

# **COVID-19 implications on the Relationship between Organizational Learning and Performance**

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## **Abstract**

This research examines the implications of COVID-19 on the relationship between organizational learning and operational performance in service organizations. By using social learning theory and transactive memory system theory, we developed competing hypotheses on how organizational learning and COVID-19 outbreak interact with each other to explain their impact on operational performance. To test our hypotheses, we surveyed 106 employees of service organizations who have been remotely working during COVID-19 outbreak. The collected data was analyzed through multivariate data techniques. We specifically measured operational performance to assess the organization's performance as they were the ones immediately affected by the outbreak of COVID-19, which then is expected to have a lagged impact on financial performance. Through exploratory factor analysis, we identified two bundles of COVID-19 work implications, namely home office work environment and social distancing. Results confirmed that home office work environment positively mediates the relationship between organizational learning and operational performance of service organizations. No mediating effect was found for social distancing. Our research adds to theory, since we evidenced that individuals' behaviors (represented here by organizational learning practices) and work environment reciprocally influence each other, even when individuals are actually apart from the usual work environment, as observed during the pandemic.

**Keywords:** COVID-19, Pandemic, Organizational learning, Social learning theory, Transactive memory system theory, Service sector, Operational performance.

## **1. Introduction**

COVID-19 has significantly impacted the health of individuals, organizations and economies. As individuals and economies are making innovative interventions to contain the spread of the virus, organizations are revisiting their processes and learning to adapt to new requirements of employees, customers and suppliers to contain the adverse impact on performance. To understand how organizations are responding to the COVID-19 pandemic, Naughton (2020) conducted an informal survey and collected 280 responses from Harvard Business Publishing Corporate Learning clients and others. Results showed that 85% of the respondents reported their organizations have implemented a virtual work policy, 76% were considering virtual learning, and 78% have created new employee communication channels that are specific to the crisis. In a short period of less than six months, organizations have embraced several disruptive changes to adapt to the new normal circumstances globally.

COVID-19 outbreak has left both manufacturing and service organizations across the globe to reflect on their existing processes. In service organizations, majority of firms have asked their employees to work from home as much as feasible, especially those conducting asynchronous work. For example, from March 13<sup>th</sup> to April 2<sup>nd</sup> 2020 the percentage of people who reported working remotely in the U.S. increased from 33% to 61%, and a large proportion of them (59%) preferred to work virtually as much as possible even after restrictions are lifted (Gallup, 2020; Graves and Karabayeva, 2020). Different service sector firms reacted differently towards the transition to work from home. Twitter announced it will allow its employees to work from home forever, and Google and Facebook have announced that they will allow most of their employees to continue working from home for the remainder of 2020 (Paul, 2020).

This transition to work remotely is expected to significantly impact both the way employees conduct their day-to-day activities and the operational performance. An opinion piece in The New York Times (2020) states that *“Remote environments will demand different approaches to mentorship, teamwork and fostering a shared sense of purpose”*. The article also cites that Yahoo in 2012 banned telecommuting by giving importance to being physically present in the office as it felt that speed and quality was often sacrificed by working from home. It further mentions that *“From the midcentury-modern palaces to the playful campuses of today’s tech giants, the (technology) industry has invested heavily in the idea that “knowledge work” depends on carefully designed office environments”*. Given that the carefully designed office environment with “huddle rooms” and “idea parking lots” are getting replaced by less equipped home office environment, it is imperative to investigate and understand the effect of this intervention on operational performance of service organizations.

Organizational learning denotes the process through which an organization continuously learns and transforms itself (Senge, 1990), effectively sustaining the innovation towards the achievement of an improved operational performance level (Heraty, 2004; Gil and Carrillo, 2016). This process built on clear understanding and deep knowledge of continuous learning practices is linked with organizational culture and environment, and drives operational performance improvement (Song et al., 2009; Santa and Nurcan, 2016; Tortorella et al., 2020a). Disruptions have been found to impact organizational learning by influencing learning at individual and collective levels (Anderson Jr and Lewis, 2014). In this sense, it becomes timely to understand the impact of COVID-19 outbreak on the relationship between organizational learning and operational performance of services that have rolled out remote work (Tovstiga and Tovstiga, 2020). However, as the pandemic effects are still under investigation, little evidence of its work implications are

already reported, especially in terms of its effect on organizational learning of service firms and operational performance. Hence, the overarching research question that this study attempts to answer is:

*RQ. What are the implications of COVID-19 outbreak on the relationship between organizational learning and operational performance in service organizations?*

Our research is grounded on social learning theory (SLT) (Bandura, 1971) and transactive memory system (TMS) theory (Wegner 1987). SLT has been identified as one of the most influential theories of learning and is considered a bridge between behaviorist learning theories and cognitive learning theories as it includes attention, memory, and motivation (Muro and Jeffrey, 2008). TMS theory describes how learning processes affect the intertwined individual and collective knowledge (i.e. individual learning affects collective learning, which in turn affects individual learning, and so on) and thereby their performance (Anderson Jr and Lewis, 2014). As both the theories explain the learning processes in organizations at different levels, we expect them to provide the appropriate lens to hypothesize how organizational learning and COVID-19 outbreak interact with each other to explain their impact on operational performance.

To test our hypotheses, we surveyed 106 key employees from Indian service organizations that have been remotely working during COVID-19 outbreak. The collected data was analyzed through multivariate data techniques. Through exploratory factor analysis, two bundles of COVID-19 work implications were identified, namely *home office work environment* and *social distancing*. Our results show that work implications of COVID-19 mediate the relationship between organizational learning and operational performance of service organizations. However, counterintuitively, the mediation of *home office work environment* has a positive effect. This study demystifies how the COVID-19 work implications can be utilized to catalyze the effects of organizational learning on

operational performance. Besides its theoretical implications, our study also contributes to practice as it provides managers from service organizations arguments to enhance their performance even in extremely critical moments, such as the one caused by the COVID-19 pandemic.

The remaining of this paper is comprised as follows. Section 2 presents the theoretical background to develop the hypotheses. Section 3 describes the applied method, whose results are shown in section 4. Section 5 concludes the study and discusses the limitation and future research opportunities.

## **2. Theoretical background**

### **2.1. Organizational learning and COVID-19 outbreak**

Organizational learning is the process integrated into daily work activities through which individuals, working teams, organizations, and communities influenced by them continuously learn and transform themselves as well as the organization (Tortorella and Fogliatto, 2014). For enabling organizational learning process, prerequisite principles and practices, e.g. open communication, willingness to risk, support for learning and training by promoting learning environment, recognition schemes and knowledge management, have to be mandatorily in place (Kontoghiorghes et al., 2005; Tortorella et al., 2015a; 2020b). The strategic process of organizational learning results in knowledge, beliefs and changes in behaviour, which increases the capabilities of an organization to innovate, grow and achieve higher performance results (Heraty, 2004; Salmador and Florín, 2013). Firms having mature organizational learning processes can maintain high operational performance results by sustaining the innovation with goals directly

linked to improvements in quality and delivery, thereby achieving higher business profitability (Huysman, 2000; Harvey et al., 2018).

However, the outbreak of COVID-19 has changed the *status quo* of organizational learning processes and their impact on operational performance. According to a stream of literature on organizational learning, knowledge is embedded in organizational routines and processes that serve to guide and constrain the actions of individuals (Desai, 2010). Several of these routines and processes have been skipped, removed and redesigned, while new ones have been created to accommodate the new normal circumstances during the outbreak of COVID-19 (Harter, 2020). On one hand, the pandemic has disruptively changed how individuals, teams and organizations learn in a work scenario with an increased proportion of remote activities and stress on employees (Tovstiga and Tovstiga, 2020). This has also led to the risk of mental illness due to the fading of boundaries between work and leisure time, restricted international travel, higher weightage to health and safety through the design of new systems, and higher chances of dealing with unsatisfactory information technologies (IT) or workspaces, to name a few. On the other hand, COVID-19 crisis has introduced ample opportunities to reflect, revisit and foster abrupt changes that make organizations stronger to face next pandemic (Craighead et al., 2020; Ammirato et al., 2020), if one had to occur. This is aligned with what Albert Einstein famously proclaimed, “in the midst of every crisis lies great opportunity”. Therefore, the relationship between organizational learning processes and operational performance is not clear in the context of COVID-19 outbreak, and is imperative to investigate it. We use SLT and TMS theory below to develop competing hypotheses (similar to the approach in Davies and Joglekar, 2013) on mediation of work implications of COVID-19 outbreak on the relationship between organizational learning and operational performance.

## 2.2. Social learning theory

According to SLT, learning is most effective when learners are allowed to observe and interact with other learners and to participate in small study groups (Bandura, 1971; Pinho et al., 2019). SLT treats learning as a cognitive process that takes place in a social context purely through observation or direct instruction. In the remote and virtual work context of COVID-19 outbreak, the level of observation that can be made by an employee is minimal and negligible in most of the cases. Working remotely gives a sense of lack of social connection as employees have fewer opportunities to interact with their colleagues (Graves and Karabayeva, 2020). Further, working from home with the absence of informal impromptu conversations and social cues, such as facial expressions and tone of voice, makes it difficult to establish bonds with colleagues. This may lead to miscommunication, personal conflicts, and frayed relationships (Golden, 2006; Graves and Karabayeva, 2020).

To successfully learn, individuals must pay attention and avoid distraction as it will negatively affect observational learning (Snethen and Van Puymbroeck, 2008). While identifying the challenges inherent to working from home during COVID-19 outbreak, Graves and Karabayeva (2020) stated that *“employees may focus on family demands during normal work hours, potentially impacting performance”*. Losing focus and distraction episodes are more frequent while working from home, which prevents the employee from being productive. This results in intrusion of work into personal time, pushing them to compromise their family responsibilities, finally adding to their stress with further reduced focus the next day.

Finally, retention of learning refers to the process of recollecting what employees paid attention to (Bandura, 1971; Pinho et al., 2019). Transforming the observed activity into verbal codes or



images increases the retention capacity (Balakrishnan and Gan, 2016). Physically working together provides diverse opportunities to create mental images, cognitive organization, symbolic and motor rehearsal, and symbolic coding, in comparison to working from home. Based on these coherent arguments from SLT, we formulate the following hypothesis:

*H1A: The work implications of COVID-19 outbreak negatively mediate the effect of Organizational Learning on Operational Performance*

### **2.3. Transactive memory system theory**

TMS theory is used to understand “the shared division of cognitive labor with respect to the encoding, storage, retrieval, and communication of information from different domains that often develop in close relationships” (Hollingshead, 2001, p.1080). TMS facilitates immediate and coordinated access to specific expertise, delivering high quality and task-relevant knowledge to collective tasks, and leading to operational performance improvement in workgroups (Lewis and Herndon, 2011). TMS theory explains how information can be quickly accessed, less likely to be forgotten or overlooked, and available to improve task and performance (Bachrach et al., 2019). TMS theory captures how a representation of each employee gets developed as team members work together, and how it helps managers to allocate tasks and team members to effectively coordinate across specialized roles (Staats, 2012). Majority of the service organizations during COVID-19 outbreak have put the recruitment and promotion processes in freeze (IBISWorld, 2020), which has removed the setting of working with unfamiliar colleagues within a team. This is expected to increase TMS as the employees are working with familiar colleagues whose representation have already been formed. Obayi et al. (2017) empirically showed that, by creating

collective buyer-supplier memory systems to mitigate and manage uncertainties, TMS positively mediates the link between supply chain flexibility and operational performance.

Different disruptions, either internally (e.g. turnover, restructuring) or externally originated (e.g. technological changes, natural disasters), interact differently with learning processes to produce their effects on performance. By simulating the impact of such disruptive events on performance, Anderson Jr and Lewis (2014) showed that some types of disruptions may permanently reduce productivity and performance, while other types may actually increase performance in the long run. Internally originated disruption has been found to be less harmful to overall productivity if teams were highly structured in terms of specialized roles and routines (Rao and Argote, 2006). Even though COVID-19 disruption was externally originated, the adaptation to the new normal circumstances, such as conducting remote work and social distancing, were imposed by the organization to their employees. Therefore, work implications of COVID-19 outbreak can be treated as restructuring disruptions internally originated without much harm to overall productivity.

Edmondson et al. (2001) studied how cardiac surgery teams responded to the adoption of a new technology (externally originated disruption) and found the teams that developed new collective knowledge about members' roles and responsibilities, and new routines to successfully interact. Extending to the context of COVID-19 outbreak, while transitioning to remote work, employees would have been introduced to new technology platforms, and the ones who were ahead in developing collective knowledge would have been successful in achieving the desired operational performance. When task environments are highly volatile, similar to that of pandemic, TMS can assist teams to complete tasks efficiently and effectively (Ren et al., 2006). Disruptions to individual knowledge have been found to enhance productivity if they were sufficiently rare, and

if collective knowledge was not disrupted (Anderson Jr and Lewis, 2014). Analogously, one might claim that COVID-19, as a disruption to individual knowledge, can enhance productivity. Based on the above arguments, we formulate the below competing hypothesis:

*H1B: The work implications of COVID-19 outbreak positively mediate the effect of Organizational Learning on Operational Performance.*

Figure 1 illustrates the theoretical model investigated in our study.

Figure 1 – Theoretical model investigated

### **3. Method**

The method applied in this study encompasses four main steps: (i) instrument development; (ii) sample selection and data collection; (iii) constructs validity and reliability; and (iv) data analysis. These steps are detailed in the subsequent sections.

#### **3.1. Instrument development**

The proposed instrument was comprised of four parts. The initial part gathered information of respondents and their organizations (see Table 1). In terms of respondents' characteristics, we asked their gender, work experience and role within the service organization. Regarding organizations' features, we collected information on their ownership (public or private), type (transnational, or national), and size (number of employees). Further, following works from Shah and Ward (2003), Tortorella et al. (2017) and Rossini et al. (2019), and indications from SEBRAE (2010), we used the threshold of 500 employees to differentiate between small/medium and large organizations. Due to the variety of service organizations, we checked organizations sectors which

were categorized in five groups (Fitzsimmons et al., 2008): (i) financial services (e.g. financing, leasing, insurance), (ii) government services (e.g. military, education, judicial, police and fire protection), (iii) distribution services (e.g. wholesaling, retailing, repairing), (iv) personal services (e.g. healthcare, restaurants, hotels), and (v) Infrastructure Services (e.g. communications, transportation, utilities, banking). Following Fitzsimmons et al. (2008), we also asked organizations' degree of interaction and customization (low or high), and degree of labor intensity (low or high).

The second part adapted the Dimensions of Learning Organization Questionnaire (Marsick and Watkins, 2003; Marsick, 2013) into the survey. Forty-three statements examined organizational learning using a 6-point Likert scale from 1 (never occurs) to 6 (always occurs). Subsequently, the third part aimed at evaluating the work implications of COVID-19 outbreak. For that, ten items (see Table 2) were consolidated based on studies from Qiu et al. (2020), Nicola et al. (2020), Lewnard and Lo (2020) and Zhang et al. (2020), and listed in the questionnaire. Similarly, a Likert scale varying from 1 (fully disagree) to 6 (fully agree) was used to quantify the agreement level with each item. The last part consisted in gathering the perceived change in performance in the last two months of individuals, teams, and organizations. Although we acknowledge that this might entail a short-term perspective on the performance improvement variation, this is inherent to the recent nature of the implications caused by the pandemic (Narayanamurthy and Tortorella, 2021), limiting the time range for assessing operational performance. For each context of analysis, two output measures were used: quality and delivery. In total, six performance items (see Table 3) were evaluated in a Likert scale that ranged from 1 (significantly worsened) to 6 (significantly improved).

The questionnaire was pre-tested by two academicians to check content and face validity. Their feedbacks allowed to revise terms and statements that could lead to misinterpretations and erroneous responses. Hence, to curb common method bias, some procedures recommended by Podsakoff and Organ (1986) and Podsakoff et al. (2003) were performed; they are: (i) concerning questionnaire organization, dependent variables were located far from independent ones; and (ii) a statement that explicitly clarified the anonymity nature of the survey and that there was no better answer was provided in the beginning of the questionnaire.

### **3.2. Sample selection and data collection**

For sample selection, a non-random approach with some predetermined selection criteria was followed (Smith, 1983). Due to our study's purpose, respondents should work in service organizations whose activities remained occurring remotely during COVID-19 outbreak. To verify that, an initial question was added to the questionnaire so that the dataset was only comprised by respondents who met this criterion. Second, respondents should play key leadership roles (e.g. coordinator, supervisor, manager and director), allowing a broader visualization and understanding of their organization. Finally, as service organizations significantly vary in terms of their characteristics, we did not restrict the sampling to any specific sector, ownership or type.

We collected data during April and May 2020. For that, an email containing the link to the questionnaire was sent to 558 potential respondents located in India. 111 responses returned from which 106 (one respondent per firm) fully met the established selection criteria, resulting a 19.0% response rate. This response rate is higher than the 15% rate usually recommended in survey-based studies (Hair et al., 2014). Most respondents were male (71.7%), played a supervisor or coordinator role (67.9%), and had less than 5 years of experience (59.4%). Participants were predominantly

from transnational service organizations (57.5%), with less than 5,000 employees (61.3%), private-owned (86.8%), and 35.8% of them were from the infrastructure sector (e.g. communications, transportation, utilities, banking). Additionally, most respondents worked in organizations with both high degree of interaction and customization (85.8%) and high degree of labor intensity (71.7%), as shown in Table 1.

Table 1 – Sample characteristics ( $n = 106$ )

It is worth mentioning that non-response bias between early ( $n_1=49$ ) and late respondents ( $n_2=57$ ) was assessed using Levene's test for equality of variances and a t-test for equality of means (Armstrong and Overton, 1977). Results displayed no significant differences in means and variances ( $p$ -value  $< 0.05$  in both tests) between the two groups. We further ran the Harman's single-factor test with an exploratory factor analysis to identify the occurrence of common method bias (Malhotra et al., 2006). Harman's test with all variables (independent and dependent) resulted in a first factor accounting for 22.35% of the total variance, evidencing that no single factor explained the majority of the variance in the model.

### **3.3. Constructs' validity and reliability**

This step was performed in two stages. Initially, two Exploratory Factor Analysis (EFA) using Principal Component (PC) extraction were conducted to validate constructs using questionnaire responses. EFA is commonly used by researchers when developing a scale and serves to identify a set of latent constructs underlying a set of measured variables (Fabrigar et al., 1999). It is

particularly applicable when there is no *a priori* hypothesis about factors or patterns of measured variables (Finch and West, 1997).

The first EFA was run using responses on the agreement level of work implications derived from COVID-19 outbreak. The objective was to identify bundles of COVID-19 work implications. Using a varimax rotation, two PCs with eigenvalues larger than 1 (3.796 and 2.235, respectively) and representing 60.31% of total variance were retained. Based on the variables' loadings in each component, bundles of COVID-19 work implications were named according to their predominant characteristics. Results were replicated using an oblique rotation as a check for orthogonality and the extracted components were similar. Unidimensionality of each component was verified and confirmed applying Principal Component Analysis at a component level. Reliability was assessed calculating Cronbach's alpha, whose results (displayed in Table 2) indicated high reliability. Responses for each bundle were determined calculating a weighted average of original responses using factor loadings as weights.

The first bundle was comprised of implications associated with *home office work environment* [HOME]. One of the main consequences from the COVID-19 pandemic was the fact that people have been encouraged to work remotely from home. Such fact may require a more extensive utilization of remote communication technologies (e.g. online platforms and email), and the need for an adaptation of the work environment and routine so that people can properly perform their activities from their homes. In this sense, measures that loaded in this component were grouped and assumed to represent pandemic's effects related to *home office work environment*. The second bundle was comprised of measures originated from the *social distancing* [SOCIAL] implied by COVID-19 outbreak. In the absence of any pharmaceutical intervention, one of the main countermeasures against COVID-19 is to reduce mixing of susceptible and infectious people

through reduction of contact (Lewnard and Lo, 2020). Hence, those measures were gathered to represent the work implication associated with social distancing caused by COVID-19 outbreak.

Table 2 – EFA to validate bundles of COVID-19 work implications (rotated component matrix)

The second EFA was performed with operational performance indicators related to individual, team and organization. Table 3 shows that all six performance indicators obtained high loadings in the first PC, with an eigenvalue of 4.935 and accounting for 82.25% of the total variance in responses. Construct reliability was tested through the Cronbach's alpha, whose result ( $\alpha = 0.891$ ) overcame the 0.6 threshold indicating high reliability in responses (Meyers et al., 2006).

Table 3 – EFA to validate the operational performance construct

The second stage of this step consisted of performing a Confirmatory Factor Analysis (CFA) for the 43 items assessed in the Dimensions of Learning Organization Questionnaire (Marsick and Watkins, 2003). This CFA aimed at verifying the convergence of items in their respective contextualization levels; i.e. individual, team, and organization. As shown in Table 4, all factor loadings were higher than 0.45 with a Cronbach alpha of 0.98; CFI and RMSEA values were 0.935 and 0.102, respectively, satisfying model fit recommendations (Tabachnick et al., 2007). Learning at Individual level [IND\_LEARN] comprised 13 items that checked how learning opportunities are generated in a working environment, and how individuals' feedback and experimentation are promoted. Learning at a team level [TEAM\_LEARN] consisted of 6 items that concern the



collaboration and encouragement for learning within teams. Finally, learning at organization level [ORG\_LEARN], consisted of 24 items that verified how learning is shared in order to foster a higher engagement level across the organization towards the achievement of its strategic objectives.

Fornell and Larcker (1981)'s criteria were used to check for face validity. We verified the Average Variance Extracted (AVE) and Composite Reliability of all constructs; confirmatory factor analysis models for organizational learning constructs satisfied the thresholds of 0.5 and 0.7, respectively (Hair et al., 2014). To test discriminant validity, we tested whether AVEs of each construct were larger than the squared correlation coefficients involving the constructs. Results on Table 5 show that all constructs met the requirement.

Table 4 – CFA of organizational learning context levels

Pairwise correlations for all constructs and their composite reliability (CR) were determined, as shown in Table 5. Significant correlation coefficients ( $p$ -value < 0.05) were found positive, indicating the nature of variables' interaction. CR values were larger than 0.7, confirming the convergent validity of constructs (Hair et al., 2014). Therefore, values for each validated construct were calculated based on their corresponding factor loadings and given in a continuous scale.

Table 5 – Correlation coefficients and composite reliability of all constructs

### **3.4. Data analysis**

In this step, a set of Ordinary Least Square (OLS) hierarchical linear regression models were performed to test the hypotheses. Three models were examined. The first two models regressed [HOME] and [SOCIAL] (mediating variables) on the control (degree of interaction and customization, and degree of labor intensity) and independent variables (IND\_LEARN, TEAM\_LEARN and ORG\_LEARN). Both models were also tested with organization sectors as dummy variables, since process and service considerations inferred by the sector could impact on the work implications of COVID-19 outbreak. The five sector-type dummies were not significant and the results remained the same on excluding these variables from the regression models. Hence, following Tortorella et al. (2018), we disregarded organization sector in the regression models to increase the degrees of freedom and significance of our tests. Finally, model 3 regressed operational performance on the control, independent and mediating variables.

It is relevant to highlight that assumptions of normality, linearity, and homoscedasticity between independent, mediating and dependent variables were examined (Hair et al., 2014). We checked residuals to confirm normality of the error term distribution. Then, linearity was tested by plotting partial regression for each model. None of the models rejected the hypothesis of adherence to the normal distribution of residuals. Homoscedasticity was visually verified by plotting standardized residuals against the predicted value. All verifications supported the required assumptions for our OLS regression analysis. The variance inflation factors (VIFs) in the regression models were all lower than 3.0, suggesting that multicollinearity was not a concern.

#### **4. Results**

Table 6 reports the standardized  $\hat{\beta}$  coefficients of the OLS regression analyses. In the hierarchical process, the first model analyzed the effect of the control variables (Model 1A) and independent

variables (Model 1B) on [HOME] construct, which was considered a potential mediating variable. Because Model 1B presented a significant improvement on the prediction capacity of [HOME] (change in  $R^2 = 0.446$ ;  $p$ -value  $< 0.01$ ), we evidenced that learning at all three context levels (i.e. individual, team and organization) are related to this construct. However, while [IND\_LEARN] and [ORG\_LEARN] presented a positive association ( $\hat{\beta} = 0.598$ ;  $p$ -value  $< 0.01$ ; and  $\hat{\beta} = 0.561$ ;  $p$ -value  $< 0.05$ , respectively), [TEAM\_LEARN] displayed a negative relationship ( $\hat{\beta} = -0.497$ ;  $p$ -value  $< 0.05$ ) with [HOME]. Similarly, the second model examined the association between the control variables (Model 2A) and independent variables (Model 2B) on the [SOCIAL] construct. Although Model 2B showed a significant change in  $R^2$  (0.148;  $p$ -value  $< 0.01$ ), results indicated that only [IND\_LEARN] has a relevant association ( $\hat{\beta} = 0.518$ ;  $p$ -value  $< 0.05$ ) with [SOCIAL]. In other words, social distancing seems to be favored only when learning at an individual level occurs.

In the third model, we tested the effect of the control (Model 3A), independent (Model 3B) and mediating variables (Model 3C) on operational performance of service organizations. All three analyses resulted in significant models ( $p$ -value  $< 0.05$ ). However, Model 3C displayed the highest capacity to predict operational performance (adjusted  $R^2 = 0.488$ ), with a significant change in  $R^2$  from Model 3B (0.202;  $p$ -value  $< 0.01$ ). Results for Model 3C indicated that, when including the mediating variables in the regression, only the organization's degree of labor intensity ( $\hat{\beta} = 0.164$ ;  $p$ -value  $< 0.05$ ) and [HOME] ( $\hat{\beta} = 0.597$ ;  $p$ -value  $< 0.01$ ) have a distinguished effect on performance.

Table 6 – Standardized  $\hat{\beta}$  coefficients of the hierarchical regression models

These findings point that [HOME] does mediate the relationship between organizational learning and performance of service organizations. However, such mediation has a positive effect (contrary to hypothesis *H1A* and partially supporting *H1B*). With regards to [SOCIAL], no mediating role was found for this construct (as illustrated in Figure 2). Although we empirically evidenced a positive association with learning at individual level, the social distancing implied by COVID-19 outbreak does not seem to have a significant direct effect on operational performance. These results shed light on the way service organizations have curbed the impacts of COVID-19 on their organizational processes.

Following the assumptions from TMS theory (Anderson Jr and Lewis, 2014) represented by *H1B*, the reinforcement of home office policies caused by the pandemic has led to increases in performance of individuals, teams and the organizations as a whole. This is particularly observed when the degree of labor intensity is high, since managers of these kind of organizations (e.g. schools, legal professionals, accountants, retailers and wholesalers) usually concentrate more on personnel matters (Fitzsimmons et al., 2008). In other words, this outcome suggests that learning at individual and organizational levels are positively associated with home office policies, ultimately resulting in operational performance. According to Marsick and Watkins (2015), learning at individual level encompasses a few characteristics, such as the creation of continuous learning opportunities and dialogue promotion. We argue that the effect of the development of such continuous learning activities on operational performance is enhanced when employees work remotely from home. One justification for this fact might be related to the findings from Hill et al. (2003) and Boland e al. (2020), which suggested that respondents like the flexibility provided by the home office work environment, and this acts as a positive halo effect. The sense of autonomy

resultant from the remote work gives employees the flexibility to choose where work is done, also leads to more autonomy in when it is done, how it is done, and what work is done. Home office may also be symbolic of the trust employers have in employees, increasing employees' motivation. When considering learning at organizational level, systems to capture and share learning, organization connection and strategic and collective leadership are expected aspects within a learning organization (Yang et al., 2004). Our findings surprisingly indicate that those aspects have their impact on operational performance increased when home office is established. This may be associated with the fact that, since employees are away from their regular routines, they put more efforts to create and establish new procedures to mitigate the negative implications of physical distance. These procedures might reinforce the standardization of regular and more frequent communication, which within the company would occur informally (Hara, 2008; Waizenegger et al., 2020). Hence, home office work environment implied by the pandemic may foster the integration and extensive use of new systems to capture and share learning at an organizational level, promoting higher operational performance in service organizations.

As employees had to move their work environment to their homes so that COVID-19 contamination could be minimized, work routines and processes had to be redesigned to overcome occasional communication barriers (von Gaudecker et al., 2020; Tortorella et al., 2020c). In this sense, this home office scenario has sparked the establishment of formal and more frequent meetings through the utilization of online platforms (Fuchs, 2020), even in departments where regular meetings were not as usual. Both the significant frequency increase and structuring of communication entailed by home office policies might explain the positive mediation on operational performance. Additionally, Bloom (2014) indicated that, when employees have the appropriate conditions (e.g. quieter environment, internet and communication infrastructure) for

remotely working from home, their productivity and job satisfaction are likely to increase. Our findings corroborate to this productivity increase, complementing that both individual and organizational learning practices are positively related with home office environment.

In opposition, learning at a team level, which is mainly characterized by collaboration encouragement (Marsick, 2013), seems to be negatively associated with working remotely corroborating to *HIA*. At a team level, tasks should be conceived so that teams present different ways of thinking; it is expected that teams learn to work together, and collaboration is culturally valued and recognized (Marsick and Watkins, 2003). One of the key principles of SLT is that learning can occur by observing a behavior and by observing the consequences of such behavior (Grusec, 1992). As the home office environment undermines the observation and extraction of information from behaviors of others (i.e. team members), the negative relationship between learning at team level and home office is somewhat justified. Nevertheless, [HOME] still positively mediates the impact of learning at team level on operational performance, replicating the positive indirect effect of learning at individual and organization levels.

Figure 2 – Empirically evidenced relationships

## **5. Conclusion**

This objective of this research was to examine the implications of COVID-19 outbreak on the relationship between organizational learning and operational performance in service organizations. By using social learning theory and transactive memory system theory, we developed competing hypotheses on how COVID-19 outbreak mediates the relationship between organizational learning

and operational performance. To test our hypotheses, we surveyed 106 key employees of service organizations who have been remotely working during COVID-19 outbreak. Through exploratory factor analysis, we identified two bundles of COVID-19 work implications, namely *home office work environment* and *social distancing*. While no evidence was found for the effect of *social distancing*, our results showed that *home office work environment* positively mediates the impact of organizational learning on operational performance during the pandemic. This study demystifies how the COVID-19 work implications can be utilized to catalyze the effects of organizational learning on operational performance.

### **5.1. Implications to theory**

From a theoretical perspective, this study empirically evidenced the mediating role that work implications caused by COVID-19 outbreak have on the relationship between organizational learning and performance in services. The pandemic has significantly impacted organizations pushing them to suddenly restructure their processes and routines so that businesses could remain operating. At a first sight, one might assume that such restructuring would lead to a reduction in organizational readiness, negatively affecting performance (*H1A*). However, our results have evidenced the duality of effects. On one hand, if organizational learning practices at individual and organizational levels (Marsick and Watkins, 2003) are extensively implemented, then organizations may actually benefit from COVID-19's work implications. This fact was particularly observed for the home office work environment implied by the pandemic, corroborating to TMS assumptions (*H1B*). This is also in alignment with past TMS theory based empirical research which have found the impact of TMS to be stronger in cultural contexts like India where power distance and in-group collectivism are higher (Bachrach et al., 2019). On the other hand, results for

organizational learning at team level appear to be supported by SLT, as it assumes that just as an individual's behavior is influenced by the environment, the environment is also influenced by the individual's behavior (Bandura, 1971). In addition, accumulation of experience is expected to be higher at a team level which makes them to stick to their original mental models by rigidly committed to their past practices and remain opposed to new realities (Wong and Tjosvold, 2006; Tortorella and Fogliatto, 2014).

Our research adds to both theoretical assumptions, since we evidenced that individuals' behaviors (represented here by organizational learning practices) and work environment reciprocally influence each other, even when individuals are actually apart from the usual work environment (i.e. home office environment). However, the negative association between learning at team level and working remotely suggests that such relationship still needs to be further investigated, consolidating more empirical evidence in order to fully confirm our indications. Overall, we argue that the work implications caused by COVID-19 outbreak do not harm the organizational learning process in service organizations, especially in the ones with higher degrees of labor intensity.

## **5.2. Implications to practice**

In practical terms, this study raised insightful findings with respect to work design and organizational structure for the after-pandemic period. More specifically, the fact that home office environment did play a positive mediating role on the relationship between organizational learning and performance might spark significant changes in organizations. To mitigate the pandemic's health effects but still maintain the business, organizations have required their employees to work from home. Not only this countermeasure may reduce fixed operational costs (e.g. rooms and buildings, furniture, computers, etc.), but it also positively impacts on operational performance, as



evidenced in our study. In opposition, such fixed operational costs might be shifted to employees, who need to implement an adequate infrastructure at their own homes. Such arguments may lead managers of service organizations to rethink their working routines and structure once the pandemic is gone. Retraining programs anchored to the agreed restructuring strategy have to be developed for their employers to ensure smooth transition towards the renewed environment with high levels of technology integration and automation adoption.

Often, the design of organizational routines, processes and structures is established based on an accrued learning obtained by previous experiences (Örtenblad, 2002; Tortorella et al., 2015b). Although possible, radical changes on the way such organizations are structured and their processes designed are quite unlikely. However, extreme disruptive moments, such as the one entailed by the COVID-19 outbreak, may motivate significant changes that need to be quickly addressed. The opportunity to experiment these changes can elucidate and demystify certain misguided assumptions previously conceived. Our research has provided managers from service organizations additional evidence that home office environment, when properly managed and established, fosters organizational learning impact leading to higher performance levels. In this sense, the benefits observed by this particular work implication of COVID-19 outbreak might endure after the pandemic if service organizations really internalize home office policies.

### **5.3. Limitations and future research opportunities**

With respect to our study's limitations, it is relevant to specifically discuss some of them. Firstly, due to the broad range of services and their characteristics, it is extremely complex to present findings that are generalizable to all kinds of service organizations. As our sample mostly comprises Indian respondents from infrastructure services, future studies could expand the data

collection not only in terms of services diversity, but also with regards to socioeconomic contexts (e.g. emerging and developed economies). This exercise is expected to be of high utility as strength of TMS to performance relationship vary depending on features of the national cultural context such as power distance and in-group collectivism. Additionally, regarding COVID-19 outbreak, this research has empirically validated two constructs of work implications. However, there may be other work implications (with either direct or indirect effects on performance) that were not investigated in our research. Hence, we suggest that further examination should be conducted in order to fully explore the work implications of the pandemic and their effects on organizational processes and performance. Finally, because we focused on services, it would be interesting to compare results with manufacturers, verifying whether our indications could be extended or not to such companies.

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## Tables

Table 1 – Sample characteristics ( $n = 106$ )

Respondent's gender			Organization sector		
Male	76	71.7%	Financial services	16	15.1%
Female	30	28.3%	Government Services	18	17.0%
Respondent's role			Distribution Services	25	23.6%
Supervisor or Coordinator	72	67.9%	Personal Services	9	8.5%
Manager or Director	34	32.1%	Infrastructure Services	38	35.8%
Respondent's experience			Organization degree of interaction and customization		
< 5 years	63	59.4%	Low	15	14.2%
> 5 years	43	40.6%	High	91	85.8%
Organization size			Organization degree of labor intensity		
< 5,000 employees	65	61.3%	Low	30	28.3%
> 5,000 employees	41	38.7%	High	76	71.7%
Organization ownership			Organization type		
Public	14	13.2%	Transnational	61	57.5%
Private	92	86.8%	National	45	42.5%

Table 2 – EFA to validate bundles of COVID-19 work implications (rotated component matrix)

Variables	Mean	Std. Dev.	Communalities	1	2	Denomination
I have more frequently used email to communicate with my suppliers, customers and/or team members	5.084	1.317	0.629	<b>0.725</b>		
I have more frequently used online platforms to communicate with my suppliers, customers and/or team members	5.103	1.393	0.547	<b>0.650</b>		Home office
My work environment is neat and organized	4.886	1.229	0.701	<b>0.834</b>		work
My work environment presents the necessary infrastructure to support my activities	4.811	1.295	0.675	<b>0.819</b>		environment
My work environment allows me to properly concentrate and focus on my daily duties	4.745	1.227	0.772	<b>0.877</b>		[HOME]
My work environment allows me to have a flexible routine (i.e. flexible hours)	4.811	1.380	0.420	<b>0.647</b>		
I have more frequently used the telephone to communicate with my suppliers, customers and/or team members	4.849	1.602	0.561		<b>0.654</b>	Social
I have more frequently used websites to communicate with my suppliers, customers and/or team members	3.962	1.886	0.448		<b>0.555</b>	distancing
I do not miss the physical interaction with my colleagues	4.292	1.626	0.629		<b>0.791</b>	[SOCIAL]
I do not face difficulty in approaching my coworkers	3.217	1.701	0.649		<b>0.795</b>	
Extraction sums of squared loadings				4.314	1.717	
Initial percent of variance explained				43.14	17.17	
Rotation sums of squared loadings (total)				3.796	2.235	
% of variance explained				37.96	22.35	
Cronbach's alpha				0.809	0.831	
KMO measure of sampling adequacy				0.782		
Bartlett's test of sphericity ( $\chi^2 / df$ )				495.35	/ 45*	

Notes: Extraction method: Principal Component Analysis; Rotation Method: Varimax with Kaiser normalization; \*  $p$ -value < 0.01.

Table 3 – EFA to validate the operational performance construct

Variables	Mean	Std. Dev.	Communalities	Performance
My own output quality	4.556	1.302	0.854	<b>0.924</b>
My own on-time output delivery	4.584	1.241	0.816	<b>0.903</b>
My team's output quality	4.434	1.366	0.852	<b>0.923</b>
My team's on-time output delivery	4.424	1.330	0.817	<b>0.904</b>
My organization's output quality	4.367	1.402	0.788	<b>0.888</b>
My organization's on-time output delivery	4.500	1.346	0.809	<b>0.899</b>
Extraction sums of squared loadings				4.935
% of variance explained				82.251
Cronbach's alpha				0.891
KMO measure of sampling adequacy				0.858
Bartlett's test of sphericity ( $\chi^2 / df$ )				720.794 / 15*

Notes: Extraction method: Principal Component Analysis; \*  $p$ -value < 0.01.

Table 4 – CFA of organizational learning context levels

Context	Items	Factor loadings	AVE	CFI	$\chi^2/df$	SRMR
Individual [IND_LEARN]	In my organization, people have open discussions about errors and ways to learn from them	0.828	0.62	0.91	4.02	0.07
	In my organization, people identify needed skills for future activities	0.784				
	In my organization, people help each other to learn	0.832				
	In my organization, people receive financial help to support learning	0.814				
	In my organization, people have available time to support learning	0.823				
	In my organization, people see problems as learning opportunities	0.922				
	In my organization, people are rewarded by learning	0.767				
	In my organization, people give open feedback to each other	0.993				
	In my organization, people listen to others opinion before talking	0.946				
	In my organization, people are encouraged to ask why	1.016				
	In my organization, when people say their opinion they also ask others what they think	0.924				
	In my organization, people treat each other with respect	0.709				
In my organization, people use time to build trust among them	0.673					
Team [TEAM_LEARN]	In my organization, teams are free to adapt their targets according to the need	0.642	0.68	0.94	3.24	0.06
	In my organization, teams treat their members as equals	0.956				
	In my organization, teams focus both, the task and how well the team is performing	0.923				
	In my organization, teams review their opinion according to data or discussions	0.859				
	In my organization, teams are rewarded by their results as teams	0.939				
	In my organization, teams trust that the organization will act according to their suggestion	0.920				
Organization [ORG_LEARN]	My organization uses 2-way communication in a regular way	0.936	0.67	0.93	3.06	0.05
	My organization allows people to have easy and fast access to needed information at any time	0.818				
	My organization keeps a data base with employees' skills	0.862				
	My organization creates systems to measure expected and actual performance	0.827				
	My organization keeps available knowledge to all employees	0.878				
	My organization tracks time and money invested on training	0.796				
	My organization recognizes people by their initiative	0.877				
	My organization gives people choice on their tasks	0.765				
	My organization invites people to contribute to the business vision	0.777				
	My organization empowers people regarding resources to complete their tasks	0.735				
	My organization supports employees that risk in a safe way	0.854				
	My organization aligns vision across different teams and work levels	0.782				
	My organization helps employees balance work and family time	0.840				
	My organization encourages people to think in a global way	0.905				
	My organization encourages people to bring the customer perspective to business	0.927				
	My organization considers the decisions impact over employees' morale	0.989				
	My organization works with local community to meet common needs	0.877				
	My organization encourages people to develop problem solving inside the company	0.884				
	In my organization, leaders generally support learning and training opportunities	0.850				
	In my organization, leaders share information with employees about market trends, etc.	0.881				
	In my organization, leaders empower others to help achieve company's vision	0.845				
In my organization, leaders are mentors and develop their teams	0.866					
In my organization, leaders continuously look for learning opportunities	0.914					
In my organization, leaders make sure that attitudes are consistent with company's values	0.845					

Table 5 – Correlation coefficients and composite reliability of all constructs

	1	2	3	4	5	6	7	8	CR
1-Performance	-	0.690**	0.322**	0.516**	0.492**	0.541**	0.166	0.244*	0.923
2-HOME		-	0.364**	0.470**	0.581**	0.649**	0.191*	0.147	0.875
3-SOCIAL			-	0.386**	0.328**	0.331**	0.120	-0.003	0.898
4-IND_LEARN				-	0.601**	0.604**	0.221*	0.211*	0.932
5-TEAM_LEARN					-	0.633**	0.250**	0.188	0.889
6-ORG_LEARN						-	0.195*	0.187	0.966
7-Interaction and customization							-	0.406**	-
8-Labor intensity								-	-

Notes: \* Correlation coefficient significant at 5% (2-tailed); \*\* Correlation coefficient significant at 1% (2-tailed).

Table 6 – Standardized  $\hat{\beta}$  coefficients of the hierarchical regression models

Variables	HOME		SOCIAL		Performance		
	Model 1 <sup>a</sup>	Model 1B	Model 2 <sup>a</sup>	Model 2B	Model 3 <sup>a</sup>	Model 3B	Model 3C
Degree of interaction and customization	0.158	0.085	0.145	0.088	0.080	0.016	-0.043
Degree of labor intensity	0.083	-0.026	-0.061	-0.122	0.212**	0.137	0.164**
IND_LEARN		0.598***		0.518**		0.174	-0.233
TEAM_LEARN		-0.497**		-0.111		-0.197	0.111
ORG_LEARN		0.561**		-0.028		0.538**	0.206
HOME							0.597***
SOCIAL							0.096
F-value	2.278	19.118***	0.915	3.952***	3.578**	9.423***	15.281***
R <sup>2</sup>	0.042	0.489	0.017	0.165	0.065	0.320	0.522
Adjusted R <sup>2</sup>	0.024	0.463	-0.002	0.123	0.047	0.286	0.488
Change in R <sup>2</sup>		0.446***		0.148***		0.255***	0.202***

Notes: \*  $p$ -value < 0.10; \*\*  $p$ -value < 0.05; \*\*\*  $p$ -value < 0.01.

## Figures

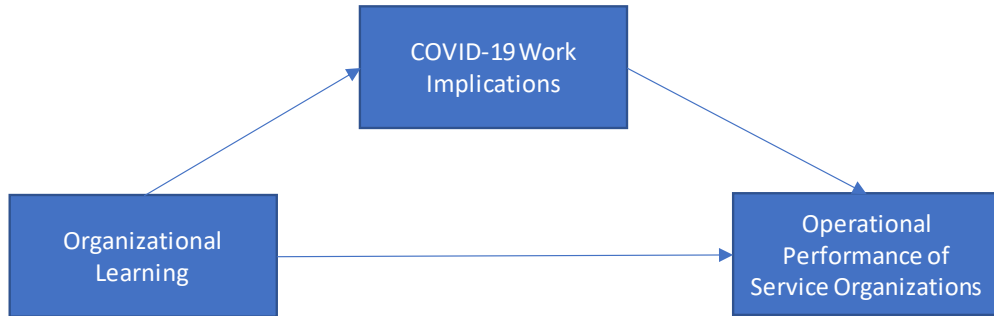


Figure 1 – Theoretical model investigated

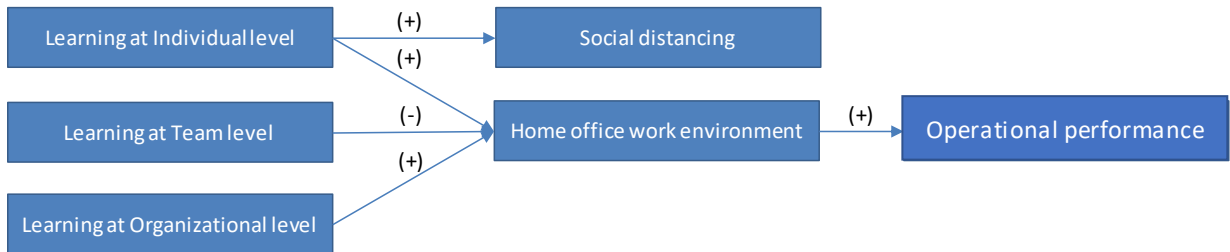


Figure 2 – Empirically evidenced relationships