers should encourage and facilitate mutual learning within the organization and take every opportunity to learn from external partners. Finally, our research findings suggest that SMEs should take the opportunity of new technologies and ensure that training and development do not cede to take place despite any developments.

CONCLUSIONS

The Covid-19 pandemic will be studied and remembered as a time of unprecedented turmoil and test for many companies around the world. The first year was a time of adaptation to the new reality

brought in by lockdown, remote work, and resultant business challenges. Employees needed to quickly acquire new skills and competence. The goal of this research was to investigate whether SMEs with a higher level of internationalization and innovation orientation were able to adapt their training and development activities quicker and better than others. The results indicated that internationalization did not exhibit any significant impact on the number of training sessions conducted during the first year of Covid-19. However, for those companies, which were conducting some training sessions online before the pandemic, internationalization does have an impact on expanding the scope and scale of employee training and development. The results clearly indicated that innovation orientation had an impact on the adaptation of training and development for Polish SMEs.

The study had several limitations. As the data collection was part of a larger nationwide survey, the study was based on a purely Polish sample. There is no reason to assume that Polish SMEs are different and distinct in terms of adaptation from other EU counterparts. Therefore, replication studies in other geographical contexts are much encouraged. Second, the study did not employ commonly accepted measures of innovation such as new product development but focused on innovation orientation. Future studies should investigate the impact of innovation performance on adaptation. Future researchers investigating SME adaptation during Covid-19 can take advantage of qualitative methods to explore individual factors of owners, managers and employees through retrospective narrative. Individual testimonies might uncover nuances and factors not tested by quantitative research. Finally, the existence of prior experience with online technologies as a moderator of the relationship between internationalization and adaptation of training and development during the first year of the pandemic requires further testing.

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