CAUSAL MODEL OF TRANSFORMATION LEADERSHIP, ORGANIZATIONAL LEARNING, ABSORPTIVE CAPACITY, AND ORGANIZATIONAL INNOVATION OF THE FOOD MANUFACTURING INDUSTRY IN THAILAND

NUANLUK SANGPERM

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION

FACULTY OF BUSINESS ADMINISTRATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI

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Program	Business Administration
Dissertation Advisor	Associate Professor Chanongkorn Kuntonbutr, D.B.A.
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Academic Year	2021

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November 2, 2021

หัวข้อดุษฎีนิพนธ์	แบบจำลองเชิงสาเหตุของภาวะผู้นำการเปลี่ยนแปลง องค์การแห่งการเรียนรู้ ความสามารถในการดูดซับ และองค์การแห่งนวัตกรรมของอุตสาหกรรมการผลิตอาหาร ในประเทศไทย
ชื่อ-นามสกุล	นางสาวนวลลักษณ์ แสงเพิ่ม
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บทคัดย่อ

อุตสาหกรรมการผลิตอาหารในประเทศไทยเป็นอุตสาหกรรมที่มีความสำคัญต่อระบบเศรษฐกิจของไทยเพราะเป็นการผลิตอาหารเพื่อรองรับกับความต้องการของคนภายในประเทศตลอดจนคนทั่วโลก บริษัทในอุตสาหกรรมการผลิตอาหารนั้นมีการเชื่องโยงกลุ่มธุรกิจทั่วทั้งห่วงโซ่อุปทานเข้าด้วยกัน ตั้งแต่ภาคเกษตรกรรม ภาคการผลิต ภาคโลจิสติกส์และภาคการส่งออก ซึ่งมีนวัตกรรมเป็นบทบาทสำคัญในการนำพาให้ธุรกิจก้าวหน้าต่อไป โดยมีภาวะผู้นำการเปลี่ยนแปลงเป็นปัจจัยที่สำคัญในการนำนวัตกรรมมาปรับใช้ให้เหมาะสมกับบริบทของบริษัท ในการศึกษาครั้งนี้มีวัตถุประสงค์คือ 1) เพื่อตรวจสอบอิทธิพลทางอ้อมของภาวะผู้นำการเปลี่ยนแปลงที่ส่งผลต่อการเป็นองค์การแห่งนวัตกรรมโดยมีความสามารถในการดูดซับเป็นตัวแปรส่งผ่าน และการเป็นองค์การแห่งการเรียนรู้เป็นตัวแปรกำกับของอุตสาหกรรมการผลิตอาหารในประเทศไทย 2) เพื่อพิจารณาอิทธิพลขององค์การแห่งการเรียนรู้ซึ่งเป็นตัวแปรกำกับ กับภาวะผู้นำการเปลี่ยนแปลงและความสามารถในการดูดซับส่งอิทธิพลต่อการเป็นองค์การแห่งนวัตกรรมของอุตสาหกรรมการผลิตอาหารในประเทศไทย

การวิจัยครั้งนี้เป็นการวิจัยเชิงปริมาณ มีการประยุกต์ใช้แบบจำลองการไกล่เกลี่ยและการกลั่นกลองเพื่อหาผลลัพธ์เชิงประจักษ์ ประชากรที่ใช้ในการศึกษาครั้งนี้ คือ บริษัทขนาดกลางและขนาดใหญ่ของอุตสาหกรรมการผลิตอาหารในประเทศไทย โดยทำการเก็บตัวอย่าง จากพนักงานที่ทำงานหน้าที่ในการพัฒนาผลิตภัณฑ์และกระบวนการผลิตจำนวน 200 บริษัทที่อยู่ในสำนักงานส่งเสริมวิสาหกิจขนาดกลางและขนาดย่อม (สสส.) นอกจากนี้ยังมีการสัมภาษณ์เชิงลึกจากผู้เชี่ยวชาญและผู้จัดการที่เกี่ยวข้องกับนวัตกรรมในอุตสาหกรรมการผลิตอาหารเพื่อเป็นการยืนยันผลการทดสอบสมมติฐาน

ผลจากการวิจัยพบว่า ภาวะผู้นำการเปลี่ยนแปลงส่งผลต่อการเป็นองค์การแห่งนวัตกรรมโดยมีการเป็นองค์การแห่งการเรียนรู้ และความสามารถในการดูดซับขององค์การเป็นตัวแปรเชื่อมโยงในความสัมพันธ์นั้น กล่าวคือ 1) การเป็นองค์การแห่งการเรียนรู้จะเป็นตัวแปรกำกับในตัวแปรส่งผ่านซึ่งคือความสามารถในการดูดซับเชิงประยุกต์ใช้ขององค์การ ส่งผลต่อความสัมพันธ์ระหว่างภาวะผู้นำการเปลี่ยนแปลงและการเป็นองค์การแห่งนวัตกรรม 2) ความสัมพันธ์ระหว่างภาวะผู้นำการเปลี่ยนแปลงและความสามารถในการดูดซับเชิงประยุกต์ใช้ขององค์การได้รับการกำกับจากการเป็นองค์การแห่งการ

เรียนรู้ รวมถึงความสัมพันธ์ระหว่างความสามารถในการดูดซับเชิงศักยภาพขององค์การและการเป็นองค์การแห่งนวัตกรรมก็ได้รับการกำกับจากการเป็นองค์การแห่งการเรียนรู้เช่นกัน

คำสำคัญ: ภาวะผู้นำการเปลี่ยนแปลง การเป็นองค์การแห่งการเรียนรู้ ความสามารถในการดูดซับความรู้ การเป็นองค์การแห่งนวัตกรรม

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ABSTRACT

The food industrial sector is crucial for the Thai economy for serving domestic and global demand. Firms operating in this sector have linkages along the entire supply chain from the agricultural sector, component manufacturing sector, through to the logistics and export sectors. Moreover, their innovations have played an important part in the further overall advancement of this business sector and transformational leadership is a key determinant to adopt innovation appropriately to specific firms in a particular industry. The objectives of this research were: 1) to verify the indirect effect of transformational leadership on organizational innovation through absorptive capacity as a mediator and organizational learning as a moderator of the food manufacturing industry in Thailand, and 2) to examine the influence of organizational learning as a moderator together with the influences of transformational leadership and absorptive capacity on organizational innovation of the food manufacturing industry in Thailand.

This research applied quantitative research by the Moderated-Mediation Model to evaluate the empirical results. The populations were medium and large firms in the food manufacturing industry. A sample of employees, who work in product and process development of 200 firms in food industrial sectors were drawn from The Office of SMEs Promotion (OSMEP), using a stratified sampling method. In addition, in-depth interviews of experts and managers concerned with innovation in the food manufacturing industry were used to confirm the results of the hypothesis tested.

The results of this research indicated that transformational leadership had an influence on organizational innovation with organizational learning and absorptive capacity as related variables, such that: 1) organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation, and 2) the relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning while the relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning.

Keywords: transformational leadership, organizational learning, absorptive capacity, organizational innovation

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CHAPTER 1
INTRODUCTION

This chapter introduces the background of the topic which is to investigate the cause and effect between multi-variables concerning leadership style, organizational learning, absorptive capacity, and organizational innovation. The research questions and theoretical perspectives are included to understand the link between variables that are included in the model. In addition, the hypotheses, framework, and significance of study are explained.

1.1 Background and Statement of the Problem

Currently, technological advances that have led to massive socio- economic changes have increased around the world. Information technology has created a competitive advantage for those firms in terms of efficiency when communicating with business partners and customers throughout the world. The competitive business environment is more intense and as a result, business firms must respond quickly. To create a competitive advantage for their firms, companies must raise their level of organizational performance. In considering the management aspects of an organization, leadership is crucial to the success of firms (Chen, Sharma, Zhan, & Liu, 2019). Dynamic capability is the key factor that can create competitive advantage for better performance in term of strategic management (Ferreira, Coelho, & Moutinho, 2018). The dynamic capability of firms is derived from better learning systems and continuous learning for employees, not matter what their level is in a business. Leader can determine the results of systems thinking, personal excellence, team work, and shared vision. Furthermore, leaders can encourage improved organizational capability for knowledge, problem-solving, decision-making and uncertainty management (Turi, Sorooshian, & Javed, 2019). Knowledge employees are considered to be important assets of any organization and can be motivated to be agile and self-actualization (Turi et al., 2019). The organizational climate should set the conditions for employee capability to learn and develop as staff members lead to the organizational learning.

Organizational learning is crucial to innovation creativity concerning product, process, marketing, and organizational sustainability (Alegre & Chiva, 2008; Baker & Sinkula, 1999). Here the role of leadership is to play an important part in terms of being creative, having analytical thinking, having a clear vision and goals, encouraging and supporting of innovative thinking, using information technology for learning to occur at the individual, team and organizational levels where the industry landscape is constantly changing for raise the firm performance to a higher level. However, not all leadership styles are crucial to the trajectory of organizational learning. The organization supports the new concept of work result in an exchange of knowledge and become an organizational learning Transformational leadership style can support organizational learning(Mirkamali, Thani, & Alami, 2011; Ojha, Acharya, & Cooper, 2018). In some circumstances, transformational leadership and organizational learning can support innovation creativity that will affect to firm performance. The context of transformation leadership is consistent in terms of realizing organizational innovation that encourages new work methods, being a good role model, encouraging followers to see the higher level of the results that will occur in the future.

Since organizational learning is supported by the business leaders, then the role of leadership is an important element in how the workplace progresses. Appropriate leadership roles are considered as creative analytical thinking, clear vision and goals, stimulating and promoting the use of creative thinking in work or problem-solving, and applying information technology for learning at the individual, team and organization levels (Buil, Martínez, & Matute, 2019). The results are positive and meaningful in encouraging an organization to develop work capacity and raise performance to a high level under the dynamic environment (Mirkamali et al., 2011). Both in terms of encouraging new methods of work or being a role model of good work, there are leaders with clear goals and visions always encourage follower to see the future success (Zagoršek, Dimovski, & Škerlavaj, 2009). At a high level in the organization supports the new concept of work, there is an exchange of knowledge, which will result in being an organizational learning. The food industry is crucial to economic progress in Thailand, and this study emphasizes how the food industry supports a national competitive advantage for the country.

Food products are necessary for all human lives and especially now that the world's population is increasing but is becoming increasingly unsustainable. The expectation is that between 2030 and 2050 there will be an extra 8.5 million and 9.3 million mouths to feed, which will mean that more food and agricultural products are required. Yet, the agricultural output has decreased due to the expansion of urban areas and other factors such as widespread pollution and production shortages. Moreover, the consumer behaviors linked with changes in technology development are affecting food manufacturing and innovation. The concept of innovation in food industry has an impact on value creation considered in terms of efficiency and safety for food production processes and sustainable resource management, given the great danger of food shortages in the future. Innovation in food systems will change consumers lifestyles, and businesses will have to prepare themselves for innovations, according to the Thailand Productivity Institute.

The food industry is one of the major sectors of Thailand and the government determines the policies that support this industry. The policy of 'Thai kitchen to World kitchen' has now operated for more than a decade, as part of the five year (2016-2021) strategic plan. This particular industry is critical to the economy and it exports much to the world for people consumption. It is a great opportunity for SME entrepreneurs to do well as part of the supply chain. Each year, the food industry generates massive revenues for Thailand, making possible better incomes for the farmers who are considered the backbone of Thailand agricultural sector. By 2019, Thai food industry had increased by approximately 4.5%. Research on organizational innovation, mostly focused on the benefits of innovation for many industries, but not the food industry in Thailand. This research aims to fill in this crucial research gap by examining the factors that lead to better organizational innovation.

Considering the research concerning to organizational innovation, most of them focus on the benefits of organizational innovation to many industries, but not the food industry in Thailand. This research aims to address the crucial research gap by examining the factors that cause the organization learning and absorptive capacity that illustrate empirical results in the organization innovation.

Given the rapid development in technology and business competition in the 21st century, the knowledge base becomes essential to business success. Firms have to develop capabilities in acquiring knowledge both external and internal aspects to apply for their precisely decisions. Currently, they perform in terms of absorptive capacity of a firm concerning searching, communication, developing and transformation of knowledge from various sources (B. Ahmad & Ercek, 2018). The contribution of absorptive capacity to business outcomes is determined in terms of new knowledge, innovation and performance. Not many studies focus on absorptive capacity and its effect on organizational innovation. Some prior studies assessed organizational learning, organizational innovation, and absorptive capacity as independent and dependent variables in the food industry. Moreover, only rarely have studies examined organizational learning as a moderator of the relationship between transformational leadership, absorptive capacity and organizational innovation. This study tries to fill the gap in our knowledge by using organizational learning as moderator for the variables mentioned above. Furthermore, absorptive capacity was determined in terms of serving as a mediator between transformational leadership and organizational innovation.

1.2 Theoretical Perspectives

The theoretical foundation of this study come from Resource Based View (RBV) that explained crucial factors that create competitive advantage of firms in four dimensions as resources that value to firms, rare, inimitability, and non-substitutability (J. Barney, 1991; J. B. Barney & Wright, 1998). The concept of RBV determine the holistic view of resource and capabilities that affect to competitive advantage of firms (Eisenhardt & Martin, 2000; Grant, 1996). It is important for business firms of every industrial sector in creating competitive advantage of the management strategy. Business firms have to acquire all necessary resources for operation process and allocate appropriately to gain highest efficiency to create barrier for their competitors and achieve goal, objectives and sustainable growth of their companies.

A new perspective relate to strategic management is the Knowledge-Based View (KBV) that firms can acquire through organizational learning has continuously increased in research field (Bapuji & Crossan, 2004). It has been considered crucial

resource for strategic planning and implementing of firms and consequently affect to economic context (P. F. Drucker, 1993; Mathews, 2003). Both business and government sector have emphasized in the field of intellectual capital through knowledge management (Choo & Bontis, 2002). Since the effect of knowledge management were clarified rerate to technology innovation and creation of new product development (Lai & Lin, 2012). The intellectual capital and knowledge based can be determined as intangible assets that provide highly value to the firms that achieve in create knowledge sharing within an organization (Hitt, Bierman, Shimizu, & Kochhar, 2001; Petrick, Scherer, Brodzinski, Quinn, & Ainina, 1999). Moreover, the relation of RBV and KBV in term of organizational management has established theoretical foundation linked together (Curado & Bontis, 2006; Malerba & Orsenigo, 2000). The success development of KBV in a specific firm can extent to RBV from the consideration of heterogeneous perspective of applying knowledge to reality (Hoskisson, Wan, Yiu, & Hitt, 1999). Since the applying of RBV to create performance of firms need to have knowledge- based for internal operation of firm. The high performance employees derived from continuous development of organizational knowledge and considered to be difficult to imitate by firms' competitors (Wiklund & Shepherd, 2003). Moreover, the development of knowledge management and organizational learning is important for management to concentrate on general knowledge associated with firm' context (Antunes & Pinheiro, 2020).

Currently, human resource has been considered as most valuable asset. Therefore, business firms have to support knowledge based for their employees to increase knowledge, skill, and capability which consequently have effect to firm performances. Then, the knowledge management and organizational learning is important in term of creating competitive advantage and firm performance (Clarke & Rollo, 2001; El Sawy, Malhotra, Gosain, & Young, 1999; Holliday, 2001)

Moreover, knowledge is determined from individual and can be transferring and sharing upon policy, culture daily work, communication process, and documents. The knowledge accumulation, attitude of individual and work style can be beneficial from sharing upon communication process (Nonaka, Toyama, & Konno, 2000). In addition, knowledge sharing and transferring between employees will fulfill the value creation in

human resource development area in term of intellectual capital and human capital. Furthermore, to create the existing of knowledge within an organization can support value creation since knowledge from individual learning can be encouraged from knowledge management process that is composed of acquisition, assimilation, transformation, and exploitation will be beneficial to business firms as all employees participate in knowledge sharing and transferring process that finally support competitive advantage and performance at every level of management within firms.

1.3 Purpose of The Study

This study focuses on the leadership style as transformational leadership that has an influence on organizational innovation through absorptive capacity. In addition, the organizational learning was observed as a moderator to transformational leadership that affect to absorptive capacity and absorptive capacity to organizational innovation.

To answer and clarify the research questions, therefore, this study purposes to:

1.3.1 To verify the indirect effect of transformational leadership on organizational innovation through absorptive capacity as a mediators and organizational learning as a moderator of food manufacturing industry in Thailand.

1.3.2 To examine the influence of organizational learning as a moderator with transformational leadership and absorptive capacity influence on organizational innovation of food manufacturing industry in Thailand.

1.4 Research Question and Hypotheses

The above background encourages the statement of problem to be investigated in term of research question that can be determined as

1.4.1 How does transformational leadership affect to the organizational innovation through absorptive capacity as a mediators and organizational learning as a moderator?

1.4.2 Do the different levels of organizational learning moderates with the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation?

From the literature review and on the basis of the relationships described in the conceptual model, the following hypotheses are posited:

H1: Transformational leadership has a direct positive influence on organizational innovation.

H2: Transformational leadership has a direct positive influence on absorptive capacity.

H3: Absorptive capacity has a direct positive influence on organizational innovation.

H4: Transformational leadership has an indirect positive influence on organizational innovation through absorptive capacity.

H5: The relationship between transformational leadership and absorptive capacity is moderated by organizational learning.

H5a: The relationship between transformational leadership and potential absorptive capacity is moderated by organizational learning.

H5b: The relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning.

H6: The relationship between absorptive capacity and organizational innovation is moderated by organizational learning.

H6a: The relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning.

H6b: The relationship between realized absorptive capacity and organizational innovation is moderated by organizational learning.

H7: The relationship between transformational leadership and organizational innovation is moderated by organizational learning.

H8: Organizational learning moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.

H8a: Organizational learning moderates the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.

H8b: Organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.

1.5 Research Framework

This research explores the complexity of organizational innovation by examining antecedent of organizational innovation namely transformational leadership, organizational learning and absorptive capacity as well as influences on organizational innovation in food manufacturing industry. The study explores the relationship between transformational leadership, organizational learning and absorptive capacity influences on organizational innovation in food manufacturing industry. The framework was instructed from reviewing of other studies and applying of theory concerning to transformational leadership style (figure 1.1).

Moreover, the knowledge-based view presents crucial theoretical foundation specifically to organizational learning and intellectual capital. It is intangible asset that is not decrease value overtime like other assets do. Then, it can be determined as an idiosyncratic development found in higher level of firm development (Curado & Bontis, 2006).

Furthermore, there is a significant impact of leadership on absorptive capacity (Bagheri, 2017). Thus, absorptive capacity performs as a mediator and organizational learning perform as a moderator variable in the framework. In summarize from various literature, the link is extended to organizational innovation.

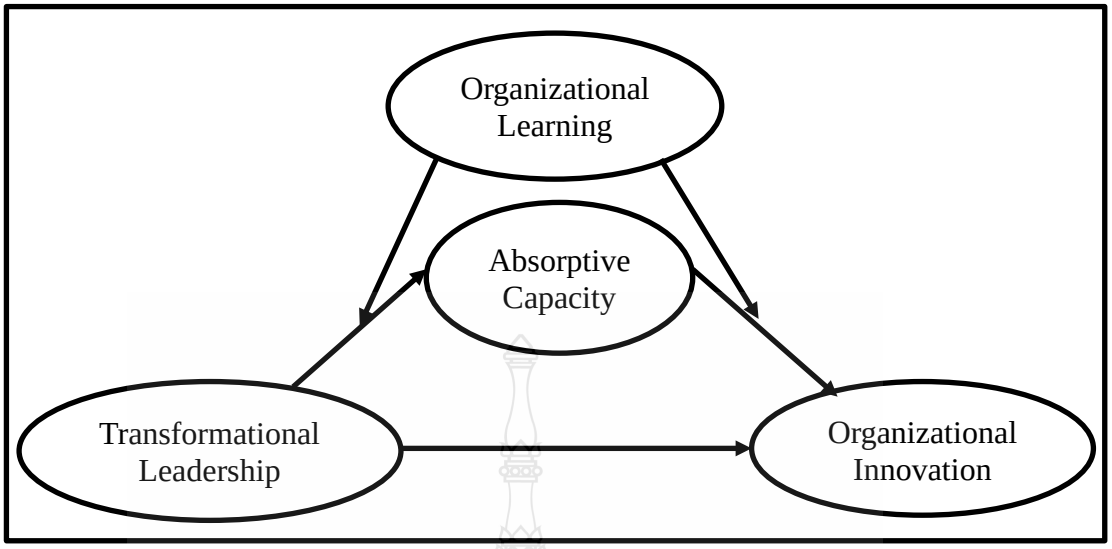


Figure 1.1 Research Framework (The Moderated - Mediation Model)

1.6 The Significance of Study

The outcome of this study is the comprehensive relationships among multi-variables in the conceptual framework include transformational leadership, organizational learning, absorptive capacity, and organizational innovation in food manufacturing industry. The results of this study can be determined significance to the following stakeholder:

1.6.1 The management of the food manufacturing industry firms can consider preparing and development of appropriate leadership style to create improvements in absorptive capacity mechanisms and hence contribute to organizational innovation.

1.6.2 The management of the food manufacturing industry firms can apply the result to enhance absorptive capacity to create organizational innovation.

1.6.3 The management can prepare their firms to be innovative in the food manufacturing industry and support their competitive advantage over their competitors.

1.6.4 In the academic area, the link between multi-factors to innovation in food manufacturing industry can be further investigation in specific area of academic.

1.7 Definitions of Terms

1.7.1 Transformational Leadership

Transformational leadership styles determined in four dimensions as idealized influence can be explained in term of leader act as a role model, inspirational motivation refers to leader behavior that stimulus employees to achieve organizational success as well as individual goals, intellectual stimulation means motivate employees to use their highest intellectual for achieving organizational goals, and individual consideration is a leader behaviors that consider and pay attention to individual problem. (B. M. Bass & Avolio, 1995).

1.7.2 Organizational Learning

The socio-cognitive approach that consider individuals sharing their ideas with others to create learning within an organization to perceives the problem and determine action to design the solution to solve the problem (C. Argyris & D. A. J. R. Schön, 1997; Bogenrieder, 2002). To determine dimension of organizational learning capability, it was constructed into multidimensional as managerial commitment ,system perspective, openness and experimentation, and knowledge transfer and integration in detail as follow (Jerez-Gomez, Cespedes-Lorente, & Valle-Cabrera, 2005).

1.7.3 Absorptive Capacity

A set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic absorptive capacity (Zahra & George, 2002). Absorptive capacity determined in four dimensions as acquisition, assimilation, transformation, and exploitation.

1.7.4 Organizational Innovation

Organizational innovation can be considered from the management that focuses on renovate the system, working process, and acquire special technique to encourage information sharing bringing the learning environment beneficial to innovation inside particular organization (J. Birkinshaw, G. Hamel, & M. J. J. A. o. m. R. Mol, 2008). Organizational innovation determined in product and process innovation (Camisón & Villar-López, 2014).

1.7.5 Food Manufacturing Industry in Thailand

According to medium and large manufacturing firms, the medium manufacturing firms are firms that generate income from 100-500 million Thai baht, and having number of employees between 50-200 persons. In considering large industrial firms, those firms have income more than 500 million Thai baht, and having number of more than 200 persons. The production of food products in Thailand are separated into 8 group as 1) Processing and preserving of meat, 2) Processing and preserving of fish, crustaceans and molluscs, 3) Processing and preserving of fruit and vegetables, 4) Manufacture of vegetable and animal oils and fats, 5) Manufacture of dairy products, 6) Manufacture of grain mill products, starches and starch products, 7) Manufacture of other food product (e.g. manufacture of bakery product, manufacture of sugar etc.), and 8) Manufacture of prepared animal feeds) (The Office of SMEs Promotion (OSMEP))

1.8 Scope of the Study

The purpose of this study is to examine the relationships between transformational leadership and organizational innovation as to develop a better understanding of the mediating role of absorptive capacity, and moderator role of organizational learning, that impact on the food manufacturing industry in Thailand. This study is focus on one industry as it allowed more control of extraneous variable and provide robustly of results for theory testing (Innis & La Londe, 1994; Morash, Droge, & Vickery, 1996; Snow & Hambrick, 1980)

The target key respondent is product and process development personnel who are considerate of having adequate knowledge about company product and process development and they can share the appropriate information, therefore, their responses are assumed to be valid and reliable.

This study applied a cross- sectional analysis, mail survey methodology to collect data. The questionnaires were sent to companies in product and process development employees for their respond.

CHAPTER 2
REVIEW OF THE LITERATURE

2.1 Introduction

This study concentrates on the effect of leadership styles considered specifically to transformational leadership on organizational learning, absorptive capacity, organizational innovation, which consequently have an impact on firm performance. Therefore, this chapter presents literatures and research studies related to overall variables composed in the framework. The literatures are presented to create understanding of meaning concerning to every variable. Furthermore, the explanations of relationship between each variable are presented to summarize for hypotheses testing. The literature reviews derived from theory and prior researches are summarized into the following topics;

2.1.1 Transformational Leadership (TL)

2.1.2 Organizational Learning (OL)

2.1.3 Absorptive Capacity (ACAP)

2.1.4 Organizational Innovation (OI)

2.1.5 Food Manufacturing Industry

2.2 Transformational Leadership

In the early stage of leadership study, the transaction or exchange of the behavior and benefit between leader and follower known as transactional leadership styles had been well- known. Transformational leadership is an expansion of transactional leadership style to higher level of leader behavior. This leadership styles can create positive outcomes on both individual and organizational level, and support self-actualization and self-esteem of followers (B. M. Bass, 1985). Moreover, it motivates self- sacrifice and achievement of organization goals from personal interest. Transformational leadership is concerned with inspiration of leaders to followers to commit and shared vision for the achievement of particular organization, challenging followers to be innovative and developing them by coaching, mentoring, and provision both challenge and support (B. M. Bass & Riggio, 2006). In addition, Bass and Riggio

(2006) identified the component of transformational leadership into 1) Idealize Influence (IL), 2) Inspirational Motivation (IM), 3) Intellectual Stimulation (IS), and 4) Individualize Consideration (IC).

1. Idealize Influence: This dimension can be explained as role models that leaders behave for their followers to trust and respect. It is the capability of leader to use their emotional influence on their subordinates to gain adherent contribute to organizational success (B. M. Bass & Bass, 2009). It is the degree of reputation leaders perceive from followers considered as role model(Gomes, 2014). The component of idealized influence can be determined in term of charismatic, confidence, and communicate beliefs and values effectively to their subordinates (Hughes, 2014). Moreover, the idealized influence creates employees engagement, commitment, and job satisfaction (Egheosasa, Ugbo, & Nkenne, 2018; Janet, Rambo, Ndiritu, & Onyango, 2015). The role of leaders who apply idealized influence will motivate employees to respond in the way that contribute to organization, others, and individuals (Zdaniuk & Bobocel, 2015). In addition, idealized influence can significantly predict employees performance particularly to lower level managers (Linge & Sikalieh, 2019). Not only lower level manager, but also Chief Executive Officers are motivated by idealized influence and perform higher performance for their responsibility (Nyokabi, K'Aol, & Njenga, 2017).

2. Inspirational Motivation: It occurs from leaders that use effective communication to gain high expectations to employees, motivate, and challenge employees to the achievement of shared vision(B. M. Bass & Avolio, 1994). It is leaders' behavior expressed as motivate, inspire, and challenge followers to work. This can be performed as motivate and inspire employees from shared meaning, encourage and challenge upon them(McCleskey, 2014). In addition, the leaders involve in envision desirable future expectation for their followers. The balance of individual need and organization goals is crucial fundamental success of inspiration motivation (Ngaithe, K'Aol, Lewa, & Ndwiga, 2016). It draws employees attention on forward point of view that support proactively behavior and career adaptability (Chan, Moon-ho, Sam, Chernyshenko, & Yu, 2015). Because forward point of view or future temporal focus can be determined as future expectation that has an impact attitude and behaviors of

employees (Bluedorn, 2002; Schmitt, Gielnik, Zacher, & Klemann, 2013; Weikamp & Göritz, 2016). In addition, the inspirational motivation will support organizational commitment to employees (Kimeto, K'Aol, & Njenga, 2017).

3. Intellectual Stimulation: This dimension of transformational leadership style concerning to behaviors that encourage followers' interest and awareness of problems, and enforce to the use of individual ability to make a resolution in some different aspect (B. M. Bass, 1985). It refers to leader behaviors that stimulate followers' effort to create new ideas and capability in problem solving.

4. Individualize Consideration: This dimension can be determined at three different levels including individual, team, and organizational culture (Bruce J. Avolio & Bass, 1995). It is a component of leader behaviors that similar to contingent reinforcement as some part provided to follower in term of reexamine their needs, aspirations for achievement (Bruce J. Avolio & Bass, 1995). It can be considered from the leader behaviors concentrate on individual consideration and provide nurturing support for their followers (Zacher, Pearce, Rooney, & McKenna, 2014)

Table 2.1 Dimension of transformational leadership

Dimension	**Related factors**	**Source**
Idealize influence	capability of leader to use their emotional influence on their subordinates	Bass & Bass, 2009
	charismatic, confidence, and communicate beliefs and values	Hughes, 2014
	employee engagement, commitment, and job satisfaction	Egheosasa, Ugbo, & Nkenne, 2018; Janet, Rambo, Ndiritu, & Onyango, 2015

Table 2.1 Dimension of transformational leadership (Cont.)

Dimension	Related factors	Source
	motivate employees	Zdaniuk & Bobocel, 2015
	predict employee performance	Linge & Sikalieh, 2019; Nyokabi, K' Aol, & Njenga, 2017
Inspirational motivation	expectations to employees, motivate, and challenge employees	Bass & Avolio, 1994
	shared meaning, encourage and challenge	McCleskey, 2014
	balance of individual need and organization goals	Ngaithe, K'Aol, Lewa, & Ndwiga, 2016
	forward point of view about the vision and goal	Chan et al., 2015
	future expectation and affects attitude and behaviors of employees	Bluedorn, 2002; Schmitt, Gielnik, Zacher, & Klemann, 2013; Weikamp & Göritz, 2016
	future expectation and affects attitude and behaviors of employees	Bluedorn, 2002; Schmitt, Gielnik, Zacher, & Klemann, 2013; Weikamp & Göritz, 2016
	organizational commitment	Kimeto, K'Aol, & Njenga, 2017

Table 2.1 Dimension of transformational leadership (Cont.)

Dimension	Related factors	Source
Intellectual stimulation	encourage followers' interest and awareness of problems	Bass, 1985
	ability to conceptualize, integrated and analyze problems	Bass & Avolio, 1994
Individualize consideration	different levels including individual, team, and organizational culture	Avolio & Bass, 1995
	needs, aspirations for achievement	Avolio & Bass, 1995
	individual consideration and provide nurturing support	Zacher, Pearce, Rooney, & McKenna, 2014

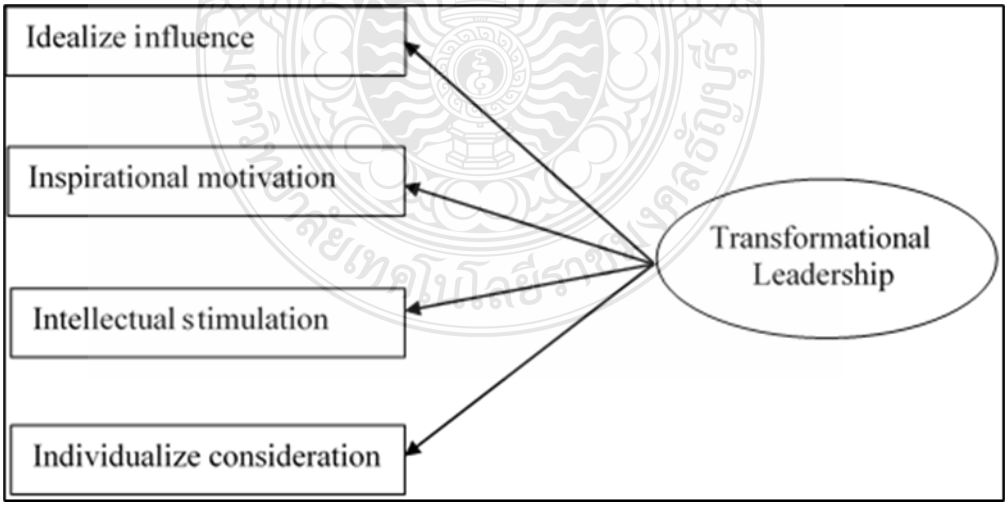


Figure 2.1 Transformational leadership (Bass & Riggio, 2006)

2.2.1 Transformational Leadership and Organizational Learning

According to the management at the high level of an organization, the openness to change in congruent with the rapid change of external business environment in the digital era is crucial. It is necessary for the leaders of particular organizations to encourage their followers to change from traditional work environment to new technology, strategy, and procedure to fit their surroundings. In summarize the transformational leaders that enrich co-creation and enhance organizational cognition can deliver reliability change through seizing and reconfiguring that support dynamic capability of particular firms (Pitelis & Wagner, 2019).

Hsiao, Chen, and Yang (2008) defined transformational leadership in term of leader that has an extraordinary influence over follower as transformation of the notions and attitudes. It is an initiating process of action to the interests of the prompts transformation and reform of a specific organization. Transformational leadership create positively influence employees openness to change from transparent communication (Yue, Men, & Ferguson, 2019). Kark, Shamir, and Chen (2003) explained the influences of transformational leadership on follower from the concept of individual in relationship with an organization in term of values and self-esteem. Furthermore, followers were influence by shifting goals from individual interest toward organizational goals in relationship with self-actualization (Yukl & Chavez, 2002).

Many studies have presented the significant effect of transformational leadership on organizational learning (Mulford, Mulford, Silins, & Leithwood, 2004; P. Senge, 2004). Idealize influence as one of the dimensions of transformational leadership is crucial to the indicator of organizational learning (Mirkamali et al., 2011). There are many evidences that support positive relationship between leaders and organizational learning (Jerez-Gomez et al., 2005; Montes, Moreno, & Morales, 2005; Swieringa & Wierdsma, 1992)

The management team that applied transformational leadership styles will support the organization in term of learning, experimentation, communication and encourage the stimulation, motivation essential for the employees to learn which consequently determined as individual consideration (McGill & Slocum Jr, 1993; Sarros, Tanewski, Winter, Santora, & Densten, 2002). To determine the relationship between

organizational learning and leadership role, leader behavior and organizational context can affect the organizational learning (Shrivastava, 1983).

2.2.2 Transformational Leadership and Organizational Innovation

Moreover, business firms have to create innovation to gain competitive advantage over their competitors from different products and services. This is a long process from employee's creativity, openness culture to express new idea, continuous development of knowledge until business firms can complete the invention to innovation that are new products needed by consumers. Transformational leadership is found stimulating creativity leading to organizational innovation (Shafi, Zoya, Lei, Song, & Sarker, 2020). Along this process, leaders have to support their employees in term of knowledge management, organizational learning, and innovation climate to achieve better organizational performance. Transformational leadership has an impact on knowledge management, innovation and organizational performance (Birasnav, 2014; Samad, 2012).

Several research explained the empowerment of transformational leadership styles will encourage innovative environment for employees and enhanced organizational innovation (Gumusluoglu & Ilsev, 2009; Jung & Sosik, 2002). In addition, it is crucial for leaders to apply inspirational motivation and intellectual stimulation to create organizational innovation (Elkins & Keller, 2003). Organizational leaders influence to decision pertaining to organizational innovation success from higher level of management to beginning level of operation (Karami, Analoui, & Kakabadse, 2006; Wong, Lee, & Chang, 2017). Furthermore, the high level of management traits such as personality, leadership style, risk taking, confidential level, and network are found as determinants of successful to the innovation of the firms at the size of small and medium enterprises (Gerstner, König, Enders, & Hambrick, 2015) (F. Ahmad, Widén, & Huvila, 2020; Musteen, Datta, & Butts, 2014).

Furthermore, transformational leaders create positive influence concerning to the market success from innovation that firms create (Gumusluoğlu & Ilsev, 2009). This style of leader affects followers freely of innovative thinking and ensures them from individual consideration, and create innovative vision and ensure followers to the market success of new product innovation (Jung, Chow, & Wu, 2003). Since innovative

professional employees concerning to innovative task need quality performance criterion and effective internal and external roles that transformation leaders can balance from the market and internal operation (R. T. Keller, 1992). Thus, this study posits the following hypothesis:

H1: The transformational leadership has a direct positive influence on organizational innovation.

2.2.3 Transformational Leadership and Absorptive Capacity

Furthermore, this study investigates the absorptive capacity that is rarely found connect between leadership style and organizational innovation. The absorptive capacity can be defined as a set of organizational routines and processes, by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability (Zahra & George, 2002). It is concerned with knowledge management within a specific firm that consequently has an impact on organizational innovation. In addition, the organizational innovation has been considered crucial to competitive advantage of an organization over sustainable operation. The transformational leadership was found significance to organizational innovation having knowledge management as mediator (Birasnav, Albufalasa, & Bader, 2013). There are many evidences support the link between transformational leadership and knowledge of particular organization that can be determined in term of absorptive capacity (Birasnav, 2014; Birasnav et al., 2013; Ding, Choi, & Aoyama, 2019; Ha-Vikström & Takala, 2016; Khan & Khan, 2019; Naqshbandi & Jasimuddin, 2018). Therefore, the following hypothesis is instructed:

H2: The transformational leadership has a direct positive influence on absorptive capacity.

2.3 Organizational Learning

Until recently, the organizational learning is a dynamic capacity that become crucial in research area concerning to organizational development. Learning theory, is describe the learning of the organization that concentrate to applied both individual focuses determined in term of psychological theory and sociological theory (Cyert & March, 1963; Levitt & March, 1988). These perspectives are basis of social cognitive because the social cognitive is not only a processing the information but focused on the

social context, organizational structural, organizational culture (Bandura, 1986), that result to cognitive process (Schwarz, 1995). Thus, the organizational learning can be described as an activity that involves gathering people in a social context/organization to exchange information (Kim,1993; Nonaka & Takeuchi, 1995).

Then, the concept of study become focusing the organizational learning on the aspect of socio - cognitive approach and organizational theory in term of environment of organization that support innovation (P. M. Senge, 1990), which consequently the perspective of strategic management has been applied continuously for the later study (Lei, Slocum, & Pitts, 1999). Organizational learning influences on the individual learning and extend to different members within an organization (Argyris, 1978; Jerez-Gomez et al., 2005; Shrivastava, 1983). Organizational learning can be considered as action concerning to acquisition interpretation, and dissemination of knowledge to create positive development within an organization (Templeton, Lewis, & Snyder, 2002). It has been determined as a dynamic process of knowledge occurring in an organization from individual level to group level, which finally affect to an entire organization (Crossan, Lane, & White, 1999). This process is the dynamic capabilities of an organizational learning concerning to incorporate in the internal process to generate new knowledge of particular company (Antunes & Pinheiro, 2020; Eisenhardt & Martin, 2000). Consequently, the organizational learning manifest the ability to change the resource to overcome competitive advantage (Breznik & Hisrich, 2014; Shane & Venkataraman, 2000). It depends upon cognitive process concerning to the practice of knowledge management within a specific organization (Zollo & Winter, 2002). In addition, the organizational learning provide an opportunity to integrate knowledge from internal and external sources contribute to organization in term of continuous improvement, adaptability, and value creation (Gachanja, Nga'nga', & Kiganane, 2020). Currently, the experience and employees behavior relate to organizational learning (C. Argyris & D. A. Schön, 1997). The context of organizational learning is the formal process relevant to the use of information and knowledge to develop innovation and change by employees (Greiling & Halachmi, 2013). However, the employees are found different in their knowledge and using of information to their work. Thus, the organizations have to consider enhance knowledge to the individuals that involve the development of their

employees (Theriou & Chatzoglou, 2009). In this regard, the leader can enhance knowledge exchange among follower to support organizational learning and knowledge sharing (Cunliffe & Easterby-Smith, 2017). To determine dimension of organizational learning capability, it was constructed into multidimensional as 1) managerial commitment 2) system perspective 3) Openness and experimentation 4) knowledge transfer and integration. The dimension of organizational learning can be explained in detail as follow (Jerez-Gomez et al., 2005):

1. Managerial commitment: This dimension can be considered as management has to place their policy relevant to learning within an organization as culture that support creation and knowledge sharing to be fundamental value for influencing of dynamic capability for long term results (Hult & Ferrell, 1997; Nonaka & Takeuchi, 1995). Furthermore, management should encourage change from current situation to new situation (Lei et al., 1999). Managerial commitment has its principle from individual learning, but need different levels of action to group and entire organization member (Hedberg, 1981; Shrivastava, 1983; Simon, 1991). Therefore, management should focus on clarify their support and involvement to personnel level(Williams, 2001). Furthermore, it is necessary to develop organizational knowledge for transfer and integrate of knowledge at the individual level (Nonaka, 1994).

2. Systems perspective: The learning within an organization have to be conducted as system until every functions can help in their development from specific point to entire organization (Gould, 2009; Leonard-Barton, 2003). Consider firms from entire system will imply the recognition of information sharing from various functions (Ulrich, Jick, & Von Glinow, 1993). Common understanding knowledge integration from overall function is important to organizational learning and develops learning from individual to organizational level (Gould, 2009). The considering of organizational level should determine from different parts and in an integration or holistic view (Gould, 2009; Kofman & Senge, 1993).

3. Openness and experimentation: The organizational climate that open to new ideas from various aspect from both external and internal will allow knowledge to be improved continuously in congruent with the situation (Sinkula, 1994). The prior dimension as commitment from management will support climate of openness, and

culture is important to support the wisdom of free expression of opinion from individual in various function within an organization. Moreover, openness and experiment will support avoiding of individual values and beliefs to gain the central facts appropriate for specific situations (Gould, 2009). Openness to different ideas can be derived from internal and external firms which consequently effect to idea generation and innovation (Garwin, 1993; Knudsen & Mortensen, 2011; Salter, Ter Wal, Criscuolo, & Alexy, 2015; Y.-C. Wu, Lin, & Chen, 2013)

4. Knowledge transfer and integration: The knowledge transfer can be considered the internal dissimilation of knowledge at an individual by communication and interaction within an organization (Nicolini & Meznar, 1995). This will result in effective work teams in developing organizational learning considered in sharing, and integration of knowledge at the individual level (Hult & Ferrell, 1997).

Table 2.2 Dimension of organizational learning

Dimension	Related factors	Source
Managerial commitment	dynamic capability for long term results	Hult & Ferrell, 1997; Nonaka & Takeuchi, 1995
	change from current situation to new situation	Lei et al., 1999
	different levels of action	Hedberg, 1981; Shrivastava, 1983; Simon, 1991
	support and involvement to personnel level	Williams, 2001
	transfer and integrate of knowledge at the individual level	Nonaka, 1994
Systems perspective	specific point to entire organization	Gould, 2009; Leonard- Barton, 2003
	information sharing	Ulrich, Jick, & Von Glinow, 1993

Table 2.2 Dimension of organizational learning (Cont.)

Dimension	Related factors	Source
	an integration or holistic view	Gould, 2009; Kofman & Senge, 1993
	individual to organizational level	Gould, 2009
Openness and experimentation	improved continuously	Sinkula, 1994
	avoiding of individual values and beliefs	Gould, 2009
	internal and external firms	Garwin, 1993; Knudsen & Mortensen, 2011; Salter, Ter Wal, Criscuolo, & Alexy, 2015; Wu, Lin, & Chen, 2013
Knowledge transfer and integration	communication and interaction within an organization	Nicolini & Meznar, 1995
	integration of knowledge at the individual level	Hult & Fzzzerrell, 1997; Nonaka & Takeuchi, 1995

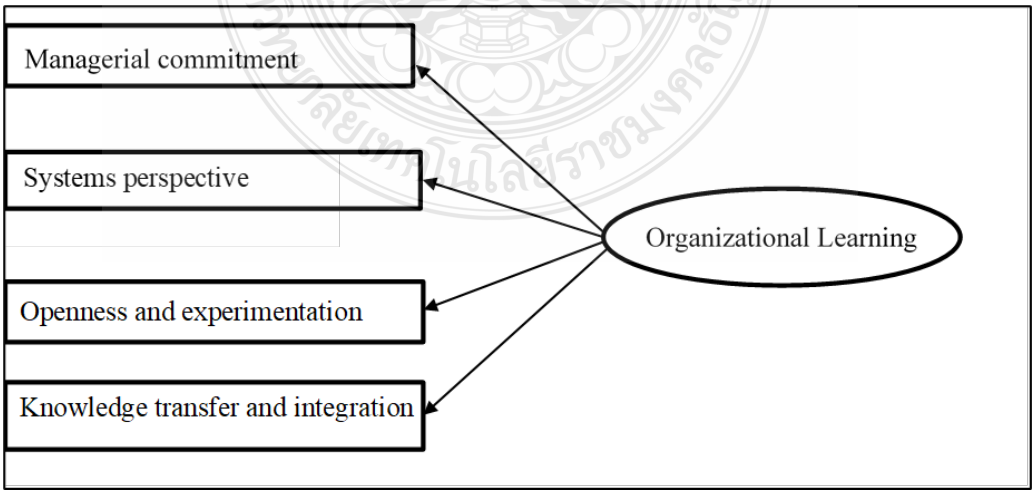


Figure 2.2 Organizational Learning (Jerez-Gomez et al., 2005)

2.3.1 Organizational Learning and Organizational Innovation

Organizational learning can encourage competitive advantage in determining a context of strategic management (Amarakoon, Weerawardena, & Verreynne, 2018). Strategic management proposes the organization to create innovation to become uniqueness and reputation. Organizational learning was explained as key aspects of knowledge base crucial to innovation capability of firm (Gachanja, et al., 2020). The positive impact of organizational learning relate to innovation and performance of an organization (Giniuniene & Jurksiene, 2015; Jiménez-Jiménez & Sanz-Valle, 2011). Management should focus more on general knowledge associated with firm interest to encourage any kind of innovation from collaborative practices by the human resource management (Nieves Rodríguez, Deniz, De Jesus, & Osorio Acosta, 2017).

There are many studies on organizational innovation have contribute from an organizational learning as a positive relationship between organizational learning and innovation (Aragón-Correa, García-Morales, & Cordón-Pozo, 2007; Gumusluoglu & Ilsev, 2009). According to the innovation context, leaders is crucial for the preparation of collective achievement of an organization from individual mindset on innovation creativities, then, organizational learning and innovation have to be stimulated for better organizational performance (García-Morales, Lloréns-Montes, & Verdú-Jover, 2008). Furthermore, organizational innovation depends on organizational learning (Cohen and Levinthal, 1990). There is rarely study examines how transformational leadership affect organizational innovation having organizational learning as a mediator even it is considered related (Hecker & Birla, 2008). The active role of transformational leader can inspire employee creativity, stimulate individual mind (Hinkin & Schriesheim, 2008). Moreover, organizational innovation should be considered as a team (Montes et al., 2005). Therefore, the transformational leadership can serve as variable that effect to organizational learning which consequently has an impact on innovation.

2.4 Absorptive Capacity (ACAP)

Cohen and Levinthal (1990) identified absorptive capability at the organizational level as the capability of an organization in absorption and apply new external knowledge to support organizational achievement of goals. In addition, the

absorptive capability is the use of new knowledge for organizational innovation. According to Lyles and Salk (1996), they explained the component of absorptive capacity as an understanding, accumulating, and applying of knowledge to organization. Similarity to Zahra and George (2002) explained more as absorptive capacity is dynamic capability concerning to development of competitive advantage separated into first, potential absorptive capability which composed of acquisition ability and assimilation ability. Second, realized absorptive capability composed of transformation ability and utilization ability.

Absorptive capacity in term of process approach was defined as "a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability" (Zahra & George, 2002).

The absorptive capacity have commonalities across different firms, however, they may have idiosyncratic in particular dimensions each firms applied and developed appropriately to their structure (Eisenhardt & Martin, 2000). The four dimensions is explained in detail of each dimension as follow (Zahra & George, 2002):

1. Acquisition: The capability of firms to acquire knowledge from outside for significant supporting to their operation is considered acquisition. Currently, not only external existing knowledge that should be acquire, but technological transformation that will occur in the future is also crucial (W. Keller, 1996). The component of acquisition can determine from concerning aspect such as the knowledge intensity, speed, and direction (Daghfous, 2004; Van Den Bosch, Van Wijk, & Volberda, 2003). Absorptive capacity was summarize crucial to acquisition of technology development, technology transfer, and product innovation (del Carmen Haro-Domínguez, Arias-Aranda, Lloréns-Montes, & Moreno, 2007; W. Keller, 1996; Liao, Wu, Hu, & Tsuei, 2009; Liao, Wu, Hu, & Tsui, 2010; Stock, Greis, & Fischer, 2001).

2. Assimilation: This can be explained in term of routine work along the process of operation that support staffs to analyze, interpret, and understand external information (Kim, 1997). Then, the information and knowledge have to be conducted in the way that staffs from various functions can apply external knowledge appropriately and correctly to its meaning. The assimilation in the dimension of absorptive capacity indicates strong

positive direct effect on time-based manufacturing practices and create value creation to customers in advance technology firms (Q. Tu, M. A. Vonderembse, T. S. Ragu-Nathan, & T. W. Sharkey, 2006). While value to customer can be defined as a set of variables that influences customer satisfaction such as quality of the product, on time delivery, cost, and flexibility (White, 1996). Moreover, the Enterprise Resource Planning (ERP) system has supported the operation of any firms in communication sharing and decision making, absorptive capacity was proved has a positive effect in the assimilation of enterprise information systems (Saraf, Liang, Xue, & Hu, 2013). In addition, assimilation from absorptive capacity was found has an influence on ERP of firms from individual users level (Khosravi, Rezvani, Subasinghage, & Perera, 2012; J.-H. Park, Suh, & Yang, 2007).

3. Transformation: Transformation refers to the potential of firms to facilitate and integrated knowledge appropriately for inter-functional coordination. In addition, the crucial is the capabilities of firms in recognize different knowledge to derive the congruent of right knowledge for exploitation. An understanding of transformation will support a clarification of absorptive capacity which contribute to reconceptualization for reducing of ambiguity in empirical studies (Todorova & Durisin, 2007). Some research conducted in high technology firms upon knowledge based view to examine mediating mechanisms in the relationship between knowledge absorptive capacity and innovation performance of firms, the results support knowledge in relation with innovation performance (Xie, Zou, & Qi, 2018).

4. Exploitation: It is a final stage of absorptive capacity that firms can effectively apply the transform knowledge into routine operation (Tiemessen, Lane, Crossan, & Inkpen, 1997). Some study suggested that specialize in exploitation is more effective at low levels of absorptive capacity while ambidexterity in exploitation has a greater effect on performance at high levels (Solís-Molina, Hernández-Espallardo, & Rodríguez-Orejuela, 2018). According to the application of information technology by firms, self-efficacy, individual knowledge, and information technology support can have an impact on individual creativity via exploitation (Seo, Chae, & Lee, 2015). Consequently, exploitation in considering from absorptive capacity has an direct positive influence on competitive advantage in creating of production innovation (Zobel, 2017).

Table 2.3 Dimension of absorptive capacity

Dimension	Related factors	Source
Acquisition	external existing knowledge	Keller, 1996
	The component of acquisition	Daghfous, 2004; Van Den Bosch, Van Wijk, & Volberda, 2003
	acquisition of technology development	del Carmen Haro-Domínguez, Arias-Aranda, Lloréns-Montes, & Moreno, 2007; Keller, 1996; Liao, Wu, Hu, & Tsuei, 2009; Liao, Wu, Hu, & Tsui, 2010; Stock, Greis, & Fischer, 2001
Assimilation	external information	Kim, 1997
		Tu, Vonderembse, Ragu-Nathan, & Sharkey, 2006
	create value creation to customers	Tu, Vonderembse, Ragu-Nathan, & Sharkey, 2006,
	customer satisfaction	White, 1996
	positive effect in the assimilation	Saraf, Liang, Xue, & Hu, 2013
	individual users level	Khosravi, Rezvani, Subasinghage, & Perera, 2012; Park, Suh, & Yang, 2007
Transformation	reconceptualization	Todorova & Durisin, 2007
	relation with innovation performance	Xie, Zou, & Qi, 2018
Exploitation	transform knowledge into routine operation	Tiemessen, Lane, Crossan, & Inkpen, 1997,
	effective at low levels of absorptive capacity	Solís-Molina, Hernández-Espallardo, & Rodríguez-Orejuela, 2018

Table 2.3 Dimension of absorptive capacity (Cont.)

Dimension	Related factors	Source
	individual creativity	Seo, Chae, & Lee, 2015
	creating of production innovation	Zobel, 2017

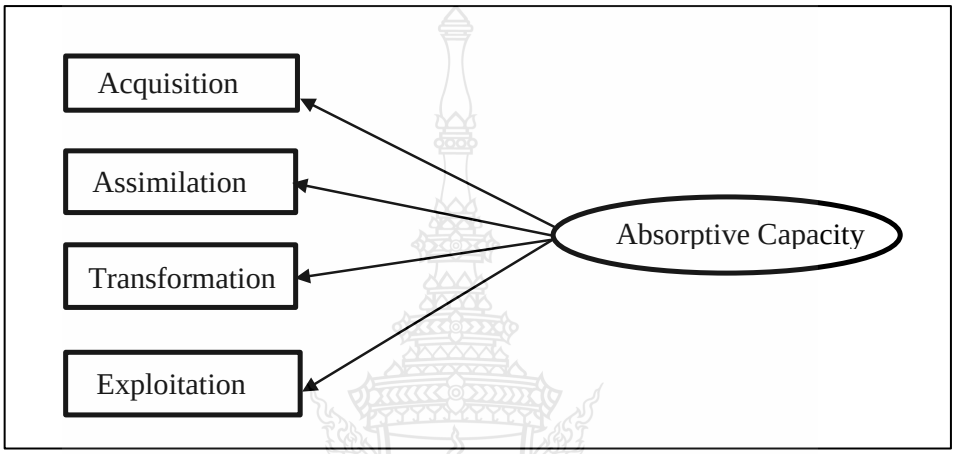


Figure 2.3 Absorptive capacity (Zahra & George, 2002)

2.4.1 Absorptive Capacity and Organizational Innovation

The absorptive capacity of an organization act as an important role for organizational innovation and performance (Ali, Seny Kan, & Sarstedt, 2016) . Absorptive capacity can be considered in various aspects. In the beginning, the multidimensional concept is considered as recognition of value, assimilation, and application for commercialization (Hutabarat & Pandin, 2014). This aspect contributes to the empirical study in their measurement of value perception from subjects, the communication of information effectively throughout an organization, and new products that can beneficial to the performance of firm operation. Moreover, the absorptive capacity can be considered in different level as individual and organizational level which emphasize on encourage better communication and relationship among organizational members (Cohen & Levinthal, 1990). However, the presented reconceptualization of absorptive capacity different from traditional concept can be illustrated in two dimensions (Zahra & George, 2002). First, absorptive capacity is dynamic and embedded in routine

and process of firms, which support the dynamic of organization to a better situation. Second, absorptive capacity can be categorized into two categories as potential capacities include knowledge acquisition and assimilation, and realized capacities include transformation and exploitation of knowledge. Moreover, they develop abortive capacity model extend to highlight new determinant on account of increasing corporate competitiveness from firm experiences. In addition, the absorptive capacity can influence performance of specific firms that apply alliance portfolio characteristic with others (George, Zahra, Wheatley, & Khan, 2001). Thus, the following hypothesis is posited:

H3: The absorptive capacity has a direct positive influence on organizational innovation.

2.4.2 The Mediating Effect of Absorptive Capacity

On the basis of above, transformational leadership is offered to be a strategic that affects knowledge absorption (Camps & Rodríguez, 2011; Nemanich & Vera, 2009). For example, absorptive capacity (T. Flatten, Adams, & Brettel, 2015). Consistent with previous study, T. Flatten et al. (2015) supported that transformational leaders promote absorptive capacity using different methods, especially by articulating a vision that focuses on the significance of knowledge transformation and exploitation, and by presenting a suitable model that presents the important of develop firms' knowledge base. This aptitude to absorb knowledge, enhanced by transformational leadership, allows firms to identify new knowledge, mix it with their existing knowledge, and then employ such knowledge in firms' processes of value creation, overcoming knowledge gaps and producing novel knowledge that in turn promotes corporate entrepreneurship. Firms that have external knowledge can recognize where to find novel opportunities and how to take advantage of them (Cohen & Levinthal, 1990). Yaseen, Al-Janaydab, and Alc (2018) also discovered that transformational leadership style and transactional leadership style are antecedents to absorptive capacity and a firm's innovation. The results confirm a significant and direct relationship between both leadership styles and firm innovation, and indirectly via absorptive capacity in Jordanian Pharmaceutical sector.

H4: Transformational leadership has an indirect positive influence on organizational innovation through absorptive capacity.

2.5 Organizational Innovation (OI)

Currently, the competitive advantage to gain sustainability operation of business firms derived from value creation the firms can offer to their customers.

The success of an organization come from competitive advantage over competitors which derived from organization creativity and innovation (Woodman, Sawyer, & Griffin, 1993). Leader has been recognized as crucial to follower in their inspiration and value of an organization. To create value for their customers effectively is the differentiation of products or process business firms can offer to customers. The most important factor concerning to differentiation is related with innovation launched into the market by firms. Thus, the transformation in innovation is crucial to an organization to develop culture that encourage organizational innovation to sustainability of organizational performance (Shahzad, Xiu, & Shahbaz, 2017). Innovation can be determined in term of an idea, practice, or material artifact found in a new and relevant unit of adoption (Limaj & Bernroider, 2019). Some researcher categorized innovation by mean of proximity and cognitive distance, the more difference, the innovation is (Jansen, Van Den Bosch, & Volberda, 2006). Then, innovation can be categorized as first, explorative innovation refers to radical innovations that are totally different from existing units in the market (Morgan & Berthon, 2008).

Those innovations present totally different and being accepted from customers (Jansen et al., 2006). Second, exploitative innovation or incremental innovation illustrates by its value add to former one in the market (Lee, Park, & Kang, 2018). However, business organizations have to manage those two types of innovation in term of ambidexterity (Lavie, Stettner, & Tushman, 2010). To manage innovation in one single path way creates higher cost and reduce sustainable success (Limaj & Bernroider, 2019). Moreover, to overcome the balance of the two types of innovation in this group, management has to focus in holistic approach by examining the combination between internal and external organization. The organizations that achieve the holistic approach of apply internal and external information to manage innovation can be summarized as success in creating organization innovation. Organizational innovation was defined as implementing a new commercial practices involve new method and new operation for new existing products (Kalkan, Bozkurt, & Arman, 2014). Organizational innovation is

crucial to management as the factor to support information exchange for collaboration of the employees and creating of innovation (J. Birkinshaw, G. Hamel, & M. J. Mol, 2008). Organizational innovation performs as capability operate through a reciprocity where technology and innovation are all considered related factor to each other (Arranz, Arroyabe, Li, & de Arroyabe, 2019). Organizational innovation support the development of technological innovation capabilities for product and process which consequently lead to higher firm performance (Camisón & Villar-López, 2014). To beneficial of an organizational innovation to performance of particular firms, leader or CEO is crucial to be reveal since the relationship between these two factors were summarized extensively. According to organizational innovation in this study, the following variables were determined to fulfill the mediating role:

1. Product innovation: Product innovation can be considered from organizational activities in relation with the development and introduction of new products to the market prior competitors (Chenhall, Kallunki, & Silvola, 2011; Dunk, 2011). This definition was summarized from the perspective of firms output considered from new products launched into market. This study applied the meaning of product innovation in line with prior studies in term of the development and introduction of new products to the market. Product innovation comes from internal knowledge on account of organizational learning (Alegre & Chiva, 2008; Tohidi & Jabbari, 2012). The crucial tools that support firms in creating of innovation is learning occurring within an organization that serve the effectiveness of an organization (P. Drucker, 1985). Product innovation can be summarized as a result from organizational learning process (McKee, 1992). The mainstream of business literature indicates transformational leadership style affect to organizational learning and innovation(Khan & Khan, 2019). Furthermore, there are many studies indicate the positive effect of product innovation on firm performance (Amores-Salvadó, Castro, & Navas-López, 2014; Lin, Tan, & Geng, 2013; Ramadani et al., 2019). Thus, product innovation from organizational innovation is crucial to determine performance of firm's operation.

2. Process innovation: Product innovation is considered to be crucial factors in increasing income. On the contrary, process innovation is determined to be important in decreasing cost which affect better performance respectively (Bernstein & Kök, 2009).

Literatures has confirmed that knowledge is an antecedent , contingency, outcome, employee innovativeness that commit to product innovation adoption (Badir, Frank, & Bogers, 2019; Dost, Badir, Sambasivan, & Umrani, 2020; Natalicchio, Ardito, Savino, & Albino, 2017; Pérez-Luño, Wiklund, & Cabrera, 2011). The significant success of product innovation is generated by inter organizational learning as an interplay between firms and suppliers (Linder & Sperber, 2019).

Table2.4 Dimension of organizational innovation

Dimension	Related factors	Source
Product Innovation	organizational activities in relation with the development and introduction of new products	Chenhall, Kallunki, & Silvola, 2011; Dunk, 2011
	internal knowledge on account of organizational learning	Alegre & Chiva, 2008; Tohidi & Jabbari, 2012
	learning occurring within an organization	Drucker, 1985
	a result from organizational learning process	McKee, 1992
	indicates transformational leadership style	Khan & Khan, 2019
	positive effect of product innovation on firm performance	Amores-Salvadó, Castro, & Navas-López, 2014; Lin, Tan, & Geng, 2013; Ramadani et al., 2019
Process Innovation	decreasing cost which affect better performance respectively	Bernstein & Kök, 2009
	antecedent, contingency, outcome, employee innovativeness	Badir, Frank, & Bogers, 2019; Dost, Badir, Sambasivan, & Umrani, 2020; Natalicchio, Ardito, Savino, & Albino, 2017;

Table2.4 Dimension of organizational innovation (Cont.)

Dimension	Related factors	Source
	interplay between firms and suppliers	Pérez-Luño, Wiklund, & Cabrera, 2011 Linder & Sperber, 2019

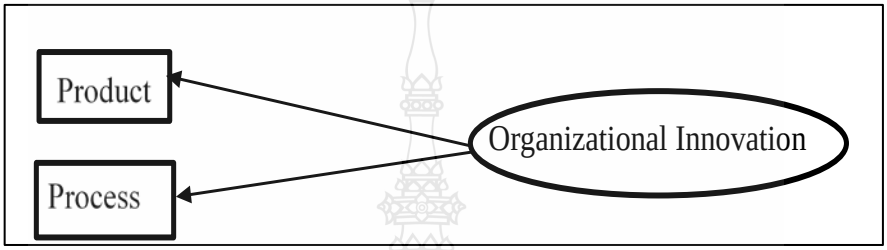


Figure 2.4 Organizational innovation (OI) (Camisón & Villar-López, 2014)

An innovation can be determined as crucial factor from market orientation contribute to positive firm performance (Agarwal, Erramilli, & Dev, 2003; Bodlaj, 2010; Han, Kim, & Srivastava, 1998; Wang & Chung, 2013). They presented the role of innovation that synchronize with market can support competitive advantage of firms from various areas and industries. Innovation affect competitive advantage to firms regardless of the environment (Hurley, Hult, & Knight, 2005). The higher innovation and quality of services, the more customer loyalty has increased (Rust & Oliver, 1994). Han et al. (1998)) and Acheson and Ferris (1990) pointed out that innovation is a factor contributing to better firm performance and associates of literature showed the performance positively. According to their consideration, innovation and absolute and effective exploration and discovery of new manners substituting existing ones is usually advocated by innovation.

If the level of innovation and quality of services improve, organizations can retain current customers and absorb more customers via attracting their loyalty, as a consequence of which their share in market and firm performance may increase (Rust, Zahorik, & Keiningham, 1994). The more valuable, incompletely imitable and rare innovations are, the higher performance will be.

Organizations with greater innovation will achieve better response from the environment, receiving the capabilities needed to increase firm performance and easy to harden sustainable competitive advantage (Hurley & Hult, 1998). Not promoting innovative projects, products, services, methods and activities will affect negatively on productivity and firm performance (Lööf & Heshmati, 2002). However, rarely studies indicated the organizational learning that may perform as moderator concerning to transformational leadership and organizational innovation. Then, this study proposed the following hypothesis:

H5: The relationship between transformational leadership and absorptive capacity is moderated by organizational learning.

H5a: The relationship between transformational leadership and potential absorptive capacity is moderated by organizational learning.

H5b: The relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning.

H6: The relationship between absorptive capacity and organizational innovation is moderated by organizational learning.

H6a: The relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning.

H6b: The relationship between realized absorptive capacity and organizational innovation is moderated by organizational learning.

H7: The relationship between transformational leadership and organizational innovation is moderated by organizational learning.

H8: Organizational learning moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.

H8a: Organizational learning moderates the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.

H8b: Organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.

2.6 Food Manufacturing Industry in Thailand.

Food manufacturing industry refer to industries that offer agricultural production, including horticultural sources, and are used primarily in food production, avoiding the transportation of goods and preservation, as well as machinery used in food. (Food processing equipment) food packaging to produce large quantities of food products, secure and convenient for the production or use in the next step and the storage and storage of plant products livestock. Food products may go through a preliminary stage or a step as a finished product.

2.6.1 The Importance of the food Industry in Thailand

The food industry was the first stent to be managed. Thailand began to announce the 1st national economic and social development plan in 1961 because the low-cost industries used foreign ships to increase Bills and can bring the rich resources of the country to develop for a lot of industrial purposes, making it easy to develop for study. Calculation is one of the key industries of the country that any government, no matter how many generations, provides. The importance and responsiveness of the "Thai Kitchen to the World Kitchen" that has been defined for more than 10 years, but the current government still continues with a 5-year regulation (2016-2021) as well as this industry. As well tail grows according to economic thinking, both from local administration and exports. This food industry also has a link to other production supporting industries. Packaging such as cans and lead live employment and higher national income.

The food industry is an essential industrial sector for the Thai economy and society. It is an industry that connects many downstream industries, and creates gross income products domestic ranked number 1 in the industrial sector valued at 941,693 million baht, representing 312,848 million baht from SMEs, or 33.2 percent of the gross domestic product in the food industry. There are 136,663 SMEs in the industry, representing 4.56 percent of the total. All SMEs of the country employed 524,497 people, representing 4.31 percent of the total employment. If considering the food production sector According to the Thai Industrial Standard classification 2009, it can be divided into 2 sub-categories, which are food production and beverage production. This can be

divided into 8 groups in the food manufacturing industry. (The Office of SMEs Promotion (OSMEP)).

2.6.2 Food Manufacturing Industry in Thailand

The Office of SMEs Promotion (OSMEP) defined medium manufacturing firms that generate income from 100-500 million Thai baht, and having number of employees between 50-200 persons. In considering large industrial firms, those firms have income more than 500 million Thai baht, and having number of employees more than 200 persons. The production of food products in Thailand are separated into 8 group as 1) Processing and preserving of meat, 2. Processing and preserving of fish, crustaceans and molluscs, 3. Processing and preserving of fruit and vegetables, 4. Manufacture of vegetable and animal oils and fats, 5. Manufacture of dairy products, 6. Manufacture of grain mill products, starches and starch products, 7. Manufacture of other food product (e.g. manufacture of bakery product, manufacture of sugar etc.), and 8. Manufacture of prepared animal feeds), Thailand has food manufacturing SMEs 13,444 unit, and this number has been continuously increased from the growth in food demand around the world.

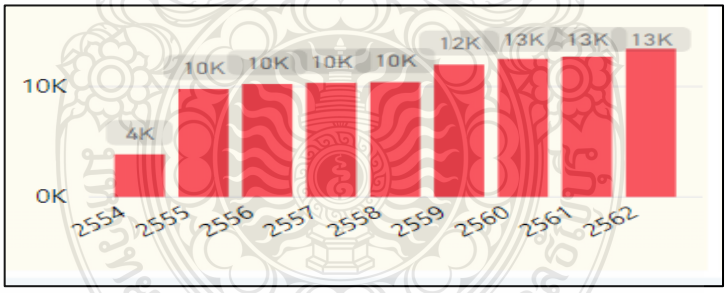


Figure 2.5 The diagram showing the yearly change of manufacturing firms
Source: https://app.powerbi.com

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

To carry out the empirical study of multi-variables in the conceptual framework, this study applied a systematic review of the literature to construct the deductive investigation according to the variables. The main objective is to clarify the influence of transformational leadership style on organizational innovation in the food manufacturing industry in Thailand. Moreover, there are moderators as organizational learning, moderated as absorptive capacity, and organizational innovation connected in the conceptual framework. In addition, there are number of firms in food manufacturing industry that have to be analyzed for the empirical result. Therefore, the quantitative analysis and in-depth interviews are applied to uncover the related variables.

3.2 Research Design

This research is a correlational study, which explained the relations of transformational leadership, organizational learning, absorptive capacity, that influence on the organizational innovation. The model applied a moderated – mediation statistical and analyzed by SPSS PROCESS MACRO (model 58, which moderated the both of independent and mediator variables path and the mediator-dependent path.), that suggest by Hays. This study determines the different level of organizational learning moderates with the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation. For the correlation study of this model, it can design the hypothesis as follow;

Hypothesis 1: Transformational leadership has a direct positive influence on organizational innovation.

Hypothesis 2: Transformational leadership has a direct positive influence on absorptive capacity.

Hypothesis 3: Absorptive capacity has a direct positive influence on organizational innovation.

Hypothesis 4: Transformational leadership has an indirect positive influence on organizational innovation through absorptive capacity.

Hypothesis 5: The relationship between transformational leadership and absorptive capacity is moderated by organizational learning.

Hypothesis 5a: The relationship between transformational leadership and potential absorptive capacity is moderated by organizational learning.

Hypothesis 5b: The relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning.

Hypothesis 6: The relationship between absorptive capacity and organizational innovation is moderated by organizational learning.

Hypothesis 6a: The relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning.

Hypothesis 6b: The relationship between realized absorptive capacity and organizational innovation is moderated by organizational learning.

Hypothesis 7: The relationship between transformational leadership and organizational innovation is moderated by organizational learning.

Hypothesis 8: Organizational learning moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.

Hypothesis 8a: Organizational learning moderates the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.

Hypothesis 8b: Organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.

A moderated- mediation model of research framework that explained the summarized of the hypothesis shown in figure 3.1 – 3.3 below.

This research applied the quantitative research design that used a cross-sectional investigation, postal survey methodology and a questionnaire as an instrument for data collection. Involved in-depth individual interviews with organization's key product development personnel (e.g., research and development manager)

The subject are firms operated in food manufacturing industry in Thailand because Thailand is one of the world's largest producers and exporters of food and processed food product and the finding and implications from this research will support and strengthen the competitiveness of the Thai food manufacturing industry.

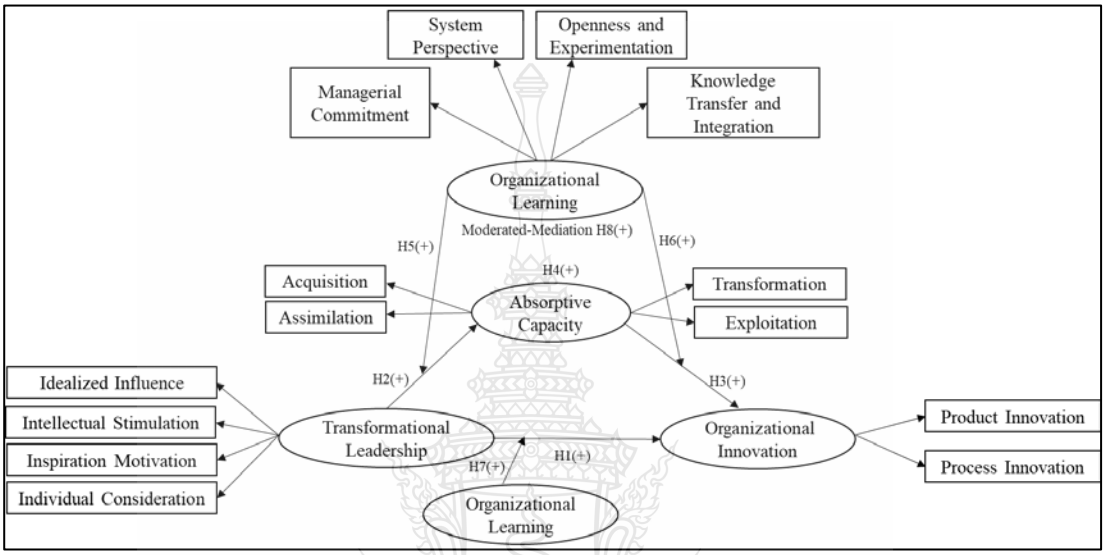


Figure 3.1 The proposed hypothesized structural model (Hypothesis 1-8)

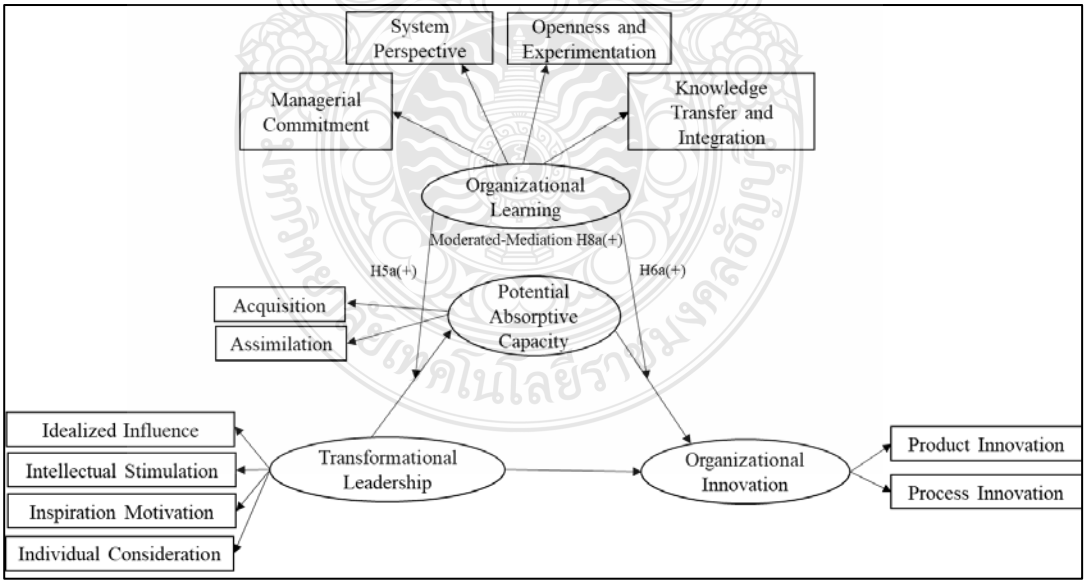


Figure 3.2 The proposed hypothesized structural model (Hypothesis 5a, 6a, 8a)

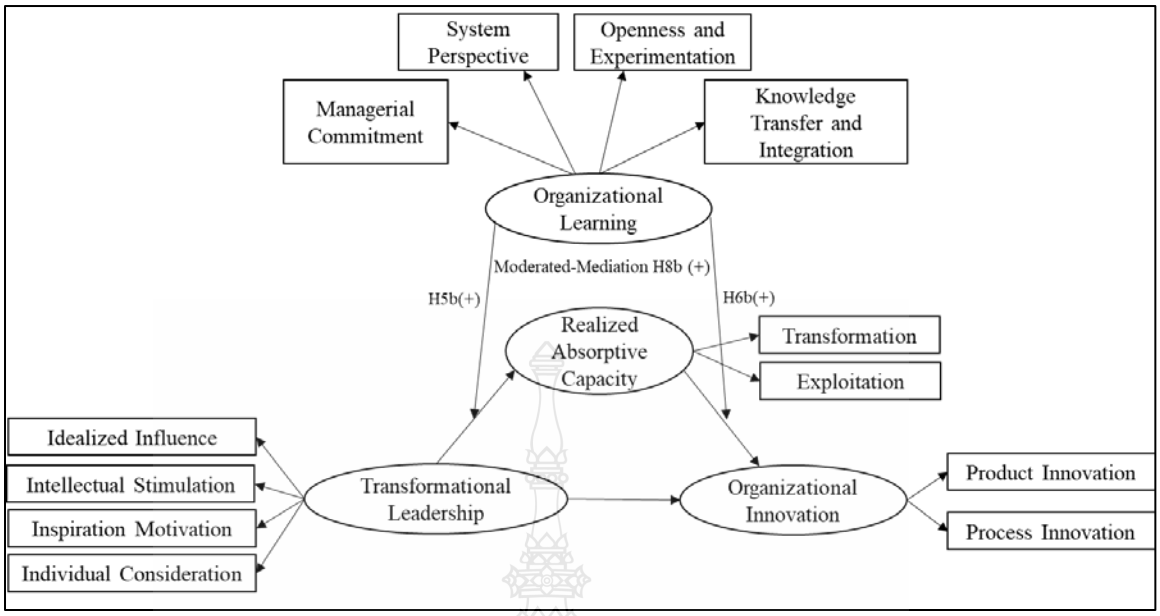


Figure 3.3 The proposed hypothesized structural model (Hypothesis 5b, 6b, 8b)

3.3 Population and Sample

According to this study, the theory testing was conducted by hypotheses testing of the multi-variables within the research framework. The study begins with the collection of quantitative data, that source of data utilized in this research is 1,777 medium and large size food manufacturing industry in Thailand.

The sample is members of food manufacturing industry in Thailand. The group members, who work involve product development in food manufacturing industry in Thailand because it has been found that innovation in the organization or absorptive capacity was due to in the employees, who work in research and development or employees, who work in product or process development. This study used a probability sampling technique which means that every member of the target population had equal opportunity to be selected. The size of the sample is prescribed to comprise of at least 10 - 20 examples per 1 parameter (Hair, Anderson, Babin, & Black, 2010). Within this study, there are 14 parameters; hence, the number of sampling subjects should between 140 - 280 samples. This covers the size of the samples group and appropriate for the data analysis (n>200) for the purpose of generating structural model formula(Madden & Dillon, 1982)

and enabling empirical data to be more sounded and credible. In this research, 200 samples are involved from food manufacturing industry in Thailand and sampling 3 product development workers per industry for protection the bias of opinions of employees. (Table 3.1) By collected data from 15 December 2020 to 10 April 2021 for a period of four month.

After that, In-depth interview for delving into interesting issues to obtain reliable data for further analysis. The interview will get an answer for research questions that are consistent with the research objectives. The number of key informants should not be too large, which would make it difficult to analyze the data ("DuPont's business strategy focused on emerging nations," 2009) (Onwuegbuzie & Leech, 2007). At the same time, they should not be so small that they cannot reach the point of data saturation (Flick, 2018). This research followed the concept of (Nastasi & Schensul, 2005), they suggest the interviewing key informant or in-depth interviews about 5-30 persons.

The researchers conducted in-depth interview of 5 managers, who involved product or process development of medium or large size firms in food industry that homogeneous population significance to reliable summarization. The in-depth interview from the managers because they had specialized knowledge and information's important of issue in this research. So, the in-depth interview method will be provided information for explained the result of this research from the related questions.

Table 3.1 Sample size of food manufacturing industry in Thailand.

Food manufacturing industry	Population	Sample	3 Sampling per industry
1. Processing and preserving of meat.	99	11	33
2. Processing and preserving of fish, crustaceans and molluscs.	175	20	60
3. Processing and preserving of fruit and vegetables.	147	17	51
4. Manufacture of vegetable and animal oils and fats.	113	13	39
5. Manufacture of dairy products.	48	5	15
6. Manufacture of grain mill products, starches and starch products.	642	70	210
7. Manufacture of other food product.	446	50	150
8. Manufacture of prepared animal feeds.	125	14	52
Total	1,777	200	600

3.4 Data Collection

For collecting this data, the researchers made a letter of courtesy to small and medium-sized enterprise and department of business development for requesting information on the type of food industry, the number of food industry, location, and telephone number.

After that, the researcher sent a letter by postal requesting support in answering the questionnaire by attaching the questionnaire to the person responsible for the product or process development. Because sending questionnaires by post, 20% of the questionnaires are returned(Anderson & Berdie, 1975), wherewith this research required the 200 samples size, accordingly the researcher send the total questionnaire 1,000 firms, which 3 forms per firm. Sending the questionnaire by postal, the respondent will respond immediately and not response if pass more than a week (Dillman, 1978) and if ten date have passed , the researcher should follow up the questionnaire from the respondents

(Fowler, 2009). So, ten days have passed from first day that respondent received the questionnaire the researcher would remind the respondent to submit the questionnaire and follow up the questionnaire periodically to get the most back queries.

For in-depth interview, the researcher made a request letter to interview the manager of the research and development department from an innovation award winning company or a company with a dedicated innovation center. Consequently, the letters were sent to the key informant for an interviewing request and appointments include appointment at a date, time and place. In reality, the time for interviewing was approximately 30-40 minutes each person.

3.5 Research Instrumentation

The instrument for data collection is questionnaires specifically designed to cover all variable within the framework. The conceptual framework has moderators as organizational learning, absorptive capability as mediator between independent variable as transformational leadership and dependent variable as organizational innovation. The semi- structured survey questionnaire is designed to simplify the flexibility and adjustment. The questionnaires are designed by using Likert Scale of Five levels range from strongly agree to strongly disagree.

The instrument of this study is divided into five sections of questionnaires combination in to a single questionnaire.

The first questionnaire is a survey for the background characteristics of the respondent includes firm size, firm age, firm export, join of firm, firm type, frequency of product development, and frequency of process development of food manufacturing industry in Thailand.

The second instrument measures transformational leadership styles, the construct was measured four composition including idealized influence, inspiration motivation, intellectual stimulation, and individual consideration. It was measured using a 23-item that is developed from literature review according to concept of (B. Bass & Avolio, 2006),which measure leader's behavior as perceived by their subordinates. All items were rated using a 5-point scale ranging from 1 ("Very strongly disagree") to 5 ("Very strongly agree").

The third instrument is organizational learning questionnaire, the construct was measured four composition including managerial commitment, system perspective, openness and experimentation, and knowledge transfer and integration. The organizational learning questionnaire (OLQ) measures organization learning in organization level as perceived by their subordinates. All items were rated using a 5-point scale ranging from 1 (“Very strongly disagree”) to 5 (“Very strongly agree”). It was measured by a 17 – item scale that is developed from literature review according to concept of Jerez-Gomez et al. (2005).

The fourth instrument is absorptive capacity questionnaire, the construct was measured four composition including acquisition, assimilation, transformation, and exploitation. The absorptive capacity questionnaire (ACAPQ) measures absorptive capacity behavior of employee. It was measured by a 21– item scale that is developed from literature review according to concept of by Zahra and George (2002) Further refined by (T. C. Flatten, Engelen, Zahra, & Brettel, 2011). It was measure absorptive capacity of organization as perceived by their subordinates. All items were rated using a 5-point scale ranging from 1 (“Very strongly disagree”) to 5 (“Very strongly agree”)

The last instrument is organizational innovation questionnaire, the construct was measured two composition including product innovation and process innovation. The organizational innovation questionnaire (OIQ) measures innovation of organization as perceived by their subordinates. All items were rated using a 5-point scale ranging from 1 (“Very strongly disagree”) to 5 (“Very strongly agree”). It was measured by a 13 – item scale that is developed from literature review according to concept of (Camisón & Villar-López, 2014)

The instrument for in-depth interview is the semi-structured interview, that is flexible for interview. The researcher developed the question for interview from the literature review and then send it to the advisor for check and improve to be appropriate and then the researcher categorized, analyzed and summarized the content from interview. The question for interview has 2 parts namely

Part 1 Demographic of key information

Part 2 The closed-ended question of transformational leadership, organizational learning, absorptive capacity, and organizational innovation as follow;

1. How does the transformational leadership important to your company?

2. How does the organizational learning function of the company affect to the organizational innovation of your company?

3. How does the absorptive capacity function of the company affect to the organizational innovation of your company?

4. What is the competitive advantage for the company, if can be organizational innovation?

5. How do the company solve about not accept innovation in company?

First of variable is transformational leadership, which is independent variable. The composition of the transformational leadership including idealized influence, inspiration motivation, intellectual stimulation, and individual consideration as shown in table 3.2

Table 3.2 Definition of the transformational leadership (Independent variable)

Variable	Definition	Source
Idealized Influence	The capability of leader to use their emotional influence on their subordinates. The leader is a role model, trust, clear vision.	Bass & Bass, 2009 Gomes, 2014 Bass and Avolio, 1994 Cavazotte, Moreno, & Hickmann, 2012
Inspiration Motivation	The leader can motivate, and challenge employees for work, arouse for the forward point of view about the vision and goal, shared meaning, encourage.	Bass & Avolio, 1994 McCleskey, 2014 Chan et al., 2015 Ngaithe, K'Aol, Lewa, & Ndwiga, 2016
Intellectual Stimulation	The leader stimulates the follower for the interest and awareness of problems in work and they can ability to conceptualize, newly in solution and integrated and analyze problems.	Bass, 1985 Bass & Avolio, 1990
Individual Consideration	The leader realizes the needs of individual follower, individual aspirations for achievement, individual consideration and provide nurturing support	Avolio & Bass, 1995 Zacher et al.,2014

Second of variable is organizational learning, which is moderator variable. The composition of the organizational learning including managerial commitment, system perspective, openness and experimentation, and knowledge transfer and integration as shown in table 3.3

Table 3.3 Definition of the organizational learning (Moderator variable)

Variable	Definition	Source
Managerial Commitment	The firm has to place their policy relevant to learning within an organization as culture that support creation and knowledge sharing to be fundamental value and the firm should encourage change from current situation to new situation	Hult & Ferrell, 1997 Nonaka & Takeuchi, 1995 Nonaka, 1994 Lei et al., 1999 Jerez-Gomez et al., 2005
System Perspective	The learning within an organization has to be conducted as system, information sharing, and common understanding knowledge integration from overall function is important to organizational learning.	Gould, 2009 Leonard-Barton, 2003 Ulrich, Jick, & Von Glinow, 1993 Jerez-Gomez et al., 2005
Openness and Experimentation	The organizational climate that open new ideas from various aspect from both external and internal will allow knowledge to be improved continuously in congruent with the situation.	Sinkula, 1994 Garwin, 1993 Knudsen & Mortensen, 2011 Jerez-Gomez et al., 2005 Wu, Lin, & Chen, 2013
Knowledge Transfer and Integration	Dissimilation of knowledge at an individual by communication and interaction within an organization, team work.	Nicolini & Meznar, 1995 Hult & Ferrell, 1997 Jerez-Gomez et al., 2005

The third of variable is absorptive capacity, which is mediator variable. The composition of the absorptive capacity including acquisition, assimilation, transformation, and exploitation as shown in table 3.4

Table 3.4 Definition of the absorptive capacity (Mediator variable)

Variable	Definition	Source
Acquisition	The capability of firms to acquire knowledge from outside for significant supporting to their operation and technological transformation that will occur in the future.	Zahra & George, 2002 Keller, 1996 W. Keller, 1996 T. C. Flatten et al., 2011
Assimilation	The external knowledge is to assimilate this knowledge by routine work along the process of operation that support staffs to analyze, interpret, understand external information, and has the system for supported the operation of any firms in communication sharing and decision making	Kim, 1998 Q. Tu, M. A. Vonderembse, T. Ragu-Nathan, & T. W. Sharkey, 2006 Saraf, Liang, Xue, & Hu, 2013 Zahra and George, 2002
Transformation,	The firm transform the newly knowledge so that it can be adapted to firm and combination abilities new knowledge from external sources and develop new knowledge for the firm.	Zahra and George, 2002 Kogut & Zander, 1992; Van den Bosch, Volberda, & De Boer, 1999
Exploitation	Transform knowledge into routine operation, and creating of innovation or technology.	Zahra and George, 2002 Seo et al., 2015 Zobel, 2017

The last of variable is organizational innovation, which is dependent variable. The composition of the absorptive capacity organizational innovation including product innovation and process exploitation as shown in table 3.5

Table 3.5 Definition of the organizational innovation (Dependent variable)

Variable	Definition	Source
Product Innovation	The organizational activities in relation with the development and introduction of new products to the market prior competitors	Camisón & Villar-López, 2014 Chenhall, Kallunki, & Silvola, 2011 Dunk, 2011
Process Innovation	The important in decreasing cost which affect better performance respectively and develop in process or quality management for develop product innovation	Camisón & Villar-López, 2014 Bernstein & Kök, 2009 Capon, Farley, Lehmann, & Hulbert, 1992 Gopalakrishnan & Damanpour, 1997

3.6 Content Validity and Instrument Reliability

Designing of the questionnaire to cover all variables is complicated under the following stages.

3. 6.1 Reviewing of the literatures and other studies concerning to variables appear in the framework.

3. 6. 2 Carefully design questions appropriately to the subjects in the food manufacturing industry in Thailand.

3. 6. 3 Each set of questionnaires have been examined concerning its language use and the extensiveness of content, accuracy, and appropriateness. The questionnaires are then subjected under content validity, which examines:

Index of item congruence: IOC as viewed by three experts, followed by alterations and amendments as suggested by the experts prior to the study. This research, the questions listed within the questionnaires contain IOC between 0.60-1.00. The evaluation assessments are as follow.

If the expert sure that the item congruent to objective = +1

If the expert unsure that the item congruent to objective = 0

If the expert sure that the item not congruent to objective = 1

Using the below formula

$$IOC = \frac{\sum R}{N}$$

R = the sum of experts' opinion

The IOC for this research was evaluated by three experts, the IOC score of all item was 0.67 – 1.00 which was considered acceptable. The suggestion of the wording has been adjusted follow the expert for improve the validity of the questionnaires. The IOC of variable shown in table 3.6.

Table 3.6 The IOC of variable

Variable	Score of IOC
Transformational Leadership	1.00
Organizational Learning	1.00
Absorptive Capacity	0.835
Organizational Innovation	1.00

In considering the reliability, the researcher conducted the reliability 30 samples of pilot study to meet the Cronbach alpha coefficient of higher than 0.7 (Nunnally, 1994). Cronbach alpha will be conducted to measure reliability of questionnaires. Cronbach is one of the most popular reliability statistics in use today (Cronbach, 1951). Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to determine its reliability. Cronbach alpha is appropriate to test reliability of

the transformational leadership questionnaire, organizational learning questionnaire, absorptive capacity questionnaire, and organizational innovation questionnaire.

This study sent the 30 questionnaires for pilot study found that the result of the measurement reliability of questionnaires, Cronbach alpha coefficient from the pilot study presented in Table 3.7 that the items have high relative internal consistency among items used in this study was acceptable.

Table 3.7 Cronbach alpha coefficient from the pilot study

Variables	Cronbach's Alpha
Transformational Leadership	0.970
Organizational Learning	0.936
Absorptive Capacity	0.951
Organizational Innovation	0.955

3.7 Sequence of Analysis

The questionnaire will be analyzed into the following sections:

3.7.1 Content validity and reliability for tryout sampling.

3.7.2 Descriptive statistics analysis for characteristics.

3.7.3 Reliability testing by Cronbach's alpha testing, which determines the internal consistency or average correlation of items in a survey instrument to determine its reliability.

3.7.4 Multicollinearity, which can be indicated by tolerance value, which must be more than 0.1 or the Variance Inflation Factor (VIF) value must be lower 10 (Hair et al., 2010).

3.7.5 Construct validity

1) Confirm factor analysis: estimated parameter base on Maximum Likelihood by AMOS. First order confirmatory factor analysis for testing the questionnaire items, which can be an accurate representation for the observe variables.

Table 3.8 Indices for model assessment (Goodness of fits) (Hair et al., 2010)

Criteria	Acceptable level
Chi-Square	-
Degree of freedom	-
Chi-Square/df	< 2 good fit
	< 3 adequate fit
	< 5 cut off
p-value	P >0.05
GFI	≥ 0.90
AGFI	≥ 0.80
RMR	Close to zero
RMSEA	< 0.10
NFI	> 0.9
CFI	> 0.9

2) Test for composite reliability (CR), which is the measurement for all reliability from the different items but it was a similar construct. CR should be more than 0.75.

3) Test for convergent validity that was identical precision, which can be determined from value of Average Variance Extracted (AVE), which is a variance of the indicators. It should be greater than 0.50, indicating that the model had structural certainty and it was suitable in terms of convergence precision(Fornell & Larcker, 1981; Gronemus , Hair, Crawford, Nyalwidhe, Cunnion, &Krishna, 2010).

4) Test for discriminant validity, that was a measured by comparing the values Root Average Variance Extracted ($\sqrt{AVE}$) with the correlation between constructs. The $\sqrt{AVE}$ of each diagonal row must be greater than the correlation value of all constructs vertically and horizontally (Fornell & Larcker, 1981; Sarstedt, Ringle, Henseler, & Hair, 2014).

3.7.6 Estimated parameters with the Process macro (Model 58) by Hayes (2017). Specifically, the researcher investigated the moderated effect of organizational learning on relationship between; 1) transformational leadership and absorptive capacity

2) absorptive capacity and organizational innovation and 3) transformational leadership and organizational innovation through absorptive capacity. As shown in figure 3.2-3.4

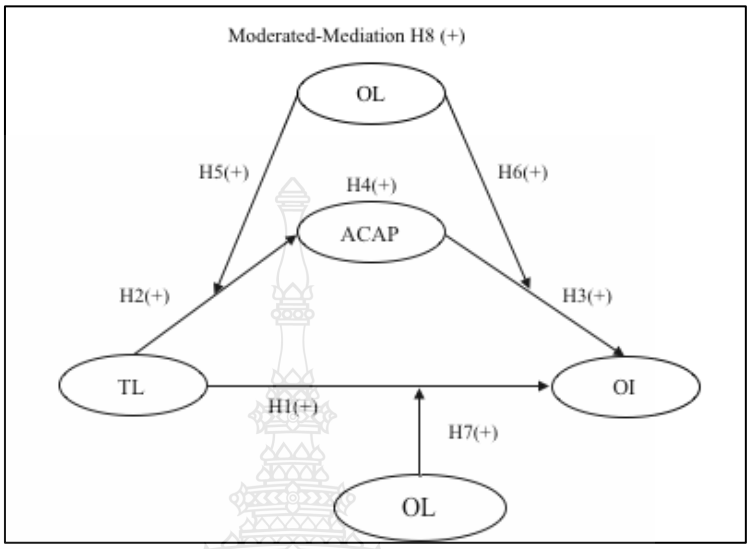


Figure 3.4 Organizational learning moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.

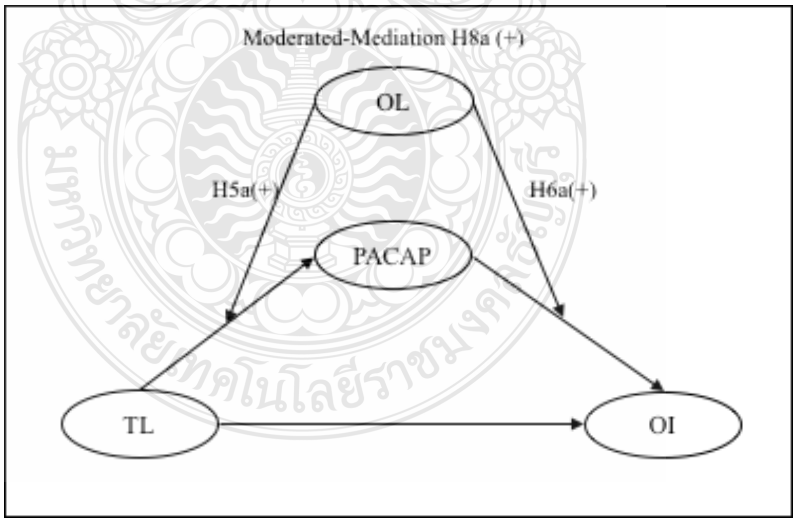


Figure 3.5 Organizational learning moderates the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.

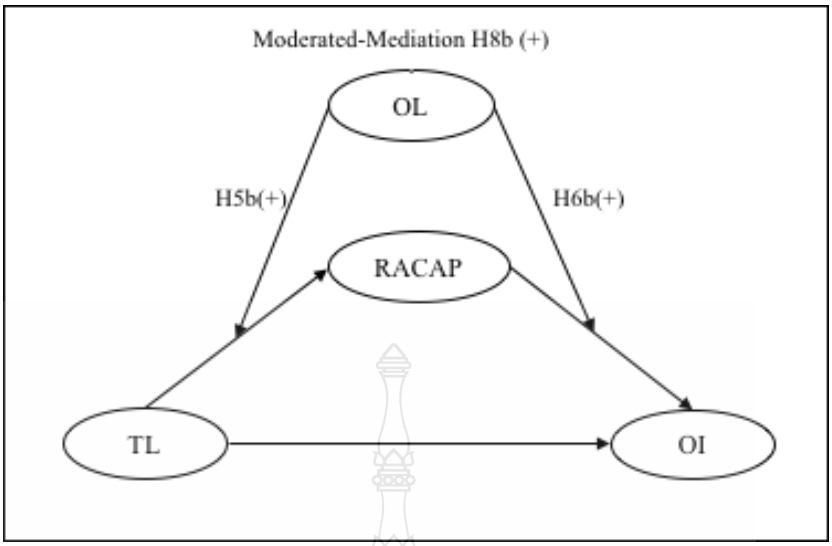


Figure 3.6 Organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.

CHAPTER 4
RESEARCH RESULTS

4.1 Introduction

This chapter presents empirical results that clarify the link between multi-variables derived from the statistical process. There are transformational leadership, absorptive capability, organizational learning, and organizational innovation. The absorptive capacity performs as mediator while organizational learning plays a moderator.

4.2 Data Preparation

4.2.1 The Sample Response Rate

The sample is members of food manufacturing industry in Thailand. The group members, who work involve product development in food manufacturing industry in Thailand. Out of the total 1,000 firms, there were 292 questionnaires from 208 firms returned to the researcher which accounted for 20.8 percent response rate. There were 21 sets from 8 firms was incomplete questionnaires and eliminated, so there were complete questionnaires 271 questionnaires from 200 firms. The samples size of the returned questionnaire by food manufacturing as shown in table 4.1

Table 4.1 The samples size of the returned questionnaire

Food manufacturing industry	Sample size	3 product development worker per industry	Returned of Questionnaires
1. Processing and preserving of meat.	11	33	15
2. Processing and preserving of fish, crustaceans and molluscs.	20	60	22
3. Processing and preserving of fruit and vegetables.	17	51	22
4. Manufacture of vegetable and animal oils and fats.	13	39	22
5. Manufacture of dairy products.	5	15	9
6. Manufacture of grain mill products, starches and starch products.	70	210	84
7. Manufacture of other food product.	50	150	81
8. Manufacture of prepared animal feeds.	14	42	16
Total	200	600	271

4.3 Characteristics of Data

Firm information received such as size of firm, age of firm, type of export, type of owner, type of firm, frequency of develop product innovation, and frequency of develop process innovation. As show in table 4.2

Table 4.2 The demographic of firm

Characteristics	Frequency	Percentage
Size		
Medium size	66	33.0
Large size	134	67.0
Export		
Non export	71	35.5
Export	129	64.5
Owner		
Thai	160	80.0
Join	40	20.0
Type of firm		
Processing and preserving of meat	11	5.5
Processing and preserving of fish, crustaceans and molluscs	20	10.0
Processing and preserving of fruit and vegetables	17	8.5
Manufacture of vegetable and animal oils and fats	13	6.5
Manufacture of dairy products	5	2.5
Manufacture of grain mill products, starches	70	35.0
Manufacture of other food product	50	25.0
Manufacture of prepared animal feeds	14	7.0
Development of product innovation		
Every 1 years	186	93.0
Every 2 years	14	7.0
Development of process innovation		
Every 1 years	153	76.5
Every 2 years	27	13.5
Every 3 years	20	10.0

This data of 200 food manufacturing industry can be summarized as followed.33.0 % of the respondents were in the medium size firm and 67.0 % were in

large size. 35.5% of the firm is non export and 64.5% is export firm. Average of the firm's age is 27.87 years (minimum = 2, maximum = 96). The percentage of the respondents are in processing and preserving of meat about 5.5%, in processing and preserving of fish, crustaceans and molluscs about 10.0%, in processing and preserving of fruit and vegetables about 8.5%, in manufacture of vegetable and animal oils and fats about 6.5%, in manufacture of dairy products about 2.5%, in manufacture of grain mill products, in starches and starch products about 35.0%, in manufacture of other food product about 25.0%, and the last is manufacture of prepared animal feeds is 7.0%.

4.4 Descriptive Statistics

4.4.1 Transformational Leadership

Transformational leadership can measure by four observe variable include the idealized influence, inspiration motivation, intellectual stimulation, and individual consideration. The statistical analysis, as shown in table 4.3

Table 4.3 Descriptive statistics for transformational leadership

Variable	Mean	Std. Deviation
Idealized Influence	4.023	0.603
Inspiration Motivation	3.800	0.664
Intellectual Stimulation	3.776	0.722
Individual Consideration	3.742	0.768

Idealized Influence had the highest mean value is 4.023, next is Inspiration Motivation (Mean = 3.800), later is Intellectual Stimulation (Mean = 3.776), and Individual Consideration (Mean = 3.742), respectively.

4.4.2 Organizational Learning

Organizational learning can measure by four observe variable include managerial commitment, system perspective, openness and experimentation, and knowledge transfer and integration. The statistical analysis, as shown in table 4.4

Table 4.4 Descriptive statistics for organizational learning

Variable	Mean	Std. Deviation
Managerial Commitment	3.583	0.786
System Perspective	3.975	0.601
Openness and Experimentation	3.730	0.719
Knowledge Transfer and Integration	3.653	0.718

System Perspective had the highest mean value is 3.975, next is Openness and Experimentation (Mean = 3.730), Knowledge Transfer and Integration (Mean = 3.653), and Managerial Commitment (Mean = 3.583), respectively.

Consideration the level of organizational learning in low, medium, high for moderated – mediation model found that, the organizational learning value lower 3.081 is low level, 25 firms. The organizational learning value between 3.081 to 4.371 is medium level, 150 firms. The organizational learning value upper 4.371 is high level, 25 firms. Shown in table 4.5

Table 4.5 Number of firms group by organizational learning level

Organizational leaning value	Level	Number of firms
Lower 3.081	Low	25
Between 3.081 to 4.371	Medium	150
Upper 4.371	High	25

4.4.3 Absorptive Capacity

Absorptive capacity can measure by four observe variable include acquisition, assimilation, transformation, and exploitation. The statistical analysis, as shown in table 4.6

Table 4.6 Descriptive statistics for absorptive capacity

Variable	Mean	Std. Deviation
Acquisition	3.867	0.564
Assimilation	3.795	0.672
Transformation	3.793	0.690
Exploitation	3.723	0.703

Acquisition had the highest mean value is 3.867, next is Assimilation (Mean = 3.795), Transformational (Mean = 3.793), and Exploitation (Mean = 3.723), respectively.

4.4.4 Organizational Innovation

Organizational innovation can measure by two observe variable include product innovation and process innovation. The statistical analysis, as shown in table 4.7

Table 4.7 Descriptive statistics for organizational innovation

Variable	Mean	Std. Deviation
Product Innovation	3.877	0.532
Process Innovation	3.821	0.563

Product Innovation had the highest mean value is 3.877, and Process Innovation has a lowest mean value 3.821

4.5 Reliability Testing

The result of the reliability of questionnaires, Cronbach alpha coefficient from the data for this study shown in Table 4.8 that the items had high relative internal consistency among items used in this study is acceptable.

Table 4.8 Result of Cronbach's alpha coefficient

Variable	Cronbach's Alpha
Transformational Leadership	0.966
Organizational Learning	0.951
Absorptive Capacity	0.949
Organizational Innovation	0.892

Transformational leadership had 23 items in questionnaire and Cronbach's alpha value was 0.966. Organizational learning had 17 items in questionnaire and Cronbach's alpha value was 0.951. Absorptive capacity had 21 items in questionnaire and Cronbach's alpha value was 0.949. The last was organizational innovation had 13 items in questionnaire and Cronbach's alpha value was 0.892.

4.6 Multicollinearity Testing

Multicollinearity was an examines the relationship between independent variable. It can be indicated by tolerance value, which must be more than 0.1 or the Variance Inflation Factor (VIF) value must be lower 10 (Hair et al.,2010). For this reseach the data had tolerance value between 0.179 to 0.324 and VIF value between 3.086 to 5.586, so this data no multicollinearity between the variable.

4.7 Construct Validity

Validation of the model to verify that it was a suitable model for measurement. The researcher tested the suitability by three theoretical models as follows:

4.7.1 Test for Composite Reliability (CR), which is the measurement for all reliability from the different items but it was a similar construct. CR should be more than 0.5

$$\text{CR} = \frac{(\sum \text{Factor Loading})^2}{(\sum \text{Factor Loading})^2 + \sum(\text{Error})}$$

4.7.2 Test for convergent validity that was identical precision, which can be determined from value of Average Variance Extracted (AVE), which is a variance of the

indicators. It should be greater than 0.50, indicating that the model had structural certainty and it was suitable in terms of convergence precision (Fornell & Larcker, 1981; Hair et al., 2010).

$$\text{AVE} = \frac{\sum(\text{Factor Loading}^2)}{\text{n}}$$

4.7.3 Discriminant validity, that was a measured by comparing the values Root Average Variance Extracted ($\sqrt{AVE}$) with the correlation between constructs. The $\sqrt{AVE}$ of each diagonal row must be greater than the correlation value of all constructs vertically and horizontally (Fornell & Larcker, 1981; Hair et al., 2010).

$$\sqrt{AVE} > \text{r}$$

When the model had convergent validity and discriminant validity, it can be able to conclude that the model was a structurally accurate. This was the property of the indicator can measure the construct correctly (Fornell & Larcker, 1981).

The measurement model was assessed by using Confirmatory Factor Analysis (CFA) for examining the relationship between observed variables.

The testing results of Confirm Factor Analysis can be shown followed;

4.7.4 Structure of Transformational Leadership

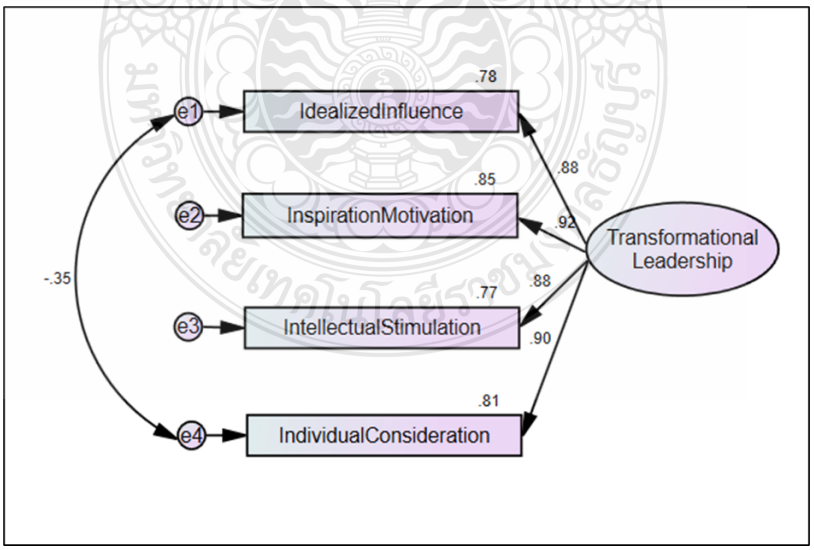


Figure 4.1 Measurement model of the first order CFA of transformational leadership

Table 4.9 Model fit analysis for transformational leadership

Criteria	Value	Acceptable level
Chi-Square	0.131	-
Degree of freedom	1	-
Chi-Square/df	0.131	< 2
p-value	0.717	P >0.05
GFI	1.000	≥ 0.90
AGFI	0.997	≥ 0.80
RMR	0.001	Close to zero
RMSEA	0.000	< 0.10
NFI	1.000	> 0.9
CFI	1.000	> 0.9

The result value of goodness of fit test was acceptable, so the construct of transformation leadership variable had according to empirical data.

4.7.5 Structure of Organizational Learning

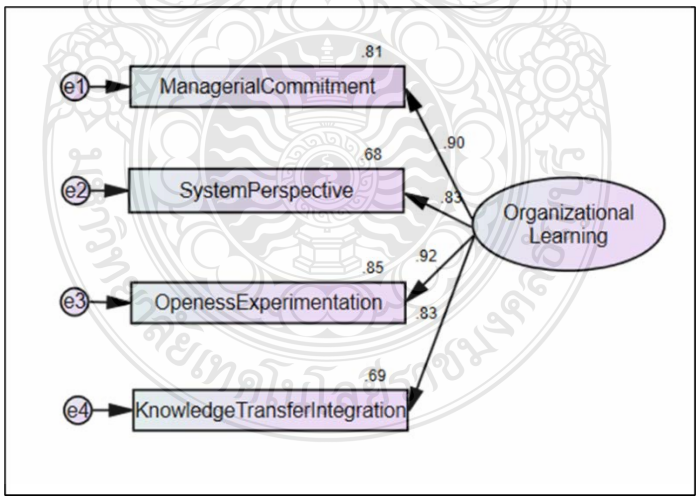


Figure 4.2 Measurement model of the first order CFA of organizational learning

Table 4.10 Model fit analysis for organizational learning

Criteria	Value	Acceptable level
Chi-Square	1.418	-
Degree of freedom	2	-
Chi-Square/df	0.709	<2
p-value	0.492	P >0.05
GFI	0.996	≥ 0.90
AGFI	0.982	≥ 0.80
RMR	0.003	Close to zero
RMSEA	0.000	< 0.10
NFI	0.998	> 0.9
CFI	1.000	> 0.9

The result value of goodness of fit test was acceptable, so the construct of organizational learning variable had according to empirical data.

4.7.6 Structure of Absorptive Capacity

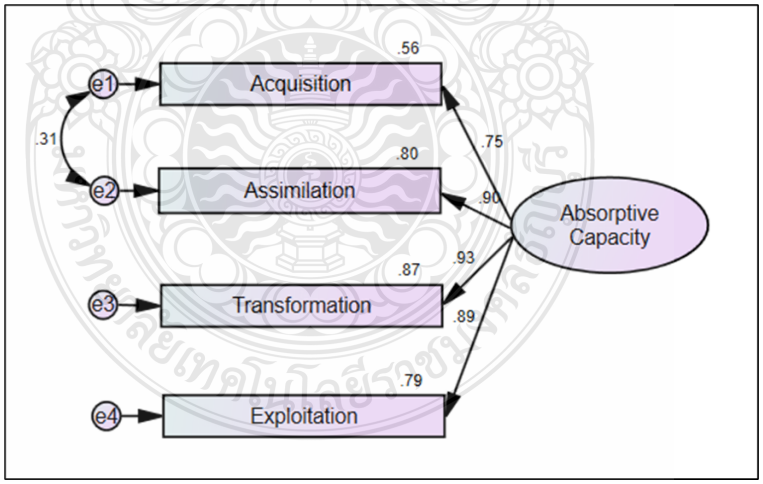


Figure 4.3 Measurement model of the first order CFA of absorptive capacity

Table 4.11 Model fit analysis for absorptive capacity.

Criteria	Value	Acceptable level
Chi-Square	2.306	-
Degree of freedom	1	-
Chi-Square/df	2.306	< 3
p-value	0.129	P >0.05
GFI	0.994	≥ 0.90
AGFI	0.943	≥ 0.80
RMR	0.003	Close to zero
RMSEA	0.081	< 0.10
NFI	0.997	> 0.9
CFI	0.998	> 0.9

The result value of goodness was acceptable, so the construct of absorptive capacity variable had according to empirical data.

4.7.8 Structure of Organizational Innovation

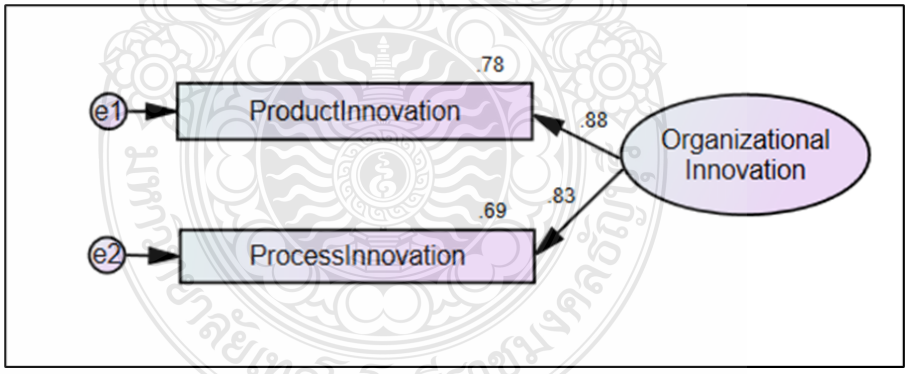


Figure 4.4 Measurement model of the first order CFA of organizational innovation

Table 4.12 Model fit analysis for organizational innovation

Criteria	Value	Acceptable level
Chi-Square	0.000	-
Degree of freedom	1	-
Chi-Square/df	0.000	< 2
p-value	1.000	P >0.05
GFI	1.000	≥ 0.90
AGFI	1.000	≥ 0.80
RMR	0.001	Close to zero
RMSEA	0.000	< 0.10
NFI	1.000	> 0.9
CFI	1.000	> 0.9

The result value of goodness of fit test was acceptable, so the construct of organizational innovation variable had according to empirical data.

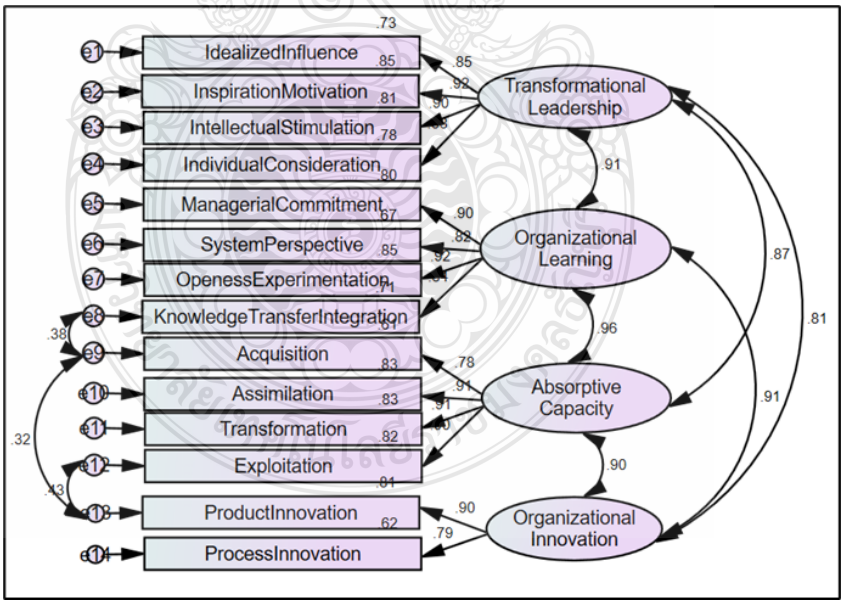


Figure 4.5 Measurement model of Confirm Factor Analysis

Table 4.13 Model fit analysis for measurement model

Criteria	Value	Acceptable level
Chi-Square	160.119	-
Degree of freedom	68	-
Chi-Square/df	2.355	< 3
p-value	0.000	P > 0.05
GFI	0.902	≥ 0.90
AGFI	0.849	≥ 0.80
RMR	0.011	Close to zero
RMSEA	0.083	< 0.10
NFI	0.950	> 0.9
CFI	0.970	> 0.9

The result value of goodness of fit test was acceptable, so all construct of independent and dependent variables had according to empirical data, as shown in table 4.12 and all of factor loading had value between 0.78-0.92, which were more than 0.70, so the model had acceptable (Chin, 1998). Next to, shown the value of construct validity and discriminant validity (Table 4.14-4.18)

Table 4.14 Convergent validity: Factor loading, R^2, Composite Reliability (CR), Average Variance Extracted (AVE) of transformational leadership

Variables	Factor loading	R^2	SE	CR	AVE
Transformational Leadership				0.938	0.791
Idealized Influence	0.854	0.729	0.271		
Inspiration Motivation	0.923	0.852	0.148		
Intellectual Stimulation	0.900	0.810	0.190		
Individual Consideration	0.880	0.775	0.225		

The construct of Transformational Leadership had factor loading between 0.854 – 0.923, which were all more than 0.70. Composite Reliability had value 0.942, and AVE had value 0.791, then all of indicators were acceptable for construct reliability.

Table 4.15 Convergent validity: Factor loading, R^2, Composite Reliability (CR), Average Variance Extracted (AVE) of organizational learning

Variables	**Factor loading**	R^2	**SE**	**CR**	**AVE**
Organizational Learning				0.927	0.760
Managerial Commitment	0.895	0.801	0.199		
System Perspective	0.822	0.675	0.325		
Openness and Experimentation	0.922	0.851	0.149		
Knowledge Transfer and Integration	0.844	0.712	0.285		

The construct of Organizational Learning had factor loading between 0.822 – 0.922, which were all more than 0.70. Composite Reliability had value 0.927, and AVE had value 0.760, then all of indicators were acceptable range for construct reliability.

Table 4.16 Convergent validity: Factor loading, R^2, Composite Reliability (CR), Average Variance Extracted (AVE) of absorptive capacity

Variables	**Factor loading**	R^2	**SE**	**CR**	**AVE**
Absorptive Capacity				0.930	0.771
Acquisition	0.783	0.613	0.387		
Assimilation	0.910	0.828	0.172		
Transformation	0.909	0.826	0.174		
Exploitation	0.903	0.815	0.185		

The construct of Absorptive Capacity had factor loading between 0.783 – 0.910, which were all more than 0.70. Composite Reliability had value 0.931, and AVE had value 0.771, then all of indicators were acceptable for construct reliability.

Table 4.17 Convergent validity: Factor loading, R^2, Composite Reliability (CR), Average Variance Extracted (AVE) of organizational innovation

Variables	Factor loading	R^2	SE	CR	AVE
Organizational Innovation				0.834	0.716
Product Innovation	0.899	0.807	0.193		
Process Innovation	0.790	0.625	0.375		

The construct of Organizational Innovation had factor loading between 0.790 – 0.899, which were all more than 0.70. Composite Reliability had value 0.834, and AVE had value 0.716, then all of indicators were acceptable for construct reliability.

Table 4.18 Discriminant validity: comparison of square root AVE with correlation between construct

	Transformational Leadership	Organizational Learning	Absorptive Capacity	Organizational Innovation
Transformational Leadership	**0.890**			
Organizational Learning	0.910	**0.871**		
Absorptive Capacity	0.868	0.963	**0.878**	
Organizational Innovation	0.808	0.906	0.896	**0.846**

The square root of AVE shown as bold at diagonal

This result of construct validity found that the convergent validity was acceptable but discriminant validity non-acceptable because the both theory of organizational learning and absorptive capacity was located between the field of dynamic capacity. Although discriminant not good, others indicator indicated was good. So, it can be accepted.

4.8 Moderated – Mediation Analysis from Model 58

The mediator variable is a link the relationship between the independent and the dependent variables. It illustrates the process as why the independent variables effect on dependent and how to the independent variables effect on dependent variables. The influence of mediator can to clearly explain the mechanism of independent variables that influence to dependent variable (Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004; A. D. Wu & Zumbo, 2008).

The moderator variable is an impact variable to the path of relationship between variables, it can be change on size or sign of relation. The mediator and moderator variable can joint analysis is called moderated mediation model or mediated moderation model. The effect on the study like this get the result of research is accurate (Piriyakul, 2015).

The regression analysis can analyze mediation model but result of estimate value of mediator variable is lower than it should be because the influence of error measurement result to decrease relation between variable, so the estimate of independent variable to dependent variable was high (Baron & Kenny, 1986).

This research use Process Macro; Model 58 for testing the hypotheses, which is one or more mediators (which moderates both the independent variables- mediator path and the mediator - dependent variables path). The moderated – mediation framework of conceptual diagram and statistical diagram analysis for hypothesis, shown in figure 4.6-4.7, the code of constructs in table 4.19, and the summarized result of a moderated-mediation analysis, as shown follow;

4.9 Organizational learning moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation

Table 4.19 The code of constructs

Construct		Code (Model58)
Transformational leadership	TL	X
Organizational learning	OL	W
Absorptive capacity	ACAP	M
Organizational innovation	OI	Y

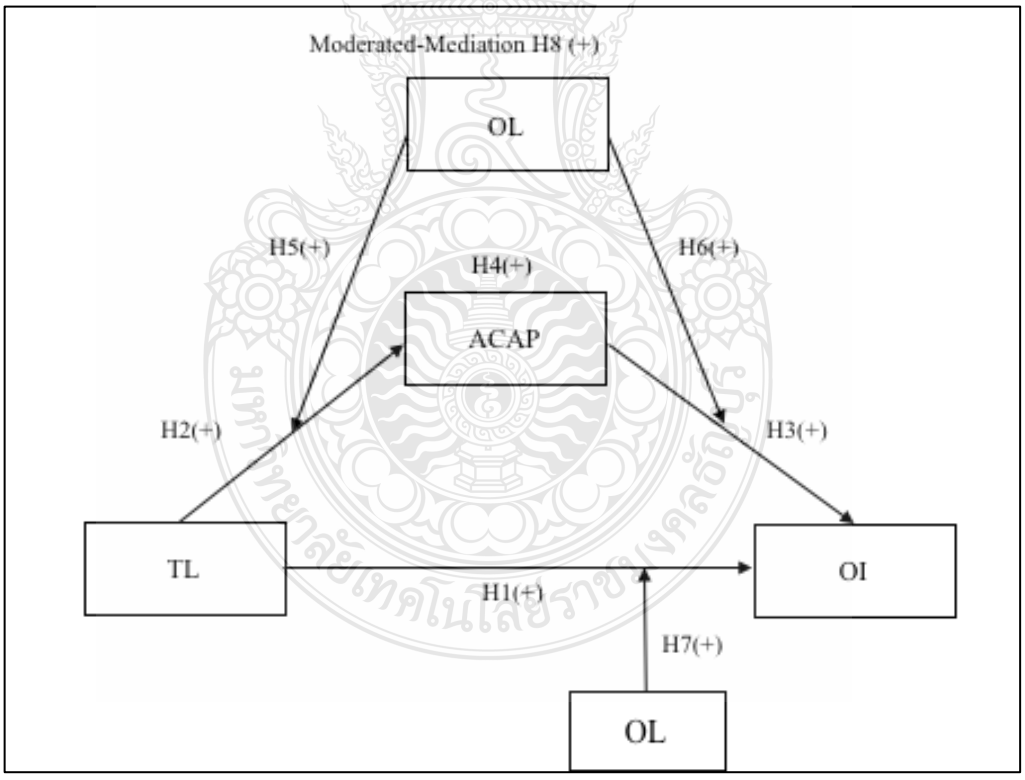


Figure 4.6 Conceptual framework

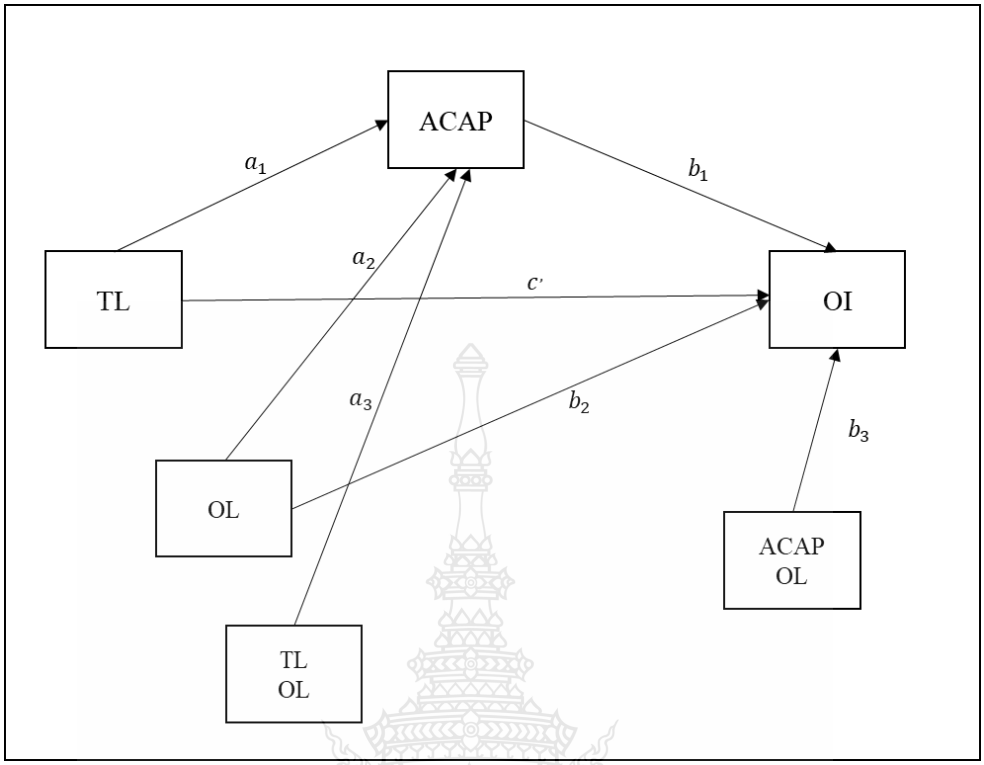


Figure 4.7 Statistical diagram of moderated – mediation analysis from model 58

Considering the Outcome Variable: Direct and Indirect Effect (Model 4)

Table 4.20 Result for model summary of outcome variable of TL, ACAP

Process Macro model 4							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
ACAP	.808	.652	.120	371.515	1.000	198.000	.000
	coeff	se	t	p	LLCI	ULCI	
Constant	.903	.153	5.921	.000	.602	1.204	
TL → ACAP	.755	.039	19.275	.000	.678	.833	
	R	R^2	MSE	F	df1	df2	p
OI	.796	.634	.097	170.411	2.000	197.000	.000
	coeff	se	t	p	LLCI	ULCI	
Constant	1.161	.148	7.825	.000	.869	1.454	
TL→OI	.103	.060	1.732	.085	-.014	.221	
ACAP→OI	.602	.064	9.438	.000	.476	.727	

Table 4.20 Result for model summary of outcome variable of TL, ACAP (Cont.)

Total Effect Model	**R**	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
	.684	.468	.140	174.235	1.000	198.000	.000
	Effect	se	t	p	LLCI	ULCI	
Total Effect	.558	.042	13.200	.000	.474	.641	
Direct Effect	.103	.060	1.732	.085	-.014	.221	
	Effect	BootSE	Boot LLCI	Boot ULCI			
Indirect Effect	.454	.072	.325	.603			

From table 4.20 First, consideration about the total effect of TL on OI, found that the total effect of TL on OI had the positive effect 0.558, statistical significance at a level of .001.

Second, consideration about the indirect effect of TL on OI through ACAP, found that the indirect effect of TL on OI through ACAP had the positive effect 0.454, statistical significance at a. level of .05. And at the statistical significance level of .05, TL had not direct effect on OI, which the coefficient effect 0.103.

Considering the Outcome Variable: OI (Model 1)

Table 4.21 Result for model summary of outcome variable of, TL, OL, OI

Process Macro model 1							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	p
OI	.797	.637	.097	113.377	3.000	196.000	.000
	Model						
	coeff	se	t	p	LLCI	ULCI	
Constant	3.787	.027	140.116	.000	3.734	3.840	
TL→OI	.092	.069	1.347	.179	-.043	.228	
OL→OI	.623	.067	9.238	.000	.490	.756	
TL*OL→OI	.174	.046	3.827	.000	.084	.264	

Table 4.21 Result for model summary of outcome variable of, TL, OL, OI (Cont.)

Tests of highest order unconditional interactions, X = TL by W =OL interaction							
		R2-chng	F	df1	df2	p	
X*W		.027	14.650	1.000	196.000	.000	
Condition effect of the focal predictor at values of the moderator (s)							
(OL value in conditional in graph are the mean and +/- SD from the mean.)							
	OL	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
LOW	-.645	-.020	.071	-.284	.777	-.160	.119
MEDIUM	.000	.092	.069	1.347	.179	-.043	.228
HIGH	.645	.205	.078	2.619	.009	.051	.359

From Table 4.21 Third, consideration about the moderation effect, found that at the statistical significance level of .001, OL had an influence on OI, which the coefficient influence 0.623 and the interaction effect between TL and OL influence on OI was significant, which the coefficient influence 0.174 that mean the relationship between TL on OI was moderated by level of OL. On the contrary, at the statistical significance level of .05, TL had not influence on OI, which the coefficient influence 0.092.

Tests of highest order unconditional interactions found that the interaction effect between TL and OL influence on OI was significant, which mean the relationship between TL on OI was moderated by level of OL.

Testing level of moderated for OL (pick-a-point), which testing three groups of dividing levels of OL into three groups high, medium, low (+ -1SD) found that the high level of OL would be result to level of OI at high level. So, at significant level .01, the high level of OL had an influence on relationship between TL and OI.

Considering the outcome variable: ACAP (Model 58)

Table 4.22 Result for model summary of outcome variable of ACAP, TL, OL

Process Macro model 58							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
ACAP	.903	.815	.064	288.546	3.000	196.000	.000
Model							
	coeff	se	t	p	LLCI	ULCI	
Constant	-.022	.022	-1.012	.313	-.066	.021	
TL→ACAP	.151	.056	2.709	.007	.041	.262	
OL→ACAP	.722	.055	13.120	.000	.613	.830	
TL*OL→ACAP	.065	.037	1.746	.082	-.008	.138	
Tests of highest order unconditional interactions, X = TL by W =OL interaction							
	R2-chng	F	df1	df2	p		
X*W	.003	3.048	1.000	196.000	.082		

From Table 4.22 Fourth, consideration about the moderated-mediation effect, found that at the statistical significance level of .01, TL had an influence on ACAP, which the coefficient influence 0.151. Simultaneously, OL had an influence on ACAP, which the coefficient influence 0.722 at the significant level of .001. And at the statistical significance level of .05, the interaction between TL and OL had not influence on OI.

At the statistical significance level of .05, tests of highest order unconditional interactions found that the interaction effect between TL and OL had not influence on ACAP, which mean the relationship between TL on ACAP was not moderated by all level of OL.

Table 4.23 The data for visualizing the condition effect of the focal predictor

TL	OL	ACAP
-.627	-.645	-.557
.000	-.645	-.488
.627	-.645	-.419
-.627	.000	-.117
.000	.000	.022
.627	.000	.073
-.627	.645	.322
.000	.645	.443
.627	.645	.564

OL value in conditional in graph are the mean and +/- SD from the mean.

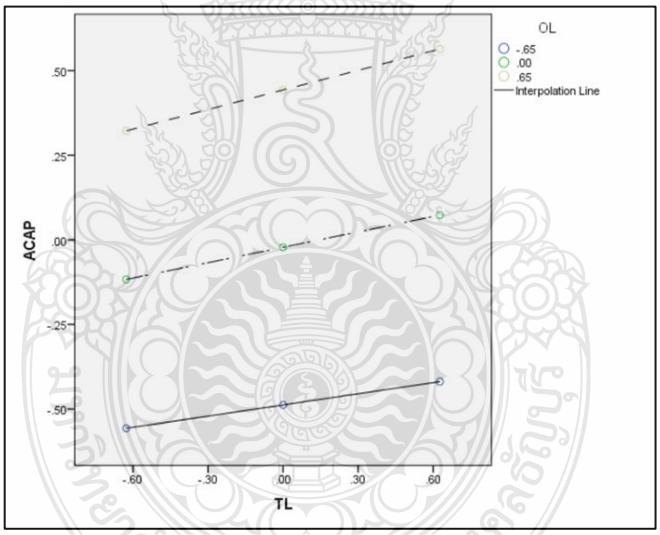


Figure 4.8 Graph analysis results of ACAP, TL, OL by moderated-mediation analysis from model 58

From table 4.23, the testing level of moderated for OL, which testing nine groups of dividing levels of TL and OL into three groups high, medium, low (+ -1SD) found that the relationship between TL and ACAP was low when the level of TL and OL was low. When the level of TL and OL was high would be result to the relationship between TL on ACAP was high too.

Considering about value of ACAP, which increase when the level of TL and OL increase, found that the level of ACAP had not difference increase. (All curves of OL parallel and slope is positive). So, at the statistical significance level of .05, it can be concluded the relationship of TL on ACAP was not moderated by level of OL.

Considering the outcome variable: OI

Table 4.24 Result for model summary of outcome variable of TL, ACAP, OL, OI interactions (M*W):

Model Summary							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
OI	.810	.657	.092	93.237	4.000	195.000	.000
Model							
	coeff	se	t	p	LLCI	ULCI	
Constant	3.822	.026	149.582	.000	3.772	3.873	
TL→OI	-.014	.067	-.210	.834	-.147	.119	
ACAP→OI	.434	.085	5.120	.000	.267	.601	
OL→OI	.310	.090	3.456	.001	.133	.486	
ACAP * OL →OI	.074	.041	1.790	.075	-.008	.155	
Tests of highest order unconditional interactions, M=ACAP, W = OL interaction,							
	R2-chng	F	df1	df2	p		
M*W	.006	3.205	1.000	195.000	.075		

Table 4.24 found that at the statistical significance level of .001, ACAP had an influence on OI, which the coefficient influence 0.434 and OL had an influence on OI, which the coefficient influence level 0.310. At the significant level of .050., TL had not influence on OI, which the coefficient influence level -0.014 and the interaction effect between ACAP and OL had not influence on OI.

The testing of highest order unconditional interactions explained that at the significant level .05., the interaction effect between ACAP and OL had not influence on OI. Could be concluded that the relationship of ACAP on OI was not moderated by level of OL.

Table 4.25 The data for visualizing the condition effect of the focal predictor

ACAP	OL	OI
-.586	-.645	3.396
.000	-.645	3.622
.586	-.645	3.849
-.586	.000	3.568
.000	.000	3.822
.586	.000	4.077
-.586	.645	3.739
.000	.645	4.022
.586	.645	4.304

OL value in conditional in graph are the mean and +/- SD from the mean.

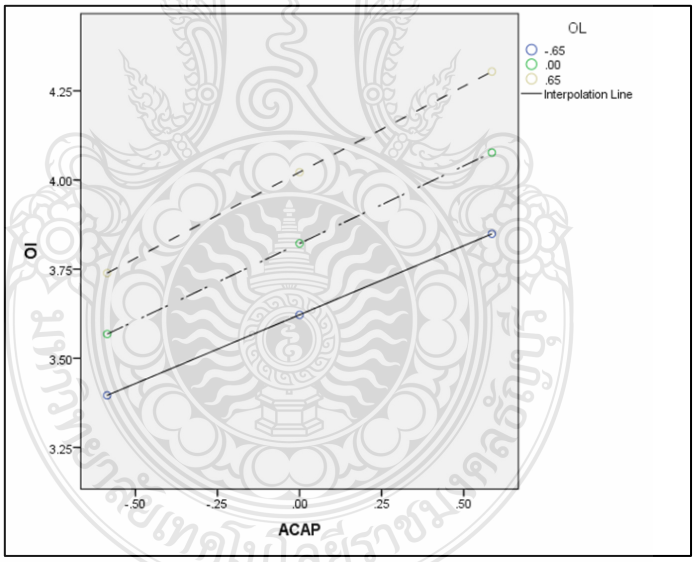


Figure 4.9 Graph analysis results of ACAP, OI, OL by moderated-mediation analysis from model 58

From table 4.25 the testing level of moderated for OL, which testing nine groups of dividing levels of ACAP and OL into three groups high, medium, low (+ -1SD) found that the relationship between ACAP and OI was low when the level of ACAP and OL

was low. When the level of ACAP on OL was high would be result to the relationship between ACAP on OI was high too.

Considering about value of OI, which increase when level of ACAP and OL increase found that the increase level of OI had not different between the level. So, it could be concluded at the significant level of .05, the relationship between ACAP on OI was not moderated by level of OL (All curves of OL parallel and slope is positive).

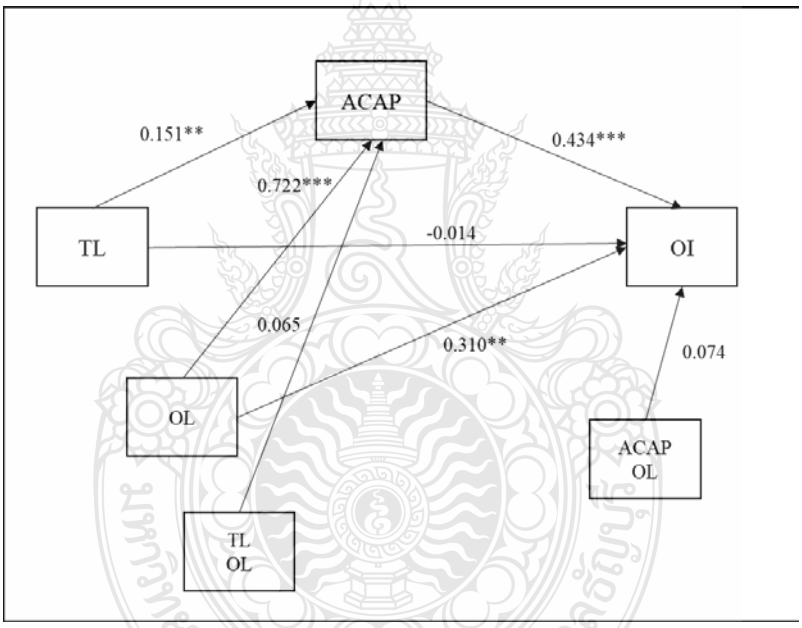
Table 4.26 Result of direct and indirect effects of X on Y

Model direct and indirect effects of X on Y					
Direct effect of X on Y					
Effect	se	t	p	LLCI	ULCI
-.014	.067	-.210	.834	-.147	.119
Indirect effect: TL → ACAP → OI					
	OL	Effect	BootSE	BootLLCI	BootULCI
LOW	-.645	.042	.030	-.008	.107
MEDIUM	.000	.066	.032	.009	.136
HIGH	.645	.093	.043	.022	.187
Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)					
Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
.066	.042	.023	.015	-.004	.055
.093	.042	.051	035	-.008	.130
.093	.066	.027	.020	-.004	.076

Table 4.26, TL had indirect effect on OI through ACAP determined with OL as the moderator variable. Explained that when dividing levels of OL into high, medium, low (+ -1SD), the indirect effect was significant in two groups were medium and high of OL based on the BootLLCI and BootULCI values or the confidence interval not cross zero point, the path was significant. Thus, the indirect effect of TL on OI through ACAP with difference level of OL was a moderator indicated only at medium and high level would be result in OI, higher (the effect was high up from 0.066 to 0.093). At the significant level of .05, the low level of OL not result in level of OI.

Considering pairwise contrasts between conditional indirect effects in found that the three indirect effect level according to the OL level had not significant based on the BootLLCI and BootULCI values or the confidence interval cross zero point. So, it can be explained the organizational learning not moderates with the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.

The moderated – mediation analysis, to find out the answer not supported the hypotheses that is organizational learning not moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.



Significance level: *p-value < .05, **p-value < .01, ***p-value < .001

Figure 4.10 Result of organizational learning moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.

The result indicate that the organizational learning not moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation. To verify the effect of organizational learning on absorptive capacity, the absorptive capacity was divided into the potential absorptive capacity and realized absorptive capacity. After that, consideration about how to the organizational learning moderates the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation, and how to the organizational learning notmoderates with the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation, respectively.

4.10 Organizational Learning Moderates the Mediating Effect of Potential Absorptive Capacity on the Relationship Between Transformational Leadership and Organizational Innovation

Table 4.27 The code of constructs

Construct		Code (Model58)
Transformational leadership	TL	X
Organizational learning	OL	W
Potential absorptive capacity	PACAP	M
Organizational innovation	OI	Y

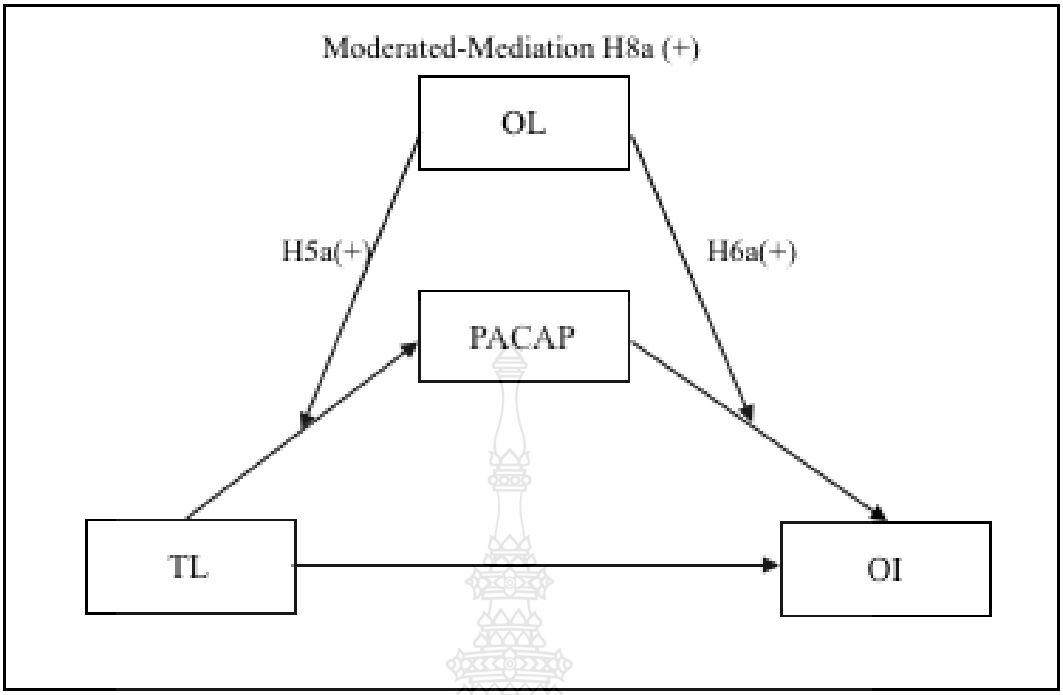


Figure 4.11 Conceptual framework

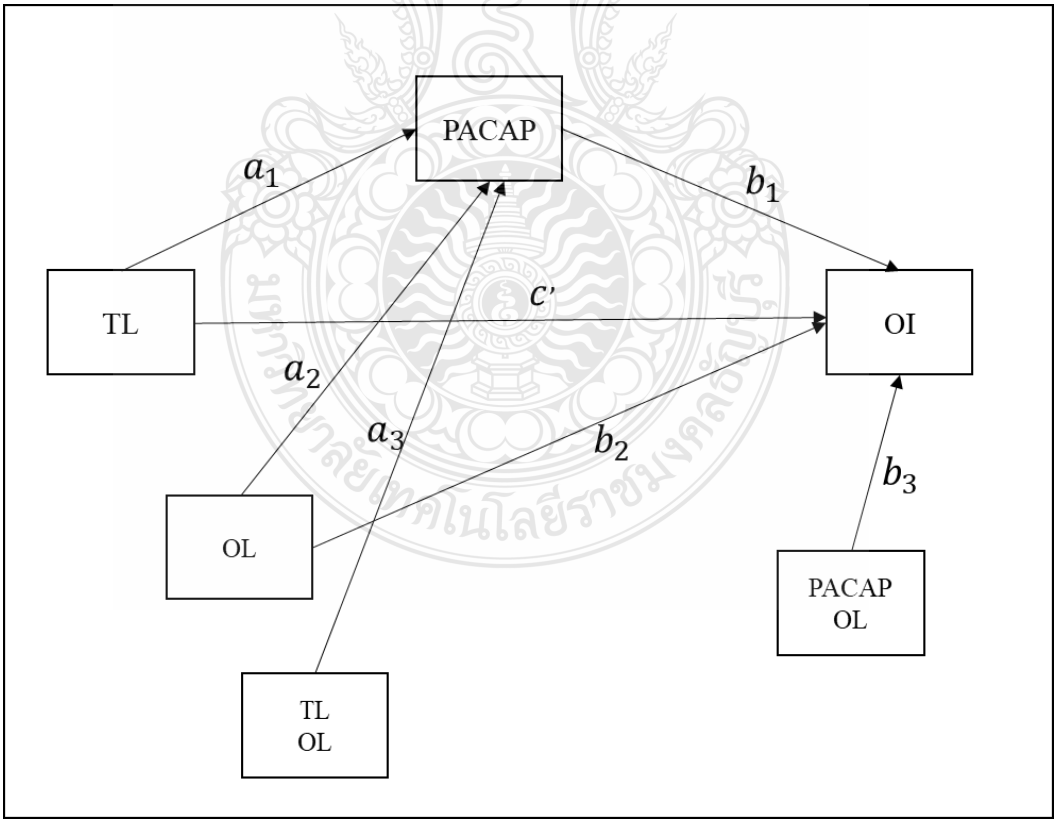


Figure 4.12 Statistical diagram of moderated – mediation analysis from model 58

Considering the Outcome Variable: PACAP (Model 58)

Table 4.28 Result for model summary of outcome variable of PACAP, TL, OL

Process Macro model 58							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
PACAP	.895	.801	.070	263.227	3.000	196.000	.000
Model							
	coeff	se	t	p	LLCI	ULCI	
Constant	.002	.023	.091	.928	-.043	.048	
TL→PACAP	.085	.058	1.462	.145	-.030	.201	
OL→PACAP	.744	.057	12.950	.000	.631	.858	
TL*OL→PACAP	-.006	.039	-.156	.876	-.083	.070	
Tests of highest order unconditional interactions, X = TL by W =OL interaction							
	R2-chng	F	df1	df2	p		
X*W	.000	0.024	1.000	196.000	.876		

From Table 4.28 consideration about the moderated-mediation effect, found that at the statistical significance level of .001, OL had an influence on PACAP, which the coefficient influence 0.744. At the statistical significance level of .05., TL had not influence on PACAP, which the coefficient influence 0.085 and the interaction effect between TL and OL had not influence on PACAP, which the coefficient influence -0.006.

At the statistical significance level of .05, tests of highest order unconditional interactions found that the interaction effect between TL and OL had not influence on PACAP, that mean the relationship between TL on PACAP was not moderated by level of OL.

Table 4.29 The data for visualizing the condition effect of the focal predictor

TL	OL	PACAP
-.627	-.645	-.534
.000	-.645	-.478
.627	-.645	-.422
-.627	.000	-.051
.000	.000	.002
.627	.000	.056
-.627	.645	.431
.000	.645	.482
.627	.645	.533

OL value in conditional in graph are the mean and +/- SD from the mean.

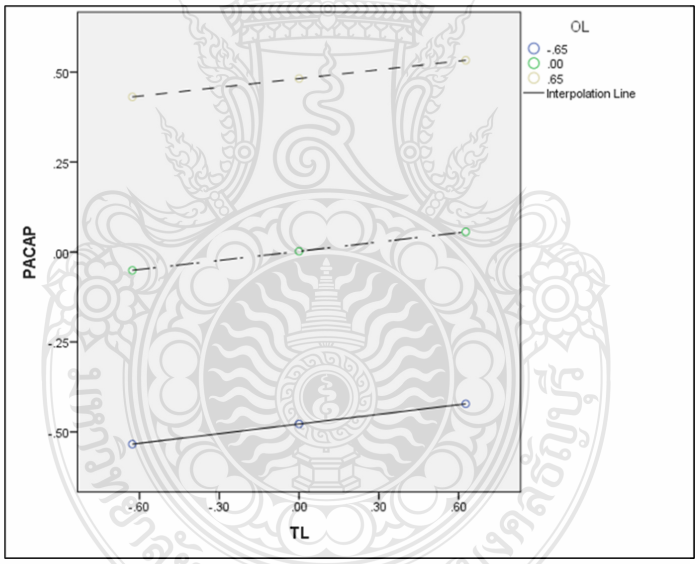


Figure 4.13 Graph analysis results of PACAP, TL, OL by moderated-mediation analysis from model 58

From table 4.29, the testing level of moderated for OL, which testing nine groups of dividing levels of TL and OL into three groups high, medium, low (+ -1SD) found that the relationship between TL and PACAP was low when the level of TL and

OL was low. When the level of TL and OL was high would be result to the relationship between TL on PACAP was high too.

Considering about value of PACAP, which increase when the level of TL and OL increase, found that the level of PACAP had not difference increase. (All curves of OL parallel and slope is positive). So, it can be concluded at the statistical significance level of .05, the relationship of TL on PACAP was not moderated by level of OL.

Considering the Outcome Variable: OI

Table 4.30 Result for model summary of outcome variable of TL, PACAP, OL, OI interactions (M*W):

Model Summary							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
OI	.797	.636	.097	85.134	4.000	195.000	.000
Model							
	coeff	se	t	p	LLCI	ULCI	
Constant	3.814	.026	147.444	.000	3.763	3.865	
TL→OI	.017	.069	.242	.809	-.119	.152	
PACAP→OI	.309	.086	3.580	.000	.139	.480	
OL→OI	.400	.092	4.375	.000	.220	.581	
PACAP * OL →OI	.097	.040	2.427	.016	.018	.176	
Tests of highest order unconditional interactions, M=PACAP, W = OL interaction,							
	R2-chng	F	df1	df2	p		
M*W	.011	5.888	1.000	195.000	.016		
Condition effect of the focal predictor at values of the moderator (s) (OL value in conditional in graph are the mean and +/- SD from the mean.)							
	OL	Effect	se	t	p	LLCI	ULCI
LOW	-.645	.247	.084	2.937	.004	.081	.412
MEDIUM	.000	.309	.086	3.580	.000	.139	.480
HIGH	.645	.372	.096	3.877	.000	.183	.561

Table 4.30 found that at the statistical significance level of .001, PACAP had an influence on OI, which the coefficient influence 0.309 and OL had an influence on OI, which the coefficient influence 0.400. At the statistical significance level of .050, TL had not influence on OI, which the coefficient influence 0.017 but the interaction effect between PACAP and OL influence on OI, which the coefficient influence 0.097.

The testing of highest order unconditional interactions explained that at the statistical significance level of .05, the interaction effect between PACAP and OL influence on OI. Could be concluded that the relationship of PACAP on OI was moderated by level of OL.

Testing level of moderated for OL (pick-a-point), which testing three groups of dividing levels of OL into three groups high, medium, low (+ -1SD) found that the low, medium and high level of OL would be result to level of OI at low, medium and high level, respectively. So, at the statistical significance level of .01, the low level of OL had an influence on relationship between PACAP and OI. Simultaneously, at the statistical significance level of .001, the medium and high level of OL had an influence on relationship between PACAP and OI.

Table 4.31 The data for visualizing the condition effect of the focal predictor

PACAP	OL	OI
-.591	-.645	3.410
.000	-.645	3.556
.591	-.645	3.702
-.591	.000	3.632
.000	.000	3.814
.591	.000	3.997
-.591	.645	3.853
.000	.645	4.072
.591	.645	4.292

OL value in conditional in graph are the mean and +/- SD from the mean.

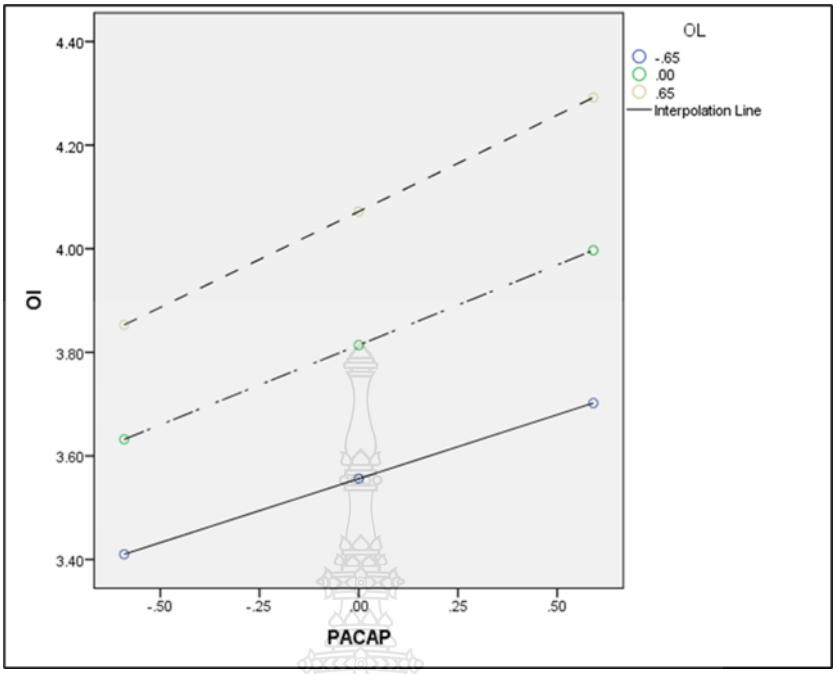


Figure 4.14 Graph analysis results of PACAP, OI, OL by moderated-mediation analysis from model 58

From table 4.31 the testing level of moderated for OL, which testing nine groups of dividing levels of PACAP and OL into three groups high, medium, low (+ -1SD) found that the relationship between PACAP and OI was low when the level of PACAP and OL was low. When the level of PACAP and OL was high would be result to the relationship between PACAP on OI was high too.

Considering about value of OI, which increase when level of PACAP and OL increase found that the increase level of OI had different between the level. So, it could be concluded at the significant level of .01, the relationship between PACAP on OI was moderated by level of OL (All curves of OL not parallel and slope is positive).

Table 4.32 Result of direct and indirect effects of X on Y

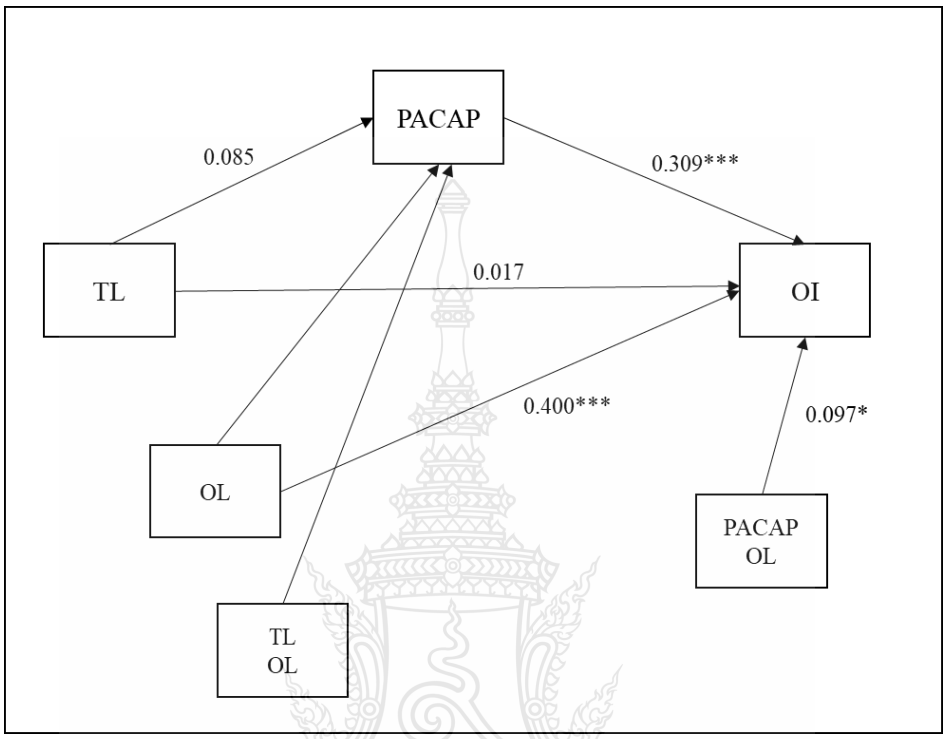
Model direct and indirect effects of X on Y					
Direct effect of X on Y					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
.017	.069	.242	.809	-.119	.152
Indirect effect: TL → PACAP → OI					
	OL	Effect	BootSE	BootLLCI	BootULCI
LOW	-.645	.022	.025	-.014	.084
MEDIUM	.000	.026	.026	-.017	.088
HIGH	.645	.030	.035	-.031	.111
Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)					
Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
.026	.022	.004	.013	-.020	.033
.030	.022	.008	031	-.045	.080
.030	.026	.004	.018	-.024	.049

Table 4.32, TL had indirect effect on OI through PACAP determined with OL as the moderator variable. Explained that when dividing levels of OL into high, medium, low (+ -1SD), the indirect effect was not significant all three groups based on the BootLLCI and BootULCI values or the confidence interval cross zero point, the path was not significant. Thus, at the statistical significance level of .05, the indirect effect of TL on OI through PACAP with difference level of OL was not moderator.

Considering pairwise contrasts between conditional indirect effects in found that the three indirect effect level according to the OL level had not significant based on the BootLLCI and BootULCI values or the confidence interval cross zero point. So, it can be explained the organizational learning not moderates the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.

The moderated – mediation analysis, to find out the answer not supported the hypotheses that is organizational learning not moderates the mediating effect of potential

absorptive capacity on the relationship between transformational leadership and organizational innovation.



Significance level: *p-value < .05, **p-value < .01, ***p-value < .001

Figure 4.15 Result of organizational learning moderates the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.

4.11 Organizational Learning Moderates the Mediating Effect of Realized Absorptive Capacity on the Relationship Between Transformational Leadership and Organizational Innovation

Table 4.33 The code of constructs

Construct		Code (Model58)
Transformational leadership	TL	X
Organizational learning	OL	W
Realized absorptive capacity	RACAP	M
Organizational innovation	OI	Y

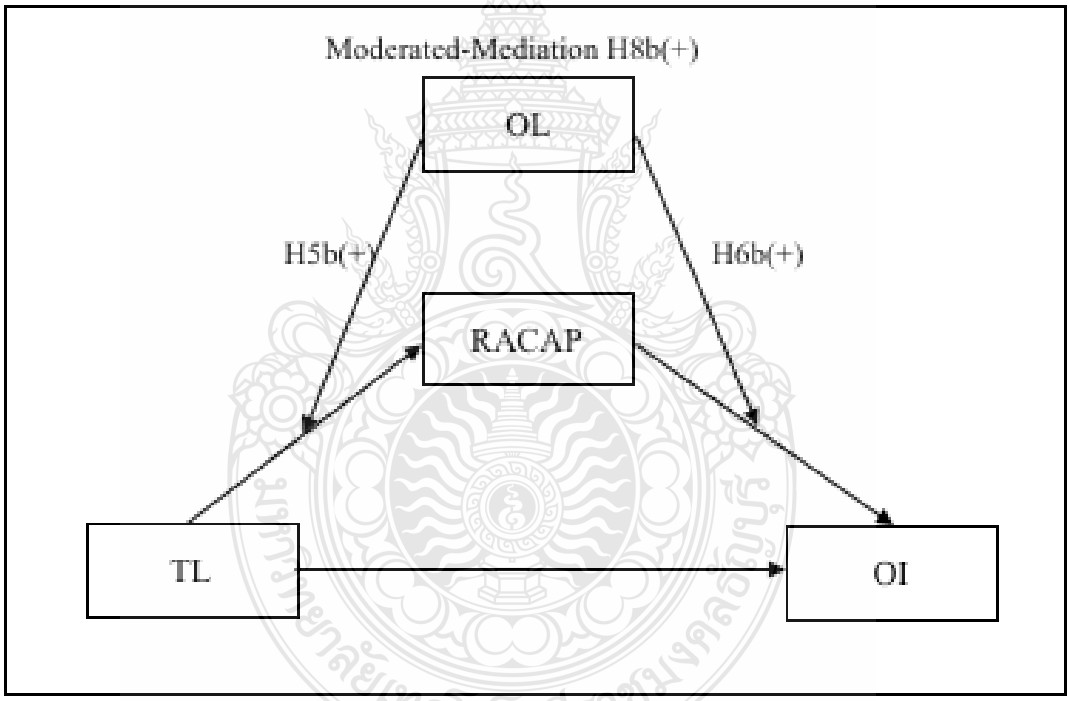


Figure 4.16 Conceptual framework

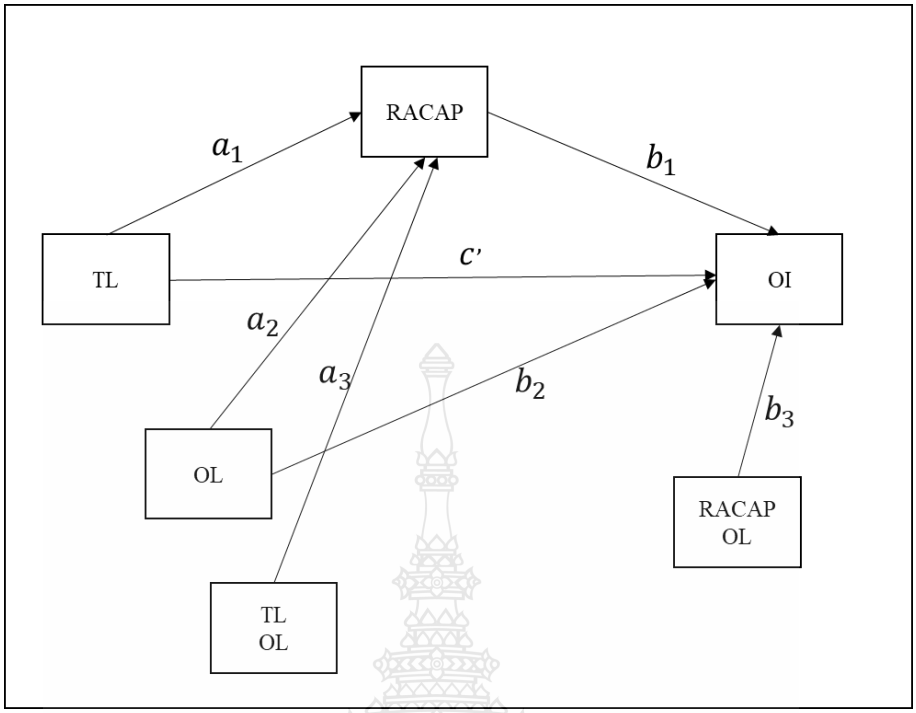


Figure 4.17 Statistical diagram of moderated – mediation analysis from model 58

Considering the Outcome Variable: Direct and Indirect Effect (Model 58)

Considering the Outcome Variable: RACAP

Table 4.34 Result for model summary of outcome variable of RACAP, TL, OL

Process Macro model 58							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
RACAP	.891	.793	.094	250.671	3.000	196.000	.000
Model							
	coeff	se	t	p	LLCI	ULCI	
Constant	-.061	.027	-2.313	.022	-.114	-.009	
TL→RACAP	.235	.067	3.496	.001	.103	.368	
OL→RACAP	.796	.066	12.013	.000	.665	.927	
TL*OL→RACAP	.178	.045	3.989	.000	.090	.267	
Tests of highest order unconditional interactions, X = TL by W =OL interaction							
	R2-chng	F	df1	df2	p		
X*W	.017	15.910	1.000	196.000	.000		

Table 4.34 Result for model summary of outcome variable of RACAP, TL, OL (Cont.)

Condition effect of the focal predictor at values of the moderator (s) (OL value in conditional in graph are the mean and +/- SD from the mean.)							
	OL	**Effect**	**se**	**t**	**p**	**LLCI**	**ULCI**
LOW	-.645	.120	.070	1.730	.085	-.017	.257
MEDIUM	.000	.235	.067	3.496	.001	.103	.368
HIGH	.645	.350	.077	4.564	.000	.199	.502

From Table 4.34 consideration about the moderated-mediation effect, found that at the statistical significance level of .001, TL had an influence on RACAP, which the coefficient influence 0.235, next to, OL had an influence on RACAP, which the coefficient influence 0.796 and the interaction effect between TL and OL influence on RACAP, which the coefficient influence 0.178.

At the statistical significance level of .001, tests of highest order unconditional interactions found that the interaction effect between TL and OL influence on RACAP was significant, which mean the relationship between TL on RACAP was moderated by level of OL.

Testing level of moderated for OL (pick-a-point), which testing three groups of dividing levels of OL into three groups high, medium, low (+ -1SD) found that the medium and high level of OL would be result to level of RACAP at medium and high level, respectively. So, at the statistical significance level of .001, the medium and high level of OL had an influence on relationship between TL and RACAP.

the testing level of moderated for OL, which testing nine groups of dividing levels of TL and OL into three groups high, medium, low (+ -1SD) found that the relationship between TL and RACAP was low when the level of TL and OL was low. When the level of TL and OL was high would be result to the relationship between TL on RACAP was high too. Shown as table 4.35

Considering about value of RACAP, which increase when the level of TL and OL increase, found that the level of RACAP had difference increase at medium and high level (two curves of OL not parallel and slope is positive). So, it can be concluded that at the statistical significance level of .001, the relationship of TL on RACAP was moderated by medium and high level of OL.

Table 4.35 The data for visualizing the condition effect of the focal predictor

TL	OL	RACAP
-.627	-.645	-.650
.000	-.645	-.575
.627	-.645	-.499
-.627	.000	-.209
.000	.000	.061
.627	.000	.086
-.627	.645	.232
.000	.645	.452
.627	.645	.672

OL value in conditional in graph are the mean and +/- SD from the mean.

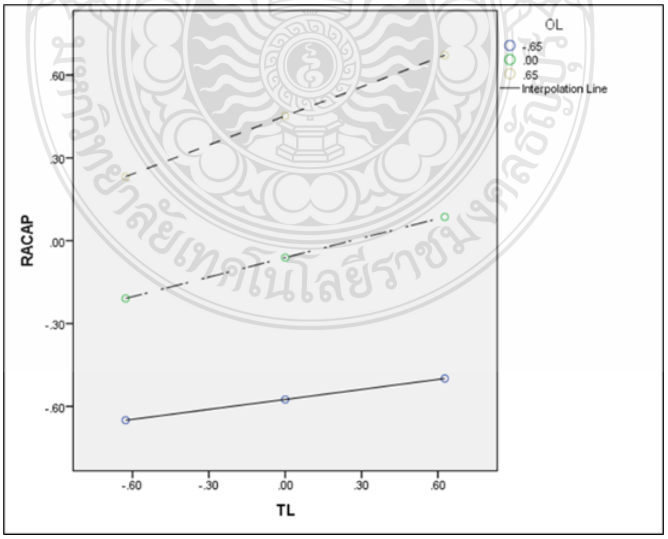


Figure 4.18 Graph analysis results of RACAP, TL, OL by moderated-mediation analysis from model 58

Considering the outcome variable: OI

Table 4.36 Result for model summary of outcome variable of TL, RACAP, OL, OI interactions (M*W):

Model Summary							
	R	**R^2**	**MSE**	**F**	**df1**	**df2**	**p**
OI	.818	.669	.088	98.585	4.000	195.000	.000
Model							
	coeff	se	t	p	LLCI	ULCI	
Constant	3.834	.026	145.989	.000	3.783	3.886	
TL→OI	-.024	.066	-.367	.714	-.155	.106	
RACAP→OI	.391	.068	5.772	.000	.257	.524	
OL→OI	.298	.086	3.481	.001	.129	.467	
RACAP * OL →OI	.034	.042	.806	.421	-.049	.117	
Tests of highest order unconditional interactions, M=RACAP, W = OL interaction,							
	R2-chng	F	df1	df2	p		
M*W	.001	.650	1.000	195.000	.421		

Table 4.36 found that at the statistical significance level of .001, RACAP had an influence on OI, which the coefficient influence 0.391 and OL had an influence on OI, which the coefficient influence 0.298. At the statistical significance level of .05, the interaction effect between RACAP and OL had not influence on OI, which the coefficient influence 0.034.

The testing of highest order unconditional interactions explained that at the significant level of .05, the interaction effect between RACAP and OL had not influence on OI. Could be concluded that the relationship of RACAP on OI was not moderated by all level of OL.

Table 4.37 The data for visualizing the condition effect of the focal predictor

RACAP	OL	OI
-.668	-.645	3.396
.000	-.645	3.642
.668	-.645	3.889
-.668	.000	3.574
.000	.000	3.834
.668	.000	4.095
-.668	.645	3.751
.000	.645	4.027
.668	.645	4.302

OL value in conditional in graph are the mean and +/- SD from the mean.

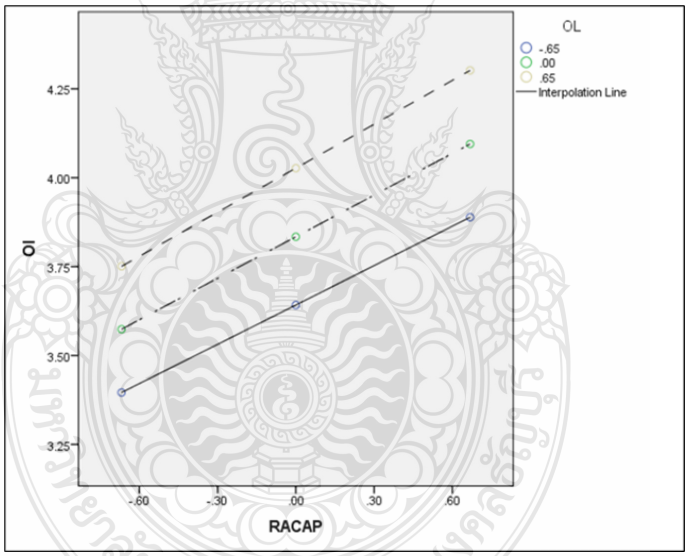


Figure 4.19 Graph analysis results of RACAP, OI, OL by moderated-mediation analysis from model 58

From table 4.37, the testing level of moderated for OL, which testing nine groups of dividing levels of ACAP and OL into three groups high, medium, low (+ -1SD) found that the relationship between RACAP and OI was low when the level of RACAP and OL was low. When the level of RACAP and OL was high would be result to the relationship between RACAP on OI was high too.

Considering about value of OI, which increase when level of RACAP and OL increase found that the increase level of OI had not different between the level. So, it could be concluded at the statistical significance level of .05, the relationship between RACAP on OI was not moderated by level of OL (All curves of OL parallel and slope is positive).

Table 4.38 Result of direct and indirect effects of X on Y

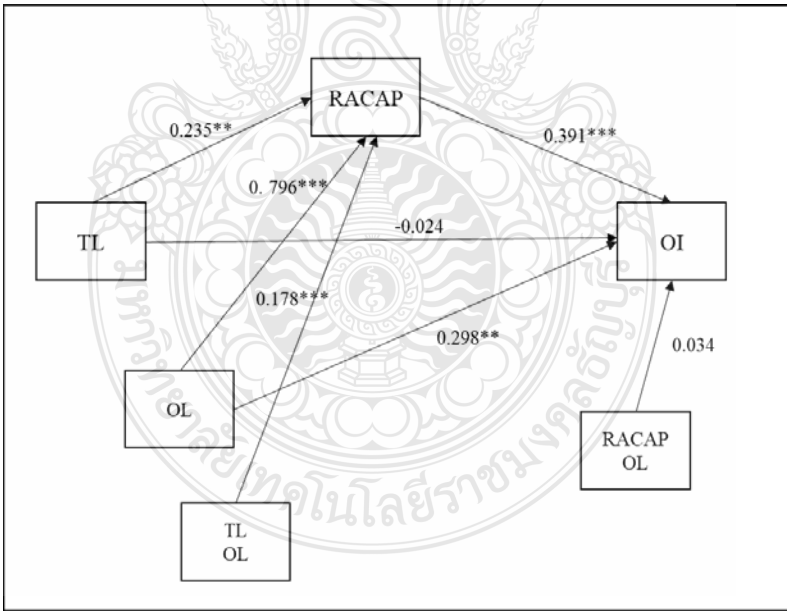
Model direct and indirect effects of X on Y					
Direct effect of X on Y					
Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
-.024	.066	-.367	.714	-.155	.106
Indirect effect: TL → RACAP → OI					
	OL	Effect	BootSE	BootLLCI	BootULCI
LOW	-.645	.044	.030	-.010	.109
MEDIUM	.000	.092	.034	.031	.164
HIGH	.645	.145	.044	.066	.237
Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)					
Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
.092	.044	.048	.015	.021	.078
.145	.044	.100	.034	.041	.171
.145	.092	.053	.020	.019	.095

Table 4.38, TL had indirect effect on OI through RACAP determined with OL as the moderator variable. Explained that when dividing levels of OL into high, medium, low (+ -1SD), the indirect effect was significant in two groups were medium and high of OL based on the BootLLCI and BootULCI values or the confidence interval not cross zero point, the path was significant. Thus, the indirect effect of TL on OI through RACAP with difference level of OL was a moderator indicated only at medium and high level would be result in OI, higher (the effect was high up from 0.092 to 0.145). At low level of OL not result in level of OI, at the statistical significance level of .05.

Considering pairwise contrasts between conditional indirect effects in found that the indirect effect level according to the OL level at medium and high level had significant based on the BootLLCI and BootULCI values or the confidence interval not cross zero point. So, it can be explained the organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.

The summarized finding of a moderated-mediation analysis for the research assumption that outcome of a moderated investigation, which could summarize that this framework is appropriate to clarify the interactions among the moderated-mediation process.

The moderated – mediation analysis, to find out the answer supported hypotheses that is organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.



Significance level: *p-value < .05, **p-value < .01, ***p-value < .001

Figure 4.20 Result of organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.

4.12 Hypotheses Summarized

Table 4.39 The summary results of hypotheses testing

Hypothesis	Results
Hypothesis 1: Transformational leadership has a direct positive influence on organizational innovation.	Supported
Hypothesis 2: Transformational leadership has a direct positive influence on absorptive capacity.	Supported
Hypothesis 3: Absorptive capacity has a direct positive influence on organizational innovation.	Supported
Hypothesis 4: Transformational leadership has and indirect positive influence on organizational innovation through absorptive capacity.	Supported
Hypothesis 5: The relationship between transformational leadership and absorptive capacity is moderated by organizational learning	Not Supported
Hypothesis 5a: The relationship between transformational leadership and potential absorptive capacity is moderated by organizational learning	Not Supported
Hypothesis 5b: The relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning	Supported
Hypothesis 6: The relationship between absorptive capacity and organizational innovation is moderated by organizational learning	Not Supported
Hypothesis 6a: The relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning	Supported
Hypothesis 6b: The relationship between realized absorptive capacity and organizational innovation is moderated by organizational learning	Not Supported
Hypothesis 7: The relationship between transformational leadership and organizational innovation is moderated by organizational learning	Supported
Hypothesis 8: Organizational learning moderates the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.	Not Supported

Table 4.39 The summary results of hypotheses testing (Cont.)

Hypothesis	Results
Hypothesis 8a: Organizational learning moderates with the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.	Not Supported
Hypothesis 8b: Organizational learning moderates with the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.	Supported

4.13 In-depth Interview

In-depth interview from key informant, who is manager of research and development department of the firm for confirm the result of quantitative research. The attitude or suggestion from key informant can be helpful to food manufacturing industry.

4.13.1 Result of In-depth Interview

Question1: How does the transformational leadership important to your company?

Summary of the interviews: Transformational leadership important for organizational innovation. This ranges from coordinating all units and linking individual knowledge together. Characteristics of leaders such as intellectual stimulation, ideal influence, individual considerations that help organizational change, can lead to new operation or production methods. The leadership style is important in that leaders should have a positive attitude to change such as technology, product, market trends, etc. The competency of the organization reflects the skills of the owner or manager, who should be able to articulate empowerment of staff, support knowledge change, or communication.

Question2: How does organizational learning affect the organizational innovation of your company?

Summary of the interview: Innovation support within the firm such as openness and experimentation have an effect on innovation but the firms focus on acquiring and assimilating new knowledge. Employees can share opinions and cross-functional communication as a key to organizational learning and innovation. Learning between

employees depends on the attitude and skills of the employee, team, and leader and their willingness and enthusiasm to learn. The organization procedures must be conducive for good coordination, modern technology, sharing new knowledge, and processing external information. When the firm increases learning, sharing of information about the industry, leaders will support the employees to understand and implement new products/operations, and accept from their mistakes.

Question3: How does the absorptive capacity function of the company affect the organizational innovation of your company?

Summary of the interview: New knowledge and information concerning market trends, material flows, and other information from the external environment can be obtained from customers, suppliers, and competitors, and how such knowledge guides the effectiveness of organizational innovation. However, the organizational innovation will not occur if the business structure fails to create good coordination, which will happen if the leadership is poor, who not support the informal communication. Structure of organizations focuses on the coordination or informal communication which is a key to creativity. Acquiring knowledge from external sources should happen all time because market trends change all the time. Firms have to focus on support acquisition, assimilation knowledge, and other aspects of business operations. When the firm receives new knowledge then it can be transformed to make it useful for a company, which can be a gradual process. Artificial intelligence technology has been widely accepted as beneficial for data analytics which estimate materials for each stage of the production process. Various types of digital communication technology are essential for the acquisition of knowledge and using information effectively and especially for internal functions. Firms in this way will have products that customers need and are of better quality.

Question 4: What is the competitive advantage organizational innovation for the firm?

Summary of the interviews: New products and processes can offer a competitive advantage. In addition to reduced costs of production, new products must be different from others, fresh and unique, such as plant-based meat, 3D printing food, wellness short which are now increasingly important in food manufacturing because consumer behavior

has changed. New knowledge for developing a product or process is an opportunity for the firm to devise a strategy for an updated organizational structure that supports learning. New products which respond to customers reflect the importance of new external knowledge, at the same time as internal knowledge from employee which is just as important. Digital transformation can support prompt information and knowledge acquisition, while assimilation will be an advantage for this industry sector. Artificial intelligence technology has been widely accepted as beneficial for data analytics that contribute to estimating materials required in each stage of the production process.

Question 5: How does the company solve the problem of not accepting innovation in the firm?

Summary of the interviews: The firm must be enterprising when designing new products or goods/services that are competitive. Organizational structure is not simply top-down communication and other forms of decision-making and online trends are important. The leaders will support good creative thinking even though mistakes can occur but the leader can accept them. There is a reward for creators. Hostility to change is a barrier to the firm so the leaders have to manage the structure or culture of the firm to support new technology or platforms. Organizational inertia in the firm will discourage any improvement in organizational innovation.

CHAPTER 5
CONCLUSION AND RECOMMENDATION

This chapter presents the conclusions for the overall results based on the variables in the framework devised for this thesis, with the quantitative method and what the interviews found. First, the findings are summarized that simplify entire result of the topic. Second, the discussion concerning the results and others studies is presented. Third, this section explains the contributions made by this study. Finally, the research limitations are indicated for scholars and practitioners to understand within the same scope direction, and follow up in future research to extend the advanced knowledge.

5.1 Conclusion

The purposes of this research were: 1) to verify the indirect effect of transformational leadership on organizational innovation through absorptive capacity as a mediator and organizational learning as a moderator of the food manufacturing industry in Thailand; and 2) to examine the influence of organizational learning as a moderator with transformational leadership and absorptive capacity influence on organizational innovation in the food manufacturing industry in Thailand. This study also observed organizational learning in terms of moderators included in the model.

The theoretical foundation for this study is based on Bass (1985) who identified transformational leadership as encouraging the performance of their subordinates to behave beyond organizational expectations (Yammarino, Spangler, & Bass, 1993). Transformational leadership can motivate their subordinate based on the following components. First, the behaviors of leaders concerning decentralization will have an impact on the work done by subordinates. Second, this component is concerned with intellectual stimulation which supports an awareness of the knowledge and problems continuously occurring in organizations. Intellectual stimulation helps subordinates to comprehend and analyze problems to find the best solutions. Third, the inspiration motivation can be considered from the subordinate perspective in terms of trust and confidence which consequently energizes their behaviors to achieve organization goals (Bruce J Avolio, Bass, & Jung, 1999). Finally, individual consideration of leader

behaviors means paying attention to everyone from their difference for their future growth and development (Bruce J Avolio et al., 1999).

According to the theme of absorptive capacity, firms can apply external knowledge to support future technological progress for a competitive advantage (Cohen & Levinthal, 1994). Absorptive capacity was summarized as being crucial to organizational innovation as capability in acquiring and assimilating new knowledge. In addition, it supports the transformation and exploitation of new knowledge essential for creation of innovation (Tepic, Trienekens, Hoste, & Omta, 2012). Absorptive capacity was examined in four dimensions: acquisition, assimilation, transformation, and the exploitation of knowledge as innovation (Zahra & George, 2002).

Organizational learning was explained as a key aspect of knowledge base that is crucial to innovation capability of firms (Gachanja, Nga'nga, & Kiganane, 2020). To determine the dimensions of organizational learning, it was constructed into four dimensions which were managerial commitment, system perspective, openness and experimentation, and knowledge transfer and integration (Jerez-Gomez et al., 2005). Many studies on organizational innovation have contributed to organizational learning by finding a positive relationship between organizational learning and innovation (Aragón-Correa et al., 2007; Gumusluoglu & Ilsev, 2009).

Meanwhile, organizational innovation refers to organizational creativity and innovation that helps create competitive advantage (Woodman et al., 1993). Innovation can be determined in terms of an idea, practice, or material artifact (Limaj & Bernroider, 2019). Organizational innovation supports technology innovation for products and processes (Camisón & Villar-López, 2014).

The independent variable of this research is transformational leadership, the mediator variable is absorptive capacity, the moderator variable is organizational learning, and the dependent variable is organizational innovation.

The medium and large sized of food manufacturing industry in Thailand were selected for empirical testing of the proposed model. The scope of these firms included agricultural production, including horticultural sources for food production, as well as machinery used in food processing, equipment and food packaging. This research set out to answer two research questions: 1) How does transformational leadership style affect

the organizational innovation through mediators as absorptive capacity and organizational learning as moderator variable? and 2) Do the different levels of organizational learning moderates with the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation?

The questionnaires were developed from a review of the literature and led to devising variables applied to the data collection. The respondents were employees, who are working in product and process development aspects in the firms. The populations were 1,777 firms in eight kinds of food manufacturing and the number of samples in this research were 200 firms.

Based on the quantitative data derived from returned questionnaires, the analysis started with profiles of the respondents, and explained by descriptive statistics. Then, the measurements of reliability and validity of all constructs and items analysis were done, and found satisfactory results. Since the proposed model includes the mediator and moderator, the Moderated – Mediation Model was inferential statistics used to uncover the empirical results of the hypotheses testing. Moreover, the Moderated-Mediation Analysis was well suited to analyzing data for the mediator and moderator appearing in the model. The results of hypothesis testing are shown in Table 5.1

Table 5.1 The hypothesis and result of testing

Hypothesis	Results
Hypothesis 1: Transformational leadership has a direct positive influence on organizational innovation.	Supported
Hypothesis 2: Transformational leadership has a direct positive influence on absorptive capacity.	Supported
Hypothesis 3: Absorptive capacity has a direct positive influence on organizational innovation.	Supported
Hypothesis 4: Transformational leadership has and indirect positive influence on organizational innovation through absorptive capacity.	Supported
Hypothesis 5: The relationship between transformational leadership and absorptive capacity is moderated by organizational learning	Not Supported

Table 5.1 The summary results of hypotheses testing (Cont.)

Hypothesis	Results
Hypothesis 5a: The relationship between transformational leadership and potential absorptive capacity is moderated by organizational learning	Not Supported
Hypothesis 5b: The relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning	Supported
Hypothesis 6: The relationship between absorptive capacity and organizational innovation is moderated by organizational learning	Not Supported
Hypothesis 6a: The relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning	Supported
Hypothesis 6b: The relationship between realized absorptive capacity and organizational innovation is moderated by organizational learning	Not Supported
Hypothesis 7: The relationship between transformational leadership and organizational innovation is moderated by organizational learning	Supported
Hypothesis 8: Organizational learning moderates with the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation.	Not Supported
Hypothesis 8a: Organizational learning moderates with the mediating effect of potential absorptive capacity on the relationship between transformational leadership and organizational innovation.	Not Supported
Hypothesis 8b: Organizational learning moderates with the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation.	Supported

Transformational leadership wields an influence on organizational innovation, organizational learning and absorptive capacity. Organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation. In addition, the relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning, including the relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning too.

5.2 Discussion

According to the research model, transformational leadership is connected to organizational innovation with absorptive capability as a mediator, and organizational learning served as a moderator. The following hypotheses were tested to clarify the research question.

5.2.1 Transformational leadership style has an effect on organizational innovation through absorptive capacity as the mediator and organizational learning as the moderator variable.

Transformational leaders can stimulate employees to think their new patterns and ways of working to find new solutions to problems (Podsakoff, MacKenzie, Moorman, & Fetter, 1990). More than that, leaders behaviors sets clear visions for employees (MacKenzie, Podsakoff, & Rich, 2001), helping employees continuously search for new information to achievement their duties in the workplace (Bruce J. Avolio & Bass, 1995). Transformational leadership has a direct positive influence on organizational innovation (H1), as found in the studies by Kartono, Bernarto, Sudbjo, and Pramono (2021). Sung and Kim (2021) found that transformational leadership has a direct positive influence on organizational innovation. Transformational leadership has a direct positive influence on absorptive capacity (H2), so these findings support previous research conducted by Shafique and Kalyar (2018), who indicated transformational leadership has a direct effect on absorptive capacity. Absorptive capacity has a direct positive influence on organizational innovation (H3), which is consistent with the work done by Mushtaq et al. (2021) that found absorptive capacity had a positive influence on innovative performance. Bessant and Trifilova (2017) also indicated absorptive capacity of firms can enhance innovation capability, so that employees learn more about internal knowledge and enhance new knowledge.

Absorptive capacity is a key component of organizational innovation, because new knowledge or new information from external resources is important for innovations such as new products and services, which are novelty (Antonio L, 2014; Howell & Avolio, 1993). External information and knowledge are critical of operations so the firms have to acquiring and assessing new external knowledge for the relevant procedures and routines (Cohen & Levinthal, 1990; Kim, 2001). Transformational leadership had an

indirect positive influence on organizational innovation through absorptive capacity (H4), and this finding echoes the work of Mushtaq, Chughtai, and Lashari (2021) and Yaseen et al. (2018). Consequently, employees perceived support in their workplace such as a conducive environment for being creative and helping new ideas, which mean organizational climate that accept the risk for accessing the innovations (Leal-Rodríguez, Ariza-Montes, Roldán, & Leal-Millán, 2014).

The relationship between transformational leadership and realized absorptive capacity is moderated by organizational learning (H5b). This finding was supported by the in-depth interviews, which found that organizational learning can contribute to the relationship between transformational leadership and realized absorptive capacity. Furthermore, the relationship between potential absorptive capacity and organizational innovation is moderated by organizational learning (H6a). The innovative outcomes explained by acquisition and assimilation knowledge means there is potential absorptive capacity (Fiol, 1996). Organizational learning can change the relationship between potential absorptive capacity and organizational innovation, which according to the in-depth interviews, is about finding new knowledge and information concerning market trends, material flows, and external information retrieved from customers, suppliers, and competitors by meeting, observation, and digital communication network. However, organizational innovation will not occur if an organizational structure fails to create good coordination and informal communication, as stated by Abbey and Dickson (1983).

In addition, organizational learning moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation (H8b). The effect of transformational leadership on organizational innovation can be considered as based on the leader ability to create a coordinated system that helps build knowledge dissemination between individuals who have various functions (Nguyen, Shen, & Le, 2021). The four behaviors of leadership are idealization influence, inspiration motivation, intellectual stimulation, and individualized consideration. These all foster the employees to have an imagination and ability to solve problems.

Moreover, the style of leadership provides new opportunities and supports employees to help with new ideas, new products, and new processes (Chaar & Easa, 2020; Shafique & Kalyar, 2018). B. M. Bass and Bass Bernard (1985) suggested that transformational leaders encourage better performance and leads to opportunity for change and flexibility in an innovative environment. Organizational learning can be determined in terms of environment of organization that support for innovation as found in interdepartmental interaction, understanding the firm objectives, support employees to learn and make decisions, foster teamwork had an interaction with absorptive capacity can enhance the new idea or new innovation in work. These finding agree with Iranmanesh, Kumar, Foroughi, Mavi, and Min (2020) who summarized innovative culture as beliefs and common values of employees creativity in product or process that is crucial to organizational innovation. Moreover, there is an interaction with informal social that effect to work coordination and innovation capacity such as product innovation, process innovation, marketing innovation, and organizational innovation in manufacturing firms in Malaysia.

Realized absorptive capacity is the key to different levels of organizational learning, which influences the relationship between transformational leadership and organizational innovation. Bessant and Trifilova (2017) studied the developing of absorptive capacity for recombinant innovation and found that changing the potential of absorptive capacity to realized absorptive capacity is the challenge for open innovation, that will help the firm focus on learning and create market value.

5.2.2 The different levels of organizational learning moderates with the mediating effect of absorptive capacity on the relationship between transformational leadership and organizational innovation

The relationship between transformational leadership and organizational innovation is moderated by organizational learning (H7), which is consistent with the work of Mokhber, Ismail, and Vakilbashi (2011) who studied transformational leadership on innovation in the organization with moderating role of organizational culture and they found that the relationship between transformational leadership and organizational innovation has a moderating effect on organizational culture (behavior that encourages the innovation). Elsewhere, Iranmanesh et al. (2020) found that besides innovation

culture or organizational climate supports innovation interacts with informal social influences on innovation capacity, and found that the level of innovation culture influence on innovation so that when innovation culture is high, so is innovation capacity. Nguyen, Shen, and Le (2021) assessed the influence of transformational leadership and knowledge management on radical and incremental innovation: the moderating role of collaborative culture, their sample had 365 participants in 86 manufacturing and service firms and they found that the influences of knowledge management aspects on innovation capability are different and depend on the level of collaborative culture, that are coordination between various functions in organization.

Overall, transformational leadership has an indirect influence on organizational innovation through realized absorptive capacity with organizational learning as moderator. This finding is similar to Howell and Avolio (1993) who found that the innovation support climate level was moderated with transformational leadership influence on relationship between transformational leadership and performance, as found in their work involving a sampler of 78 managers in Canadian financial institutions. The finding was supported by Abbey and Dickson (1983) who indicated the employees' perceptions of work climate and rewards are consistent with performance as it applies to innovative behavior.

5.3 Contribution

The empirical results from the model supported by qualitative information provide several contributions to this topic and they are as follows.

5.3.1 Theoretical Contribution

The research model applies a multivariate analysis where several variables are components of the model. The moderator variable is the different level of organizational learning which moderates the mediating effect of realized absorptive capacity on the relationship between transformational leadership and organizational innovation. In addition, the different levels of organizational learning serve as a moderator on the relationship between transformational leadership and realized absorptive capacity. This occurs simultaneously with the different levels of organizational learning as a moderator on the relationship between potential absorptive capacity and organizational innovation.

Other the crucial of result are that, the transformational leadership has a direct positive influence on organizational innovation. Next to the transformational leadership has a direct positive influence on absorptive capacity. After that, the absorptive capacity has a direct positive influence on organizational innovation. Then, transformational leadership has and indirect positive influence on organizational innovation through absorptive capacity. Furthermore, the relationship between transformational leadership and organizational innovation is moderated by organizational learning. Moreover, this result was derived from applying of an advanced methodology suggests considering using a moderator from structural equation modeling (SEM). This model helped to summarize a moderated – mediation analysis method.

5.3.2 Practical Contribution

According to firms operating in food manufacturing industry, the results found that the level of organizational innovation relies on the level of organizational learning. Management should be consider creating organizational learning because it will enhance the level of organizational innovation. Components of organizational learning that indicate significant effects in term of moderator are managerial commitment, systems perspective, openness and experimentation, and knowledge transfer and integration. Managers must be committed to empowering employees so they can make good decisions in a dynamic environment. As part of the system perspective, managers have to provide knowledge and encourage positive mindsets in their employees so that firm objectives can be achieved. The appropriate internal cooperation systems must have a better support moderator of organizational learning to other factors. The other crucial observed variable is openness and experimentation. The empirical results indicated that management should support experimental studies and support process innovation. Moreover, to follow up other firm operations and applying new techniques in internal operation is essential. External experiences and concepts can be appropriate tools for staff development which improves organizational culture.

The empirical results indicated that policy and programs encourage and support personnel to understand how new knowledge should be constructed. Most activities derive from unofficial discussions and learning opportunities. The meetings of team members and whole units that cross function is beneficial to knowledge exchange the firm operation, and

these should be conducted regularly. It is important to summarize crucial content after meetings so that cross-sectional team meetings lead to better marketing, manufacturing, and R&D, which can be updated when needed. Special programs to support employees for new knowledge will contribute to innovation management. In addition, team members with various functions in various units/departments can generate different types of knowledge for product and process innovation. Moreover, the online training is a new tool for staff training depending on their level of tasks. Supervisors can examine their staff and provide some rewards for those who participate in training and development.

Therefore, the crucial factor in organizational innovation is that food firms should concentrate on transformational leadership style. This type of leadership includes idealized influence, intellectual stimulation, inspirational motivation, and individualized considerations of staff members. Those behaviors can be explained in holistic terms as being a role model to others, where the leader can support colleagues for new ideas related to value creation, new alternative resolution strategies, help teams to understand shared value of work, help others in self-development. This leadership style creates a new mindset throughout the organization. For the management, training and development programs in longitudinal periods can help staff members change their mindsets and behaviors in responding to transformational leadership style. The role model from the top management is also effective for creating management to be transformational leadership style. Individual consideration takes the form of promoting self-development and resolution of individual problems. The acquisition, assimilation, transformation, and exploitation of knowledge are significant observed variables in the absorptive capability of management practices to function well in the food industry. Acquisition refers to ability of firms to identify and acquire external knowledge appropriately so that their operations benefit. The greater the effort to identify and gather knowledge, the better quality of acquisition capabilities the firm will have. Firms should place more emphasis on increasing external knowledge acquisition. The new information and knowledge will support not only innovation alone, but also the industry or market situation of the food industry when it comes to food products and processes, and keep up with new and changing consumer tastes and behaviors. Therefore, the acquisition of external knowledge and information effectively will support firm innovation in congruent with market situation.

Moreover, external knowledge can be acquired regularly from both customers and suppliers. Digital technology can promote the refinement of knowledge for all firms. The realized absorptive capacity plays a crucial role in raising the level of organizational innovation, so the transformation and exploitation of knowledge are important for the firm. Firms in the food manufacturing industry can transform and exploit knowledge or information sourced externally. The implementation of the suggestion above will result in better organizational innovation. Firms can acquire updated information for their operations in both innovation management and marketing management terms, leading to a competitive advantage.

Currently, artificial intelligence technology has been widely accepted as beneficial for data analytics that contribute to estimating materials required in each stage of the production process. Various types of digital communication technology are essential for the acquisition of knowledge and information. The other significant factor of absorptive capability is the assimilation of knowledge to internal functions. Firms in the food industry in Thailand can facilitate knowledge exchange and sharing. The success of product innovation of particular firms can be considered from the perspective of offering more new products that comprise different materials or components, and achieving good market demand. Process innovation is concerned with reducing production costs or food wastes, higher production quality from new technique, machine, and software. The other crucial point is that food products uniqueness means will be differentiated from others or future food, such as semi-finished products that customers want, and examples here include plant-based meat, 3D printing food, and wellness shot.

However, several barriers such as organizational structure, leadership style, organizational culture, and others may obstruct knowledge sharing and assimilation. In this circumstance, knowledge management can be applied appropriately to fit the structure of specific firms. Knowledge management can be determined as the process of creating, sharing, and utilizing knowledge (Seneviratne, Baldry, & Pathirage, 2010). It contributes to generating intellectual assets and information to support staff members talents for being more productive and competitive (Kusumastuti, Arviansyah, Nurmala, & Wibowo, 2021).

In conclusion, organizational learning supports firms in terms of employees learning about the workplace objectives, engaging with experimentation, and being conducive to knowledge transfer. This involves absorptive capacity as a dynamic system, whether in the form of assimilation, acquisition, transformation, and exploitation. So, after the firm acquires the new knowledge, it then has to adopt with knowledge or skill of firm for improve novel product or process completed. The firm has to manage those resources based on resource - based view, namely value in firms such a way that they are, rare, inimitability, and non-substitutability lead to sustainable competitive advantage. (J. Barney, 1991; J. B. Barney & Wright, 1998); (Eisenhardt & Martin, 2000; Grant, 1996).

Government policy and relevant government agencies can apply the results from this study to formulate strategies that will improve innovation of those firms. To improve the competence of firms in the food industry, innovation should be encouraged and ensure that it will focus on leadership style, organizational learning, and absorptive capability of businesses. Government policies and specific government agencies should rethink how those firms can develop leadership style, and dynamic capability from an organizational learning and absorptive capability perspective. Furthermore, digital transformation can support prompt information and knowledge acquisition, while assimilation will be an advantage for this industry sector.

5.4 Research Limitations and Suggestions for Future Research

5.4.1 Limitation of the Study

This study has some limitations that should be considered. First, the population derived from only one specific industry - food manufacturing industry. The findings and implications found here may not be applicable in other industry that different background example; firms in the electronics and digital industries. Second, the organizational culture of firms in particular industries is crucial to consider when applying the results for practical outcomes. Organizational learning can occur effectively within the internal environment and social climate of particular firms, which are derived from organizational culture as well as leadership style. Finally, the subjects of this study come from medium and large sized firms in the food manufacturing industry. Small firms were not included here despite the fact they may be just as innovative as medium and large sized firms.

Managers of small food manufacturing firms may be affected in different ways by results reported here.

5.4.2 Future Research

According to the limitation of this study, other scholars can consider conduct the study based upon following area. This study concentrated on medium and large sized firms that were expected to be innovative, but in future study small firms should be investigated so that all firms in the food industry are covered. Moreover, the framework of this study can be applied to other industries no matter what size they are to document the ability of those firms to be innovative and operate well. Knowledge management is crucial for clarifying aspects of function when the framework is comprised of other variables. However, researchers should recognize that the weighted important of variables in the framework may vary from industry to industry.

Second, in terms of methodology the longitudinal study method focuses on the impact of an organizational culture on absorptive capacity and innovation performance, which is something that future research projects should consider. Furthermore, qualitative analysis can be used to summarize the findings for innovation in specific ways.

Third, concerning other drivers of innovation such as digital technology and specific types of advanced technology, researchers can investigate the transformational character of digital technology in firms in the food industry, and combine it with transformational leadership style, organizational learning, absorptive capability, and organizational innovation. Moreover, the scholars can conduct in-depth research specifically on the complexity of elements concerning each observed variable to clarify organizational psychology in the food industry management area.

Fourth and finally, the business environment requires aggressive strategies beat rival business, and here the internal environment may be a barrier to innovation, for example inertia in the organizational environment which should be investigated. The results will be an important part of transformational leadership in terms of creating organizational innovation. Soon, artificial intelligence will be applied extensively in the food industry and will result in changes in dynamic capacity of organizational learning and absorptive capacity. So, those two factors should be considered from a learning perspective as another than the socio-cognitive approach.

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APPENDICES

APPENDIX A

Questionnaire

QUESTIONNAIRE

Title “Causal Model of Transformational Leadership, Organizational Learning, Absorptive Capacity, and Organizational Innovation in Food Manufacturing in Thailand”

Instruction

1. This questionnaire has an explore the opinions of employee who work in product or process development in food production for study in organizational innovation of food manufacturing industry in Thailand (Medium and Large size)

2. The questionnaires have five sections, namely

1. Characteristics of firms
2. Transformational leadership
3. Organizational learning
4. Absorptive capacity
5. Organizational innovation

3. For complete and valuable research, please answer all questions, your answers will be kept confidential and used for this study only. This research will present the results of the research as a whole. The answers received will not affect the respondents in anyway.

Best regards.

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Instruction: Please mark ✓ in ☐ that match with your opinion.

Section 1 Characteristics of firms

1. Size (Please check only one)

☐ Medium (Firms that generate income from 100-500 million Thai baht, and having number of employees between 50-200 persons)

☐ Large (Firms have income more than 500 million Thai baht, and having number of employees more than 200 persons)

2. Firm Age _____ years

3. Type of export (Please check only one)

☐ Export ☐ Non-export

4. Type of Owner (Please check only one)

☐ Thai ☐ Joint (Thai and Foreign)

5. Type of industry (The Office of Small and Medium Enterprises Promotion (OSMEP))

☐ Processing and preserving of meat.

☐ Processing and preserving of fish, crustaceans and molluscs

☐ Processing and preserving of fruit and vegetables product.

☐ Manufacture of vegetable and animal oils fats.

☐ Manufacture of dairy products.

☐ Manufacture of grain mill products, starches and starch products

☐ Manufacture of other food

☐ Manufacture of prepared animal and feeds.

6. Development of product innovation (Both of new product and improve original product)

☐ Every year ☐ Every 2 years

☐ Every 3 years ☐ Other please assign.....

7. Development of process innovation (Both of new process and improve original process)

☐ Every 1 years ☐ Every 2 years

☐ Every 3 years ☐ Other please assign.....

Section 2 Transformational leadership

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

Items	Agreement Level				
	5	4	3	2	1
Idealized Influence					
1. Your company has managers who are dedicated in work.	(5)	(4)	(3)	(2)	(1)
2. Your company has managers that make the employees proud to work with.	(5)	(4)	(3)	(2)	(1)
3. Your company has managers who are stable in their ideas and ideals.	(5)	(4)	(3)	(2)	(1)
4. Your company has managers who behave respectfully and trustworthy.	(5)	(4)	(3)	(2)	(1)
5. Your company has managers who behave as a role model to employees in their work.	(5)	(4)	(3)	(2)	(1)
6. Your company has manager who defined clearly vision and management direction.	(5)	(4)	(3)	(2)	(1)
Inspiration Motivation					
7. Your company has managers that raise morale for employees.	(5)	(4)	(3)	(2)	(1)
8. Your company has managers that support other to understand the value of their works.	(5)	(4)	(3)	(2)	(1)
9. Your company has managers who encourage employees to participate in sharing their opinions in work.	(5)	(4)	(3)	(2)	(1)
10. Your company has managers who encourage employees to common consider organizational development goals.	(5)	(4)	(3)	(2)	(1)
11. Your company has managers who raise awareness to employees for self-worth.	(5)	(4)	(3)	(2)	(1)
12. Your company has managers who motivates employees to be committed, enthusiasm and want to achieve the goals of the organization.	(5)	(4)	(3)	(2)	(1)
13. Your company has managers who encourage employees to put in more effort than usual to achieve the vision of the organization.	(5)	(4)	(3)	(2)	(1)

Items	Agreement Level				
	5	4	3	2	1
Intellectual Stimulation					
14. Your company has managers who encourage employees to think a new solving solution.	(5)	(4)	(3)	(2)	(1)
15. Your company has managers that help team to understand the cooperation in new method.	(5)	(4)	(3)	(2)	(1)
16. Your company has managers that help employees in creating new concept that never appear before.	(5)	(4)	(3)	(2)	(1)
17. Your company has managers who take risks by inventing and presenting innovations for organizational development.	(5)	(4)	(3)	(2)	(1)
18. Your company has managers who view problems positively and turning the crisis into an opportunity for job development.	(5)	(4)	(3)	(2)	(1)
19. Your company has a manager who encourages employees to view problems as challenges and opportunity to win by solving problems together.	(5)	(4)	(3)	(2)	(1)
Individual Consideration					
20. Your company has managers who assign the tasks based on each employee's abilities.	(5)	(4)	(3)	(2)	(1)
21. Your company has managers who listen to each employee's opinions.	(5)	(4)	(3)	(2)	(1)
22. Your company has managers who respect individual differences.	(5)	(4)	(3)	(2)	(1)
23. Your company has managers who encourage employees to develop their abilities according to their individual potential.	(5)	(4)	(3)	(2)	(1)

Section 3: Organizational Learning

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

Items	Agreement Level				
	5	4	3	2	1
Managerial Commitment					
24. Your company often engages employees in the decision-making on important matters.	(5)	(4)	(3)	(2)	(1)
25. Your company deems the employee's learning as investments rather than expenses.	(5)	(4)	(3)	(2)	(1)
26. Your company has adapted to the situation or adapted to be ahead of new circumstances.	(5)	(4)	(3)	(2)	(1)
27. Your company regard that the employee's learning ability is a key factor of the company.	(5)	(4)	(3)	(2)	(1)
28. Your company has reward to employees that have creative ideas.	(5)	(4)	(3)	(2)	(1)
System Perspective					
29. Employees in your company have a clear understanding of the company's objectives.	(5)	(4)	(3)	(2)	(1)
30. Your company has developed the knowledge of the individual to the organizational level for achieve the company objectives.	(5)	(4)	(3)	(2)	(1)
31. The departments in your company have a good coordination.	(5)	(4)	(3)	(2)	(1)
32. The departments in your company have coordinated with modern technologies.	(5)	(4)	(3)	(2)	(1)
Openness and Experimentation					
33. Your company supports experimentation and innovation to improve work processes.	(5)	(4)	(3)	(2)	(1)
34. Your company follows the performance of other companies and has applied the interesting techniques or practices.	(5)	(4)	(3)	(2)	(1)
35. Your company uses outsourced ideas as a tool to create learning to employees.	(5)	(4)	(3)	(2)	(1)
36. Your company supports the employees to continually develop a modern way in their work- knowledge for keep up with new situations.	(5)	(4)	(3)	(2)	(1)

Items	Agreement Level				
	5	4	3	2	1
Knowledge Transfer and Integration					
37. Every level in the company always has an analysis the causes of errors in work operation.	(5)	(4)	(3)	(2)	(1)
38. Employees have the opportunity to discuss new issues, new programs, new activities that benefit to company.	(5)	(4)	(3)	(2)	(1)
39. Your company has a regularly team work.	(5)	(4)	(3)	(2)	(1)
40. Your company has tools that help to learn about past situations. (Manual or company database)	(5)	(4)	(3)	(2)	(1)

Section4: Absorptive Capacity

5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

Items	Agreement Level				
	5	4	3	2	1
Acquisition					
41. Your company always have employees visit customers	(5)	(4)	(3)	(2)	(1)
42. Your company communicate customers via social media	(5)	(4)	(3)	(2)	(1)
43. Your company search customers information regularly to evaluate product	(5)	(4)	(3)	(2)	(1)
44. Your company search customers' information regularly to evaluate customer need.	(5)	(4)	(3)	(2)	(1)
45. Your company search for information from suppliers regularly for development of product.	(5)	(4)	(3)	(2)	(1)
46. Your company has communicated with supplier via social network.	(5)	(4)	(3)	(2)	(1)
47. Your company always following the news of businesses in the food industry.	(5)	(4)	(3)	(2)	(1)

Items	Agreement Level				
	5	4	3	2	1
Assimilation					
48. Your company use integrated offices such as e-office for cooperation.	(5)	(4)	(3)	(2)	(1)
49. Your company always have meeting to exchange and discuss new knowledge that will have an impact on operation.	(5)	(4)	(3)	(2)	(1)
50. Your company has summarized in new knowledge or information systematically for use in work decision making.	(5)	(4)	(3)	(2)	(1)
51. Employees in your company have been trained concerning to skill for systematic analysis of new knowledge.	(5)	(4)	(3)	(2)	(1)
52. Your company has trained employees to understand new things.	(5)	(4)	(3)	(2)	(1)
53. Your company has a policy to disseminate information between internal departments.	(5)	(4)	(3)	(2)	(1)
54. Your company has cross-functional teams to manage new knowledge.	(5)	(4)	(3)	(2)	(1)
Transformation					
55. Employees in the company can provide suggestions for improving the company's products and processes based on new knowledge.	(5)	(4)	(3)	(2)	(1)
56. Your company has a systematic procedure for employees to understand new knowledge.	(5)	(4)	(3)	(2)	(1)
57. Your company has applied new knowledge to existing knowledge.	(5)	(4)	(3)	(2)	(1)
Exploitation					
58.Your company always has activities related to research and development of products and production processes.	(5)	(4)	(3)	(2)	(1)
59.Your company responds promptly to business changes by using new knowledge.	(5)	(4)	(3)	(2)	(1)
60.Your company has applied technology to work systematically.	(5)	(4)	(3)	(2)	(1)
61.Your company has created new innovations related to tasks prior the competitors.	(5)	(4)	(3)	(2)	(1)

Section 5: Organizational Innovation
5 = Strongly agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly disagree

Items	Agreement Level				
	5	4	3	2	1
Product Innovation					
62. Your company offers more new products than competitors do.	(5)	(4)	(3)	(2)	(1)
63. The new products of your company meet the needs of customers.	(5)	(4)	(3)	(2)	(1)
64. Your company develops new unique products.	(5)	(4)	(3)	(2)	(1)
65. The development of new product yield good marketing response	(5)	(4)	(3)	(2)	(1)
66. Your company has new product that improve comfortable function to be customers consumed or utilized	(5)	(4)	(3)	(2)	(1)
67. Your company has standard quality products.	(5)	(4)	(3)	(2)	(1)
Process Innovation					
68. Your company can decrease production cost continuously.	(5)	(4)	(3)	(2)	(1)
69. Your company can increase production efficiency with new techniques, machine and software that convenient and fast.	(5)	(4)	(3)	(2)	(1)
70. Your company has a production quality control by modern technology.	(5)	(4)	(3)	(2)	(1)
71. Your company has production process that reduces loss of nutrition value.	(5)	(4)	(3)	(2)	(1)
72. Your company has improved the production process by using new technology, such as using computer systems in production or product design.	(5)	(4)	(3)	(2)	(1)
73. Your company has production process that reduces food waste.	(5)	(4)	(3)	(2)	(1)
74. Your company uses raw materials to produce new products that are different from the original products.	(5)	(4)	(3)	(2)	(1)

Biography

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