

The Effects of Ambidexterity and Generative Learning on New Product Performance: An Empirical Study

Pınar ÇÖMEZ¹

Abstract

In this study the impacts of ambidexterity (derived from the explorative and exploitative innovation strategies) and generative learning on new product performance has been examined considering the contingent manner under competition.

Data was collected from manufacturing organizations in Adana Area, a major industrial and agricultural region of Turkey. Survey respondents were mid-level and top managers (n= 150).

It has been used descriptive statistic, correlation and regression analysis as data analyzing methods. Our findings reveal that ambidexterity and generative learning affect new product performance and the competitive intensity plays a significant role in those relationships.

Key words: innovation strategies, ambidexterity, generative learning, new product performance



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INTRODUCTION

The strong relationships between innovativeness and new product development process is known for a long time (Wind and Mahajan 1997). Firms implementing innovative strategies and being proactive, can gain many benefits of introducing new products to the market before their competitors (Varadarajan, and Peterson 1992, Robinson and Min 2002). In this manner, it might be said that innovation opens the doors for long-term success in the firms given importance to R&D activities. Organizations, which use their capabilities and competitive advantages better and learn new information more quickly and internalize it, will be one step ahead of their competitors. Dess and Origer (1987) suggest that firms operating in dynamic and complex environments should implement their corporate strategies effectively for being more competitive. To achieve this they should get feedbacks from their shareholders, labors and even from their customers and competitors. Companies will improve and differentiate their core competencies by using these feedbacks (Cegarra- Newarra and Dewhurst, 2007). This is a learning process and learning can improve organization's performance in general (Jonhson and Sohi, 2003). According to Argyr's; learning is defined in some studies as adaptive and generative. Especially, the results of the generative learning on firm performance can be seen in a short term (Wang and Rafiq, 2009). Considering the literature, it is realized that corporate strategies and organizational learning may influence the performance and firm survival significantly. Companies active in current jobs and, at the same time, have enough adaptation ability to future conditions are called ambidextrous and this concept is increasingly emerging in high importance in the literature (Tushman and O'Reilly, 1996; Gibson and Birkinshaw, 2004). In this study it is searched for the effect of the ambidexterity on new product performance in the strategic context and assumes that the ambidexterity is the interaction between explorative and exploitative innovation strategies. Although studies showing the relationships between innovativeness, organizational learning and firm performance can be found in the literature, there is still a gap explaining how the performance influences occur. To fill this gap, it has been considered the new product performance as the dependent variable. Furthermore, to have a look from contingency perspective, it has been examined how the relationships in this study may vary under the intensive competitiveness in the business environment.

Figure 1 gives our theoretical model of our approach to the relationships between ambidexterity, generative learning and new product performance. In our model we specify how we derive ambidexterity from explorative and exploitative innovation strategies in accordance with the literature

¹ Adana Science and Technology University, Faculty of Business
E-mail: pcomez@gmail.com

and besides we investigate the simultaneous impacts of ambidexterity and generative learning on new product performance.

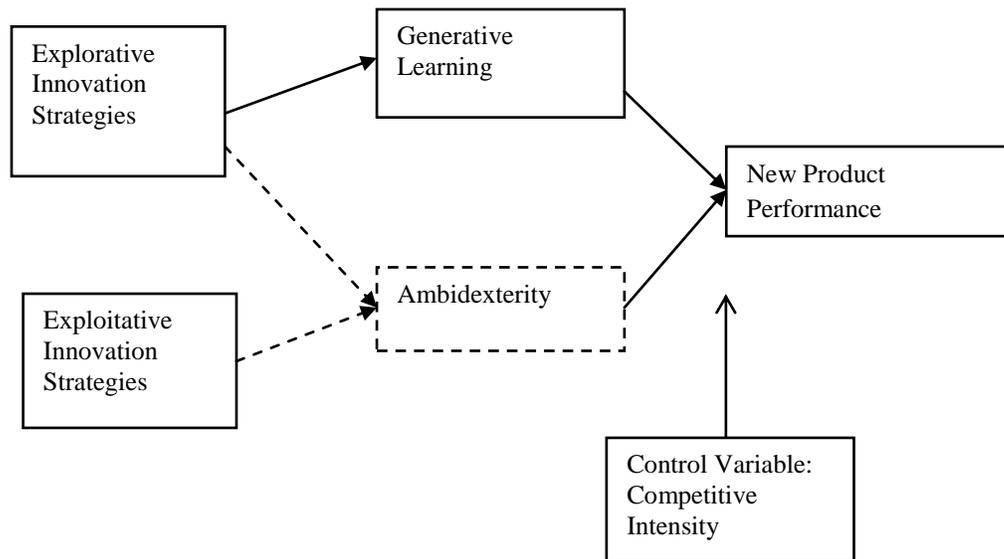


Fig. 1: Theoretical model of Study

LITERATURE REVIEW AND HYPOTHESIS

Ambidexterity and New Product Performance

As mentioned above, a firm gain competitive advantage by introducing a new product to the market (Lieberman and Montgomery 1988). Firms can use explorative innovation strategies to meet the customer expectations, shape their preferences and even create new markets. However, an exploitative innovation strategy may also lead to better new product performance. Exploitive innovation process may cost often lower than explorative. Furthermore, explorative innovation strategies are more risky. This makes the exploitive strategies better for customer satisfaction by product (service) improvements, at the beginning (Shankar, Carpenter, and Krishnamurthi 1998).

The modern business life forces organizations to be agile, creative, competitive, flexible and multi-faceted. (Cegarra-Navarro and Dewhurst, 2007; Menguc and Auh, 2008). They should not only meet the customer needs but also exceed their expectations and serve new concepts (Menguc and Auh, 2008). For sustainable competitiveness and survival, firms should exploit their competencies while exploring new ones (Floyd and Lane, 2000) thus they should be ambidextrous. In Oxford English Dictionary The term “ambidexterous” is explained in as to be able to use the right and left hands equally well and in the literature, Robert Duncan was the first using this term in his innovation model in 1976 (Menguc and Auh, 2008). In the literature review we reminded that the ambidexterity concept is accepted as a key capability for sustainable competitive advantage of organizations (de Geus, 1998, Grant and Bade-Fuller, 1996) and there are several studies in literature, searching for clarifying the ambidexterity process in different disciplines. Consequently, some of these studies refer to marketing (Authene-Gima, 2005; Narver and Slater, 1995, Morgan and Berthon, 2008), strategic management (Gibson and Birkinshaw, 2004; He and Wong, 2004; Tushman and O'Reilly, 1996; O'Reilly and Tushman, 2004), and management (organization theory) literature (Volberda et al. 1999). Exploration and exploitation are fundamentally different concepts. They need different structures (He, Wong, 2004), originated from different mindsets (March, 1991) and take different routines and processes (Burgelman, 2002) in an organization. This distinction

may result in the competition for scarce sources between exploration and exploitation. At this point March (1991) suggest in the name of ambidexterity that firms should consider the balance between exploration and exploitation. Because these two concepts are fundamentally different, they would add the organizations more creativity, flexibility and agility for sustainable competitive advantages and their survivals. He and Wong (2004) suggest the ambidexterity as the strategic logic to get rid of organizational inertia or myopia which occurs in a firm concentrating on current capabilities too much and preferring to extend them rather than searching for new ones (Radner, 1975, Levinthal & March,1993). Furthermore Morgan and Berthon (2008) extend concept within the framework market pull- technology push approach to propose a new typology of technological innovation strategy. They used explorative and exploitive innovation strategies as the dimensions of this typhology. According to them exploitative innovation strategy deals with basic knowledge, learning processes and adjustments in technological practices in organizations while explorative innovation strategy occurs from proactive technological policies and advances the existing knowhow and technological practices clearly. As above mentioned, although there is a competition for organizational scarce sources between them, exploration and exploitation should ideally be gathered and work in synergy for organizational competitive advantage leading to performance maximization (Teece et al., 1997). In line with this approval it can be proposed that the ambidexterity might affect positively on new product performance. Hence, we offer our first hypothesis as following:

H1: Ambidexterity effects new product performance positively

Explorative Innovation Strategy, Generative Learning, and Performance

Organizational learning is becoming a considerable strategy (Russo and Vurro, 2010) by the increasing importance of the knowledge as the major competitive strategic resource. In the literature there are studies showing the necessity of the organizational learning for organizational success (Bong et al., 2004; Cegarra and Dewhurst, 2007). There can be found many definitions from different approaches of organizational learning process (Shrivastava et al., 2001; Bontis et al. 2002) but especially Argyris and Schön's conceptualization accepted basically and used in papers widespread. They first defined "single-loop learning" and "double loop learning" process in 1978. Their concept is seen associated with "adaptive learning" and "generative learning" in fallowing researches in the literature (Senge 1990, McGill et al, 1993). Giving the importance of it, there are many approaches relating learning with other organizational concepts. For example in their 4I (intuiting, interpreting, integrating and institutionalizing) framework of learning, Crossan et al (1999) are connecting strategie and learning. Fallowing these studies it has been deepened on the literature and discovered the relationships between organizational learning and strategies. The starting point was Argris's double-loop single-loop learning, named generative learning which is defined as the process of generation, distribution and interpretation of new ideas and organizational risk taking action (Morgan and Berthon, 2008). Consequently, relying on the cause-effect relationship between environment and the firm it can hardly be said that generative learning occurs in dynamic environments that force organizations to be proactive, risk-taking and question their missions and strategies in the boundaries of their capabilities (Slater and Narver, 1995; Wang and Rafiq, 2009). Furthermore, many studies assume that generative learning is the source and leads to explorative innovation strategy (Morgan and Berthon, 2008; He and Wong, 2004). We are of the same opinion that generative learning and explorative innovation are strongly related each other but we propose that the corporate strategies are assessed by the top management and their effects can be seen on many processes within the organization, hence we offer our 2. Hypothesis as following:

H2: Explorative innovation strategy effects generative learning positively.

Innovation requires creating and implementing new ideas, process and system within an organization while introducing new products and closely related to generative learning. Dibella and others (1996) accepted learning as a change process that improves the outcomes or performance of the organizational

activities and according to Slater and Narver (1995) learning might improve organizational outcomes; considering our model, innovation outcomes. Damanpour (1991) mentions that innovation outcomes focus on the performance improvement and Hurley and Hult (1998) aim to relate the organizational learning and innovation outcomes positively. According to the literature it is supposed that the generative learning process may influence an organization's innovative performance positively and develop our third Hypothesis as;

H3: Generative learning positively effects new product performance.

METHODS

Data and Sample

Data was collected from mid and top -level managers working at manufacturing organizations in Adana Region, Turkey via questionnaires. By choosing the firms geographically homogeneous it is considered to reduce the impact of confounding variables (Triandis, 1994). It has been received 155 surveys with the response rate 30%

Most of the respondents were males (98%) and out of these 70% were top-managers. The average age of the respondents was 48 .

Measurement

All items except demographics were measured on a Likert 5-type scale, (1 = Strongly Disagree to 5 = Strongly Agree). To collect demographic data questions like gender, education, age of the firm, current assets etc. are asked additionally.

Dependent Variable

New product performance is measured with 4 items adapted from Gatignon and Xuereb (1997) and Li and Calantone (1998) assessing over the previous 3 year period.

Independent Variables

Ambidexterity is a derived variable from the multiplication of the variables explorative innovation strategies and exploitative innovation strategies. The strategy questions (totally 10 items) are adopted from the research from Jansen et al. (2006).

Generative Learning is measured with the three items adapted from Morgan and Berthon (2008).

Controlled Variable: *Competitive Intensity* measured with 4 items adapted from Jaworski and Kohli (1993).

ANALYSES AND RESULTS

First, all of the items were submitted to exploratory factor analysis. To have the best fit, the principal component analysis with varimax rotation has been done. Table 1 shows the results of the principal factor analysis. The lowest factor loading is 0.516 and the coefficient alpha (announced total variance) estimates for all the scales are greater than the recommended level of 0.70 (Nunnally, 1978). This means that the scales have adequate internal consistency and means; standard deviations were also calculated for each variable and created a correlation matrix for all variables employed in hypothesis testing. Means, standard deviations, reliability, and correlations among all the scales used in the analyses are shown in Table 2.

Table 1: Result of the principal component analysis

	1	2	3	4	5
Generative Learning					
Individuals in this business unit have a 'license to think'.	,824				
Individuals in this business unit are encouraged to think for themselves.	,865				
The 'system' is open to new ideas.	,886				
Ideas in this business unit flow freely and openly.	,803				
Ideas in this business unit are shared	,775				
Announced Total Variance:0.91					
Exploitative innovation strategies					
We frequently refine the provision of existing products and services.		,766			
We regularly implement small adaptations to existing products and services		,773			
We introduce improved, but existing products and services for our local market		,724			
We increase economies of scales in existing markets		,651			
Our unit expands services for existing clients		,784			
Lowering costs of internal processes is an important objective		,516			
We frequently refine the provision of existing products and services.		,557			
Announced Total Variance:0.86					
Explorative Innovation Strategy					
We invent new products and services.			,634		
We experiment with new products and services in our local market.			,788		
We commercialize products and services that are completely new to our unit			,835		
Announced Total Variance:0.77					
New Product Performance Compared to your competitors' product, how would you evaluate this product's performance in the following areas?					
Return on investment				,761	
Sales growth				,872	
Profit level				,802	
Market share				,785	
Announced Total Variance:0.85					
Competitive Intensity					
There are many "promotion wars" in this product industry					,758
Any product that a company can offer, others can easily match					,888
Price competition is a hallmark of this product industry					,800
There are many competitors in this product industry					,782
Announced Total Variance:0.86					

Table 2: Descriptive Statistics and Correlations

	Mean	Sd	Alfa	1	2	3	4
1 Explorative Innovation Strategie	3,75	,64	0,77				
2 Generative Learning	3,47	,97	0,91	,455(**)			
3 New Product Performance	3,41	,82	0,85	,291(**)	,336(**)		
4 Ambidexterity	13,67	3,68	-	-	,525(**)	,332(**)	,365(**)

** $P < 0.01$

According to the correlation analysis (Table 2) new product performance is positively related with generative learning and ambidexterity ($P < 0,01$). Additionally, generative learning is positively related to new product performance ($P < 0,01$).

Regression Analysis

To investigate the relationships proposed in the hypotheses and the role of the competitive intensity, separate regression equations have been modelled and regression analyses have been done. The results of the analyses are grouped according to dependent and independent variables and given in Tables 3, 4 and 5 respectively.

Table 3: Regression Analysis1

Independent Variable	Dependent variable					
	Model 1 New Product Performance		Model 2 New Product Performance (perceived competitive intensity high)		Model 3 New Product Performance (perceived competitive intensity low)	
	β	T	β	T	β	T
Generative Learning	,304	6,318**	-,260	-3,987**	-,205	-3,407**
R^2	,101		,065		,080	
F	25,320		7,240		10,573	
Adjusted R^2	.001		.004		.000	

Dependent Variable: New Product Performance ** $P < 0,01$

Table 4: Regression Analysis2

Independent Variable	Dependent variables					
	Model 4 New Product Performance.		Model 5 New Product Performance (perceived competitive intensity high)		Model 6 New Product Performance (perceived competitive intensity low)	
	β	T	β	T	β	T
Ambidexterity	,405	7,109**	-	-	-	-
R^2	,111		N/A		, N/A	
F	27,340		N/A		N/A	
Adjusted R^2	.000		N/A		N/A	

Dependent Variable: New Product Performance ** $P < 0,01$

Table 5: Regression Analysis3

Independent Variable	Dependent variables					
	Model 7 Generative Learning		Model 8 Generative Learning (perceived competitive intensity high)		Model 9 Generative Learning (perceived competitive intensity low)	
	β	T	β	T	β	T
Explorative Innovation Strategy	,332	5,229**	-	-	-	-
R^2	,111		, N/A		N/A	
F	26,550		N/A		N/A	
Adjusted R^2	.000		N/A		N/A	

Dependent Variable: Generative Learning ** $P < 0,01$

The regression analysis¹ show that generative learning affects new product performance positively (Model 1: $F= 25,320$, $\beta=, 304$, $P<0.01$). Hypothese 3 is supported. In Model 2 ($F= 7,240$, $\beta=-,260$, $P<0.01$) and Model 3 ($F= 10,573$, $\beta=-,205$, $P<0.01$) generative learning affects negatively on new product performance in high and low perceived competitive intensity.

The regression analysis² show that ambidexterity affects new product performance positively (Model 4: $F= 27,340$, $\beta=, 405$, $P<0.01$). Hypothese 1 is supported. Model 5 and Model 6 have been found no significantly.

The regression analysis³ show that explorative innovation strategy affects generative learning positively (Model 7: $F= 26,550$, $\beta=, 332$, $P<0.01$). Hypothese 2 is supported. Model 8 and Model 9 have been found no significantly.

CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to explore the relationships between ambidexterity in the context of innovation strategies, generative learning, and new product performance from a contingency aspect. Providing compelling evidence, this study offers several implications for future research. It has been gathered precious information via surveys and measured with proper methodology the relationships between innovation strategies in the concept of ambidexterity, learning and innovation outcomes in the alterations of new product performance and the role of the perceived competitive intensity to look from the contingency aspect. Organizations operating in competitive environments are forced to develop clearly their vision and following appropriate strategies by their internal and/or external shareholders, competitors and customers. By implementing these strategies, organizations should not only be proactive and creative but also able with their existing capabilities. Ambidexterity is an answer to this need and this study approaches it in the innovation strategy context. Organizational learning is considered as a key process for organizational innovation and success (Vera and Crossan, 2002; Morgan and Berthon, 2008; Raisch and Birkinshaw, 2008) and there are studies empirically showing the relationships between organizational learning and performance (Bontis et al. 2002; Jimenez and Cegarra, 2007). Researchers have begun to investigate the effects of organizational learning on different organizational outcomes from different perspectives. For example, Burgelman (2002), searched for the effects of the exploratory (generative) and exploitative (adaptive) learning in strategy development process and He and Wong (2004) investigated the influences of generative and adaptive learning on innovation and firm performance. A few studies investigated innovation performance within the framework of learning and strategy building. Russo and Vurro (2010) found that balancing explorative and exploitative learning strategies leads to enhanced innovative firm performance. Generative learning is seen in many studies as a core corporate strategy and has strong relationships with explorative innovation strategies, leading to better performance (He and Wong, 2004; Menguc and Auh, 2008) but there was still a gap in the literature concerning research on different innovative performance outcomes.

Considering the literatur, ambidexterity is seen as balancing exploratory and exploitative innovation strategies which are constituted at the top management level will increase organizational success and maintain survival. According the interactions between strategies, learning activities and performance outcomes within an organization, it can be assumed assumed that ambidexterity and generative learning might affect the new product performance.

The new product performance is contingent on several market and environmental factors (e.g., Bowman and Gatignon 1996; Kerin, Varadarajan, and Peterson 1992). There is no strategy working in every conditions and business so that companies should decide their strategic orientations according the environmental conditions (Ginsberg and Venkatraman 1985). Environmental conditions are defined by suppliers, customers, and current and potential competitors and substitutes (Porter 1985). According to Voss and Voss (2000) competitive intensity is among the most important factors influencing strategic decisions. To show the effect of the contingency aspect in this study competitive intensity is included as a control variable in our model.

The results of the regression analyses show that ambidexterity and generative learning effects on new product performance positive. Furthermore, it has been found that explorative innovation strategy effects positively on generative learning. Analyses of the models including the competitive intensity as control variable show that there are negative effects of the generative learning on new product performance in perceived competitive intensity both high and low. According to common literature in competitive environments, the innovation advantage decreases and competition based mostly on cost. Our findings are compatible with this prediction. With the intensive competition companies start to pay their attention on costs and prices. This may affect negatively on their willingness to be generative and innovative.

Limitations and Future Research Implications

The findings of the study suggest that future research on the ambidexterity could include and examine other management perceptions like change thus many researchers accept organizational learning is seen as a change process. We have not included in our model other environmental control variables to examine. There may be mediating effects of the generative learning on the relationship between explorative innovation strategy and new product performance. Future researchers may develop a new model following this effect. This study has limitations. The first limitation relates to data collection at a single point in time (as in the case of this study), which does not allow for changes in perception and attitudes over time. For this reason, a longitudinal study of culture is strongly recommended. Future research should examine the usefulness of the revised instrument in different populations. We used the Likert-5 scale to measure the whole constructs of our model. There might be other scale configurations which fit better to measure the dimensions of the constructs.

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