# Organizational learning capability and its impact on organizational innovation

Ephrem Assefa Haile
*School of Business, St. Mary's University, Addis Ababa, Ethiopia and College of Development Studies, Addis Ababa University, Addis Ababa, Ethiopia, and*
Vala Lale Tüzüner
*Department of Human Resource Management, School of Business, Istanbul University, Istanbul, Turkey*

Received 9 March 2022
Revised 5 May 2022
30 May 2022
Accepted 1 June 2022

## Abstract

**Purpose** – This study aims to determine the effect of organizational learning capability (OLC) on organizational innovation (OI) and identify the type of innovation that is accorded more emphasis by Ethiopian manufacturing firms.

**Design/methodology/approach** – This study applied an explanatory research design, and cross-sectional data were gathered through structured questionnaires from general and HR managers of 197 manufacturing firms in Addis Ababa and Oromia, Ethiopia. The ordinary least square regression method was applied to analyze the data.

**Findings** – The study provides empirical insights into how OLC affects OI. The findings revealed that the sampled firms have scored low mean values in terms of OLC and OI. In addition, OLC had a positive but low effect on OI and its dimensions. Because of their weak institutional support, the sampled firms tended to emphasize administrative innovation rather than product and process innovations.

**Research limitations/implications** – This study would have yielded better results if it was built on evidence-based data to reveal how radical or incremental OIs are, as well as how OLC and OI vary across different sectors. The theoretical and practical implications drawn from the findings are also presented.

**Originality/value** – There is little empirical evidence of the nexus among OLC, process and administrative innovations, especially from the perspective of developing economies. This study empirically supports the direct relationship between the constructs. In developing countries such as Ethiopia, where there are weak institutional resources and support, administrative innovation shall be emphasized in the short run.

**Keywords** Organizational learning capability, Organizational innovation, Product innovation, Process innovation, Administrative innovation

**Paper type** Research paper

## Introduction

In today's hypercompetitive environment, firms in both developed and developing countries are expected to build their capability to acquire, interpret, share and retain knowledge for current and future usage. The knowledge generated through the learning process enhances



Asia Pacific Journal of Innovation and Entrepreneurship
Vol. 16 No. 1, 2022
pp. 69-85
Emerald Publishing Limited
e-ISSN: 2398-7812
p-ISSN: 2071-1395
DOI 10.1108/APJIE-03-2022-0015

firm competitiveness (Oyeniyi, 2011) and affects its propensity to innovate (Bontis *et al.*, 2002; Alegre and Chiva, 2008; Hsu and Fang, 2009).

There is a growing impetus among scholars to unlock the relationship between organizational learning capability (OLC) and firm innovation (François, 2002; Akgun *et al.*, 2007; Alegre and Chiva, 2008; Fang *et al.*, 2011; Uğurlu and Kurt, 2016; Gomes and Wojahn, 2017). However, the extant literature is limited to exploring the relationship between product innovation and OLC, which is the capability of a firm to acquire, transfer and integrate knowledge to improve its performance (Jerez-Gómez *et al.*, 2005). Thus, there is disproportionately little evidence of how this capability simultaneously affects the other dimensions of organizational innovation (OI), namely, process and administrative innovations. OI, which refers to the implementation of an internally generated or borrowed idea pertaining to a product, device, system, process, policy, program or service that is new to the organization at the time of adoption (Damanpour and Evan, 1984), extends beyond product innovation and includes process and administrative innovations as well (Damanpour and Evan, 1984; Movando and Farell, 2003; Nasution *et al.*, 2011; Jiménez-Jiménez and Sanz-Valle, 2011). Moreover, although it has been argued that learning facilitates firm innovation, there is little empirical evidence of how OLC impacts administrative innovation (Santos-Vijande *et al.*, 2012).

Using the dynamic capability theory (Teece *et al.*, 1997), this study aims to explain how OLC affects OI. This theory emphasizes the integration, building and reconfiguration of firm-specific resources, capabilities and competencies to cope with the ever-changing environment. Firm-specific capability reflects a firm's ability to initiate and implement innovative ideas that are built through a continuous learning process. Through this capability, the firm develops management capabilities and integrates R&D, product and process development, manufacturing, human resources and organizational learning (Eisenhardt and Martin, 2000).

This study has the following two differences from previous studies. First, there is a dearth of empirical research on OI and its drivers in developing countries (Adebowale *et al.*, 2014; Gebreeyesus, 2009). Moreover, the limited number of innovation-related studies conducted in Africa has focused on the drivers of product and process innovation rather than administrative innovation (Daksa *et al.*, 2018). Hence, this study provides empirical evidence of how firms can develop administrative innovation by building their learning capability. Second, although process innovation demands an organizational system that favors learning and exploiting knowledge from different sources (OECD, 2005), there is a lack of empirical support, especially from developing countries such as Ethiopia (Goel and Nelson, 2018). Albeit developing nations, especially those in Africa, lag behind developed countries in terms of innovation, these days, the innovation capability of the Sub-Saharan Africa region is gradually evolving because of the progress made in institutional, infrastructural and human capital developments (Bekana, 2020). Ethiopia is one of the fastest growing economies in Africa, with a 8.5% GDP growth rate, which is even higher than the Sub-Saharan Africa average (3.4%) reported in 2018 (IMF, 2018). Thus, it is important to understand the state of affairs of innovation in this African county. Therefore, this study aims to meet the following three objectives: to assess the status of manufacturing firms regarding OLC and OI; to examine how OLC affects OI and its dimensions, namely, product, process and administrative innovation; and to determine the form of innovation that accorded attention by manufacturing firms in Addis Ababa and Oromia administrative areas of Ethiopia.

## Literature review and hypothesis development

### *Organizational learning capability and organizational innovation*

The dynamic capability theory is essential to explain the relationship between OLC and firm innovation. This theory emphasizes the ability of a firm to integrate, build and reconfigure

internal and external resources and competencies to address rapidly changing environments (Teece *et al.*, 1997). This capability reflects a firm's ability to initiate and implement innovative ideas, which are built through continuous learning processes and path-dependent histories of the firm.

A firm's learning capability is presumed to impact its ability to initiate and implement innovative practices faster than its competitors. OLC is a multidimensional construct that depends on the following important drivers: managerial commitment to learning (MC), system perspective (SP), openness and experimentation (OE) and knowledge transfer and integration (KTI) (Jerez-Gómez *et al.*, 2005). A highly committed managerial team that supports learning by allocating the necessary resources, removing obstacles that might hinder the learning process and encouraging employees to gather, share and experiment with fresh ideas enhances the learning capability of a firm and, eventually, its ability to be involved in innovative practices. SP denotes bringing an organization's members together around a common identity by building a shared vision. OE involves important OLC elements in that, for learning to occur, openness necessitates the need to remain open to new ideas, while experimentation involves testing ideas and trying out new methods that require a risk-taking culture, learning from mistakes, and a culture for creativity. To build learning capability, KTI is necessary in that, organizations should not only transfer the acquired knowledge to employees through dialogues, teamwork and meetings but also integrate this knowledge into organizational processes and retain it in the repository for later consumption.

Firms characterized by a strong learning orientation or culture and generative learning are more likely to introduce new products and secure sustained competitive advantage (Santos-Vijande *et al.*, 2012). Unlike single-loop learning (Argyris and Schon, 1978), generative learning (Senge, 1990) or double-loop learning (Argyris and Schon, 1978) or explorative learning (March, 1991) involves continuous experimentation of ideas, challenging or even modifying the underlying beliefs and value systems in organizations. This, in turn, creates a conducive environment to solicit creative ideas and partake in innovative practices.

Although learning is key to ensuring firm competitiveness, organizations, especially those in developing countries, are constrained by factors that impede the learning process. Studies conducted in relation to OLC in developing countries have indicated that the inability to create, share and use knowledge (Tafesse, 2021) and the lack of a supportive culture for organizational learning (Beyene *et al.*, 2016) are the most pressing problems inhibiting the learning capability of firms. Moreover, a study conducted to assess the perception of employees working in different sectors in Albania reported a moderate level of organizational learning measured in terms of continuous learning and inquiry and dialogue (Dorda and Shtëmbari, 2020).

The limited capability of firms in developing countries to acquire, share, transfer and retain information diminishes their propensity to partake in innovative activities. A study conducted on manufacturing and service sector firms in Ethiopia confirmed that organizations that have access to information, own skilled workforce, offer training and conduct R&D are more likely to innovate than their counterparts (Daksa *et al.*, 2018). Similar studies conducted on manufacturing firms in Jordan (Karasneh, 2019), telecom firms in Pakistan (Hussain *et al.*, 2018), ICT industry in Malaysia (Salim and Sulaiman, 2011) and textile industry in Brazil (Gomes and Wojahn, 2016; Tambosi *et al.*, 2020) have discovered the positive effect of OLC on innovations conducted in organizational settings. However, apart from reporting the effect of OLC on OI, none of the above studies have examined the studied organizations with respect to their level of learning and innovation. Therefore, this

study expects that manufacturing firms in Ethiopia would manifest a relatively low level of learning capability and OI because of the aforementioned constraints. As a result, OLC is expected to have a positive but low level of impact on OI. The above background information leads us to state the first hypothesis:

*H1*. OLC has a statistically significant positive effect on OI.

*Organizational learning capability and product innovation*

Product innovation refers to new or better products being produced and sold (Meeus and Edquist, 2006). It also refers to the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This often includes significant changes in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics (OECD, 2005).

Product innovation relies on the knowledge stock of a firm, which is acquired through a continuous learning process. As Cohen and Levinthal (1990) indicated, prior knowledge enhances the learning or absorptive capacity of the firm and, in turn, boosts the firm's innovation performance. Learning helps the firm in not only exploiting subsequent external knowledge but also evaluating the viability of engaging in new technological development programs. In this regard, the theory of organizational ambidexterity (Duncan, 1976) urges firms to not only exploit the existing offers but also explore new opportunities by embarking on product innovation initiatives (Benner and Tushman, 2003).

Previous innovation-related studies have indicated that organizations in many developing countries, including Ethiopia, lag behind the developed world in terms of introducing product innovation (Tafesse, 2021; Daksa *et al.*, 2018). This is attributed to the fact that compared to other forms of innovation (such as administrative innovation), product innovation demands huge investment costs on technology development or acquisition, which is difficult for many developing countries.

Innovative firms view learning as a strategic tool for solving complex organizational problems and achieving their long-term goals through innovative offers. To this end, managers of innovative firms strive to resolve organizational red taps, such as obsolete views, an organizational culture that condemns rather than tolerating error, failure, ambiguity and taking risks. A recent study conducted on 243 small and medium manufacturing firms in Ethiopia revealed that OLC positively affects technological innovation (product and process innovations) capability and firm performance (Hailekiros and Renyong, 2016). Likewise, a study based on data gathered from 286 textile manufacturers and 146 producers of leather products in Ethiopia discovered that organizational learning orientation (commitment to learning, shared vision and open-mindedness) positively affects product innovation performance (Beyene *et al.*, 2016). Therefore, considering the above discussion, the researchers expect a positive but relatively low effect of OLC on product innovation in the case of manufacturing firms in Ethiopia. Based on the above theoretical backdrop, the second hypothesis is stated below:

*H2*. OLC has a statistically significant positive effect on product innovation.

*Organizational learning capability and process innovation*

Process innovation – which refers to the implementation of new or significantly improved methods for production or delivery to include significant changes in techniques, equipment and/or software (OECD, 2005) – is influenced by a firm's learning capability. According to

the dynamic capability theory (Teece *et al.*, 1997), firm capabilities that are difficult to replicate, imitate and substitute allow the firm to create new processes to respond to changing market circumstances. Process innovation is concerned with *how* products are produced and primarily aimed at decreasing unit costs, increasing product quality, improving delivery systems and enhancing customer satisfaction. Just-in-time production (Cooper, 1998), lean production (Womack, Jones, and Roos, 1990), adopting new automation equipment on a production line or the use of computer-assisted design for product development are examples of process innovation (OECD, 2005).

Accumulated knowledge, which is the source of process innovation, can be achieved through learning from experience or imitating other firms (Cabral and Leiblein, 2001) or can result from a firm's R&D efforts (Reichstein and Salter, 2006). Although the importance of learning from past experiences or routines is undeniable, it is antithetic to learning if it leads to a situation known as *competency traps*, wherein the organization persists with the existing organizational routines or practices rather than trying out new alternative methods that might be superior to solving problems (Ahuja, 2016). Being stuck with the current set of competencies eventually limits the ability of the firm to innovate and adapt to the changing environment.

Most changes made in the production process are based on trial-and-error or learning-by-doing rather than resulting from R&D operations (Edquist *et al.*, 1998). Innovation demands an organizational system that favors learning and exploiting knowledge from internal and external sources (OECD, 2005). The diffusion theory of innovation (Rogers, 1983) states that firms differ in terms of the rate at which they adopt new ideas, and learning plays a pivotal role in the process of innovation diffusion, whereby adopters learn from their prior experiences. Thus, a creative and risk-taking culture would encourage employees to freely suggest their ideas on how to enhance production efficiency, minimize wastage and reduce operation costs. Based on the above discussion, the third hypothesis is stated as follows:

*H3*. OLC has a statistically significant positive effect on process innovation.

*Organizational learning capability and administrative innovation*

Administrative innovation occurs in the administrative circle and affects the relationships or the social system among organizational members and their environment (Subramanian and Nilakanta, 1996). As per the Oslo Manual of Innovation (OECD, 2005), this form of innovation encompasses introducing new business practices, workplace organization and external relations. Automated personnel record systems, formalized strategic planning processes, management by objectives zero-based budgeting, staff development, job rotation, flex time, reward systems (Damanpour and Evan, 1984) and enterprise resource planning are examples of administrative innovation. Administrative innovations are intended to improve organizational performance by reducing administrative costs (OECD, 2005). According to the dynamic capability theory (Teece *et al.*, 1997), to achieve competitive advantage, firms should use their idiosyncratic capabilities not only by developing new products and processes but also by designing and implementing administrative practices, such as new business models, structures and procedures.

Although administrative innovation supports a firm's effort to introduce product innovation (Cho *et al.*, 2019), it has received disproportionately little attention from scholars, especially in developing countries (Daksa *et al.*, 2018; Stata, 1989). However, recently, the importance of administrative innovation has gained prominence because of its role in increasing productivity and product quality and reducing operational costs. Stata (1989) highlighted the importance of organizational learning for administrative innovation and

firm competitiveness. For instance, the experience acquired through learning has allowed Japanese firms, such as Toyota, to capitalize on administrative innovation and reduce their manufacturing cycles, inventories and costs while maintaining higher product quality.

Learning is the key to the acquisition of new knowledge that forms the basis for administrative innovation (Moreno *et al.*, 2015). Naveh *et al.* (2006) stated that, through learning, firms can identify their mistakes and modify the course of actions to be taken while implementing administrative innovations. A recent study conducted in Ethiopia (Daksa *et al.*, 2018) reported that firms that own websites can gather up-to-date information from external sources, share and assimilate this knowledge within the organization and perform better in terms of introducing administrative innovation, such as new organizational structure or management practices. In accordance with the above discussion, the fourth hypothesis is stated as follows:

*H4*. OLC has a statistically significant positive effect on administrative innovation.

## Methodology

### *Design, population and sample*

An explanatory research design was applied to reveal the effect of OLC on OI and its dimensions. Data were gathered between August 26 and December 21, 2018 through structured questionnaires from general and HR managers of 197 manufacturing firms located in two administrative areas in Ethiopia: Addis Ababa and Oromia. As per the data obtained from the Ethiopian Chamber of Commerce, there are 630 manufacturing firms with more than 100 employees in these two areas. Using Cochran's (1977) formula, the sample size was computed as 239, of which a pair of 197 completed questionnaires (82.42% response rate) was used for further analysis. The firms were selected using a stratified sampling method according to their proportion to the total sample size. The firms operated in leather and shoe (28 firms); food and beverage (31 firms); textile and garment (30 firms); metal/steel (32 firms); personal-care products (20 firms); chemical (17 firms); electronic, electric and telecom equipment (20 firms); pharmaceuticals (10 firms); and others (9 firms). Of the 197 firms, 106 firms (53.8%) conducted R&D-related activities. In terms of firm ownership, 99 firms (50.3%) were locally owned, 66 firms (33.5%) were foreign owned and the remaining 32 firms (16.2%) were jointly owned by local and foreign investors. The number of employees working in these firms varied between 100 and 4,870.

### *Measurement of constructs*

The survey respondents were asked to state their level of agreement on a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). To avoid common method bias, the researchers gathered data from two sources: questions related to OLC and those related to OI, which were responded to by HR and general managers, respectively. Moreover, the scale used to measure OLC (independent variable) was adopted from Jerez-Gómez *et al.*'s (2005) study. It had 16 items divided into four dimensions: MC, SP, OE and KTI. The scale was completed by HR managers. In contrast, OI (dependent variable) was measured using a scale developed by Nasution *et al.* (2011), which had 15 items and was composed of three dimensions: product, process and administrative innovations. The scale was completed by top-level managers. The reliability of the measurement scale for both scales exceeded 0.70 (Table 3).

Furthermore, to show the net effect of OLC on OI, the authors of the current study have placed some variables under control that have been reported to impact OI. These variables

include firm age (Hu *et al.*, 2015), firm size (Alsharkas, 2014; Medase, 2020) and R&D (Cohen and Levinthal, 1990; Sun, 2015).

*Data analysis.* The data gathered through the questionnaire were processed through SPSS version 24. Ordinary least square (OLS) method was used to determine the effect of OLC on OI. Before analyzing data, the authors of this study have tested the data to fulfill the basic assumptions of OLS method: normality, linearity, homoscedasticity, multicollinearity and autocorrelation. These assumptions were fully met, implying that OLS method was appropriate for estimating the effect of OLC on OI, and its dimensions. A confirmatory factor analysis (CFA) was also performed to assess how a latent construct is well-explained by its factors. Moreover, descriptive statistics were used to describe the mean values of the study constructs.

*Result*

Confirmatory factor analysis for organizational learning capability. OLC is a multidimensional construct composed of the following four dimensions (Jerez-Gómez *et al.*, 2005): MC, SP, OE and KTI. Initially, an exploratory factor analysis (EFA) was conducted to assess the initial factor structure of OLC. Based on the EFA results, two items with lower communalities (less than 0.50) were removed from the factor list. Then, CFA was conducted to test if the existing data supported the four theoretical factors. Based on the CFA results, two additional items with lower explanatory power were deleted to validate the construct. Thus, the remaining 12 items were grouped into 4 factors (3 items per factor).

Convergent and discriminant validity tests were conducted to assess OLC's four-factor structure. As proof of convergent validity, the composite reliability (CR) and average variance extracted (AVE) values for the constructs were above 0.70 and 0.50, respectively (Table 1). In addition, to avoid the discriminant validity from becoming a concern, the maximum shared variance (MSV) values for each factor were set below their respective AVE values (Fornell and Larcker, 1981). This implies that OLC is free from convergent and discriminant validity concerns.

Confirmatory factor analysis for organizational innovation. EFA was conducted to explore OI's initial factor structure. Out of the 15 items used to measure OI, 2 items were excluded because of cross-loading and their lower communality value. The remaining 13 items were loaded into their respective factors mentioned above. Moreover, the CFA results supported the hypothesized three-factor structure (product, process and administrative innovations). As a measure of convergent validity (Table 2), the CR values for product, process and administrative innovations were above the minimum threshold level (0.70). Moreover, the AVE values for each of these factors were above 0.50, implying that the measurement scale is free from convergent validity concerns. Furthermore, the MSV values for these factors fell short of their respective AVE coefficients.

Furthermore, as shown in Table 3, the Cronbach's alpha coefficient ($\alpha$), as a measure of internal consistency of the measurement items, for each of the OLC and OI factors was above the minimum threshold (0.70), implying that the scales used in this study were reliable.

**Table 1.** Convergent and discriminant validity for OLC

| | CR | AVE | MSV | MaxR(H) | KTI | MCL | SP | OE |
|---|---|---|---|---|---|---|---|---|
| KTI | 0.834 | 0.627 | 0.540 | 0.844 | *0.792* | | | |
| MCL | 0.857 | 0.669 | 0.486 | 0.879 | 0.640 | *0.818* | | |
| SP | 0.828 | 0.618 | 0.504 | 0.845 | 0.683 | 0.672 | *0.786* | |
| OE | 0.841 | 0.639 | 0.540 | 0.853 | 0.735 | 0.697 | 0.710 | *0.799* |

*Correlation analysis*

Table 4 presents the Pearson correlation analysis used to test the association between OLC and OI. The results indicate that there is a positive and moderate relationship between OLC and OI, as well as its three dimensions.

*Ordinary least square analysis*

Tables 5–8 depict the OLS estimation aimed to test the effect of OLC on OI and its dimensions. The results show that OLC has a positive effect on OI and its dimensions. In line with the research hypotheses, the researchers specified four regression equations:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u \quad (1)$$

where $Y$ = dependent variable (OI), $\beta_0$ = constant intercept, $\beta_1$, $\beta_2$, $\beta_3$ and $\beta_4$ = slopes of $X_1$ (OLC), $X_2$ (R&D), $X_3$ (FirmSize) and $X_4$ (FirmAge), respectively, and $u$ = error term:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u \quad (2)$$

where $Y$ = dependent variable (Pdt-Inov/product innovation), $\beta_0$ = constant intercept, $\beta_1$, $\beta_2$, $\beta_3$ and $\beta_4$ = slopes of $X_1$ (OLC), $X_2$ (R&D), $X_3$ (FirmSize) and $X_4$ (FirmAge), respectively, and $u$ = error term:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u \quad (3)$$

where $Y$ = dependent variable (Pro-Inov/process innovation), $\beta_0$ = constant intercept, $\beta_1$, $\beta_2$, $\beta_3$ and $\beta_4$ = slopes of $X_1$ (OLC), $X_2$ (R&D), $X_3$ (FirmSize) and $X_4$ (FirmAge), respectively, and $u$ = error term:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u \quad (4)$$

where $Y$ = dependent variable (Adm-Inov/administrative innovation), $\beta_0$ = constant intercept, $\beta_1$, $\beta_2$, $\beta_3$ and $\beta_4$ = slopes of $X_1$ (OLC), $X_2$ (R&D), $X_3$ (FirmSize) and $X_4$ (FirmAge), respectively, and $u$ = error term.

**Table 2.**
Convergent and discriminant validity for OI

| | CR | AVE | MSV | MaxR(H) | Pdt-Inv | Pro-Inv | Adm-Inv |
|---|---|---|---|---|---|---|---|
| Pdt-Inv | 0.867 | 0.567 | 0.521 | 0.870 | *0.753* | | |
| Pro-Inv | 0.847 | 0.580 | 0.521 | 0.848 | 0.722 | *0.762* | |
| Adm-Inv | 0.847 | 0.582 | 0.511 | 0.853 | 0.449 | 0.715 | *0.763* |

**Table 3.**
Reliability test (Cronbach's alpha coefficient)

| Main constructs | Factors/dimensions | Reliability ($\alpha$) |
|---|---|---|
| Organizational learning capability (OLC) | Managerial commitment for learning (MC) | 0.856 |
| | Systems perspective (SP) | 0.824 |
| | Openness and experimentation (OE) | 0.792 |
| | Knowledge transfer and integration (KTI) | 0.794 |
| Organizational innovation (OI) | Product innovation (Pdt-Inv) | 0.872 |
| | Process innovation (Pro-Inv) | 0.827 |
| | Administrative innovation (Adm-Inv) | 0.803 |

| | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. OLC | 4.153 | 0.15325 | 1.00 | | | | | | | | |
| 2. OI | 4.019 | 0.14180 | 0.530** | 1.00 | | | | | | | |
| 3. MC | 4.211 | 0.19245 | 0.839** | 0.452** | 1.00 | | | | | | |
| 4. SP | 3.878 | 0.17707 | 0.830** | 0.374** | 0.582** | 1.00 | | | | | |
| 5. OE | 4.103 | 0.17781 | 0.864** | 0.483** | 0.647** | 0.619** | 1.00 | | | | |
| 6. KTI | 4.423 | 0.17876 | 0.843** | 0.481** | 0.582** | 0.615** | 0.660** | 1.00 | | | |
| 7. Pdt-Inv | 3.973 | 0.18371 | 0.382** | 0.863** | 0.359** | 0.262** | 0.342** | 0.323** | 1.00 | | |
| 8. Pro-Inv | 3.792 | 0.16311 | 0.478** | 0.887** | 0.382** | 0.334** | 0.441** | 0.459** | 0.648** | 1.00 | |
| 9. Adm-Inv | 4.304 | 0.15568 | 0.505** | 0.758** | 0.407** | 0.372** | 0.463** | 0.466** | 0.400** | 0.623** | 1.00 |

**Notes:** **Correlation is significant at the 0.01 level (two-tailed); *correlation is significant at the 0.05 level (two-tailed)

**Table 4.** Means, standard deviations and correlations ($n$ = 197)

| | OLS estimation | | | |
|---|---|---|---|---|
| OI | Coef. | Std. error | $t$ | $p>\|t\|$ |
| Constant | 0.1245079 | 0.0420597 | 2.96 | 0.003 |
| OLC | 0.4156363 | 0.0589906 | 7.05 | *0.000* |
| R&D | 0.0687906 | 0.0181286 | 3.79 | *0.000* |
| Firm age | −0.0012731 | 0.0061774 | −0.21 | 0.837 |
| Firm size | 0.0000227 | 0.0000146 | 1.56 | 0.120 |

**Notes:** OI: organizational innovation; $F(4, 192) = 24.08$; Prob > $F = 0.0000$; $R$-squared = 0.3340; Adj. $R$-squared = 0.3202

**Table 5.** OLS regression estimation results (OLC-OI)

| | OLS estimation | | | |
|---|---|---|---|---|
| PDT-Inov | Coef. | Std. error | $t$ | $p>\|t\|$ |
| Constant | 0.1425162 | 0.0595209 | 2.39 | 0.018 |
| OLC | 0.3680886 | 0.0834807 | 4.41 | *0.000* |
| R&D | 0.07666 | 0.0256547 | 2.99 | *0.003* |
| Firm age | −0.0084636 | 0.008742 | −0.97 | 0.334 |
| Firm size | 0.0000532 | 0.0000206 | 2.58 | *0.011* |

**Notes:** PDT-Inov: product innovation; $F(4, 192) = 12.41$; Prob > $F = 0.0000$; $R$-squared = 0.2054; Adj. $R$-squared = 0.1889

**Table 6.** OLS regression estimation results (OLC-product innovation)

*Model estimation*

In this study, OI was treated as the dependent variable, while OLC was treated as the independent variable. However, before interpreting linear regression coefficients, it is imperative to check for endogeneity problems. Endogeneity occurs when the explanatory variable ($x$) is correlated with the error terms ($e$) in the regression model. The presence of endogenous regressors in the model should be checked first, as they would result in a biased and inconsistent OLS estimation. Thus, the researchers used the Durbin–Wu–Hausman (DWH) test to determine whether there was an endogeneity problem. The result of the DWH

test (augmented regression test) indicated the absence of an endogeneity problem. The *p*-values for the two tests of endogeneity, namely, Durbin (score) and Wu–Hausman, were 0.0611 and 0.0643, respectively. Thus, the independent variable (OLC) was not correlated with the error term. This eventually makes OLS estimation more reliable than the two-stage least square estimation:

$$OI = 1245079 + 0.4156363(OLC) + 0.0687906(R\&D) + e \quad (1)$$

$$PDT - Inov = 0.1425162 + 0.3680886(OLC) + 0.07666(R\&D) + 0.0000532(FirmSize) + e \quad (2)$$

$$PRO - Inov = 0.0723239 + 0.4098687(OLC) + 0.0900187(R\&D) + e \quad (3)$$

$$ADM - Inov = .1541815 + 0.4808386(OLC) + e \quad (4)$$

**Table 7.**
OLS regression estimation results (OLC-process innovation)

| | OLS estimation | | | |
|---|---|---|---|---|
| PRO-Inov | Coef. | Std. error | *t* | *p*>\|*t*\| |
| Constant | 0.0723239 | 0.0498355 | 1.45 | 0.148 |
| OLC | 0.4098687 | 0.0698964 | 5.86 | *0.000* |
| R&D | 0.0900187 | 0.0214801 | 4.19 | *0.000* |
| Firm age | 0.000404 | 0.0073195 | 0.06 | 0.956 |
| Firm size | 9.21e-06 | 0.0000173 | 0.53 | 0.594 |

**Notes:** PRO-Inov: process innovation; $F(4, 192) = 19.93$; Prob > $F = 0.0000$; $R$-squared = 0.2934; Adj. $R$-squared = 0.2787

**Table 8.**
OLS regression estimation results (OLC-administrative innovation)

| | OLS estimation | | | |
|---|---|---|---|---|
| ADM-Inov | Coef. | Std. error | *t* | *p*>\|*t*\| |
| Constant | 0.1541815 | 0.0483047 | 3.19 | 0.002 |
| OLC | 0.4808386 | 0.0677495 | 7.10 | *0.000* |
| R&D | 0.0377258 | 0.0208203 | 1.81 | 0.072 |
| Firm age | 0.0060379 | 0.0070947 | 0.85 | 0.396 |
| Firm size | −1.91e−06 | 0.0000167 | −0.11 | 0.909 |

**Notes:** ADM-Inov: administrative innovation; $F(4, 192) = 17.86$; Prob > $F = 0.0000$; $R$-squared = 0.2712; Adj. $R$-squared = 0.2560

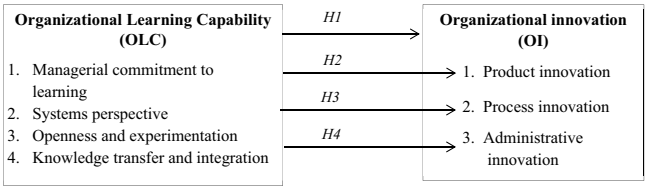


**Figure 1.**
Research model linking OLC with OI

## Discussion

The results of descriptive statistics demonstrated that the sampled manufacturing firms scored low with regard to their learning capability ($\bar{x} = 4.15$). As indicated in Table 4, the firms scored low mean value in all OLC dimensions, namely, MC ($\bar{x} = 4.2$), SP ($\bar{x} = 3.87$), OE ($\bar{x} = 4.1$) and KTI ($\bar{x} = 4.42$). This finding is congruent with the results reported by previous studies conducted in Ethiopia (Tafesse, 2021; Beyene *et al.*, 2016; Beyene *et al.*, 2016; Hailekiros and Renyong, 2016). These studies discovered that a low level of learning culture and lack of system to acquire and use knowledge have inhibited the learning capability of manufacturing firms in the country. Furthermore, the studied firms were low in terms of introducing new products, processes and administrative practices ($\bar{x} = 4.02$). Although many African countries have shown rapid economic growth, their industries are still constrained by skill gaps and technological development, which inhibits their propensity to be involved in innovative activities (Diyamett and Mutambala, 2014). The findings of this study are also congruent with those of previous studies conducted in the country (Beyene *et al.*, 2016). The above researchers, based on Hofstede's classification of national culture, reported that the country's high-power distance culture by restraining learning capability has negatively affected the ability of the manufacturing firms to be involved in innovative activities.

Although the surveyed firms were low in their overall innovation practices, they were relatively better off in terms of administrative innovation ($\bar{x} = 4.30$) than product innovation ($\bar{x} = 3.97$) and process innovations ($\bar{x} = 3.79$). As compared to product and process innovations, administrative innovation involves a low level of technology and expenses. Thus, in developing countries such as Ethiopia, where technological advancements and financial constraints are at stake, firms are more likely to introduce process and administrative innovations than R&D-based product innovation. Instead, they are involved in innovative practices by importing new technologies from developed countries, which results in labor-saving process innovation rather than product innovation (Vivarelli, 2014). Moreover, the results of the OLS analysis showed that after controlling for firm size, firm age and R&D, OLC positively and significantly affected OI ($\beta = 0.4156$, $P < 0.01$). Thus, a one-unit increase in OLC led to a 41.56-unit increase in the organization's ability to innovate. Hence, the first hypothesis is accepted. Moreover, OLC was found to positively affect product innovation ($\beta = 0.368$, $p < 0.05$), process innovation ($\beta = 0.409$, $p < 0.05$) and administrative innovation ($\beta = 0.4808$, $p < 0.05$). This indicates that OLC exerted more effect on administrative innovation than on product and process innovations. The results are consistent with those obtained by previous studies (Akgun *et al.*, 2007; Uğurlu and Kurt, 2016; Gomes and Wojahn, 2017; Fang *et al.*, 2011; François, 2002). Overall, these results support all proposed hypotheses in this paper.

Regarding control variables, only R&D had a significant positive effect on OI ($\beta = 0.068$, $p < 0.05$) and its two subdimensions: product innovation ($\beta = 0.076$, $p < 0.05$) and process innovation ($\beta = 0.090$, $p < 0.05$). Previous studies have reported that R&D is positively correlated with OI (Sun, 2015) in general and process innovation (Baldwin *et al.*, 2002; Mairesse and Mohnen, 2005; Un and Asakawa, 2015) and product innovation (Un *et al.*, 2010; Heij *et al.*, 2019) in particular. However, firm age did not have a statistically significant effect on OI and all its dimensions. Similarly, firm size did cause a significant effect on OI and its dimensions, except for product innovation, which was a positive but weak effect size. Likewise, among the control variables, only R&D practices positively affected OLC. Although previous studies have found a positive effect of firm age on OLC (Hu *et al.*, 2015), this study reported the reverse ($\beta = -0.124$, $p < 0.05$). This can be attributed to the fact that, compared to young firms, old firms are more likely to detect and fix problems based on the prevailing organizational norms and frameworks (single-loop learning). Because of this,

they are less likely to question the status quo and be open to new ideas that might contradict organizational norms (double-loop learning). This, in turn, diminishes the learning capability of firms. Similar findings were reported by Çınar and Eren (2015).

## Conclusion

This study aimed to reveal the relationship between OLC and OI. It was found that OLC boosts OI in general and its subdimensions – namely, product, process and administrative innovations – in particular. Thus, the existence of a shared vision among organizational members; the commitment of the top management to cultivate a learning culture in the organization; an organizational culture that welcomes and experiments with new ideas; and a system to share and accumulate knowledge increase a firm's propensity to launch new products, processes and administrative practices. Therefore, organizations are highly recommended to discard obsolete norms, value systems and policies that might freeze the learning process.

The manufacturing firms surveyed in this study were low not only in terms of their learning capability but also in their involvement in innovation practices. This implies that organizations in the country should strive to transform their culture from one that impedes openness and experimentation of ideas toward a culture that is more conducive to innovation. Creating an innovation-oriented culture intrinsically emanates from organizational leaders, who should take the lead in creating an organization-wide system that uses learning as a crucial tool to meet strategic objectives. In this regard, firms should enhance their absorptive capacity, meaning that they should build their ability to acquire new knowledge, assimilate it with organizational processes and transform and use it to ensure competitiveness (Charry *et al.*, 2017). Moreover, because the national culture affects the learning orientations and, thereby, the innovation practices of organizations (Beyene *et al.*, 2016), the Ethiopian government should induce innovation by taking different measures, such as introducing innovation policy and strategies and funding R&D projects (OECD, 2005).

This study has certain practical implications for the management of manufacturing firms in Ethiopia. As shown in Table 6, OLC positively influenced product innovation, though the effect size was quite small. Compared to other forms of innovation, product innovation entails huge investment in technology development or adoption. According to the diffusion theory of innovation (Rogers, 1983), firms differ in terms of the rate at which they adopt innovation. In this regard, continual learning is the key for technological innovation adoption, implying that firms that are proactive in establishing an organization-wide learning system that firmly establishes a shared vision; welcomes new ideas; shares, experiments and retains knowledge are more likely to introduce new product innovations than their counterparts. Therefore, to launch new products with different features, technical specifications or functionalities to the market, managers of manufacturing firms should not only play the leading role in establishing such a system but also encourage, appraise and reward their employees for being involved in continual learning. In this regard, gathering and imparting information to others should be part of an employee's job. For this reason, employees should be provided with the necessary training to enhance their creativity and fill their skill gaps. Skill shortages and problems of competence, finance and appropriation are the major challenges to innovation activities. Hence, emphasis should be given to the quality of the education system at the national level to meet the demands of innovative firms (OECD, 2005). Furthermore, managers should periodically appraise organizational frameworks that restrain a firm's ability to launch new products to the market.

Likewise, as elucidated in Table 7, OLC has a positive but relatively low effect on process innovation ($\beta = 0.409$, $p < 0.05$). Unlike product innovation, process innovation is internal to the organization, which includes activities used to augment product quality, enhance operational efficiency and reduce costs. However, the sampled firms have limited capability to introduce new processes ($\bar{x} = 3.97$) as compared to their ability to launch new products or administrative practices. Most process innovations are the result of trial-and-error rather than R&D efforts. Therefore, to initiate and implement successful process innovations, managers are recommended to build a culture of innovation, train employees to create novel ideas regarding approaches to do things, properly document prior experiences and upgrade employees' skills to use state-of-the-art production technologies. Moreover, the sampled firms were low in terms of the OE dimension of OLC. This would lead to a situation known as a competency trap, wherein organization actors tend to stick with prior experiences or procedures rather than trying or experimenting with new methods to solve organizational problems (Ahuja, 2016). Under such circumstances, employees develop expertise in certain technologies and refrain from trying out new ones (maladaptive specialization). Thus, managers should look for alternative ways of doing things and update the organization's knowledge repository system as a basis for process innovation. Moreover, because of the cross-functional nature of process innovation, managers are highly suggested to create a platform to share ideas and develop a common understanding among different work units on operational processes.

Furthermore, the study indicated that OLC has a positive and relatively higher effect on administrative innovation ($\beta = 0.480$, $p < 0.05$) than on product and process innovations (Table 8). To remain compatible with the ever-changing environment, organizations embark on introducing administrative innovations, such as redesigning their organizational structure, devising new communication channels, revisiting their management techniques, adopting automated record systems or fostering strong external relationships. Because the success of these innovations hinges upon learning, managers of manufacturing firms in Ethiopia are recommended to support the learning process by involving employees in decision-making, consider employee learning as a strategic asset rather than cost, train their employees to devise creative solutions to organizational problems, establish an *employee suggestion system* so that workers can easily suggest new procedures or methods for doing their jobs and reward those who suggest workable new ideas. The sampled firms were low in terms of the SP dimension of OLC ($\bar{x} = 3.87$), and managers are highly advised to go beyond the boundary of the organization to create networks and collaborations with external institutions, such as customers, suppliers, consultants and academic or research institutions (OECD, 2005). The results of a prior study (Merono-Cerdan and López-Nicolas, 2013) revealed that organizations that create innovative skills and build information-sharing systems have successfully implemented new organizational methods in business practices and workplace organizations.

This study is not without limitations. One of the shortcomings arises from the small sample size ($n = 197$ firms). In addition, this study did not investigate the degree of newness (radical vs incremental) of innovation. Therefore, further studies should be based on longitudinal data gathered from a large sample size and reveal how OLC and OI vary across different sectors as well as investigate the degree of newness of product, process and administrative innovations.

## References

Adebowale, B.A., Diyamett, B., Lema, R. and Oyelaran-Oyeyinka, O. (2014), "Innovation research and economic development in Africa", *African Journal of Science, Technology, Innovation and Development*, Vol. 6 No. 5, pp. 5-11.

Ahuja, G. (2016), "Competency trap", in Augier, D.T.M. (Ed.), *The Palgrave Encyclopedia of Strategic Management*, pp. 1-5.

Akgun, A.E., Keskin, H., Byrne, J. and Aren, S. (2007), "Emotional and learning capability and their impact on product innovativeness and firm performance", *Technovation*, Vol. 27 No. 9, pp. 501-513.

Alegre, J. and Chiva, R. (2008), "Assessing the impact of organizational learning capability on product innovation performance: an empirical test", *Technovation*, Vol. 28 No. 6, pp. 315-326.

Alsharkas, Z. (2014), "Firm size, competition, financing and innovation", *International Journal of Management and Economics*, Vol. 44 No. 1, pp. 51-73.

Argyris, C. and Schon, D.A. (1978), *Organizational Learning: A Theory of Action Perspective*, Addison-Wesley Publishing Company.

Baldwin, J., Hanel, P. and Sabourin, D. (2002), "Determinants of innovative activity in Canadian manufacturing firms", in Kleinknecht, A., Mohnen, P., Kleinknecht, A. and Mohnen, P. (Eds), *Innovation and Firm Performance*, 1st ed., Palgrave Macmillan, pp. 86-112.

Bekana, D.M. (2020), "Institutions, innovation and economic growth in Sub-Saharan Africa: a literature review", *Ethiopian Journal of Economics*, Vol. 29 No. 1, pp. 43-74.

Benner, M.J. and Tushman, M.L. (2003), "Explotation, exploration, and process management: the productivity dilemma revisited", *Academy of Management Review*, Vol. 28 No. 2, pp. 238-258.

Beyene, K., Shi, C. and Wu, W. (2016), "Linking culture, organizational learning orientation and product innovation performnace: the case of Ethiopian manufacturing firms", *South African Journal of Industrial Engineering*, Vol. 27 No. 1, pp. 88-101.

Bontis, N., Crossan, M.M. and Hulland, J. (2002), "Managing an organizational learning system by aligning stocks and flows", *Journal of Management Studies*, Vol. 39 No. 4, pp. 437-469.

Cabral, R. and Leiblein, M.J. (2001), "Adoption of a process innovation with learning-by-doing: evidence from the semiconductor industry", *The Journal of Industrial Economics*, Vol. 49 No. 3, pp. 269-280.

Charry, G.P., Barahona, N.L. and Collazos, A.Z. (2017), "Absorptive capacity (AC): knowledge generation and its evolution from variable to construct", *Revista Espacios*, Vol. 38 No. 36, pp. 1-19.

Cho, H., Lee, P. and Shin, C.H. (2019), "Becoming a sustainable organization: focusing on process, administrative innovation and human resource practices", *Sustainability*, Vol. 11 No. 13, pp. 1-17.

Çınar, F. and Eren, E. (2015), "Organizational learning capacity impact on sustainable innovation: the case of public hospitals", *3rd International Conference on Leadership, Technology and Innovation Management*, Elsevier, Vol. 181, pp. 251-260.

Cochran, W.G. (1977), *Sampling Techniques*, 3rd ed., John Wiley and Sons.

Cohen, W.M. and Levinthal, D.A. (1990), "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly*, Vol. 35 No. 1, pp. 128-152.

Daksa, M.D., Yismaw, M.A., Lemessa, S.D. and Hundie, S.K. (2018), "Enterprise innovation in developing countries: an evidence from Ethiopia", *Journal of Innovation and Entrepreneurship*, Vol. 7 No. 1, pp. 1-19.

Damanpour, F. and Evan, W.M. (1984), "Organizational innovation and performance: the problem of 'organizational lag", *Administrative Science Quarterly*, Vol. 29 No. 3, pp. 392-409.

Diyamett, B. and Mutambala, M. (2014), "Is the current booming growth in Africa worth celebrating? Some evidence from Tanzania", *Southern Voice Occasional Paper*, Vol. 9, pp. 1-12.

Dorda, B. and Shtëmbari, E. (2020), "Learning organizations in developing countries: investigations on the individual level", *American International Journal of Business Management*, Vol. 3 No. 4, pp. 80-87.

Edquist, C., Hommen, L. and McKelvey, M. (1998), "Product versus process innovation: implications for employment", in Charles Edquist, M.M. (Ed.), *Systems of Innovation: Growth, Competitiveness and Employment*, Edward Elgar, pp. 128-152.

Eisenhardt, K.M. and Martin, J.A. (2000), "Dynamic capabilities: What are they? ", *Strategic Management Journal*, Vol. 21 Nos 10/11, pp. 1105-1121.

Fang, C.H., Chang, S.-T. and Chen, G.-L. (2011), "Organizational learning capability and organizational innovation: the moderating role of knowledge inertia", *African Journal of Business Management*, Vol. 5 No. 5, pp. 1864-1870.

Fornell, C. and Larcker, D.F. (1981), "Structural equation models with unobservable variables and measurement error: algebra and statistics ", *Journal of Marketing Research*, Vol. 18 No. 3, pp. 382-388.

François, T. (2002), "Organizational learning and innovation in High-Tech small firms", *Proceedings of the 36th HI International Conference on System Sciences (HICSS'03)*.

Gebreeyesus, M. (2009), "Innovation and microenterprises growth in Ethiopia", *United Nations University - Maastricht Economic and Social Research and Training Centre on Innovation and Technology*, pp. 1-30.

Goel, R.K. and Nelson, M.A. (2018), "Determinants of process innovation introductions: evidence from 115 developing countries", *Managerial and Decision Economics*, Vol. 39 No. 5, pp. 515-525.

Gomes, G. and Wojahn, R.M. (2016), "Organizational learning capability, innovation and performance: study in small and medium-sized enterprises (SMEs)", *Revista de Administração*, pp. 1-13.

Gomes, G. and Wojahn, R.M. (2017), "Organizational learning capability, innovation and performance: study in small and medium sized enterprises (SMES)", in Saes, M.S. (Ed.), *Revista de Administração*, Vol. 52 No. 2, pp. 163-175.

Hailekiros, G.S. and Renyong, H. (2016), "The effect of organizational learning capability on firm performance: mediated by technological innovation capability", *European Journal of Business and Management*, Vol. 8 No. 30, pp. 87-95.

Heij, C.V., Bosch, F.A. and Hollen, R.M. (2019), "How to leverage the impact of R&D on product innovation? The moderating effect of management innovation", *R&D Management*, Vol. 50 No. 2, pp. 277-294.

Hsu, Y.H. and Fang, W. (2009), "Intellectual capital and new product development performance: the mediating role of organizational learning capability", *Technological Forecasting and Social Change*, Vol. 76 No. 5, pp. 664-677.

Hu, H., Wu, J. and Shi, J. (2015), "Strategic HRM and organisational learning in the Chinese private sector during second-pioneering", *The International Journal of Human Resource Management*, pp. 1-20.

Hussain, K., Wahab, E., Zeb, A., Khan, M.A., Javaid, M. and Khan, M.A. (2018), "Examining the relationship between learning capabilities and organizational performance: the mediating role of organizational innovativeness", *MATEC Web of Conferences*, Vol. 150, pp. 1-8.

IMF (2018), "World economic outlook: cyclical upswing", Structural Change, Washington, DC.

Jerez-GóMez, P., CéSpedes-Lorente, J. and Valle-Cabrera, R. (2005), "Organizational learning capability: a proposal of measurement", *Journal of Business Research*, Vol. 58 No. 6, pp. 715-725.

Jiménez-Jiménez, D. and Sanz-Valle, R. (2011), "Innovation, organizational learning, and performance", *Journal of Business Research*, Vol. 64 No. 4, pp. 408-417.

Karasneh, A.A.F. (2019), "Reinforcing innovation through knowledge management: mediating role of organizational learning", *Interdisciplinary Journal of Information, Knowledge, and Management*, Vol. 14, pp. 235-252.

Mairesse, J. and Mohnen, P. (2005), "The importance of R&D for innovation: a reassessment using French survey data. (A. L. Scherer, Ed)", *The Journal of Technology Transfer*, Vol. 30 Nos 1/2, pp. 1-2.

March, J.G. (1991), "Exploration and exploitation in organizational learning", *Organization Science*, Vol. 2 No. 1, pp. 71-87.

Medase, S.K. (2020), "Product innovation and employees' slack time: the moderating role of firm age and size", *Journal of Innovation and Knowledge*, Vol. 5 No. 3, pp. 151-174.

Meeus, M. and Edquist, C. (2006), "Introduction to part I: product and process innovation", in Jerald Hage, M.M. (Ed.), *Innovation, Science and Institutional Change. A Research Handbook*, Oxford University Press, pp. 23-37.

Merono-Cerdan, A.L. and LóPez-Nicolas, C. (2013), "Understanding the drivers of organizational innovations", *The Service Industries Journal*, Vol. 33 Nos 13/14, pp. 1312-1325.

Moreno, E.F., Mata, J.L., Bello, J.M. and Lopez, M. and O, H. (2015), "Predictors of administrative innovation: functions and organizational methods - Mexican and Colombian hospitals", *Rev. bus. manag*, Vol. 17 No. 54, pp. 806-821.

Movando, F. and Farell, M. (2003), "Cultural orientation: its relationship with market orientation, innovation and organizational performance", *Management Decision*, Vol. 41 No. 3, pp. 241-249.

Nasution, H.N., Matanda, M.J. and Ndubisi, N.O. (2011), "Entrepreneurship: its relationship with market orientation and learning orientation and as antecedents to innovation and customer value", *Industrial Marketing Management*, Vol. 40 No. 3, pp. 336-345.

Naveh, E., Meilich, O. and Marcus, A. (2006), "The effects of administrative innovation implementation on performance: an organizational learning approach", *Strategic Organization*, Vol. 4 No. 3, pp. 275-302.

OECD (2005), *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd ed., OECD Publishing.

Oyeniyi, O. (2011), "Organizational learning and sustainable competitive advantage (SCA): the Nigerian experience", *Journal of Economics and Business Research*, pp. 102-116.

Reichstein, T. and Salter, A. (2006), "Investigating the sources of process innovation among UK manufacturing firms", *Industrial and Corporate Change*, pp. 1-30.

Rogers, E.M. (1983), *Diffusion of Innovations*, 3rd ed., The Free Press, New York, NY.

Salim, I.M. and Sulaiman, M. (2011), "Organizational learning, innovation and performance: a study of Malaysian small and medium sized enterprises", *International Journal of Business and Management*, Vol. 6 No. 12, pp. 118-125.

Santos-Vijande, M.L., López-Sánchez, J.Á. and González-Mieres, C. (2012), "Organizational learning, innovation, and performance in KIBS", *Journal of Management and Organization*, Vol. 18 No. 6, pp. 870-904.

Senge, P.M. (1990), *The Fifth Discipline: The Art and Practice of Organizational Learning*, 1st ed., DOUBLEDAY, New York, NY.

Stata, R. (1989), "Organizational learning- the key to management innovation", *Sloan Management Review*, Vol. 63, pp. 63-74.

Subramanian, A. and Nilakanta, S. (1996), "Organizational innovativeness: exploring the relationship between organizational determinants of innovation, types of innovations, and measures of organizational performance", *Omega, Int. J. Mgmt Sci*, Vol. 26 No. 4, pp. 631-647.

Sun, L. (2015), "R and D expenditures and future innovation: evidence from the chemical industry", *International Journal of Law and Management*, Vol. 57 No. 5, pp. 552-560.

Tafesse, M. (2021), "Organizational learning practices in public higher education institutions of Ethiopia", *Technium Education and Humanities*, Vol. 1 No. 1, pp. 55-78.

Tambosi, S.S., Gomes, G. and Amal, M. (2020), "organisational learning capability and innovation: study on companies located in regional cluster", *International Journal of Innovation Management*, pp. 1-28.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.

Uğurlu, Ö.Y. and Kurt, M. (2016), "The impact of organizational learning capability on product innovation performance: evidence from the Turkish manufacturing sector", *Emaj: Emerging Markets Journal*, Vol. 6 No. 1, pp. 70-84.

Un, C.A. and Asakawa, K. (2015), "Types of R&D collaborations and process innovation: the benefit of collaborating upstream in the knowledge chain", *Journal of Product Innovation Management*, Vol. 32 No. 1, pp. 138-153.

Un, C.A., Alvaro, A.C.C. and Asakawa, K. (2010), "R&D collaborations and product innovation", *Journal of Product Innovation Management*, Vol. 27 No. 5, pp. 673-689.

Vivarelli, M. (2014), "Innovation, employment and skills in advanced and developing countries: a survey of economic literature", *Journal of Economic Issues*, Vol. 48 No. 1, pp. 123-154.

## Further reading

Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.

Chen, J., Liu, Z.-C. and Wu, N.-Q. (2009), "Relationships between organizational learning, innovation and performance: an empirical examination", *Proceedings of the 2009 International Conference on Information Management, Innovation Management and Industrial Engineering*, Vol. 3, pp. 488-492.

Chiva, R., Alegre, J. and Lapiedra, R. (2007), "Measuring organisational learning capability among the workforce", *International Journal of Manpower*, Vol. 28 Nos 3/4, pp. 224-242.

Dibella, A.J., Nevis, E.C. and Gould, J.M. (1996), "Understanding organizational learning capability", *Journal of Management Studies*, Vol. 33 No. 3, pp. 361-379.

Hopper, D., Coughlan, J. and Mullen, M. (2008), "Structural equation modeling: guidelines for determining model fit", *Electronic Journal on Business Research Methods*, Vol. 6 No. 1, pp. 53-60.

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6 No. 1, pp. 1-55.

Jin, Z., Hewitt-Dundas, N. and Thompson, N.J. (2004), "Innovativeness and performance: evidence from manufacturing sectors", *Journal of Strategic Marketing*, Vol. 12 No. 4, pp. 255-266.

Kline, R.B. (2011), *Principles and Practice of Structural Equation Modeling*, 3rd ed., Guilford Press, New York, NY.

Makabila, G., Iravo, M. and AssumptahKagiri, W.A. (2017), "Does organizational learning lead to competitive advantage? An evaluation of state corporations in Kenya", *International Journal of Scientific and Research Publications*, Vol. 7 No. 8, pp. 141-158.

Ode, E. and Ayavoo, R. (2020), "The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation", *Journal of Innovation and Knowledge*, Vol. 5, pp. 209-217.

Škerlavaj, M., Song, J.H. and Lee, Y. (2010), "Organizational learning culture, innovative culture and innovations in South Korean firms", *Expert Systems with Applications*, Vol. 37 No. 9, pp. 6390-6403.

Tsang, E.W. (1997), "Organizational learning and the learning organization: a dichotomy between descriptive and prescriptive research", *Human Relations*, Vol. 50 No. 1, pp. 73-89.

**Corresponding author**
Ephrem Assefa Haile can be contacted at: ephrem_assefa@smuc.edu.et