The Impact of Organizational Learning Based on ERP System on Technological Innovation

Zhoucan Xu(✉)

School of Information Management, Wuhan University, Hubei 430072, China
wh_xyz@yeah.net

Abstract. With the development and popularization of computer and network communication technology, enterprises are facing more globalized and digital competition. It has become an urgent requirement for Chinese enterprises to carry out information transformation and apply ERP system. The ERP system provides many good learning environments for all members of the enterprise, which can effectively promote organizational learning. The essay studies the theories in organizational learning, organizational capability and technological innovation, constructs a concept model and presents its relevant hypotheses. We have done a large-scale questionnaire to various kinds of enterprises in different industries across multiple provinces and cities in China, and obtained 405 valid sample data. This paper firstly uses SPSS22.0 to conduct a preliminary analysis of the questionnaire, and evaluates the model's reliability and validity. Then this paper conducts descriptive statistical analysis on the data of each variable, and obtains the mean, standard deviation and correlation coefficient of each variable; as shown in Table 2, the correlation analysis results are consistent with all the hypotheses. Then this paper conducts hierarchical regression analysis and hypothesis testing, as shown in Table 3, all regression models have passed the F test; the overall significance of each model is good, and each hypothesis has been verified. Hypothesis testing results show that external learning is beneficial for enterprises to develop the dynamic capabilities but not beneficial for enterprises to develop the existing operational capabilities; internal learning is beneficial for enterprises to develop the existing operational capabilities but not beneficial for enterprises to develop the dynamic capabilities; operational capabilities are beneficial for enterprises to take incremental innovation but not beneficial for enterprises to take radical innovation; dynamic capabilities are beneficial for enterprises to undertake incremental innovation and radical innovation. Finally, this paper puts forward four suggestions for Chinese enterprises to apply ERP system to carry out organizational learning and then promote technological innovation .

Keywords: Organizational learning · Organizational capability · Technological innovation · ERP system

1 Introduction

With increasing globalization and competition, the continuous market segmentation and the continuous emergence of new technologies have brought about earth-shaking changes

V. Balakrishnan et al. (Eds.): ICMEIM 2022, AHSSEH 6, pp. 582–593, 2022.
https://doi.org/10.2991/978-94-6463-044-2_74

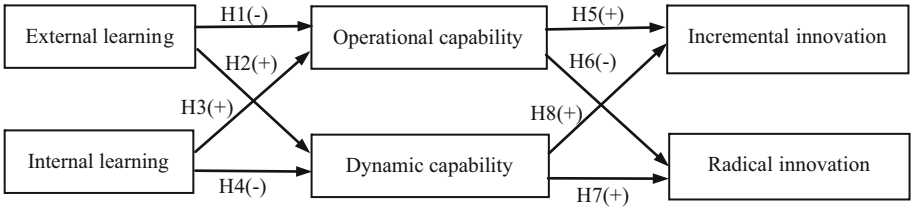

Fig. 1. The concept model

in the environment that enterprises rely on to survive. In order to obtain more competitive advantages in the fierce market competition, Chinese enterprises are constantly seeking methods and tools to improve their management level. It is a very important way for them to enhance their competitiveness by adopting Enterprise Resource Planning (ERP), using information technology and enterprise management informatization.

ERP adopts the latest achievements of computer and network communication technology. It is the integration of management information systems combining Business Process Reengineering (BPR), Supply Chain Management (SCM) and Customer Relationship Management (CRM). The introduction of ERP system flattened the organizational structure of the enterprise. On the one hand, it accelerates the dissemination of information among members and departments, and can improve the learning capability, knowledge sharing and utilization efficiency of the enterprise by supporting information acquisition, information distribution, information interpretation and enterprise memory. On the other hand, it enables enterprises to communicate with suppliers conveniently and efficiently, to respond to customer needs opportunely, to acquire information and knowledge related to their own fields, and to absorb, refine and recreate them. This makes enterprises more well-informed, flexible and organic (Fig. 1).

Organizational learning is crucial to technological innovation, and the quality of organizational learning directly determines innovation performance. Generally speaking, the acquisition and utilization of new knowledge can change the existing level of capabilities of a firm, thereby promote innovation. According to this, this paper adopts the method of questionnaire to analyze whether organizational capability has a mediating effect on the relationship between organizational learning based on ERP system and technological innovation? That is: Does organizational learning improve organizational capabilities and further improve technological innovation? We hope that research results of this paper can provide useful reference for enterprises to carry out technological innovation. We raise the concept model as the following:

2 Theoretical Premises

2.1 Organizational Learning

Templeton et al. analyzed more than 70 definitions of organizational learning and pointed out that organizational learning is a collection of information acquisition, information dissemination, shared interpretation and organizational memory activities that intentionally or unintentionally affect positive organizational change [1]. It can be seen that the

organizational learning ability reflects information processing ability of enterprise to a large extent. The occurrence of organizational learning is the result of the interaction between enterprise and environment, which can be realized by information processing through information technology. Information processing can reduce uncertainty and improve the effect of organizational learning; moreover, enterprises can use information technology to fully investigate the environmental information on which it depends, collect internal experience information and other organizational information. In particular, information technology will process the information in the process of searching for the information needed for organizational learning, that is, when the information is beneficial to organizational learning, it will inform the enterprise to use or store the information in time; if the information has no practical significance to the enterprise, the information is removed immediately to avoid adverse effects on the enterprise and its organizational learning.

According to the specific scope of learning, organizational learning can be divided into external learning and internal learning. External learning increases an organization's knowledge reserve by absorbing external knowledge and combining existing knowledge with newly acquired external knowledge. Organizations can obtain relevant knowledge from external partners (customers, suppliers, competitors, etc.), or obtain required knowledge from other organizations in the industry chain, realize external learning, and increase the knowledge stock of the organization. Internal learning refers to the acquisition of new knowledge by an organization through internal R&D, training, or experience accumulated during production; internal learning occurs when organizational members create and share knowledge within the organization. Internal learning improves the organizational capability to acquire knowledge through the absorption and sharing of knowledge within the organization, thereby promote the technological innovation of enterprises [2].

2.2 Organizational Capability

According to Winter, Helfat and Peteraf researches, organizational capabilities were divided into operational capabilities and dynamic capabilities [3] [4]. Operational capability refers to the ability to consistently produce the same amount of products and sells them to the same customers to maintain its existence, and it reflects organizational capability to maintain normal operations, similar to organizational routines; dynamic capability refers to an organization's ability to integrate, build, and reconfigure operational capabilities to adapt to environmental changes [5]. When the market environment is relatively stable, operational capability dominates the organization's competitive advantage; when the market environment changes rapidly, dynamic capability becomes the main source for an enterprise to obtain competitive advantage, they are interdependent and complementary, and are both indispensable for any enterprise. In addition, operational capabilities mainly rely on the existing knowledge base, while dynamic capabilities mainly rely on new knowledge that an organization obtains timely.

2.3 Technological Innovation

According to the degree of technological innovation, technological innovation can be divided into incremental innovation and radical innovation [6]. Incremental innovations are small improvements or simple tweaks to existing technology. While the short-term benefits of incremental innovation are not obvious, the long-term outcomes of incremental innovation are huge. Moreover, incremental innovation can strengthen the production and technology of the enterprise, consolidate the connection between the enterprise and the customer, the market, and maintain the competitive advantage of the enterprise. Radical innovation, on the other hand, mainly refers to the abandonment of existing practices, which can lead to new production technologies and processes. It requires a long-term and comprehensive strategic planning, huge R&D investment, a practical planning and effective management.

3 Hypothesis Presentation

3.1 Organizational Learning and Organizational Capability

External learning mainly refers to companies conducting market research on some topics, collecting information about customer demands and preferences, strategic information about suppliers, information about technological development trends, and collecting information and knowledge through industry journals, government publications, and new media and so on [7]. The operational capability is mainly based on the existing knowledge, and the entry of new knowledge may bring certain concussion and impact on it, thus weaken the existing operational capability to a certain extent [8].

Hypothesis 1: External learning is not beneficial for enterprises to develop the existing operational capabilities.

Through external learning, enterprises can obtain various information of market demand in time, so that managers can make more accurate and timely product innovation decisions [9]. At the same time, in order to adapt to the fierce market competition, many enterprises have built knowledge networks and shared knowledge bases across multiple industries, actively carried out mutual learning activities, and improved their ability to deal with complex situations and adaptability.

Hypothesis 2: External learning is beneficial for enterprises to develop the dynamic capabilities.

Internal learning mainly refers to the frequent communication and sharing of various important knowledge and information among employees, which has a huge impact on the operational and dynamic capabilities of the enterprise. Internal learning helps to share existing knowledge, especially for advanced knowledge and experience, internal learning can strengthen employees' cognitive consistency, raise their knowledge and operational capabilities, and heighten their efficiency in engaging in production activities [10].

Hypothesis 3: Internal learning is beneficial for enterprises to develop the existing operational capabilities.

Dynamic capabilities rely less on existing knowledge and more on new knowledge that can timely respond to environmental changes [8]. If Chinese enterprises only pay

attention to internal learning and give up the learning of external advanced knowledge, they will only invite the inertia, continue to widen the gap with foreign advanced enterprises, then they cannot adapt to the fierce market competition.

Hypothesis 4: Internal learning is not beneficial for enterprises to develop the dynamic capabilities.

3.2 Organizational Capability and Technological Innovation

Operational capabilities are based on existing knowledge and resources, are mainly the collection and expression of explicit knowledge, technical problems and opportunities discovered by the organization in relation to existing activities. Operational capabilities focus on existing activities, gradually form and strengthen, and have a certain rigidity; radical innovation will inevitably lead to damage to the value of existing operational capabilities. At the same time, the stronger operational capabilities the enterprise has, the stronger its capability is to respond to environmental changes through incremental innovation, and the decision makers may be more inclined to incremental innovation rather than radical innovation.

Hypothesis 5: Operational capabilities are beneficial for enterprises to take incremental innovation.

Hypothesis 6: Operational capabilities are not beneficial for enterprises to take radical innovation.

Dynamic capabilities refer to the ability to integrate, construct and reconfigure enterprises' resources, mainly rely on new knowledge to adapt to environmental changes. In a rapidly changing environment, companies often need to respond to these changes in the form of radical innovations that not only leverage existing operational capabilities to solve problems, but also rely on dynamic capabilities to integrate and reconfigure enterprises' resources according to the environmental changes.

Hypothesis 7: Dynamic capabilities are beneficial for enterprises to undertake radical innovation.

Dynamic capabilities are gradually formed in the context of environmental changes and external learning stimuli, affect and change existing operational capabilities through knowledge transfer and creation within the enterprise. Enterprises with strong dynamic capabilities will also affect their operational capabilities and their ability to adapt to environmental changes, thereby promote incremental innovation.

Hypothesis 8: Dynamic capabilities are beneficial for enterprises to undertake incremental innovation.

4 Research Methodology

4.1 Samples and Data Collection

In order to increase the representativeness of sample enterprises of different income levels, regions and ownerships in China, we conducted a large-scale questionnaire survey of various types of enterprises (mainly including state-owned, foreign-funded, collective, and private enterprises) across multiple provinces and cities. The survey focused on the

manufacturing industry (mainly including electronics, machinery, pharmaceuticals, processing and other industries). Before the formal survey, we conducted a pre-investigation, randomly selected more than 10 enterprises in Wuhan for field survey, and perfected the questionnaire according to the feedback results.

This study collected data by E-mail. We sent a total of 1900 questionnaires, and some people did not reply immediately, so we sent them E-mail again. We received 476 questionnaires. Regrettably, 71 of the 476 questionnaires were eliminated due to non-cooperation, corporate liquidation, and incomplete information. As a result, there were 405 valid questionnaires. As of April 2022, the survey had an overall response rate of 25.1% and a valid rate of 21.3%. The questionnaires were completed by the CEOs or their designees. Most of the respondents held senior management positions, with an average of 7.2 years in the same company, and bachelors or above occupies 67.5%. Generally speaking, 20% response rate from senior managers is acceptable in social science research, so the results of this survey are credible.

4.2 Variable Measurement

Due to the difficulty of applying objective scales to organizational learning, organizational capabilities, and technological innovation activities, all multi-item measures were based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). If no objective scale is available, the Likert scale is appropriate. Through it, various information that cannot be reflected by objective indicators can be obtained.

The variables and indicators used in this paper are as follows:

4.2.1 Organizational Learning

According to Dyer & Singh's research, five indicators were mainly used to measure external learning: (1) frequently collecting the information on customer demands and preferences; (2) often collecting suppliers' strategic information; (3) often collecting the information on technological development trends; (4) conducting object-oriented market research; (5) often gathering the information through industry journals, governmental publications, and news media [7]. The Cronbach's coefficient alpha for this scale is 0.7932.

According to Bierly & Hamalainen's research, five indicators were mainly used to measure internal learning: (1) managers often exchanged the information about competitors with employees; (2) various departments communicated service experiences; (3) all departments worked together to provide common services customers; (4) the existing organizational structure of the enterprise is very reasonable; (5) the desire of each department within the enterprise to learn from each other was very strong [11]. The Cronbach's coefficient alpha for this scale is 0.8105.

4.2.2 Organizational Capability

According to Winter, Cohen et al. and the actual operation of Chinese enterprises, five indicators were mainly used to measure operational capabilities: (1) the ability to maintain an effective engineering process; (2) the ability to increase the productive speed;

(3) the enterprise's ability to target management and strategic planning; (4) the ability of team building and employee cooperation; (5) the ability of cost control [12][13]. The Cronbach's coefficient alpha for this scale is 0.8081.

According to the research of Teece et al. and Zollo & Winter, five indicators were mainly used to measure dynamic capabilities: (1) the ability to become a market leader; (2) the ability to reduce market development time; (3) the leadership; (4) the ability to operate in the uncharted territories; (5) the ability to deal with changes [5] [10]. The Cronbach's coefficient alpha for this scale is 0.7869.

4.2.3 Technological Innovation

According to Ettlie et al., three indicators were mainly used to measure incremental innovation: (1) firms created new products in terms of the style and service to sell; (2) often improved upon existing technologies; (3) improvement and innovation of existing technological processes [6]. The Cronbach's coefficient alpha for this scale is 0.7053. At the same time, four indicators were mainly used to measure radical innovation: (1) creation of new products; (2) introduction of the latest ideas into product R&D; (3) development and introduction of brand-new technologies in the industry; (4) invention of new processes and technologies [6]. The Cronbach's coefficient alpha for this scale is 0.7743.

5 Empirical Testing and Result Analysis

5.1 Reliability and Validity Analysis

This paper firstly uses SPSS22.0 to do a preliminary analysis of questionnaire, and assesses the model's reliability and validity, which can assure that the method used in the following analysis is reliable and valid. Generally speaking, reliability coefficients of 0.7 or higher are considered adequate, as shown in Table 1, the Cronbach's coefficient alpha of each variable in this study is greater than 0.7, which indicates good reliability. The combined reliability of each variable is greater than 0.8, and Average Variances Extracted (AVE) of each variable is greater than 0.5, it shows good convergent validity. All the indicators we used meet the requirements of model validation.

Table 1. Reliability and validity of variables

Variables	α	Combined reliability	AVE
External learning	0.7932	0.8361	0.732
Internal learning	0.8105	0.8695	0.697
Operational capability	0.8081	0.8517	0.730
Dynamic capability	0.7869	0.8203	0.584
Incremental innovation	0.7053	0.8072	0.526
Radical innovation	0.7743	0.8146	0.615

Table 2. Descriptive statistics and correlation analysis

Variables	Mean	Standard deviation	Firm age	Firm size	EL	IL	OC	DC	II	RI
Firm age	12.94	7.58	1							
Firm size	6.35	2.11	-0.085	1						
EL	3.94	1.1732	-0.029	0.061	1					
IL	4.07	0.9678	0.073	0.145	0.162*	1				
OC	4.29	1.0251	0.056	0.187	-0.051*	0.385**	1			
DC	4.06	1.0865	-0.092	0.034	0.397**	-0.082*	-0.158	1		
II	4.13	1.0943	0.041	0.192	0.091*	0.248*	0.716*	0.304**	1	
RI	3.92	1.0724	-0.067	0.083	0.135*	0.055*	-0.98*	0.473**	-0.173*	1

Note: * stands for P < 0. 1, ** stands for P < 0. 05, EL stands for external learning, IL stands for internal learning, OC stands for operational capability, DC stands for dynamic capability, II stands for incremental innovation, RI stands for radical innovation, and the representation of corresponding variables in Table 3 is also the same.

5.2 Descriptive Statistics and Correlation Analysis

This paper uses SPSS22.0 to carry out a descriptive statistical analysis on the data of each variable, so as to obtain the mean, standard deviation and correlation coefficient of each variable. As shown in Table 2, the correlation analysis results are consistent with the hypotheses.

5.3 Hypothesis Testing

This paper uses SPSS22.0 to perform hierarchical regression analysis and hypothesis testing, as shown in Table 3, all regression models have passed the F test, and the overall significance of each model is good.

5.3.1 Examining the Impact of Organizational Learning on Organizational Capability

From Model 1 and 2, it can be seen that the β of external learning on operational capability and dynamic capability respectively is -0.035, 0.347, and $p < 0.1$, $p < 0.05$, external learning has a negative impact on operational capability and a significant positive impact on dynamic capability. Therefore, H1 and H2 are verified.

The β of internal learning on operational capability and dynamic capability respectively is 0.318, -0.051, and $p < 0.05$, $p < 0.1$, internal learning has a significant positive impact on operational capability and a negative impact on dynamic capability. Therefore, H3 and H4 are verified.

Table 3. Regression analysis results

Variables	Model 1 OC	Model 2 DC	Model 3 II	Model 4 RI	Model 5 II	Model 6 RI	Model 7 II	Model 8 RI
Firm age	0.091*	0.088*	0.093	0.084	0.125*	0.117	0.115*	0.103
Firm size	0.063	0.054	0.035	0.037	0.049	0.050	0.023	0.027
EL	-0.035*	0.347**	0.086**	0.426**			0.054**	0.325**
IL	0.318**	-0.051*	0.392**	0.089**			0.287**	0.051**
OC					0.573**	-0.091*	0.459**	-0.062*
DC					0.218**	0.464**	0.106**	0.338**
R	0.392	0.306	0.318	0.337	0.357	0.371	0.401	0.394
ΔR^2	0.347	0.295	0.304	0.312	0.336	0.355	0.375	0.371
F	26.193	23.528	24.185	25.724	23.611	24.087	26.832	26.752

Note: * stands for P < 0. 1, ** stands for P < 0. 05.

5.3.2 Examining the Impact of Organizational Learning on Technological Innovation

From Model 3 and 4, it can be seen that the β of external learning on incremental innovation and radical innovation is respectively 0.086, 0.426, and $p < 0.05$, therefore, external learning has a significant positive impact on incremental innovation and radical innovation.

The β of internal learning on incremental innovation and radical innovation is respectively 0.392, 0.089, and $p < 0.05$, so internal learning has a significant positive impact on incremental innovation and radical innovation.

5.3.3 Examining the Impact of Organizational Capability on Technological Innovation

From Model 5 and 7, it can be seen that the β of operational capability on incremental innovation is respectively 0.573, 0.459, and $p < 0.05$, operational capability has a significant positive impact on incremental innovation, therefore, H5 is verified. The β of dynamic capability on incremental innovation is respectively 0.218, 0.106, and $p < 0.05$, dynamic capability has a significant positive impact on incremental innovation, therefore, H8 is verified.

From Model 6 and 8, it can be seen that the β of operational capability on radical innovation is respectively -0.091, -0.062, and $p < 0.1$, operational capability has a negative impact on radical innovation, therefore, H6 is verified. The β of dynamic capability on radical innovation is respectively 0.464, 0.338, and $p < 0.05$, dynamic capability has a significant positive impact on radical innovation, therefore, H7 is verified.

5.3.4 Examining the Impact of Organizational Learning and Organizational Capability on Technological Innovation

Bring organizational learning and organizational capability together into the regression statistical analysis equation in order to measure their relationship with technological innovation.

From Model 7 and 8, it can be seen that when organizational capability is introduced into model 3 and 4, the β of external learning on incremental innovation and radical innovation decreased from 0.086, 0.426 ($p < 0.05$) to 0.054, 0.325 ($p < 0.05$), the β of internal learning on incremental innovation and radical innovation decreased from 0.392, 0.089 ($p < 0.05$) to 0.287, 0.051 ($p < 0.05$). This indicates that organizational capability plays a partial mediating role in the relationship between organizational learning and technological innovation.

That is, organizational learning affects organizational capability, and organizational capability further affects technological innovation.

6 Conclusions

This paper divides organizational learning into external learning and internal learning, which not only reveals the main differences between the two different learning styles, but also confirms that different organizational learning styles have different effects on organizational capabilities. External learning is beneficial for enterprises to develop the dynamic capabilities, but not beneficial for enterprises to develop the existing operational capabilities; internal learning is beneficial for enterprises to develop the existing operational capabilities, but not beneficial for enterprises to develop the dynamic capabilities.

The essential elements of organizational capabilities are composed of various kinds of knowledge, which are formed from organizational external learning and internal learning, and have obvious path dependence characteristics. Knowledge can often be thought of as a multi-layered structure, and different levels of knowledge provide different types of organizational capabilities. Operational capabilities are beneficial for enterprises to take incremental innovation, but not beneficial for enterprises to take radical innovation; dynamic capabilities are beneficial for enterprises to undertake radical innovation and incremental innovation.

The conclusions of this paper provide four suggestions for Chinese enterprises to carry out technological innovation smoothly: Firstly, in the current turbulent market environment, Chinese enterprises should make full use of the ERP system to communicate with various departments of the enterprise and external partners, and use it to efficient acquisition, delivery and share information, thereby promote internal and external learning activities of enterprise, and continuously enhance the dynamic and adaptive capacity of the enterprise. Secondly, business executives should note that internal learning is of course very important for the enterprises, but they should also be aware of its negative effects, especially for enterprises with the overall weaker level, pure internal learning will limit their development; therefore, they need to combine external learning activities to integrate more new knowledge and new information into the existing knowledge base of the enterprises on the basis of acquiring new knowledge and new skills, so as

to improve the overall knowledge and skills of employees. Thirdly, business executives should realize that operational capability and dynamic capability complement each other; for the smooth development of incremental innovation, neither dynamic capability nor operational capability is dispensable. Fourthly, in order to adapt to the changing environment, enterprises should first devote resources to incremental innovation, especially when resources are scarce. However, it is difficult to maintain a long-term competitive advantage with purely incremental innovation, we must rely on radical innovation. Therefore, we need to correctly understand the interaction of incremental innovation and radical innovation in the implementation of technological innovation, and ensure their coordinated development.

Due to the limitations of research objects, research methods and data samples, this paper mainly has the following two deficiencies: firstly, the results of this paper show that organizational capabilities only play a partial mediating role between organizational learning and technological innovation. Therefore, follow-up research needs to consider the mediating role of other factors in order to more clearly outline the mechanism by which organizational learning affects technological innovation. Secondly, the sample data of this paper come from some provinces and cities, and organizational learning of Chinese enterprises may vary due to the imbalance of economic development and the application of ERP systems in different regions. Therefore, follow-up research needs to consider conducting questionnaire in more provinces and cities, in order to fully and accurately reflect the actual situation in China, and conduct corresponding comparative research to improve the generalizability of the research results.

References

1. Gary F. Templeton, Bruce R. Lewis, Charles A Snyder, “Development of a Measure for the Organizational Learning Construct”, Journal of Management Information Systems 19(2) (2002) 175-218.
2. P E. Bierly, A K. Chakrabarti, "Technological Learning, Strategic Flexibility, and New Product Development in the Pharmaceutical Industry", Engineering Management, IEEE Transactions on 43(4) (1996) 368-380.
3. Sidney G. Winter, "Understanding Dynamic Capabilities", Strategic Management Journal 24(10) (2003) 991-995.
4. Constance E. Helfat, Margaret A. Peteraf, "The Dynamic Resource- based View: Capability Life Cycles", Strategic Management Journal 24(10) (2003) 997-1010.
5. David J. Teece, Gary Pisano, Amy Shuen. "Dynamic Capabilities and Strategic Management", Strategic Management Journal 18(7) (1997) 509-533.
6. John E. Ettlie, William P. Bridges, Robert D. O’Keefe, "Organization Strategy and Structural Differences for Radical versus Incremental Innovation", Management Science 30(6) (1984) 682-695.
7. Jeffrey H. Dyer, Harbir Singh, “The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage”, Academy of Management Review 23(4) (1998) 660-679.
8. Kathleen M. Eisenhardt, Jeffrey A. Martin, “Dynamic Capabilities: What Are They?”, Strategic Management Journal 21(10/11) (2000) 1105-1121.
9. Joel A. C. Baum, Paul Ingram, "Survival-enhancing Learning in the Manhattan Hotel Industry, 1898-1980", Management Science 44(7) (1998) 996-1016.

10. Maurizio Zollo, Sidney G. Winter, "Deliberate Learning and the Evolution of Dynamic Capabilities", Organization Science 13(3) (2002) 339-351.
11. P. E. Bierly, T. Hämäläinen, “Organizational Learning and Strategy”, Scandinavian Journal of Management 11(3) (1995) 209-224.
12. Sidney G. Winter, "The Satisficing Principle in Capability Learning", Strategic Management Journal 21(10/11) (2000) 981-996.
13. M. D. Cohen, R. Burkhart, G. Dosi, et al., “Routines and Other Recurring Action Patterns of Organizations: Contemporary Research Issues”, Industrial & Corporate Change 5(3) (1996) 653-688.