

Resource Management in Higher Education:

The Effect of Stabilizing and Pioneering on Product Innovation

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Abstract

This paper examines how bundling sub-processes (stabilizing and pioneering) affects product innovation in the context of higher education. Data were collected from 123 faculties councils' members at Mansoura University. Multiple regression approach was used to test the study hypotheses using Warp PLS. Results showed that both stabilizing and pioneering significantly affect product innovation.

Introduction

Public higher education institutions (HEIs) face many challenges including rapidly changing environments, globalization, changes in funding arrangements and competition from private higher education institutions along with appearance of organizations that offer corresponding services as HEIs. In developing countries, HEIs should manage their resources properly and innovatively to be a head of competition and cope with challenges ahead (Al-Husseini and Elbeltagi, 2016; Fahy, Hurléy, Hooley, and DeLuca, 2009). Obenchain and Marie (2002) added that there is more pressure on HEIs as they play a dual role in innovation in which they serve as the source of demand for innovation and the source of supply for the talents needed to support such innovation. From either perspective, HEIs should efficiently manage their resource to foster innovation.

Kim, Kumar, and Kumar (2012) stated that over the past 30 years, innovation has caught the attention of researchers. In rapidly changing environments, innovation is important for all types of organizations either public or private and specially HEIs to capture new opportunities and neutralize threats (Al-Husseini and Elbeltagi, 2016; Kim et al., 2012). Innovation helps HEIs to introduce new products, services, or processes to create value for customers. Innovation occurs as a result of incorporating new resources with existing resources or reconfiguring existing resources to create new capabilities or enhance existing capabilities (Sirmon, Hitt, and Ireland, 2007).

For HEIs to fulfill their dual role in innovation, they should “orchestrate” their resources. Resource management framework (RM) is concerned with the role of managers in managing firms’ resources. RM is an attempt to respond to criticism to resource-based theory (RBT). Priem and Butler (2001) criticized RBT for focusing on the characteristics of resources to create value and sustain competitive advantage at the expense of manager’s role in managing these resources. RM consists of three process which are structuring, bundling, and leveraging (Sirmon, Hitt, and Ireland, 2007). Bundling sub-processes are concerned with creating organization capabilities. Mousavi and Bossink (2017) stated that resources and capabilities are key factors for sustainable innovation.

Theoretical background and research hypotheses

Resource management

The ultimate goal of any firm is to create value for customers and preserve it (Conner, 1991). According to Borch and Madsen (2007) and Worthington (2007), Penrose (1959) assured that some firms outperform their counterparts, that is attributable to the heterogeneity of resources in resources markets, but possessing valuable and rare resources alone is not sufficient for creating value and gaining a competitive advantage, however, these resources must be managed properly. One of the most widely accepted theories that confirms this notion is the resource-based theory (RBT). Rumelt (1991) and Wernerfelt (1984) confirmed that as the firm’s position in the market is important in determining its performance, firms’ resources play an important role in value creation. Moreover, it may be considered the source of positioning the firm in the market.

In 1991, Barney was the first to introduce a robust and clear explanation for why some firms outperform others in the same industry. He introduced the VRIN framework which stands for valuable, rare, inimitable, and non-substitutable. It was a clear structure for the resource-based theory. Firm resources must be of value to the firm in which this value can be translated to reducing costs, seizing an opportunity in the marketplace or neutralizing a threat, otherwise, these resources can’t be considered valuable (Barney, 1991; Newbert, 2008). Besides having valuable resources, they must be rare in which these resources must be inaccessible for firms’ competitors (Newbert, 2008), and can’t be easily identified by firms’ current and potential competitors (Boss, 2014). Moreover, the combination of firms’ resources shouldn’t be easily imitated. Finally, if firms’ competitors can’t possess

resources that subrogates these resources, then this allows the firm to gain sustainable competitive advantage (Worthington, 2007).

RBT has received great support through empirical testing (Crook, Ketchen Jr, Combs, and Todd, 2008; Newbert, 2008). Despite this strong support, it has faced many criticisms. One of the most important critique is that RBT didn't give attention to the way the resources are managed. Priem and Butler (2001) criticized RBT for focusing on the resources itself and its prerequisite characteristics for gaining competitive advantage and neglected the way of how these resources are used to gain competitive advantage. In addition, Hansen, Perry, and Reese (2004) concluded that "what a firm does with its resources is at least as important as which resources it possesses". In response to this criticism, researchers tried to overcome this shortfall through defining the essential managerial actions to achieve competitive advantage by managing firm resource effectively. One of the most noticeable papers in responding to such criticism, Sirmon et al. (2007) introduced resource management framework that addresses the managerial actions required in utilizing firm resource to create value for customers.

Resource management is defined by Sirmon as "the comprehensive process of structuring the firm's resources portfolio, bundling the resources to build capabilities, and leveraging those capabilities with the purpose of creating and maintaining value for customers and owners" (Sirmon et al., 2007; Sirmon, Hitt, Ireland, and Gilbert, 2011). Structuring process is concerned with the formation of firm's resources portfolio either through acquiring these resources from external markets, accumulating these resources internally, or divesting the unutilized resources. While bundling process focuses on capabilities through preserving the current capabilities, enhancing the existing capabilities, or creating new ones. Finally, the leveraging process is concerned with the use of the firm's capabilities to capture an opportunity in the market. Our focus will be solely on the bundling process.

Bundling

Sirmon et al. (2007) defined bundling as "the process of combining firm resources to construct or alter capabilities". It can be clearly seen that from this basic definition, bundling is the process of utilizing firm's resources in the form of capabilities. Moreover, the definition points to two main ways of utilizing these resources either through constructing new one or through altering the existing ones. Sirmon et al. added that bundling processes are situational as managers may use

different bundling processes according to the required capabilities to either make minor changes or substantial ones.

Stabilizing

Sirmon et al. (2007) defined stabilizing sub-process as "the process of making minor incremental improvements to existing capabilities". For example, sending employees to training courses throughout the year to keep their skills and knowledge up to date. Firms may use stabilizing process to preserve their current competitive advantage or avoid losing competitive parity (Worthington, 2007).

Pioneering

Sirmon et al. (2007) defined pioneering sub-process as "the process of creating new capabilities with which to address the firm's competitive context". Unlike enriching process, pioneering process creates new capabilities through acquiring new resources from external markets. For example, a firm may find an opportunity by acquiring a new resource that allows it to create new capability to introduce a new product/service or operating process (Worthington IV, 2007).

Innovation

The only constant thing is the "change". For any organization to survive and compete in nowadays competitive and dynamic environment, innovation can be considered the sanctuary for any organization (Danneels, 2002). Many studies have concluded that through innovation firms can enhance their performance and survive as well as that for educational organizations (Cefis and Marsili, 2005, 2006; Giovannetti, Ricchiuti, and Velucchi, 2011; Otara, 2012).

Innovation has been defined in different ways in literature. Schumpeter (1934) is considered the first in literature to mention innovation, he defined innovation as the creation and implementation of new products, services, process, or markets (De Jong, 2006). Ever since, innovation has been redefined in many different ways:

Van de Ven (1986) defined innovation as "development and implementation of new ideas by people". As well Hage (1999) defined innovation as the adoption of new idea or behavior that may lead to a new product, service, technology, or administrative practices. Moreover, Daft (1978) defined innovation as a process that consists of 4 steps, starting with conceptualizing an idea, proposing it, then adopting and implementing that idea.

White and Glickman (2007) confirmed with other researchers in defining innovation as the introduction of new idea, method, or device. They added that the concept of

innovation can be applicable in higher education institutions through doing things in new ways, making changes to improve administrative or scholarly performance.

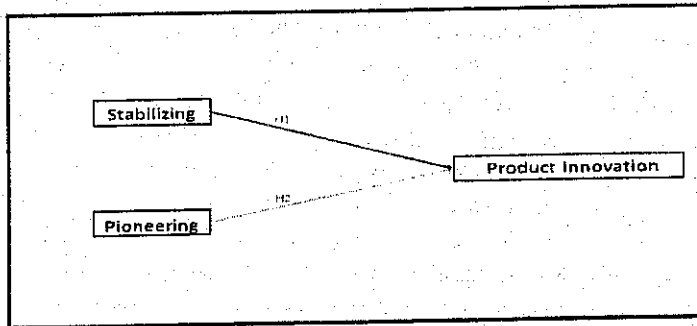
Through these various definitions of innovation, the researcher concluded that innovation as concept entails creation of new ideas, where these ideas are then proposed and implementing that may lead to the introduction of a new product, service, process, technology, practices, method resulting in performance improvement of gaining a competitive advantage. Moreover, based on these definitions, it can be clearly seen that innovation can be classified in many types. Kim et al. (2012) asserted that classifying innovation into different types and understanding each type is necessary which will allow managers to respond correctly to each type of innovation to achieve a successful innovation process (Elsetouhi, 2014).

Valencia, Valle, and Jiménez (2010) articulated that the product innovation is considered a critical antecedent to product success, as well as it plays a key role in achieving the firm's aims (Elsetouhi, 2014). Moreover, product innovation gives a firm more flexibility in adapting to the needs of new customers. Product innovation is defined as the process by which an organization produces and develops new products, which can bring about organizational success (Al-Husseini and Elbeltagi, 2016). Damanpour and Gopalakrishnan (2001) defined product innovation as a newly introduced product or service that satisfy customers' needs (Damanpour, 2010; Liao, Fei, and Chen, 2007; Shu, Page, Gao, and Jiang, 2012). Joe, Bessant, and Pavitt (2005) defined product innovation as the changes in what (product/service) an organization offers. OECD (2005) defined product innovation as the introduction of new or significantly improved product or service. In the context of HE, product innovation is defined as accepting, developing, and implementing new products such as courses, research projects, teaching materials, and curricula (Al-Husseini and Elbeltagi, 2016).

Research Hypotheses

This research adopts the following conceptual framework.

Figure (1)
Conceptual Framework



Previous researches have focused on resources needed to innovate or the effect of resources on innovation, but how to manage these resources is also at least as important as what resources a firm possesses (Carnes, Chirico, Hitt, Huh, and Pisano, 2016; Hansen et al., 2004).

Existing literature asserted that managing resources effectively is important to produce innovation (Helfat et al., 2009; Sirmon et al., 2007, 2011). Moreover, Fleming (2001) stated that "the ultimate source of novelty" is the recombination processes for existing resources. Nelson and Winter (1982) added that novelty is a result of recombining "conceptual and physical materials" that an organization already possesses (Fleming, 2001). In addition, according to Carnes et al. (2016), Schumpeter (1934) noticed that innovation is a result of bundling resources in a valuable way or developing new combinations. These researchers' conclusion supports the notion of the importance of managing organization resources to produce innovation and specially bundling processes.

Furthermore, Carnes et al. (2016) stated that previous research that explored the relation between resources, capabilities and the production of innovation had inconsistent results. She proposed that these studies have showed inconsistent result due to overlooking the role of managers in managing firm resources. Hence, organizations should identify and develop appropriate capabilities to produce the type of innovation needed to create value and sustain competitive advantage.

In accordance to the definition of innovation, innovation is concerned with developing new products, services, and processes. Nonetheless, Stabilizing process doesn't generate the necessary capabilities to develop totally new product, services,

or processes (Carnes & Ireland, 2013). But stabilizing process is concerned with maintain an organization's current position by preserving its capabilities "up to date" through incremental improvements to existing capabilities. Thus, stabilizing process doesn't lead to radical innovations, but with the purpose of incremental improvements, it may support incremental product innovations. Hence, first hypothesis is developed as follows:

H1: Stabilizing process has significant positive direct effect on product innovation.

According to Sirmon et al. (2007), pioneering process is concerned with creating new capabilities. Unlike enriching process, pioneering process doesn't involve the repackaging of existing resources, but it requires acquiring and integrating new resources with existing resources portfolio to create completely new and novel capabilities to create value and gain competitive advantage (Carnes & Ireland, 2013; Sirmon et al., 2007; Worthington IV, 2007). Accordingly, pioneering involves creating entirely new products, services, and processes. Thus, pioneering process may result in product innovation. Hence, second hypothesis is developed as follows:

H2: Pioneering process has significant positive direct effect on product innovation.

Research Method

Population and data collection procedure

The population of this study consists of faculties council members at Mansoura University as they represent the top management team of each faculty where every important is taken. Each faculty council consists of Faculty Dean, Vice Dean for Education and Students Affairs, Vice Dean for Graduate Studies and Research Affairs, Vice dean for Community Service and Environment Development Affairs, Head of each Department, at least one professor as representative for each department, a representative of assistant professors, a representative of lecturers and members from outside the faculty representing the community. As this study focuses on the decision takers, hence we focus on council members who have voting right. For this reason, we excluded the members who do not have voting right in the council resulting in a population of 429 member for this study. According to Saunders, Lewis, and Thornhill (2015), if the entire population can be targeted then no need to take sample. Consequently, this study collects census data without sampling. To collect the required data. A questionnaire was distributed through two ways. First, through delivery and collection from each professor office in the faculties that it's Dean give permission for this. Second, through distributing the questionnaire in the monthly meeting of the faculty council. Two faculties refused to take part in the study reducing the available respondents to 328 members. A total of 131 questionnaires were completed and returned. Of these, 8 were incomplete and

they were excluded because of a large number of missing values in questions resulting in a response rate (40%). This response rate is acceptable in studies targeted respondents at high managerial levels (Cycyota and Harrison, 2006). The demographic characteristics of the respondents is shown in table (1).

Table (1)
Demographic characteristic of respondents (n = 123)

Characteristic	Frequency	Percentage	Cumulative %
Gender			
Male	82	66.67%	66.67%
Female	41	33.33%	100%
Total	123	100%	
Age			
Less than 40	10	8.13%	8.13%
40 to less than 50	31	25.2%	33.33%
More than 50	82	66.67%	100%
Total	123	100%	
Academic Qualification			
Lecturer	11	8.94%	8.94%
Assistant Professor	16	13.01%	21.95%
Professor	72	58.54%	80.49%
Emeritus Lecturer	1	0.81%	81.3%
Emeritus Assistant Professor	0	0	81.3%
Emeritus Professor	23	18.7%	100%
Total	123	100%	
Faculty Type			
Theoretical	20	16.26%	16.26%
Practical	103	83.74%	100%
Total	123	100%	
Council Position			
Dean	5	4.07%	4.07%
Vice Dean	18	14.63%	18.7%
Head of Department	40	32.52%	51.22%
Other	60	48.78%	100%
Total	123	100%	
Experience Years			

Characteristic	Frequency	Percentage	Cumulative %
Less than 3 years	31	25.2%	25.2%
More than 3 years	32	26.02%	51.22%
Non-managerial	60	48.78%	100%
Total	123	100%	

Measurement instrument

The items used to measure the research variables were approved by literature. The measures of stabilizing and pioneering processes were adopted from (Yi, Li, Hitt, Liu, and Wei, 2016) consisting of 4 items for stabilizing and 3 items for pioneering. While the measure of product innovation was adopted from (Škerlavaj, Song, and Lee, 2010) and (Al-Husseini and Elbeltagi, 2016) consisting of 10 items. The measurement was translated into Arabic. As well it was reviewed by four professors and three lecturers and were revised as needed. Moreover, the questionnaire was presented to a certified translator to review the translation. The study respondents were asked to give their agreement or disagreement level for each statement provided using five-point Likert scale.

Results

Measurement Model Assessment

As shown in table (2), the measurement constructs and their items satisfied the required criteria for validity and reliability. Reliability has been tested through three criteria (individual item loading, Cronbach's alpha coefficient, Composite reliability). Each item loading is accepted if the item loading is more than or equal to 0.5 and its P-value is lower than 0.05 and these conditions are satisfied (Hair Jr, Hult, Ringle, and Sarstedt, 2016). For Cronbach's alpha and composite reliability, the construct is accepted if the value of both is more than or equal to 0.7 and this condition is satisfied as well (Hair, 2014). Finally, convergent validity is measured through average variance extracted and the minimum AVE accepted is 0.5 for each construct (Hair Jr et al., 2016). Hence, all results show support for the measurement model.

Table (2)
Loading, Cronbach's Alpha (α), Composite Reliability (CR), and Average Variance Extracted (AVE)

Variables	Item Code	Loading	Cronbach Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Stabilizing	BS		0.720	0.827	0.546
	BS1	0.659			
	BS2	0.670			
	BS3	0.823			
	BS4	0.791			
Pioneering	BP		0.811	0.927	0.809
	BP1	0.859			
	BP2	0.927			
	BP3	0.911			
Product Innovation	PD		0.924	0.936	0.596
	PD1	0.813			
	PD2	0.803			
	PD3	0.848			
	PD4	0.703			
	PD5	0.769			
	PD6	0.729			
	PD7	0.642			
	PD8	0.821			
	PD9	0.757			
	PD10	0.811			

Structural Model and Hypotheses Testing

As shown in figure (2) and table (3), findings showed support for H1 and H2 where stabilizing and pioneering have significant direct positive effect on product innovation.

Figure (2)
The statistically proposed model

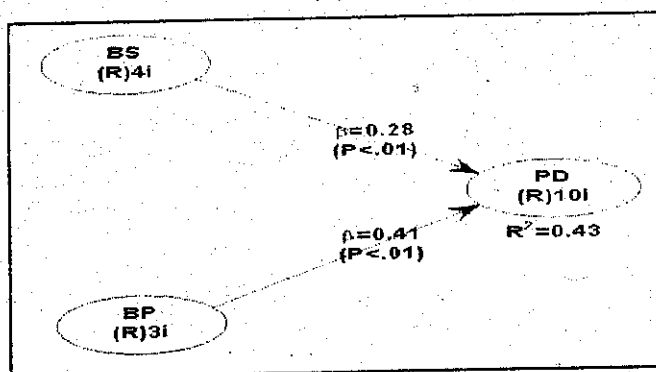


Table (3)
The path coefficients

H	Independent Variable	Dependent Variable	Path Coefficients	P-Value	Result
H1	BS	PD	0.28	<0.01	Supported
H2	BP	PD	0.41	<0.01	Supported

Discussion

This study investigated the direct effect of stabilizing and pioneering on product innovation. The results showed that stabilizing and pioneering have significant positive direct effect on product innovation. Obviously, when faculties "sharpen their saw" in other words maintain the current level of their capabilities proficiency through keeping their teaching staff up to date, making the required maintenance for lecture rooms, halls, and other supporting resources such as faculty library and infrastructure these minor actions will lead to incremental product innovations, off course not totally new products or services will be provided but at least incremental ones. On the other hand, the pioneering process focuses on integrating new resources or capabilities with current resources (Sirmon et al., 2007), largely for the purpose of creating entirely new capabilities. Ahuja and Lampert (2001) suggested that a pioneering process requires exploratory learning, supporting the need for additional, new external resources and skills for integration and transformation. Accordingly,

pioneering involves creating entirely new products or services. Thus, pioneering process will result in product innovation.

Theoretical Implications

The current study has several theoretical implications, which can be added to the body of the knowledge as follows. According to the researcher best knowledge there is no previous study that empirically tested the impact on bundling process (stabilizing and pioneering) on product innovation in the context of higher education.

Second, the notion of resource-based theory and what is known now as resource orchestration has truly little attention in the context of higher education institutions which was a research gap spotted and this is study tried to fill it.

Managerial Implications

Our findings provide important insights for top management of higher education institutions. An understanding of the most influential bundling actions on product innovation and which bundling actions will directly produce new service. Moreover, the results show the importance of managing resources and capabilities as they contribute greatly to the introduction of new process and services which are critically to the success of higher education institutions.

Limitations and future research direction

Despite its contributions, this study has several limitations that can provide direction for further research. First, this study studied the impact one process of the resource orchestration processes which include two other processes which are structuring and leveraging. Therefore, further researches may need to test the effect of the whole processes on innovation. Second, this study focuses on investigating the impact of bundling process on product innovation in the context of higher education in public universities due to time constraints. Hence, further researches may need to explore such impact in private universities as well and it would be preferable to compare the impact of bundling processes on innovation in public and private university. Finally, this is study did not test the effect of moderating variables that might have possible impact on the relation between bundling processes and innovation. According to literature, there are many possible variables such as strategic orientation, innovation climate, and innovation culture.

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