南華大學企業管理學系管理科學碩士班
碩士論文
Master Program in Management Sciences
Department of Business Administration
College of Management
Nanhua University
Master Thesis

創業思維對於創新能力及新產品開發績效之影響：以風險承擔與社會競爭為調節因子—高科技產業為例

The Influence of Entrepreneurial Mindset on Innovation Capability and New Product Development Performance:The Moderating Effect of Risk Taking and Social Competition--High-tech Industry as Example

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中華民國 110 年 06 月

June 2021

南　華　大　學

企業管理學系管理科學碩士班

碩士學位論文

創業思維對於創新能力及新產品開發績效之影響：以風險承擔與社會競爭為調節因子－高科技產業為例

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經考試合格特此證明

口試委員：

指導教授：

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口試日期：中華民國　110　年　06　月　29　日

Letter of Recommendation for ABT Masters

Tang Gekhor, a student of NHU Master Program for Business Administration for 1,5 years, has completed all of the courses and theses required for graduation.

1. In terms of studies, Tang Gekhor has acquired 39 credits, passed all of the obligatory subjects such as Research Methods, Management Science, Seminar on Marketing Management, Seminar on Business Ethics, etc. (Please refer to transcript.)
2. In terms of theses, Tang Gekhor has completed the following:
   i. Master thesis : The Influence of Entrepreneurial Mindset on Innovation Capability and New Product Development Performance: The Moderating Effect of Risk Taking and Social Competition: [redacted] in High-Tech Industry as Example.
   ii. Journal : Praxis International Journal of Social Science and Literature (Vol - 4, Issue - 5, May 2021)

I believe that Tang Gekhor has already received full formative education of NHU Master Program for Business Management and is qualified to apply for Master's Degree Examination. Therefore, I hereby recommend his preliminary paper, The Influence of Entrepreneurial Mindset on Innovation Capability and New Product Development Performance: The Moderating Effect of Risk Taking and Social Competition: [redacted] High-Tech Industry as Example., for the oral defense.

吳萬壹

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Date: 110.6.15

ACKNOWLEDGEMENT

Initially, I would like to express my most profound gratitude to my counsels Professor LIAO YING-KAI and Professor WU WANN-YIH, for their direction, consideration, persistence, time and most extreme exertion during the entire process of writing my dissertation.

Second of all, I would also like to reveal my deepest thanks to other professors, family, classmates, friends for the guidance, consultation, suggestion, ideas, advice, encouragement, experience sharing, grammar and writing format correction. This dissertation would not have been smoothly and perfectly done without those support and encouragement.

Lastly, I would also like to sincerely say thanks to all the respondents in this dissertation for your special contributions.

Tang Gekhor

June 2021

南華大學管理學院企業管理學系管理科學碩士班

109 學年度第 2 學期碩士論文摘要

論文題目: 創業思維對於創新能力及新產品開發績效之影響--以風險承擔與社會競爭為調節因子—高科技產業為例

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論文摘要內容：

在當今不斷變化的環境中，為了使公司取得成功，領導者必須培養某些人格特質，使他們能夠鼓勵變革、工作時的獨立性與創新的想法。簡單地說，企業應該鼓勵員工具有企業家思維。此外，為了在瞬息萬變的市場中生存並保持領先地位，公司需要依賴NPD團隊來開發具有創新功能的新產品，以滿足當今市場的客戶需求。因此，提升員工創新能力尤為重要。本研究的目的是在新產品開發的背景下，檢驗企業家心態和創新能力對 NPD 績效的影響，以及風險承擔和社會競爭的調節作用。本研究中 170 名受訪者是透過 Amazon M-turk 平台之問卷調查收集而來，本研究採用 SPSS 23 和 SEM-PLS 2.0 進行數據分析。 研究结果支持了除假设 5a 之外的所有发展假设，表明创业心态对创新能力有显着的正向影响，创业心态和创新能力对 NPD 绩效有积极和显着的影响，风险承担有创业心态和创新能力对NPD绩效的影响有显着的调节作用，社会竞争对创新能力对NPD绩效的影响有显着的调节作用，除了社会竞争对创业心态对 NPD 绩效的影响没有显着的调节作用。NPD 性能本研究的结果有助于现有关于 NPD 的文献。

關鍵詞：創業心態、創新能力、NPD 績效、風險承擔、社會競爭

Title of Thesis: The Influence of Entrepreneurial Mindset on Innovation Capability and New Product Development Performance: The Moderating Effect of Risk Taking and Social Competition--High-tech Industry as Example

Department: Master Program in Management Sciences, Department of Business Administration, Nanhua University

Final Defense Date: June 2021 Degree Conferred: M.B. A

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ABSTRACT

In today changing environment, A successful leader must develop certain qualities that allow them to encourage change, independence when working, as well as creative and novel ideas. To be simplistic, firms should encourage employees to have entrepreneur mindset. Moreover, to stay survive in the dynamic market and also stay head of the rivals, firms need to heavily rely on NPD team to produce new products with innovative features that can fulfill and satisfy customer needs in nowadays market. Therefore, focusing on improving employee innovation capability is also significantly important. The purpose of this study is to examine, in the context of new product development, the influence of entrepreneur mindset and innovation capability on NPD performance, and the moderating role of risk taking and social competition. 170 respondents in this study were collected through the questionnaire survey publishing in the Amazon M-turk. SPSS 23 and SEM-PLS 2.0 were employed to conduct the data analysis. The finding of the study provide support to all developed hypotheses except for the hypothesis 5a, suggesting that the entrepreneurial mindset has a significant and positive influence on innovation capability, entrepreneurial mindset and innovation capability have positive and

significant influence on the NPD performance, risk taking has a significant moderating effect on the influence of entrepreneurial mindset and innovation capability on NPD performance, and social competition has a significant moderating effect on the influence of innovation capability on NPD performance except for social competition has no significant moderating effect on the influence of entrepreneurial mindset on NPD performance The result from this study contribute to the existing literature regarding NPD.

Keywords: entrepreneurial mindset, innovation capability, NPD performance, risk taking, social competition

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CHAPTER ONE

INTRODUCTION

1.1 Research Background and Research Motivation

In the world of dynamic environment involving technology and market changes, short product life cycle, and global dynamic competition, the need for organizations to successfully produce new products and services with greater innovation is demanded, which consequently stimulate an upsurge of research interest in this topic (Dul and Ceylan, 2011; Evanschitsky et al., 2012). Innovation which is derived from creativity in the first stage becomes an essential factor for the firms to stay survive and remain long-term success as well as to gain the competitive advantage over its rival because it allows the firms to enhance technology, increase knowledge, improve capacity exploitation and grab the market from such ideas (Waruwu et al, 2020).

According to Kamal et al. (2016), high innovation, defined as the generating and introducing of potential useful new ideas, products, services, ways of working to the groups, organizations, and society, is internationally desirable because it can give firms the significant advantages and benefits. As exampled, Birdi (2016) reported on how a creative training program can enable the participants to generate new ideas that can have a further impact on organizational performance. To achieve the vision of successful new product development (NPD) with the excellent innovation, firms need more employees with highly innovative in new product development (NPD) team so that it can allows the organizations to leverage the strengths from each individual within the team to complete the tasks faster with effectiveness and efficiency, to be more sensitive and flexible to changes, and to overcome the challenges in the marketplace.

Entrepreneurship or entrepreneurial mindset is also a vital influential

element for gaining the sustainable competitive advantage. It is not only marked as the significant factor which the innovation capability relies on (Weerawardena and O'Cass, 2004) but also regarded as an important component for NPD performance. According to McMullen and Kier (2016), individuals with entrepreneurial mindset are always keen on goals thriving and willing to use contingency plan. Since the process of NPD faces a great uncertainty (Ortega et al., 2017), the NPD project team may challenge to widely different types of risks (Ayala-cruz, 2016; Colombo et al., 2015; Kohli and Jaworski, 1990). However, individuals or leaders with entrepreneurial mindset are willing to take a big amount of risk even if the consequences are unknown. Individuals with entrepreneurial mindset will also increase the tension of working or experience to accomplish goals and achieve the satisfied outcome (Miron-Spektor and Beenen, 2015). With the entrepreneurial mindset, individuals will be pushed to have a bigger tendency to proactively face with stress and anxiety (Miron-Spektor and Beenen, 2015; Seijts et al., 2013).

According to Shao et al. (2019), nowadays, leadership is required to be brave and faster in strategic decision-making, critical thinking, strong commitment and collective agreement. Leaders who have entrepreneurial skills will be able to enact technology and make it works that can further promote creativity, innovation and NPD performance (Ringberg et al., 2019). Therefore, entrepreneurial mindset will help to facilitate leader in management in the dynamic world, which can further promote creativity, innovation and performance within NPD team. Past studies have broadly and generally provided several perspectives of the entrepreneurial mindset to evaluate its attribute, qualities, effects (Naumann, 2017), but the different aspects have caused to a variety of the different definitions. Because of the array of different

definitions, the questions of what the entrepreneurial mindset really is and how people tap into it remain asking and the need for better understanding of the concept of entrepreneurial mindset is required. Hence, the researcher of this study intends to define a specific and clear concept of entrepreneurial mindset in the context of new product development.

Moreover, the contradict results of the influence of entrepreneurship on innovation capability have been found among previous researches. Some researches including Dewi (2018) and Audretsh et al (2015) revealed that entrepreneurship has no significant impact on individual innovation capability which is contradict to the theory of Bygrave (1991), proposing that the innovation stands in the beginning of process of entrepreneurship. This is also contradicted to the theory of Drucker (1985, 2002), suggest that in social service, in economic activities, in public institution or in private firms, all entrepreneurships need to be created and advanced. The entrepreneurship is able to apply the innovation ideas including new products, services, process of the production, technology, materials, business models or styles. Since the finding results were not compromised, the author of this study also intends to investigate the influence of entrepreneurial mindset on innovation capability and NPD performance to make the confirmation regarding its influence on innovation capability and NPD performance.

The concept of risk taking which is regarded as the level of the willingness of the managers or entrepreneurs to make risky and huge resource commitments in new product development project even if it has a high chance of costly failure, is rooted in the entrepreneurial mindset (Sebora and Theerapatvong, 2010). Dhliwayo and Vuuren (2007) proposed that risk taking is associated with the entrepreneurial mindset. Risk taking behavior allows entrepreneurs to perform better in NPD team (Njeru, 2012; Lackeus, 2016)

because it enables entrepreneurs to discover the fundamental source of innovation, sense and seize the opportunity in environment, reconfigure to the changes of environment, and able to comprehend and adopt the principle of successful innovation. Many past researches have paid a lot of attention on the impact of risk taking, entrepreneurship and innovation on NPD/firm performance (e.g., Rauch, 2009; Wiklund and Shepherd, 2003; Xue et al., 2018). Most studies did not consider the individual effect of risk taking as the potential moderating factor for the relationship between entrepreneurship or entrepreneurial mindset, innovation and NPD performance. According to these limitations, the author of this research has the intention on detecting the potential moderating effect of risk taking on the influence of entrepreneurial mindset and innovation capability on NPD performance at team level.

According to the recent research studies, social competition is a crucial component for NPD project in effort gain, which in contrast to independent work. Social competition is defined as the argument that occurs in the NPD team among the members that he/she will strive for making more progress of working performance than other team members (Trapnell and Paulhus, 2012). Moreover, Lount Jr and Wilk (2014) indicated that competition within team can provide a standard for an individual performance and affect consecutive effort expenditure. For example, when individual team members perceived other team members to be more successful in a valued task, they should increase their personal performance goal to match or exceed other performance. (Kudonoo and Nkansah, 2018) proposed that the indicators including the ability to innovate, the willingness to engage in social competition were used to represent entrepreneurship intention. Müller-Stewens and Möller (2017) conducted a systematic review study and collected the publication papers that drive NPD performance with the total number of

284. Among the 284 publications, Müller-Stewens and Möller (2017) further stated that only thirty articles cover individual and team-related issues including information and knowledge sharing (Mu et al., 2011), cross-functional corporation (Liu et al., 2015), reflexibility (Lin et al., 2015) and personality traits (de Visser et al., 2014), NPD team configuration (Keller, 2001), trust and familiarity in NPD team (Genç and di Benedetto, 2015; Tsai et al, 2014; Dayan, 2010; Markham and Lee, 2014). Since those past studies did not pay attention on social competition, one among the influential factor for NPD performance. Therefore, the researcher aims to focus on aspect of social competition and find out its effect that can significantly moderate the influence of entrepreneurial mindset and innovation capability on NPD performance.

1.2 Research Objectives

According to the above-mention research gaps, this research study plans to develop a research framework to examine the antecedents and moderators to enhance NPD performance. Specifically, the objectives of this study are:

1. To evaluate the interrelationship between entrepreneurial mindset and innovation capability and their impact on NPD performance.
2. To evaluate the moderating effect of risk taking for the impact of entrepreneurial mindset on NPD performance.
3. To measure the moderating effect of social competition on the impact of innovation capability on NPD performance.

1.3 Procedure and Research Structures

The Structure of this study is as follows, the first section provided information regarding the research background, objective motivation, and the

process for the research. The second section of this study gave the readers with information regarding the relevant literature including theocratical development, and the definition of key terms, as well as the hypothesis development. The third section of this study, the readers were provided knowledge regarding the sampling technique, sampling design, measurement of the research construct, research framework, and study plan. The graphical representation of the research procedure of this study is shown in figure 1.1 below:

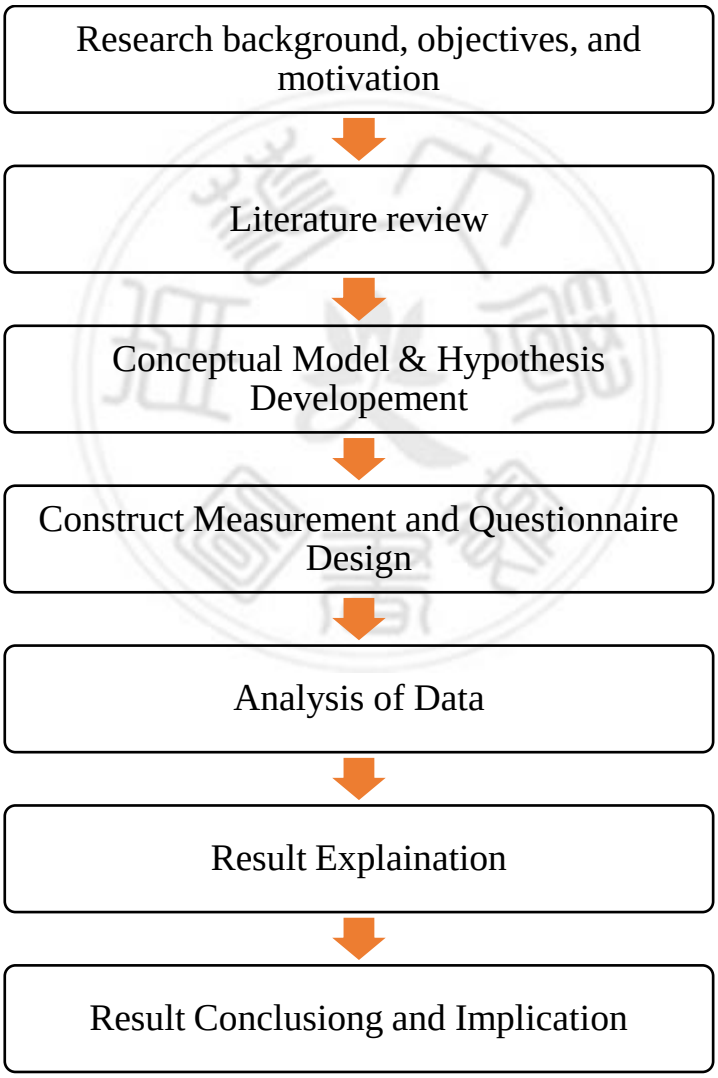

Figure 1.1 Research procedure

Source: Original Study

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Foundation: Self-theory and Personal Traits Theory

According to Roger (1951), the self-theory is a self-centroid theory that allow for the explanation of one action, manifestation of one characteristic through their personality, it involved the perception that one has for themselves and the relationship that they have with others, this doctrine involves two main aspects including the ideal self and Real self. A few decades later, Dweck (1999; 2000) confirmed that the self-theory was later developed in order to explain an individual intelligence by suggesting important motivation factor for the individual achievement. According to Dweck (1999), an individual can fall into two types of mindsets, the fixed and incremental or growth mindset. A fixed-minded individual believed that one mental capability, physical limit, talents etc. are naturally formed and cannot be modified. These individuals believe that a person is born with a given gift and not from their hard work or practices, they are prone to opting out of the situation once there are slow learning process and when they are faced with setbacks (Dweck, 2006).

According to Johnson (2009), such an individual often has low goal setting and low self-confident, and his/her thought often manifest in a helpless mannerism in respond to bad outcomes. The individual who has a growth mind set believed in self-development and achieving higher skill set due to their hard work, has often new and creative ways in order to solve their issue, and has tendency to learn new ways to achieve their goal. Once face with their own issue, either the individuals innately confident or not they will adopt the learning attitude (Dweck, 2006; Johnson, 2009).

As mentioned in Dweck (2006), this mindset is often found in majority of the business leaders who are constantly facing the dynamic market and are able to adopt new learning curve in order to ensure the survival of the firms. The growth mindset will be served as a basic of understanding in order to explain the importance of having an entrepreneurial mindset, in order to improve the performance. Due to the individuals strive to become their Ideal self in according to the self-theory, this will allow for the individuals to become more proactive in learning new skill, this can also help explain the significance of social competition on the influence of entrepreneurial mindset on the NPD-Performance. In light of this, affirming the ideal self as we can see from the vision and mission of each firm, the self-theory could be used to explain the innovation capability of the firm where the firm strive to meet its ideal self in term of adopting new innovative approaches, etc.

The two main categories of factors that would influence an individual decision making and their actions. The first type is demographical aspects (i.e., Arora and Kumari, 2015; Imbaya and Tarus, 2012). The second type is regarded to the psychological aspects which is the personality (i.e., Brice, 2004; Kautonen et al., 2015; Mayfield et al, 2008). Previous research regarding the personality has suggested that it has significant over the entrepreneurial tendency and influences over actions such as entrepreneurial motivation (Miner, 1994), entrepreneurs' career choice (Zhao et al., 2005), new business venturing (Ciavarella et al, 2004), opportunity recognition and acknowledgement (Ardichili et al., 2003). Trait theory generally on how the habitual pattern of one individual led to their determination of their action. One of the major contributions of to the trait theory is Costa and Mcrae (1992) model of personality or the big five taxonomies of personality, which has been used in many of previous work. Based on McClelland (1961) trait approach in

order to explain the entrepreneur psychologies, suggesting that entrepreneur can differentiate themselves through the process of exchange between their internal locus of control and external locus of control (Gaddam, 2008). This study would like to adopt the trait theory as a mechanism for explaining the behavior of the individual who has entrepreneurial mindset in term of taking risk, and thus how these actions would help to improve upon their performance. As mentioned in Karabulut (2016) suggested that through the lens of the trait theory, suggested that one risk tolerance is a major trait in order to develop entrepreneurial intentions, while other trait such as the higher locus of control, need for achievement and alertness also play major part in the contribution to the entrepreneurial intentions.

According to previous work, intelligence task orientation and flexibility are central point of the personality of a successful leader in addition to the skills, and competences of the individuals. (Lewis, 2001; Pettersen, 1991; Whitten, 1996). Crawford's (2002) empirical study has also provided support in term of knowledge, skill, and personalities trait as important aspect for successful business leaders.

2.2 Definition of Key Research Constructs

2.2.1 Entrepreneurial Mindset

An entrepreneurial mindset is defined as a mindset of entrepreneur in exploring new opportunities enthusiastically and execute those opportunities effectively. Business firms always develop the entrepreneurial mindset for leaders to achieve success because it is a crucial element. A particular perspective that orientates human leads toward the activities associated with entrepreneurship and its outcomes. According to Johnson (2009), individuals with entrepreneurial mindset often create opportunities, produce innovation

and new values. The characteristics of the individuals with entrepreneurial mindset set have the ability to face determined challenges and acknowledge the changes and uncertainty in the reality. Based on previous literature, innovation, creativity, risk-taking, and business alertness have been identified as the dimensions of entrepreneurial mindset. For the new business ventures, beside the natural characteristics of entrepreneur such as being innovative and creative, the ability to produce new product, new process, and new methods of doing things with novelty is needed (Ottih, 2014). Entrepreneurial mindset enables individuals to take benefits from the opportunities. Individuals with entrepreneurial mindset are able to signify the environment that represent the opportunities. This kind of psychological reasoning can help the entrepreneurs to use their curiosity to make the connections that create value.

According to Sudrajat (2015), the researcher of this study operationalizes entrepreneurial mindset is regarded as a mindset in seeking opportunities, producing innovation, risk taking and handling the changes and uncertainty. It refers to the ability or thought of exploring new opportunities via flexibility, innovation, reaction, and renewal mindset. The researcher makes the combination of two main perspectives adopted from both Sudrajat (2015) and Davis et al. (2016) to draw a full picture of entrepreneurial mindset that individual with entrepreneurial mindset should contain personal traits which were defined from personal characteristics such as preference, independence, limited structure, risk taking, nonconformity, passion, action orientation, keenness on accomplishment. Furthermore, the individuals who have entrepreneurial mindset should also have skills including the following scales: producing new idea, focusing on future, having self-confident and execution, being optimistic and persistent as well as interpersonally sensitive.

2.2.2 Innovation Capability

Nowadays, the aim of enhancing innovation capability of the firm has been taken seriously to stay survive in the constantly changing market and even stay ahead of their rivals (Xiao and Gang, 2017). Angehrn et al. (2001) and Raava (2007) discussed that Innovation capability can be identified in the company level or individual level. Previous theoretical researches have studied widely about innovation capability. Ussahawanitchakit (2007) stated that the majority of institutions and researchers have developed components of the innovation capability for the company level and so other researchers proposed measurement indicators for the individual innovation capability including technological innovation, strategy innovation, innovation of product and innovation of process. Innovation capability refers to the capability to produce new products that can meet and satisfy the customer needs in the market, capability to employ better technological process for new product development, capability to develop and adjust the existing one and adapt new products to meet the future needs, and ability to respond quickly to the unpredictable technological changes and related activities made by the competitors (Andrawina et al., 2008). Innovation in the service sector is defined by two factors including the ability of the firm or individuals to develop new products and the ability to adjust the existing products either fundamentally or additionally (Rajapathirana and Hui, 2018).

Innovation capability is marked as the firm's ability to constantly convert the knowledge and ideas into new products, new processes, and new system for the benefits of their stakeholders and the firm itself (Saulina, 2014). Calantone et al. (2002) proposed that innovation capability is defined as the firm innovativeness which is conceptualized from two main perspectives. The first perspective of firm innovativeness is regarded as the rate of innovation

adoption by the firm “behavioral variable”. The second perspective refers to the willingness to change of the organization. Some research studies conducted in regard to of the individual creativity and mechanism assessment.

Aulawi et al. (2009) proposed two important indicators used to explain the individual innovation capability such as product innovation capability and process of innovation capability. These two dimensions are assumed to have different social and economic impacts. The product innovation capability or the introduction of new products are normally expected to have a positive improvement on the income growth and workers while the process of innovation is regarded as the development of efficiency (cost reduction). Since this present study is conducted in the NPD team level, the assessment of innovation capability in the level of team is focused. In this study, team’s innovation capability is regarded the team’s capability to create new products and valuable products for the firm, the team’s capability to develop and adjust the existing products, and the team’s capability to create new and better working procedure (Aulawi, 2018).

2.2.3 NPD Performance

NPD performance is defined as the success of a new product launched in the market (Narver et al, 2004; Paladino, 2007) and is mainly recognized at the very end of the new product development (NPD) process (Tidd and Bessant, 2018). Since excellent NPD performance is a major driver for developing a sustainable competitive advantage of a firm, it is regarded as the organizational goal (Munin, 2010; Ciriaco et al., 2010). Several perspectives regarding the measurement of NPD performance have been developed and proposed (Ciriaco et al., 2010; Mat and Jantan, 2009; Robert and Carolyn, 2003). Ulrich and Eppingger (2004) proposed five indicators for measuring NPD performance including quality of the product, cost of the product, time for developing the

product, and ability to develop the product. Moreover, Leenders and Wiernga (2002) defined NPD performance using NPD decision-making speed, NPD decision-making quality, NPD speed, commitment to NPD decisions converted into action, NPD cost efficiency, and capability to respond to new opportunities. Driva et al. (2000) conducted a study regarding NPD performance in manufacturing industry and also suggested five measurement indicators for NPD performance such as total project cost, the differences between actual and projected cost, completion time, product launch date, and project completion date. According to Hsu (2016), NPD performance is defined by financial indicators and nonfinancial indicators. The financial indicators include sales volume, sales amount, and profits and the nonfinancial indicators include enhanced corporate technology competence, improved corporate image, and customer product evaluations.

This study defined NPD performance according to the innovation of product and NPD team performance. According to Weerawardena and O'Cass (2004), innovation is the application of ideas with novelty that allow the NPD team to create additional value for the firm. New product development performance has two main components such as innovative work behavior and new product success has been operationalized in this study.

Innovative work behavior needs to achieve success in new product development projects. Based on Carmeli et al. (2016) and Scott and Bruce (1994), innovative working behavior is defined as the willingness to adapt and explore new ideas, and willingness to change in the status quo. According to Scott and Bruce (1994), innovation behavior consists of three fundamental stages of the process. The first step is to spot the problems within the workplace, and the second steps is to develop novelty within the idea and solution, and in the last stage is to develop the supporting system for the ideas integration and

solution in the organization. Innovation is related to the standardized steps; each employee is required to the accomplishment of different activities and behavior.

According to Paladino (2007), new product success refers to the success of using of existing resources, capabilities and abilities to create something new. Additionally, Murat Ar andh Baki (2011) stated that new product success refers to the innovativeness of process and product. Moreover, Wong and Tong (2012) argued that the new product success involves in transforming the innovative idea into new product or process. Deshpandé et al. (1993) claimed that it is so challenging in examining the success in post-production phase in many researches regarding new product development. Therefore, this study defined new product success as income and the profitability that generated by the new product launch of the firm (Akgün et al., 2012; Paladino, 2007).

2.2.4 Risk Taking

Damodaran (2007) stated that risk is involved in the daily life. We cannot grow if we do not take risk or face any uncertainty that drives us to make a certain decision. A successful firm makes the right decision because it has faced with different risks. Several research studies in this kind of field have focused on risk attitude (Pennings and Smidts, 2000), risk management (Millson and Wilemon, 2008; Mu et al., 2009), risk preference (Keeney and Raiffa, 1976), risk propensity (Brockhaus, 1980), and risk aversion (Dyer and Sarin, 1982). Past studies have also discussed about the perspectives of risk taking and the level of risk which is depending on the company size. Based on Wiklund and Shepherd (2003), risk-taking is regarded as the company's tendency for involving in high-risk projects due to the high chance of returns and even the potential consequences are unpredictable, the firms is willing to act courageously. In this research study, risk taking is identified as the tendency to take a large amount of risk (Somech and Drach-Zahavy, 2013).

According to Akgun et al. (2006), risk is related to the change of beliefs and routines regarding newly developed product in the NPD context. Risk is unavoidable in the NPD process even though the outcome is unpredictable and too much risk might be harmful. Risk taking involves threats and opportunities but NPD team have to decide even though the results are unknown. New product might be failed in the marketplace but no new products will ever be marketed if no risks are taken (Dess and Lumpkin, 2005).

2.2.5 Social Competition

Social Competition is an important debate topic among academician and practitioner (sommer, 1995). According to Sommer (1995), social competition refers to the type of unconventional competition that an individual take in order to become more skilled and show their value to their peers. The inner self challenges allow for the individual to make the self-comparison with themselves and their surroundings. this social comparison process allows for the individual to check themselves in measure to their social- work surrounding which is an addition to their inner-determination. Drawing upon Festinger's Seminal work suggest that there is effort gain with in the team where social caparison is an influencing factor that allow for the sense making process in the social interactivity (Festinger, 1954). This fundamental phenomenon can be discovered in several previous literatures of social motivation, such as upward comparison, performance matching (Jackson and Harkins, 1985), or goal comparison (Stroebe et al., 1996), and is also regarded as the central aspect of social competition within teams (Seta, 1982).

The core value of social competition is based on two doctrines including the strive for domination over the peers and the contrast which is maintaining social relationship while being cooperative, specifically, getting ahead and getting along respectively (Trapnell and Paulhus, 2012). In group, competition

among the members can make a standard of performance for each individual and affect consecutive effort expenditure (Lount Jr and Wilk, 2014; Wittchen et al., 2011). For example, the personal performance would be increased to match and even exceed the performance when individual members notice that other members in team perform a valued task better or successfully (Stroebe et al., 1996). In the exploratory studies discovered that social competition can lead to significant effort gains in teams which in contrast to working alone (Seta, 1982; Stroebe et al., 1996). This study operationalized social competition is based on two doctrines including the strive for domination over the peers and the contrast which is maintaining social relationship while being cooperative, specifically, getting ahead and getting along respectively (Trapnell and Paulhus, 2012).

2.3 Hypothesis Development

2.3.1 The Influence of Entrepreneurial Mindset on Innovation Capability

Entrepreneurship is not sufficient in itself is regarded as a process of searching and seeking opportunities and also daring of taking risk. After the right opportunities were found, the products or services then were produced with an understanding of the customer needs to build a product advantage according to its innovation (Fontana, 2011). Entrepreneurship is needed to obtain innovation and development in economic activities or social services as well as private firms or public institutes. Entrepreneurship may assist in creating innovative idea including new products or services, new processes of production, new technologies, new materials and even new business models (Drucker, 1985a). Entrepreneurship was found to have a positive effect on innovation (Hacioglu et al., 2012; Ma'atoofi and Tajeddini, 2010). According to Lee and Hsieh (2010), Ability to implement the innovative ideas was

contributed by entrepreneurship. Firms have the demand of improving entrepreneurial mindset due to the need of open innovation According to the above-mention information, the following hypotheses are proposed:

H1: Entrepreneurial mindset has a positive influence on innovation capability

2.3.2 The Influence of Entrepreneurial Mindset on NPD Performance

Individuals with entrepreneurial mindset can rapidly sense, act and mobilize even under uncertainty to exploit entrepreneurial opportunities. Entrepreneurial mindset is defined as crucial for entrepreneurship in previous studies (Neneh, 2012; Ireland et al., 2003) implying that it can improve the new product development success and performance. Several studied have revealed the significant relationship between entrepreneurial mindset and firm performance in difference countries. Njeru (2012) conducted a study regarding the impact of entrepreneurial mindset on performance of small manufactures in Nairobi industrial area by examining the effect of each dimension of entrepreneurial mindset including business alertness, innovativeness, and creativity on business performance. Results of the study showed that each dimension of entrepreneurial mindset such as innovativeness, business alertness, and creativity significantly influence on the performance of business.

The findings by Susilo (2014) conducted in Indonesia also disclosed that business performance has a significant relationship with entrepreneurial mindset. Regarding an exploratory study carried out by Ngek (2012) on entrepreneurial mindset in fostering the success of small and medium enterprises (SMEs) in South Africa showed that lack of entrepreneurial mindset contributes to higher failure rate of SMEs. According to the above-mention information, the following hypotheses are proposed:

H2: Entrepreneurial mindset has a positive influence on NPD performance

2.3.3 The Influence of Innovation Capability on NPD Performance

Innovation capability is regarded as the potential driving factor behind new product development (NPD) (Camison and Villar-Lopez, 2012; Laforet, 2011), to guarantee the sustainable new product development that can fulfill the customers' needs and can potentially compete in the changing marketplace (O'Cass and Sok, 2014; Sok et al., 2013). To form the competitive landscape, innovative firms regularly keep themselves be well-informed about their competitors and market themselves by adopting different internal competencies of the organization that enable innovation and new product development (Hong et al., 2013; Laforet, 2011; Tavassoli, 2018). In the innovation literatures, the argument stated that firms having greater interaction with customers in the initial stages of product design can gain more knowledge of the acquisition that can be used to fulfill and satisfy the customer needs (Camison and Villar-Lopez, 2012; O'Cass and Sok, 2014).

Colombo et al. (2015) stated that innovation capability (IC) can provide deep insights that enable the firms to take advantage of the current skills and knowledge as well as expand the horizons for better understanding of potential customer needs. Holtzman (2014) discovered the significant role of innovation capability (IC) in new product development (NPD) within firms. Furthermore, Sulistyo and Siyamtinah (2016) also confirmed that both managerial and technological innovation capability (IC) have a positive effect on new product development (NPD) and firm performance. Thus, firms with high innovation capability (IC) are more likely to excel in new product development (NPD) (Laforet, 2011; O'Cass and Sok, 2014). and are also more flexible in their

responses to the continuously changing demands in the market (Sok et al., 2013). According to the above-mention information, the following hypotheses are proposed:

H3: innovation capability has a positive influence on NPD performance

2.3.4 The Moderating Effect of Risk Taking on the Influence of Entrepreneurial Mindset and Innovation Capability on NPD Performance

Forlani and Mullin (2000) argued that risk refers to the level of uncertainty and potential losses related to the results, which may be caused from a set of behaviors or a given behaviors. Similarly, Dhliwayo and Vuuren (2007) stated that risk taking is an essential component of the strategic entrepreneurial mindset because it helps a business to achieve success and growth based on how the entrepreneurs perceive the risks and manage it in their situation or environment. According to Dunlap (2008), business ventures should implement entrepreneurial mindset to enable the entrepreneurs with full ability to accept the risks and manage it. Furthermore, Neneh (2012) and Ireland et al. (2003) also stated that in entrepreneurship researches, the entrepreneurial mindset has been regarded as a key factor within several studies, suggesting that it helps the businesses to enhance the performance and achieve success. The entrepreneurial mindset is a core value of entrepreneurship with several studies (Neneh, 2012; Ireland et al., 2003), suggesting that it has the impact on the success and performance of businesses.

Nieuwenhuizen and Kroon (2002) showed that the willingness to take risks (risk tolerance) has a strong relationship with entrepreneurial business success. Therefore, the study further suggested that risk is an important factor and should be included in entrepreneurship education and training programs. Janney and Dess (2006) made an argument that risk taking decisions are more

likely to happen in the process of new venture creation. According to this argument, a conclusion was made regarding the risk construct with the three dimensions such as risk refers to variance, risk refers to a downside loss and bankruptcy and risk refers to an opportunity. Moreover, Simon et al. (2000) also have proofed that risk perception change because of certain cognitive biases that can drive the entrepreneurs to take less risk. Therefore, Ward (1997) concluded that no risk taking, the growth of business might decrease. Thus, risk taking becomes imperative for entrepreneurial firms.

Risky decision-making is unavoidable for a firm that commits its resources to new product development (NPD) (Millson and Wilemon, 2008). In new product development (NPD) process, risks occur because of several uncertain factors including uncertainty in operation, market and pure risk. Among those uncertain factors, market uncertainty including weak market response from customers because of unsatisfied features or price can lead to lower-than-expected margins (Harrington and Niehaus, 2004). This kind of risk primarily results from incomplete information (Ansoff, 1965). Operating uncertainty including credit, working capital, foreign exchange, cash flow, or input price change is rooted in resource constraints. Lastly, pure risk refers to those that caused from the possibility of crime occur such as robbery and embezzlement (Harrington and Niehaus, 2004) or even from the lack of internal recognition or technical ability (Mu et al., 2009).

Calantone et al. (2003) revealed that risk taking has a positive effect on the corporate strategy development and increases new product development (NPD) performance. Therefore, managers must be daring to make a risky investment to increase new product development speed. The enterprises that extremely depend on the existing competitive advantages and try to avoid risks are not conducive to new product development (NPD) (Narver et al., 2004).

The studies on organizations in transitional economies discovered that risk taking is essential for new product development (NPD) success (Li and Atuahene-Gima, 2001). Firms that take a large amount of risk are often experienced having a heavy dept or making large resource commitments due to the interest in obtaining high returns by seizing the opportunities in the marketplace (Lumpkin and Dess, 1996). Firms must implement a high amount of risk taking to make sure that the innovation is mainly focused to meet unarticulated and emerging customer needs and wants. According to the above-mention information, the following hypotheses are proposed:

The key element to the firm success depends on the ability of the firms to initiate on innovation when it comes to innovation capability and the business performance (Saulina et al. 2014). Garcia-Morales et al. (2007) confirmed that technological firms that have better innovation capability attain a well responsiveness from the environment, achieve more capabilities needed easily to improve the firm performance and create a sustainable competitive advantage. Technological firms with higher innovation capability attain a well response from the surrounding environment, achieve the required the capabilities more easily to improve firm performance and develop a sustainable competitive advantage. Furthermore, several studies have revealed that innovation has a positive relationship with business performance (Zangwill, 1992; Garcia-Morales et al., 2007; Koellinger, 2008). Moreover, several researches revealed a positive relationship between innovation and business performance (Zangwill, 1992; Garcia-Morales et al., 2007; Koellinger, 2008).

The leader's support is significant to initiate the innovation because innovation is frequently risky, costly, and disruptive. The leaders' choices and decisions either have a positive or negative influence on the performance of an organization, this phenomenon has been stated in the upper echelon's theory.

The decisions and choices that have made by the leaders can either have a positive or negative impact on the firm performance based on the upper echelons' theory. The leaders play as a central role in designing the process of the organization, creating organizational structure, determining the organizational culture, and influencing on the behavior of all employees in the organization. Leaders play important role for the success of innovation, because of the crucial role in shaping culture, designing structures, defining processes, and influencing employees' behavior (Denti and Hemlin, 2012). In order for the success of innovation to be achieved, leaders must have certain trait including: intelligent, aware and smart, leading with responsibility, technically skilled, able to maneuver in social and professional situations, energetic, good at communications, and hard-working

According to Albuquerque and Hopenhayn (2004), to achieve innovation and turning the new idea into a physical product or service, the firms need to take a certain amount of risk. Albuquerque and Hopenhayn (2004) further claimed that not only the right culture (environment) but also risk taking are crucial for innovativeness. The right culture (environment) and also risk taking is important in innovativeness. Notedly, pro-activeness and innovativeness simply embrace the risk taking with them. Being proactive in order to forecast the future needs is required to take risk. Similarly, being innovative to achieve novel ideas also needs to take a certain amount of risk due to the unknown outcome of both actions. According to the above-mention information, the following hypotheses are proposed:

H4a: Risk taking moderate the positive influence of entrepreneurial mindset on NPD performance.

H4b: Risk taking moderate the positive influence of innovation capability on NPD performance.

2.3.5 The Moderating Effect of Social Competition on the Influence of Entrepreneurial Mindset and Innovation Capability on NPD Performance

According to Deutsch (1949), people are likely to have a self-evaluation when they have a collaborative working due to not only the concerning of group goal achievement but also individual goal accomplishment. Therefore, this kind of phenomenon can have the impact on team performance in the concept of social competition and also get many supports from previous studies (e.g. (Brouwer, 2016; De Dreu and Weingart, 2003; Gardner et al., 2009; Invancevich et al., 1990).

According to past literature, the influence of competition on team performance has conflicting outcomes. Some researchers discovered that the competition positively impact on team performance with the proof that social competition can drive individuals to have more task engagement (Goldman et al., 1977) and to have better performance than their partners (Julian and Perry, 1967; Scott and Cherrington, 1974) whenever the job is repetitive and can be solely performed. Nevertheless, some researches revealed that social competition can drive poorer level of performance for the jobs or tasks that contain higher level of complexity due to the requirement of interdependent work (Miller and Hanblin, 1963; Stanne et al., 1999).

According to Tajfel et al. (1979), the maintenance of positive individual's goals shifts to group 'goals. This phenomenon can drive the group members to have a high group goal engagement and easy to accomplish the goals. In order to improve the result from this phenomenon, two major approaches were adopted. The first approach is to use the social competitive strategy which refers to the creation of a certain group conflict.

The second approach is to use the social creative strategy in order to achieve the social identity maintaining and group distinctiveness enhancement. There are two major approaches promote the results, one is to adopt the strategy of social competitive, which means to create a certain of conflict within group; another is to adopt the strategy of social creative to maintain positive social identity and to enhance group distinctiveness. The further discovery from Haslam (2004) stated that the group who involve in competition may improve greater level of creativity. Thus, Douglas et al. (2005) specified that social competition can influence on group creativity. Furthermore, the further studies from He et al. (2014) discovered that social competition has significantly impact on the relationship between team reflexibility and team performance. Likewise, some studies including Crwoford and Lepine (2013) also showed that appreciate competition enable the group achievement.

Kudonoo and Nkansah (2018) claimed that individuals with entrepreneurial mindset have personal traits which is defined by personal characteristics including capability of exploring new ideas, willingness for taking risk, exclusivity in seeking solutions for problems, keenness on engaging in social competition, and sense of belonging. Based on this statement, it can imply that in term of competition, individuals who consist the mindset of entrepreneurship tend to be socially competitive, creative and innovative in processing ideas and also flexible to changes when there are uncertainties exist. According to the above-mention information, the following hypotheses are proposed:

$H5_a$: The social competition moderates the positive influence of entrepreneurial mindset on NPD performance.

$H5_b$: The social competition moderates the positive influence of innovation capability on NPD performance.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Research Model

This research's main purpose is to examine the influence of entrepreneurial mindset and innovation capability on NPD performance. The moderating effect of risk taking and social competition is also evaluated. The respective research model is presented in figure 3.1 below:

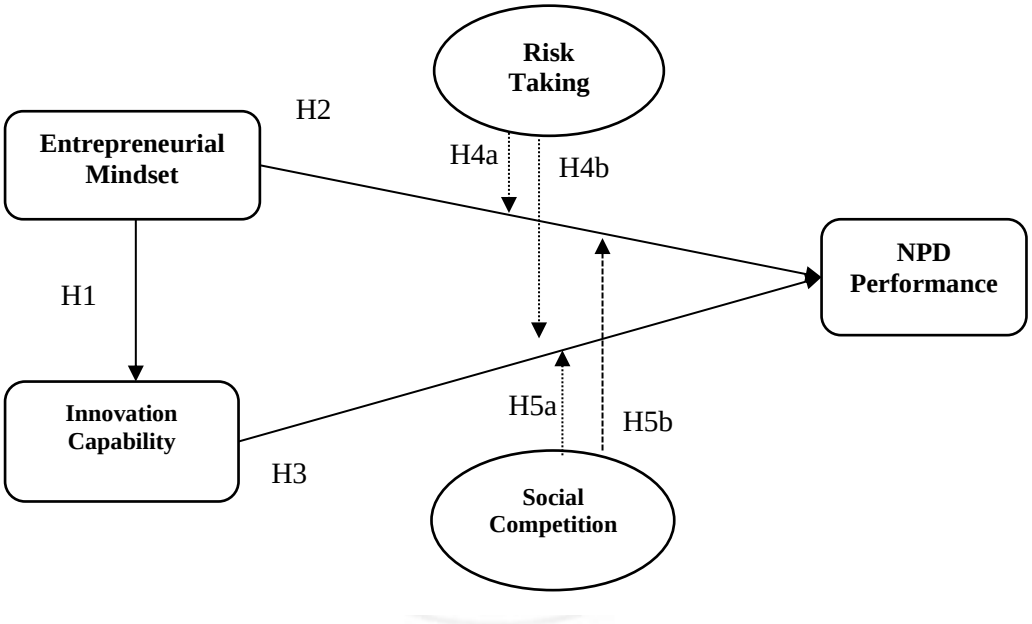

Figure 3.1 The Conceptual Framework

Source: Original study

The following hypotheses was created in order to test the measurement model of the research study:

H_1: Entrepreneurial mindset has a positive influence on innovation capability

H_2: Entrepreneurial mindset has a positive influence on NPD performance.

H_3: Innovation capability has a positive influence on NPD performance.

H_{4a}: Risk taking moderates the positive influence of entrepreneurial mindset on NPD performance.

H_{4b}: Risk taking moderates the positive influence of innovation capability on NPD performance.

H_{5a}: Social competition moderates the positive influence of entrepreneurial mindset on NPD performance.

H_{5b}: Social competition moderates the positive influence of innovation capability on NPD performance.

3.2 Quantitative Research

Quantitative method used in this research study by adopting questionnaire survey to collect the data from team leaders and team members who have involved in new product development projects in high-tech firms so that the researcher can assure the adequation of data collection. The researcher believes that this kind of firms can provide the accurate information regarding the product innovation and creativity because they have experiences in the new product development (NPD) project.

3.3 Participants and Sampling Plan

The google survey form was developed to produce the questionnaire survey which consist of forty-two questions in total. Then, the survey was published in the Amazon M-Turk Platform to collect the data. This kind of platform is an online survey panel platform that provides access to a wide range of respondent profiles and allows respondents to complete the questionnaire survey in exchange for monetary rewards (Conley and Tosti-Kharas, 2014). Since this study focused on high-tech industry, the survey was made available through Mturk to all respondents who confirmed having experience or work in

new product development projects in high tech companies. In order to ensure the adequation and validity of the data collection, all the questions was input as the answers are required so that the respondents cannot go through all the questions and not even skip any question. Moreover, to avoid the duplicated survey completion, all the respondents were required to provide their working ID. All the respondents were asked to express their ideas and opinions about entrepreneurial mindset, innovation capability, NPD performance, social competition and risk taking as well as to provide the demographic information at the end of the survey section.

Another way to ensure the validity and adequation of the data is related to the sample size. Therefore, the formula presented below was used to calculate the suitable sample size for this research study (Kerlinger et al., 2000; Marcoulides and Sauuders, 2006):

$$n = \frac{Z^2_{\alpha/2}.\sigma^2}{e^2} \quad (1)$$

Moreover, a 7-point-Likert scale was adopted for the questionnaire survey assessment so the sample size calculation is displayed below:

$$n = \frac{Z_{\alpha/2}.\sigma^2}{e^2} \quad (2)$$

$e = 5\%, Z = 1.96, \sigma = 1.3$ (assumption)

So, the estimation of the number of samples in this research study:

$$n = \frac{1.96^2 \times 1.3^2}{(7 \times 0.02)^2} = 331 \ (3)$$

After the sample size calculation, this study should collect at least 331 respondents to maintain the validity and adequacy of the data.

3.4 Construct Measurement

This study identified five constructs to test research hypotheses. These constructs include: (1) Entrepreneurship Mindset, (2) Innovation, (3) NPD Performance, (4) Social Competition, and (5) Risk Taking. This paper seeks the measurement of each of the construct from previous studies. Except the measurement items of respondents' characteristics, all measurement items used 7-point Likert scale to measure the opinions from the respondents.

3.4.1 Entrepreneurship Mindset

Entrepreneurial mindset was operationalized for this research study as mentioned in chapter two. The researcher adopted the measurement scale from both Sudrajat (2015) and Davis et al. (2016) and developed a new measurement scale for this research construct. Specifically, the measurement scale of this construct contains two dimensions such as personal traits which consists of seven measurement items adopted from Sudrajat (2015) and skills which also consists of seven measurement items adopted from Davis et al. (2016). A 7-point-Likert scale (from 1 strongly disagree to 7 strongly agree) was to measure the agreeableness of this research construct. The questionnaire items for the entrepreneurial mindset were presented in Table 3.1 below:

Table 3.1 The Measurement Items of Entrepreneurial Mindset

Construct	Dimension	Measurement Items	References
Entrepreneurial Mindset	Personality Traits	1. I'm uncomfortable to follow other's rules. 2. I find it boring to work on clearly structure tasks. 3. I like to stand out from the crowd. 4. I'm willing to take a certain amount of risk to achieve real success. 5. I tend to make decision quickly. 6. I'm passionate about work that I do.	(Sadrajat, 2015)

Table 3.1 The Measurement Items of Entrepreneurial Mindset (Continued)

Construct	Dimension	Measurement Items	References
		7. I want to be the best at what I do.	
	Skills	1. I'm focused on the long term 2. Sometimes ideas just bubble out of me. 3. I have a reputation for being able to take an idea and make it work 4. I'm self-confident person. 5. Even things aren't going well, I look on the bright side. 6. I do not give up easily. 7. I'm sensitive to other's feelings.	(Davis et al., 2016)

3.4.2 Innovation Capability

Innovation capability was also operationalized for this research study as mention in chapter two. The researcher adopts the measurement scale from (Calantone et al., 2002). Specifically, the measurement scale of this construct contains six measurement items. A 7-point-Likert scale (from 1 strongly disagree to 7 strongly agree) was used to measure the agreeableness of this research construct. The questionnaire items for the innovation capability were presented in Table 3.2 below:

Table 3.2 The Measurement Items of Innovation Capability

Construct	Measurement Items	Reference
Innovation Capability	1. Our company frequently tries out new ideas. 2. Our company seeks new ways of doing things. 3. Our company is creative in its operating methods. 4. Our company is frequently the first to market new products and services. 5. Innovation is perceived as too risky in our company and is resisted (reversed coded). 6. Our new product introduction has increased during the last five years.	(Calantone et al, 2002)

3.4.3 NPD Performance

NPD performance was also operationalized in this study and consists of two key elements including innovative work behavior and new product success. New product success was operationalized in this study through the

adoption of six items from Akgün et al. (2012) and innovative work behavior was operationalized through the adoption of six items from Dayan and Di Benedetto (2009); Scott and Bruce (1994). Specifically, the measurement scale of this construct contains two dimensions including new product success which consists of six items and innovative work behavior which also consists of six items (Akgün et al., 2012). A 7-point-Likert scale was used to measure the agreeableness of this research construct. The questionnaire items for the NPD performance were presented in Table 3.3 below:

Table 3.3 The Measurement Items of NPD Performance

Construct	Dimension	Items	Reference
NPD Performance	New Product Success	1. Our product meets or exceeds volume expectations. 2. Our product meets or exceeds the first-year number expected to be produced and commercialized. 3. Our product meets or exceeds overall sales expectations. 4. Our product meets or exceeds profit expectations. 5. Our product meets or exceeds return on investment expectations. 6. Our product meets or exceeds senior management expectations.	(Akgün et al., 2012).
	Innovative Work Behavior	1. My team members search out new technologies, processes, techniques, and/or product ideas. 2. My team members generate creative ideas. 3. My team members promote and champion ideas to others. 4. My team members investigate and secure funds needed to implement new ideas.	(Dayan and Di Benedetto, 2009); (Scott and Bruce 1994)

Table 3.3 The Measurement Items of NPD Performance (Continued)

Construct	Dimension	Items	Reference
		5. My team members develop adequate plans and schedules for the implementation of new ideas.	
		6. My team members are innovative.	

3.4.4 Risk Taking

Risk taking was also operationalized for this research study as mentioned in chapter two. The researcher adopted the measurement scale from Sue-Chan and Hempel (2016); Choi and Price (2005); Amara et al. (2008). Specifically, the measurement scale of this construct consists of five measurement items. A 7-point-Likert scale was used to measure the agreeableness of this research construct. The questionnaire items for the risk taking were presented in Table 3.4 below:

Table 3.4 The Measurement Items of Risk Taking

Construct	Measurement Items	Reference
Risk Taking	1. Our team members are able to deal with new equipment. 2. Our team members are able to deal with new marketing strategies. 3. Our team members are able to deal with the replacement of former suppliers with new suppliers. 4. Our team members are able to work with new members. 5. Our team members are able to invest in new production technologies	(Amara et al, 2008; Choi and Price, 2005; Sue-Chan and Hempel, 2016)

3.4.5 Social Competition

Innovation capability was also operationalized for this research study as mention in chapter two. The researcher adopted the measurement scale from both Karau and Elsaid (2009). Specifically, the measurement scale of this construct contains two dimensions including getting head which consists of

five items and getting along which consists of six items (Karau and Elsaid, 2009). A 7-point-Likert scale was used to measure the agreeableness of this research construct. The questionnaire items for the social competition were presented in Table 3.5 below:

Table 3.5 The Measurement Items of Social Competition

Construct		Items	Reference
Social Competition		1. I find competitive event unpleasant 2. I don't like competing against other people 3. I try to avoid competing with others 4. I prefer group work to individual work 5. Whenever possible, I like to work with other rather than by myself	(Karau and Elsaid, 2009)

3.4.6 Demographic Information

The measurement items for respondent's information were shown in the final section of the completed survey. The questions are as such:

Respondents Information

1. Respondent Gender
2. Respondent Age
3. Educational Background
4. Position in Company
5. Working Experience
6. Working industry

3.5 Pilot Test

Before conducting formal test of factor loading and reliability, the pilot testing with sample of at least 50 respondents was conducted to verify the dimensionality and reliability as well as consistency of each research construct and its dimension. Factor analysis was firstly conducted to test the

dimensionality of the research constructs. In this analysis, the questionnaire items were selected basically depend on the high factor loading scores. Then in the reliability test, Cronbach's alpha value and item to total correlation were used to represent the internal consistency of each construct and identified dimension and its reliability. The following criteria must be fulfilled: (1) factor loading >0.7, (2) eigenvalue >1, (3) cumulative explained variance >0.6, (4) item to total correlation >0.5, and (5) Cronbach's alpha >0.7. The questionnaire item that does not meet the threshold were deleted and excluded in the future analysis.

3.6 Data Analytical Techniques

SPSS 23 and Smart PLS 2.0 were adopted to analyze the collected data. The following data analysis methods were implemented:

3.6.1 Descriptive Statistic Analysis

Descriptive statistical analysis was adopted for better understanding of the demographic information of the respondents and the characteristics of our research constructs. After the conducting the descriptive statistical analysis, the frequency was revealed to illustrate the respondent demographic and the mean scores and standard deviation were revealed to illustrate the characteristics of all research constructs.

3.6.2 Factor Loading and Reliability Test

Exploratory and confirmatory factor analysis was implemented to verify the measurement scales of each individual research construct and its dimensionality. This study employed the principal component factor analysis and varimax rotation methods to group the collected data into factors. After

factor analysis conduction and reliability test, item-to-total correlation coefficients and Cronbach's alpha were used to confirm the reliability and internal consistency of each individual research factor. Based on Hair et al. (2010), factor loading should be bigger than 0.7, eigenvalue should be greater than 1, accumulative explained variance should be higher than 0.6, item to total correlation should be higher than 0.5, Cronbach's alpha should be bigger than 0.7. For the measurement items that do not fulfill the criteria were excluded in further analysis.

3.6.3 Common Method Variance

To survey the possibility of common method variance which is one-sided by gathering two measures from a similar source utilizing a similar technique simultaneously, the validity check was conducted. Initially, to conduct the validity test, a Harman one-factor test was used, this allows for the variables to be loaded into one principal component factor (Podsakoff et al., 2003). Secondly by showing the contrast between the square root of the AVE (average variance extracted) to the Pearson correlations between all of the constructs, the discriminant validity was achieved when the AVE is higher than any inter-construct-correlation (Fornell and Larcker, 1981, Hair et al., 2017).

3.6.4 Hypotheses Testing Technique

3.6.4.1 The Partial Least Square (PLS)

To test the hypotheses in this study, the researcher employed the Partial Least Squares (PLS or PLS-SEM) path modeling algorithm for measuring both the construct measurement model and structural model. Klein and Schermelleh Engel (2010) stated that Partial Least Square (PLS) is when it comes to the sample size limit, multicollinearity and the normal distribution assumption, the

PLS-SEM is more versatile as compare to CB-SEM or other options. Moreover, Hair et al. (2011) revealed that PLS is more suitable in practice when:

1. The purpose of the research study is to predict the key driven factors or constructs;
2. Big research model with more complexity, which including many constructs and indicators);
3. the research study contains relatively small sample size;
4. the study consists of non-normality within its collected data;
5. the study adopts the latent variable score for further analysis.

According to the above mention statement, PLS was appropriately and practically employed in this study due to the complexity of the research model and the aim of determining the impact of independent variables (antecedents) on the dependent variables (outcomes).

3.6.4.1.1 Evaluation of the Measurement Model

In this research study, many purification processes such as the factor loading analysis, correlation analysis and internal consistency analysis (Cronbach 'Alpha) were implemented in order to show the reliability, validity, and dimensionality of the research constructs. theoretically. The conduction of factor loading analysis is to classify the dimensionality of each construct in the research study by selecting the questionnaire items with the high scores of factors loading and then compare these selected questionnaire items with items according to the theoretical suggestion. The internal consistency and reliability of the research construct were verified by assessing the item-to-total correlation and coefficient alpha. The reliability and validity of the research construct were identified by measuring the average variance extracted (AVE),

composite reliability (C.R), and Cronbach's alpha. Hair et al. (2017) stated that in order to showcase the reliability and validity of the research construct, the following requirements need to be fulfilled: the composite reliability (C.R) > 0.6 indicating the variance shared by respect indicators is strong (Nunnally and Bernstein, 1994),), average variance extracted (AVE) > 0.5 indicating the latent variables can explain more than the average (Henseler and Ringle, 2009) , Cronbach's alpha > 0.7 showcasing the internal consistency of the research constructs.

3.6.4.1.2 Evaluation of the Structural Model

Hair et al. (2012) suggested that the coefficient of determination (R^2) is the primary criteria for the assessment of the PLS model, which signified the amount of explained variance of each endogenous latent variable. Based on Chin (1998), $R^2 \geq 0.672$ is defined as substantial, $R^2 \geq 0.33$ is defined as moderate, and $R^2 \geq 0.19$ is defined as weak. Moreover, the goodness-of-fit is the second criteria for the PLS model assessment. The goodness-of-fit (i.e., the GoF index) refer to the geometric mean of the average communality and the models' average R^2 value. Vinzi et al. (2010) stated that GoF ≥ 0.36 is classified as large, GoF ≥ 0.25 is classified as moderate, and GoF ≥ 0.1 is classified as low. The criteria for the structural model evaluation in this research study should be: $R^2 > 0.6$ and GoF > 0.33

The reliability and validity of the measurement model were verified using the above mention criteria. After justifying the reliability and validity of the measurement model and structural, the coefficients of the path parameters (β) were conducted for the hypotheses testing in this study. Those (β) values with p-value smaller than 0.05 is defined as significant. The PLS procedure was employed using SmartPLS2 software package.

3.6.4.2 Evaluation of Moderating Effects

3.6.4.2.1 Hierarchical Regression

A hierarchical regression was adopted to test the moderating effects in this study. The adoption of a hierarchical regression can keep retain the continuous nature of variables without disappearing information or decreasing the power to diagnose the interact effects (e.g Aiken and West, 1991; Cohen et al., 2013). However, the possibility of high multi-collinearity issue (high correlation between the variables) (Lee and Sukoco, 2008) might occur, so a standardized method or so-called centering method was implemented to lower these effects (Frazier et al., 2004). The criteria for hierarchical regression must be fulfilled to confirm the occurrence of moderating effect such as R-square (R^2) > 0.10, the marginal change of ΔR^2, and F-value (ΔF) should be significant at a t-value>1.96 with $p<0.05$.

3.6.4.2.1 Analysis of Variance (ANOVA)

ANOVA test was conducted as an additional analysis for evaluating the moderating effects and was employed to determine the interaction effects between independent variables and moderators and also to show the significance difference of the dependent variable in this study. The moderation effect testing is significant depending on the significance of ΔF ($p<0.05$). In this analysis, the data of independent variable and moderator variable using mean values were divided into four categories /groups: (1) low-low; (2) low-high; (3) high-high; (4) high-low. Moreover, Duncan test and F test were also adopted to illustrate the significant difference of the mean values of dependent variable among the four groups.

CHAPTER
FOUR RESULTS

4.1 Pilot Testing Results

Table 4.1 presents the pilot testing of factor loading and reliability analysis with the sample size of 80. After conducting the analysis, the results show that after deleting the questionnaire items such as PT1, PT2, PT3, PT5, S1, S2, S6, S7, SOC4, and SOC5 that consist of the factor loading scores lesser that 0.7, all of our respective research variables have fulfilled all criteria. Specifically, all the research variables have the factor loading scores ranging from 0.713 to 0.911 which are higher than 0.7, eigenvalue ranging from 1,980 to 4.330 which are greater than 1, cumulative explained variance ranging from 64.415 to 78.775 which are more than 0.6, item to total correlation ranging from 0.573 to 0.847 which are bigger than 0.5, and Cronbach's alpha ranging from 0.742 to 0.922 which are larger than 0.7 suggesting that all of the research variables in this study have high consistency and reliability.

Table 4.1 Results of Pilot Testing of Factor Loading and Reliability

CONSTRUCT	DIMENSION	Research Items	Factor Loading	Eigenvalue	Cumulative Explained variance	Item to Total Correlation	Cronbach's Alpha
Entrepreneurial Mindset	Personality Traits	PT6	0.849	1.980	66.002	0.619	0.742
		PT7	0.807			0.555	
		PT4	0.780			0.527	
		PT2	Delete PT2 due to factor loading =0.184 <0.7				
		PT1	Delete PT1 due to factor loading =0.169 <0.7				
		PT5	Delete PT5 due to factor loading =0.494 <0.7				
		PT3	Delete PT3 due to factor loading =0.653 <0.7				
	Skills	S4	0.835	2.044	68.117	0.614	0.766
		S5	0.832			0.609	
		S3	0.808			0.573	
		S7	Delete S7 due to factor loading =0.450<0.7				
		S2	Delete S2 due to factor loading =0.539<0.7				

Table 4.1 Results of Pilot Testing of Factor Loading and Reliability (Continued)

CONSTRUCT	DIMENSION	Research Items	Factor Loading	Eigenvalue	Cumulative Explained variance	Item to Total Correlation	Cronbach's Alpha
		S1	Delete S1 due to factor loading =0.569<0.7				
		S6	Delete S6 due to factor loading =0.670<0.7				
Innovation Capability		IC4	0.903	4.067	67.782	0.847	0.904
		IC5	0.837			0.757	
		IC6	0.834			0.749	
		IC2	0.800			0.708	
		IC3	0.798			0.704	
		IC1	0.760			0.667	
NPD Performance	New Product Success	NPS4	0.896	4.330	72.163	0.841	0.922
		NPS5	0.864			0.797	
		NPS3	0.861			0.793	
		NPS2	0.853			0.781	
		NPS1	0.847			0.774	
		NPS6	0.770			0.680	
	Innovative Work Behavior	IWB5	0.881	4.188	69.803	0.817	0.913
		IWB2	0.865			0.787	
		IWB1	0.854			0.787	
		IWB6	0.814			0.716	
		IWB3	0.812			0.725	
		IWB4	0.783			0.696	
Risk Taking		RT2	0.841	3.221	64.415	0.727	0.861
		RT1	0.824			0.707	
		RT4	0.815			0.693	
		RT5	0.814			0.694	
		RT3	0.713			0.574	
Social Competition		SOC2	0.911	2.363	78.775	0.786	0.865
		SOC3	0.905			0.774	
		SOC1	0.844			0.673	
		SOC4	Delete SOC4 due to factor loading =0.489<0.7				
		SOC5	Delete SOC5 due to factor loading =0.444<0.7				

Source: Original study

4.2 Descriptive Analysis

4.2.1 Characteristics of Respondents

Table 4.2 presents the demographic information of our 170 valid respondents, including six important sections: (1) Gender, (2) Age, (3) Educational Background, (4) Position in Company, (5) Working Experience, and (6) Working Industry. After conducting the descriptive analysis, the result reveals that 116 respondents are male (68.2%) and the majority of the respondents were aged ranging from 26 to 33 years old (45.3%), followed by 34-41 (28.8%). For the educational background, more than 80% have been holding the Bachelor Degree or above. For the position in Company, the respondents are both team members (48.2%) and team leaders (51.8%). Moreover, most of the respondents have working experience in their respective firm for more than 5. All of the respondents in this study worked in different industries including information (44.1%), finance and insurance (14.1%), telecommunication (12.9%), manufacturing (12.4%), trade, transportation, and utilities (8.8%), and education and health service (7.6%).

Table 4.2 Demographic Information of the Respondents

Demographic Variables		**Frequency**	**Percentage**
Gender	Male	116	68.2
	Female	54	31.8
	Total	**170**	**100**
Age	18-25	21	12.4
	26-33	77	45.3
	34-41	49	28.8
	42-48	17	10.0
	48-55	4	2.4
	Over 55	2	1.2
	Total	**170**	**100**
Educational Background	High School	16	9.4
	Bachelor	112	65.9
	Master	41	24.1
	PhD	1	0.6
	Total	**170**	**100**

Table 4.2 Demographic Information of the Respondents (Continued)

Demographic Variables		**Frequency**	**Percentage**
Position in Company	Team Members	82	48.2
	Team Leaders	88	51.8
	Total	**170**	**100**
Working Experience	Less than 1 year	5	2.9
	2 to 3 years	37	21.8
	3 to 5 years	44	25.9
	More than 5 years	84	49.4
	Total	**170**	**100**
Working Industry	Manufacturing	21	12.4
	Education and Health Service	13	7.6
	Finance and Insurance	24	14.1
	Telecommunications	22	12.9
	Trade, Transportation, and Utilities	15	8.8
	Information	75	44.1
	Total	**170**	**100**

Source: Original study

4.2.2 Descriptive Analysis of the Questionnaire Items

Table 4.3 presents the descriptive statistic of our respective research variables, including mean value and the standard deviations. After conducting the descriptive analysis, the results revealed that most the respondents provide a high level of agreeableness to our questionnaire items for all research constructs. Specifically, we can see that all questionnaire items in the research constructs such as entrepreneurial mindset, innovation capability, and NPD performance, all have the mean scores higher than 5, suggesting high level of agreeableness with the questionnaire items, with the exception of the social competition construct that contains the questionnaire items with the mean scores lower than 4 suggesting quite low level of agreeableness from the respondents in 7-point-Likert scale. Moreover, the standard deviations are acceptable in the exploratory research nature of this study.

Table 4.3 Descriptive Analysis for the Questionnaire Items

Research Item	Description	Mean	Std. Deviation
Research Construct: Entrepreneurship Mindset			
Personality Traits			
[PT4]	I'm willing to take a certain amount of risk to achieve real success.	5.60	1.343
[PT6]	I'm passionate about work that I do	5.88	1.181
[PT7]	I want to be the best at what I do	6.04	1.087
Skills			
S3	I have a reputation for being able to take an idea and make it work	5.68	1.091
S4	I'm self-confident person	5.86	1.178
S5	Even things aren't going well, I look on the bright side	5.59	1.243
Research Construct: Innovation Capability			
IC1	Our team uses innovative techniques for task-related communication	5.48	1.293
IC2	Our team heavily uses innovative techniques and concepts at work	5.51	1.407
IC3	Our team makes my task procedures novel and speedy	5.46	1.288
IC4	The implementation of our team is innovative	5.52	1.492
IC5	The implementation of our team is effective	5.69	1.274
IC6	Overall, team members perform innovative behaviors to enhance the performance of NPD team	5.58	1.220
Research Construct: NPD Performance			
New Product Success			
NPS1	Our product meets or exceeds volume expectations	5.39	1.333
NPS2	Our product meets or exceeds the first-year number expected to be produced and commercialized	5.25	1.297
NPS3	Our product meets or exceeds overall sales expectations	5.32	1.228
NPS4	Our product meets or exceeds profit expectations	5.29	1.334
NPS5	Our product meets or exceeds return on investment expectations	5.31	1.333
NPS6	Our product meets or exceeds senior management expectations	5.30	1.345
Innovative Work Behavior			
IWB1	My team members search out new technologies, processes, techniques, and/or product ideas	5.62	1.181
IWB2	My team members generate creative ideas	5.68	1.097
IWB3	My team members promote and champion ideas to others	5.71	0.970

Table 4.3 Descriptive Analysis for the Questionnaire (Continued)

Research Item	Description	Mean	Std. Deviation
IWB4	My team members investigate and secure funds needed to implement new ideas.	5.35	1.312
IWB5	My team members develop adequate plans and schedules for the implementation of new ideas	5.59	1.149
IWB6	My team members are innovative	5.77	1.120
Research Construct: Risk Taking			
RT1	Our team members are able to deal with new equipment	5.88	1.176
RT2	Our team members are able to deal with new marketing strategies	5.84	1.198
RT3	Our team members are able to deal with the replacement of former suppliers with new suppliers.	5.52	1.222
RT4	Our team members are able to work with new members	5.79	1.183
RT5	Our team members are able to invest in new production technologies	5.59	1.159
Research Construct: Social Competition			
SOC1	I find competitive event unpleasant	3.75	1.948
SOC2	I don't like competing against other people	3.78	1.935
SOC3	I try to avoid competing with others	3.87	1.951

Source: Original study

4.3 Factor Loading and Reliability Analysis

4.3.1 Entrepreneurial Mindset

Table 4.4 presents the results of factor loading and reliability analysis of entrepreneurial mindset construct with its two respective dimensions such as personality traits and skills. Firstly, personality traits with its 7 respective measurement items consists of the eigenvalue of 2.090>1 and cumulative explain variance of 69.678>0.6 showcasing good convergence of the measurement items within this dimension. All of the factor loading scores are bigger than 0.7, ranging from 0.814 to 0.846 suggesting good internal consistency. The Cronbach alpha of this dimension is 0.782>0.7 and items total

correlation are all greater than 0.5, ranging from 0.590 to 0.635 showcasing high reliability of the measurement dimension.

Secondly, skills construct with its 3 respective measurement items consists of the eigenvalue of 1.965>1 and cumulative explain variance of 65.510>0.6 showcasing good convergence of the measurement items within this dimension. All of the factor loading scores are bigger than 0.7, ranging from 0.779 to 0.831 suggesting good internal consistency. The Cronbach alpha of this dimension is 0.736>0.7 and items total correlation are all greater than 0.5, ranging from 0.521 to 0.593 showcasing high reliability of the measurement dimension.

Table 4.4 Factor Loading and Reliability of Entrepreneurial Mindset

CONSTRUCT	DIMENSION	Research Items	Factor Loading	Eigenvalue	Cumulative Explained variance	Item to Total Correlation	Cronbach's Alpha
Entrepreneurial Mindset	Personality Traits	PT7	0.846	2.090	69.678	0.635	0.782
		PT6	0.843			0.628	
		PT4	0.814			0.590	
	Skills	S4	0.831	1.965	65.510	0.593	0.736
		S5	0.817			0.571	
		S3	0.779			0.521	

Source: Original study

4.3.2 Innovation Capability

Table 4.5 presents the results of factor loading and reliability analysis of innovation capability construct. The innovation capability construct with its 6 respective measurement items consists of the eigenvalue of 4.135>1 and cumulative explain variance of 68.909>0.6 showcasing good convergence of the measurement items within this dimension. All of the factor loading scores are bigger than 0.7, ranging from 0.780 to 0.882 suggesting good internal consistency. The Cronbach alpha of this dimension is 0.782>0.7 and items total

correlation are all greater than 0.5, ranging from 0.685 to 0.819 showcasing high reliability of the measurement dimension.

Table 4.5 Factor Loading and Reliability of Innovation Capability

CONSTRUCT	DIMENSION	Research Items	Factor Loading	Eigenvalue	Cumulative Explained variance	Item to Total Correlation	Cronbach's Alpha
Innovation Capabilities		IC4	0.882	4.135	68.909	0.819	0.909
		IC6	0.835			0.754	
		IC2	0.834			0.756	
		IC5	0.825			0.741	
		IC1	0.821			0.737	
		IC3	0.780			0.685	

Source: Original study

4.3.3 NPD Performance

Table 4.6 presents the results of factor loading and reliability analysis of new product development (NPD) performance construct with its two respective dimensions such as new product success and innovative work behavior. Firstly, new product success with its 6 respective measurement items consists of the eigenvalue of 4.268>1 and cumulative explain variance of 71.134>0.6 showcasing good convergence of the measurement items within this dimension. All of the factor loading scores are bigger than 0.7, ranging from 0.808 to 0.870 suggesting good internal consistency. The Cronbach alpha of this dimension is 0.919>0.7 and items total correlation are all greater than 0.5, ranging from 0.723 to 0.805 showcasing high reliability of the measurement dimension.

Secondly, innovative work behavior with also 6 respective measurement items consists of the eigenvalue of 3.113>1 and cumulative explain variance of 62.258>0.6 after deleting IWB4 showcasing good convergence of the measurement items within this dimension. All of the factor loading scores are bigger than 0.7, ranging from 0.756 to 0.832 suggesting good internal consistency. The Cronbach alpha of this dimension is 0.848>0.7 and items total

correlation are all greater than 0.5, ranging from 0.616 to 0.712 showcasing high reliability of the measurement dimension.

Table 4.6 Factor Loading and Reliability of NPD Performance

CONSTRUCT	DIMENSION	Research Items	Factor Loading	Eigenvalue	Cumulative Explained variance	Item to Total Correlation	Cronbach's Alpha
NPD Performance	New Product Success	NPS1	0.870	4.268	71.134	0.805	0.919
		NPS3	0.865			0.797	
		NPS4	0.865			0.797	
		NPS5	0.830			0.750	
		NPS6	0.821			0.739	
		NPS2	0.808			0.723	
	Innovative Work Behavior	IWB5	0.832	3.113	62.258	0.712	0.848
		IWB2	0.803			0.675	
		IWB3	0.777			0.642	
		IWB6	0.775			0.639	
		IWB1	0.756			0.616	
		IWB4	Deleted due to cumulative explained Variance =59.161				

Source: Original study

4.3.4 Risk Taking

Table 4.7 presents the results of factor loading and reliability analysis of risk-taking construct. The risk-taking construct with its 5 respective measurement items consists of the eigenvalue of 2.613>1 and cumulative explain variance of 65.331>0.6 after deleting RT3 showcasing good convergence of the measurement items within this dimension. All of the factor loading scores are bigger than 0.7, ranging from 0.790 to 0.833 suggesting good internal consistency. The Cronbach alpha of this dimension is 0.823>0.7 and items total correlation are all greater than 0.5, ranging from 0.622 to 0.682 showcasing high reliability of the measurement dimension.

Table 4.7 Factor Loading and Reliability of Risk Taking

CONSTRUCT	DIMENSION	Research Items	Factor Loading	Eigenvalue	Cumulative Explained variance	Item to Total Correlation	Cronbach's Alpha
Risk Taking		RT1	0.833	2.613	65.331	0.682	0.823
		RT5	0.810			0.648	
		RT4	0.799			0.633	
		RT2	0.790			0.622	
		RT3	Deleted due to cumulative explained variance =57.984				

Source: Original study

4.3.5 Social Competition

Table 4.8 presents the results of factor loading and reliability analysis of social competition construct. The social competition construct with its 3 respective measurement items consists of the eigenvalue of 2.363>1 and cumulative explain variance of 78.775>0.6 showcasing good convergence of the measurement items within this dimension. All of the factor loading scores are bigger than 0.7, ranging from 0.844 to 0.911 suggesting good internal consistency. The Cronbach alpha of this dimension is 0.865>0.7 and items total correlation are all greater than 0.5, ranging from 0.673 to 0.786 showcasing high reliability of the measurement dimension.

Table 4.8 Factor Loading and Reliability of Social Competition

CONSTRUCT	DIMENSION	Research Items	Factor Loading	Eigenvalue	Cumulative Explained variance	Item to Total Correlation	Cronbach's Alpha
Social Competition		SOC2	0.911	2.363	78.775	0.786	0.865
		SOC3	0.905			0.774	
		SOC1	0.844			0.673	

Source: Original study

4.4 Common Method Variance Testing

To test the common method variance, initially, a Harman one-factor test was conducted, this allows for the variables to be loaded into one principal component factor (Podsakoff et al., 2003). The empirical results revealed the total explained variance of a single factor of 45.364% without rotation which is lower than the accepted threshold of 50%. Secondly, discriminant validity was implemented by showing the comparison between the square root of the AVE (average variance extracted) to the Pearson correlations between all of the constructs. Table 4.9 presents the discriminant validity of the research constructs of this study adopting the principal of Fornell and Larcker (1981). The statistical results showcased that the discriminant validity was achieved since the square root of average variance extracted (AVEs) in the diagnose of each construct are significantly larger than the Pearson correlation between research constructs shown below the diagnose suggesting the confirmation of the discriminant validity of the research constructs in this study (Fornell and Larcker, 1981, Hair et al., 2017). These results from both a Harmon single-factor test and discriminant validity test suggested the common method variance might not be an issue in this study. The results of discriminant validity are presented in table 4.9 below:

Table 4.9 Discriminant Validity of the Research Constructs

	Entrepreneurial Mindset	Innovation Capability	NPD Performance
Entrepreneurial Mindset	**0.877**		
Innovation Capability	.381**	**0.830**	
NPD Performance	.373**	.741**	**0.761**

Source: Original study

4.5 Hypothesis Testing

4.5.1 Evaluation of the Measurement Model

Table 4.10 presents the reliability and Convergent Validity of the Research Constructs. The results reveals that all of the research constructs in this study consist of average variance extracted (AVE) of higher than 0.5, ranging from 0.578 to 0.769 suggesting high convergent validity as each research construct can be explained by its respective measurement items by more than 50%. The composite reliability (CR) values of the research constructs are ranging from 0.867 to 0.938 suggesting "satisfactory to good" of internal consistency of the measurement items within each research construct. To confirm the internal consistency reliability among the measurement items within each construct, Cronbach's alpha was used. According to the table 4.10, the Cronbach's alpha values of all research constructs were bigger than 0.7, ranging from 0.711 to 0.926 showcased that high internal consistency reliability and validity was confirmed.

Table 4.10 Reliability and Convergent Validity of the Research Constructs

	AVE	Composite Reliability	Cronbach's Alpha	R Square	Mean	Std Deviation
Entrepreneurial Mindset	0.769	0.869	0.711		5.563	0.999
Innovation Capability	0.689	0.930	0.909	0.327	5.541	1.104
NPD Performance	0.578	0.938	0.926	0.671	5.312	1.103

Source: Original study

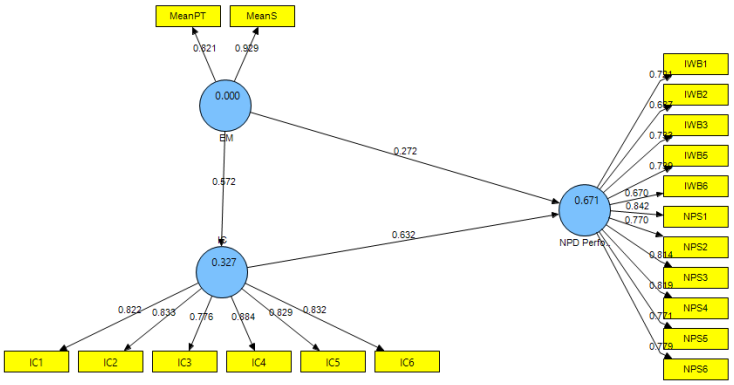

Figure 4.1 Parameter Estimate of the Research Constructs (β)

Source: Original study

4.5.2 Evaluation of the Structural Model

Table 4.11 presents the assessment of path coefficients for testing our research hypotheses including hypothesis 1, hypothesis 2, and hypothesis 3 using the parameter estimates. The hypothesis 1 stated that entrepreneurial mindset has a positive influence on innovation capability and the results reveal that entrepreneurial mindset has a positive and significant influence on innovation capability (β=0.578, t=11.064). Therefore, the hypothesis 1 is supported suggesting that entrepreneurial skill can promote innovation capability. The hypothesis 2 stated that entrepreneurial mindset has a positive influence on NPD performance and the results reveal that entrepreneurial mindset also has a positive and significant influence on NPD performance (β=0.271, t=4.325). Therefore, the hypothesis 2 is supported suggesting that entrepreneurial mindset can improve NPD performance. The hypothesis 3 stated that innovation capability has a positive influence on NPD performance and the results reveal that innovation capability also has a positive and significant influence on NPD performance (β=0.635, t=10.149). Therefore, the hypothesis 3 is supported suggesting that innovation capability can enhance NPD performance.

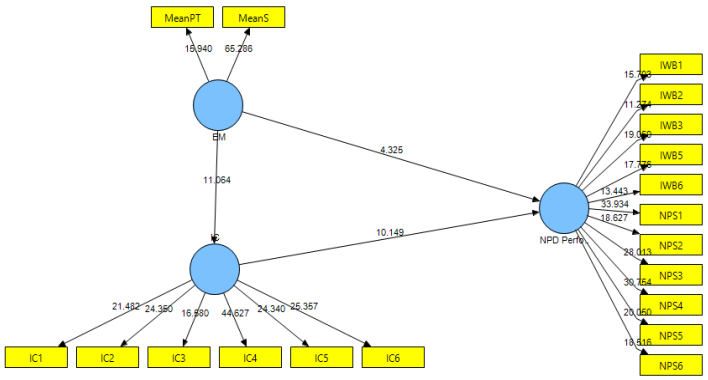

Figure 4.2 The Test of the Research Constructs (t-test)

Source: Original study

Table 4.11 Parameter Estimates for Hypotheses Testing

Hypo.	Path	Original Sample (O)	Parameter Estimated (β)	Standard Deviation (STDEV)	T Statistics (|O/STERR|)	P value
H1	Entrepreneurial Mindset -> Innovation Capability	0.572	0.578	0.052	11.064	***
H2	Entrepreneurial Mindset -> NPD Performance	0.272	0.271	0.063	4.325	***
H3	Innovation Capability -> NPD Performance	0.632	0.635	0.062	10.149	***

t-value>1.96 sig. p<0.05 *, t-value >2.576 sig. p<0.01**, t-value>3.291 sig. p<0.001***

Source: Original study

4.6 Evaluation of the Moderating Effects

4.6.1 Hierarchical Regression

A hierarchical regression was adopted to test the moderating effects as proposed in H4a, H4b, H5a, and H5b. The adoption of a hierarchical regression can keep retain the continuous nature of variables without disappearing information or decreasing the power to diagnose the interact effects (e.g Aiken and West, 1991; Cohen et al., 2013). However, the possibility of high multi-collinearity issue (high correlation between the variables) (Lee and Sukoco, 2010) might occur, so a standardized method or so-called centering method

was implemented to lower these effects (Frazier et al., 2004). The criteria for hierarchical regression must be fulfilled such as R-square (R^2) > 0.10, the marginal change of ΔR^2, and F-value (ΔF) should be significant at a t-value>1.96 with $p<0.05$.

Table 4.12 presents the moderating effects of risk taking and social competition on the influence of entrepreneurial mindset and innovation capability on NPD performance. Model 1 reveals the moderating effect of risk taking on the influence of entrepreneurial mindset on NPD performance is not significant at t-value >1.96, sig. $p<0.05$ but if at the confident interval of 90% it can be defined as significant (β=0,119 t=1.754, $p<0.1$). Therefore, the hypothesis 4a is marginally supported. Model 2 reveals the moderating effect of risk taking on the influence of innovation capability on NPD performance is significant (β=0.158, t=2.734, $p<0.01$). Therefore, the hypothesis 4b is supported. Model 3 reveals the moderating effect of social competition on the influence of entrepreneurial mindset on NPD performance is significant (β=0.575, t=-0.561, $p>0.05$). Therefore, the hypothesis 5a is not supported. Model 4 reveals the moderating effect of social competition on the influence of innovation capability on NPD performance is significant (β=0.119, t=2.300, $p<0.05$). Therefore, the hypothesis 5b is supported.

Table 4.12 The Moderating Effects of Risk Taking and Social Competition

Independent Variables	Dependent Variables			
	NPD Performance			
	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)
Main Effects				
Entrepreneurial Mindset	0.095 (t=0.351)		0.421*** (t=5.660)	
Risk Taking	0.643*** (t=8424)	0.342*** (t=4.412)		
Social Competition			0.129 (t=1.738)	0.004 (t=0.075)
Innovation Capability		0.516*** (t=7.048)		0.748*** (t=14.537)
Interaction Effects				
Entrepreneurial Mindset x Risk Taking	0.119† (t=1.754)			
Innovation Capability x Risk Taking		0.158** (t=2.734)		
Entrepreneurial Mindset x Social Competition			0.575 (t=-0.561)	
Innovation Capability x Social Competition				0.119* (t=2.300)
R square	0.420	0.559	0.172	0.563
R square change	0.011	0.020	0.002	0.014
F change	3.075	7.476	0.315	5.291
P (sig.)	0.081	0.000	0.575	0.023
Durbin-Watson	2.135	2.007	1.988	2.017

Table 4.12 The Moderating Effects of Risk Taking and Social Competition (Continued)

Independent Variables	Dependent Variables			
	NPD Performance			
	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)
VIF	1.302-1.637	1.238-2.219	1.089-1.129	1.006-1.023
Hypotheses	H4a is marginal supported	H4b is supported	H5a is not supported	H5b is supported

Note: t-value>1.833 sig. p<0.1†, t-value>1.96 sig. p<0.05 *, t-value >2.576 sig. p<0.01**, t-value>3.291 sig. p<0.001***

Source: Original study

4.6.2 Analysis of Variance (ANOVA)

After conducting the evaluation of moderating effects of risk taking and social competition on the influence of entrepreneurial mindset and innovation capability on NPD performance implementing a hierarchical regression and the results showed H4a, H4b, and H5b are supported except H5a. ANOVA test was conducted as an additional analysis and was employed to determine the interaction effects between independent variables (entrepreneurial mindset and innovation capability) and moderators (risk taking and social competition) and also to show the significance difference of the dependent variable (NPD performance) in this study. Initially, K-mean analysis was conducted to cluster each independent variable and its moderator into four specific groups (2x2) such as (1) low/low, (2) low/high, (3) high/low, and (4) high/high. Then, ANOVA was conducted to reveal the significant differences of the dependent

variable (NPD performance) among the four different groups by comparing their mean scores.

Table 4.13 and figure 4.3 present the interaction effect between risk taking and entrepreneurial mindset on NPD performance. After conducting K-mean analysis following by ANOVA testing, the results reveal that the respondents who have higher entrepreneurial mindset along with higher risk-taking behavior are likely to have significantly better NPD performance ($F=16.430$, $P<0.000$) suggesting under higher level of risk taking, the influence of entrepreneurial mindset on NPD performance will be enlarged.

Table 4.13 The Result of Interaction Effect Between Risk Taking and Entrepreneurial Mindset on NPD Performance

Factor	Low Entrepreneurial Mindset		High Entrepreneurial Mindset		F-Value	Duncan
	1.Low Risk Taking	2.High Risk Taking	3.Low Risk Taking	4.High Risk Taking	16.430 (0.000)	(13,24)
NPD Performance	4.365	5.341	4.507	5.741		

Source: Original study

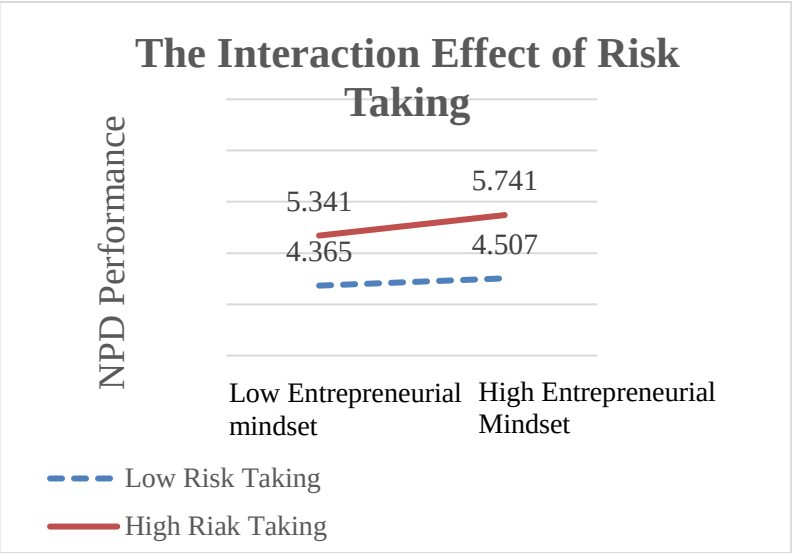

Figure 4.3 The Interaction Effect Between Risk Taking and Entrepreneurial Mindset on NPD Performance

Source: Original study

Table 4.14 and figure 4.4 present the interaction effect between risk taking and innovation capability on NPD performance. After conducting K-mean analysis following by ANOVA testing, the results reveal that the respondents who have higher innovation capability along with higher risk-taking behavior are likely to significantly improve NPD performance ($F=40.872$, $P<0.000$) suggesting under higher level of risk taking, the influence of innovation capability on NPD performance will be amplified.

Table 4.14 The Result of Interaction Effect Between Risk Taking and Innovation Capability on NPD Performance

Name of Factor	Low Innovation Capability		High Innovation Capability		F-Value	Duncan
NPD Performance	1.Low Risk Taking	2.High Risk Taking	3.Low Risk Taking	4.High Risk Taking	40.872 (0.000)	(12,23,34)
	3.809	4.457	5.175	5.770		

Source: Original study

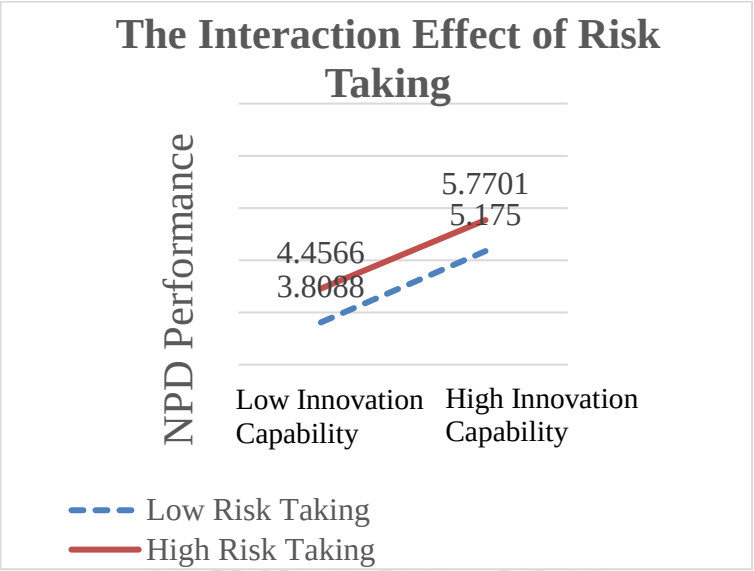

Figure 4.4 The Interaction Effect Between Risk Taking and Innovation Capability on NPD Performance

Source: Original study

Table 4.15 and figure 4.5 present the interaction effect between social competition and entrepreneurial mindset on NPD performance. After conducting K-mean analysis following by ANOVA testing, the results reveal that the respondents who have higher entrepreneurial mindset along with higher involvement in social competition intended to have significantly better NPD performance (F=5.040, P=0.002) suggesting under higher involvement in

social competition, the influence of entrepreneurial mindset on NPD performance will be significantly improved.

Table 4.15 The Result of Interaction Effect Between Social Competition and Entrepreneurial Mindset on NPD Performance

Name of Factor	Low Entrepreneurial Mindset		High Entrepreneurial Mindset		F-Value	Duncan
	1.Low Social Competition	2.High Social Competition	3.Low Social Competition	4.High Social Competition		
NPD Performance	4.789	5.031	5.472	5.632	5.040 (0.002)	(12,23,34)

Source: Original study

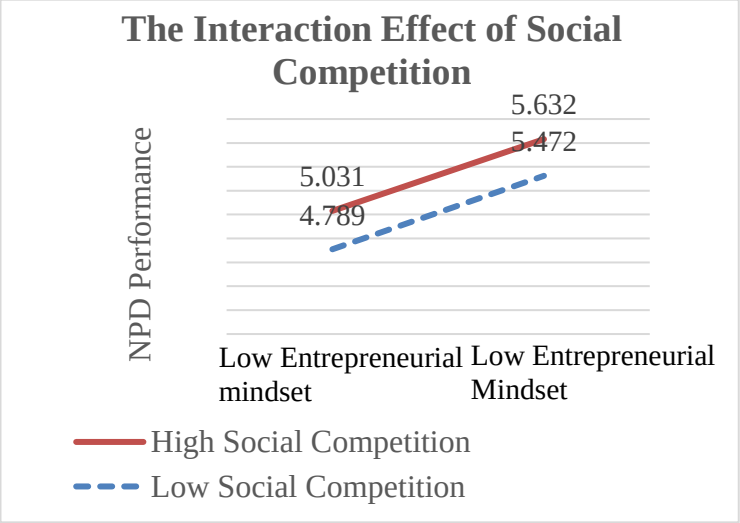

Figure 4.5 The Interaction Effect Between Social Competition and Entrepreneurial Mindset on NPD Performance

Source: Original study

Table 4.16 and figure 4.6 present the interaction effect between social competition and innovation capability on NPD performance. After conducting K-mean analysis following by ANOVA testing, the results reveal that the respondents who have higher entrepreneurial mindset along with higher involvement in social competition intended to have significantly better NPD performance (F=5.040, P=0.002) suggesting under higher involvement in

social competition, the influence of innovation capability on NPD performance will be significantly enhanced.

Table 4.16 The Result of Interaction Effect between Social Competition and Innovation Capability on NPD Performance

Factor	Low Innovation Capability		High Innovation Capability		F-Value	Duncan
	1.Low Social Competition	2.High Social Competition	3.Low Social Competition	4.High Social Competition		
NPD Performance	4.114	4.380	5.680	5.876	38.175 (0.000)	(21,43)

Source: Original study

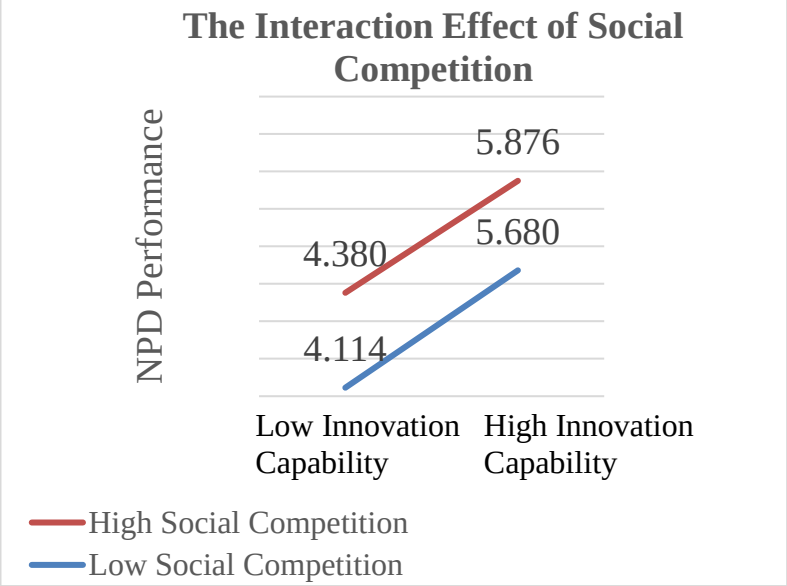

Figure 4.6 The Interaction Effect Between Social Competition and Innovation Capability on NPD Performance

Source: Original study

4.7 Additional Analysis

After conducting the hypotheses testing successfully, an additional analysis was conducted using an alternative model shown in figure 4.7 and figure 4.8 below. In the alternative model consists of entrepreneurial skills, innovation capability, and innovative work behavior as the independent

variables and new product success as the dependent variable. SEM-PLS was also employed for the measurement model assessment and the evaluation of the structural model.

Table 4.17 presents the reliability and convergent validity of the alternative model. The results reveals that all of the research constructs in this study consist of average variance extracted (AVE) of higher than 0.5, ranging from 0.622 to 0.711 suggesting high convergent validity as each research construct can be explained by its respective measurement items by more than 60%. The composite reliability (CR) values of all research constructs are ranging from 0.850 to 0.937 suggesting "satisfactory to good" of internal consistency. To confirm the internal consistency reliability among the measurement items within each construct, Cronbach's alpha was also used. According to the table 4.17, the Cronbach's alpha values of all research constructs were bigger than 0.7, ranging from 0.736 to 0.919 showcased that high internal consistency reliability and validity was confirmed.

Table 4.17 Reliability and Convergent Validity of The Alternative Model

	AVE	**Composite Reliability**	**R Square**	**Cronbach's Alpha**	**Mean**	**Std. Deviation**
Entrepreneurial Skills	0.653	0.850		0.736	5.286	1.167
Innovative Work Behavior	0.622	0.892	0.560	0.848	5.314	1.104
New Product Success	0.711	0.937	0.642	0.919	5.310	1.106
Innovation Capability	0.689	0.930	0.361	0.909	5.541	1.104

Source: Original study

Table 4.18 presents the discriminant validity of the research constructs of the alternative model adopting the principal of Fornell and Larcker (1981). The results show that the square root of AVEs of each construct in the diagnose are significantly larger than the Pearson correlation between research constructs shown below the diagnose suggesting the confirmation of the discriminant validity of the research constructs for the alternative model.

Table 4.18 Discriminant Validity of The Alternative Model

	Entrepreneurial Skills	Innovative Work Behavior	New Product Success	Innovation Capability
Entrepreneurial Skills	**0.808**			
Innovative Work Behavior	.343**	**0.789**		
New Product Success	.342**	.993**	**0.843**	
Innovation Capability	.332**	.734**	.745**	**0.830**

Source: Original study

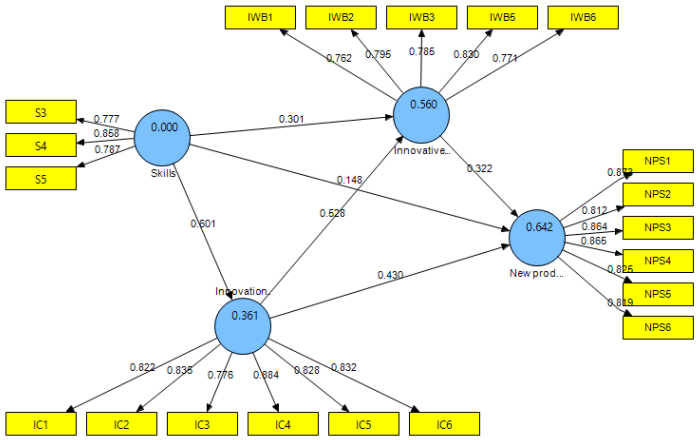

Figure 4.7 Parameter Estimate of the Research Constructs for the Alternative Model (β)

Source: Original study

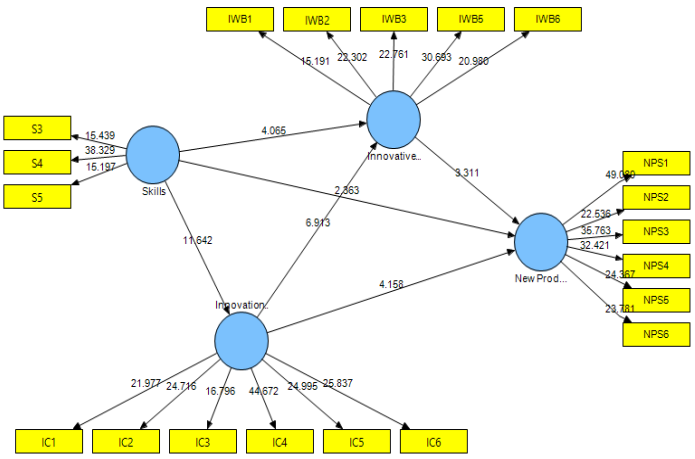

Figure 4.8 The Test of the Research Constructs for the Alternative Model (t-test)

Source: Original study

Table 4.19 presents the assessment of path coefficients for the alternative model using the parameter estimates. The results reveal that entrepreneurial skill has significantly influence on innovative work behavior (β=0.580, t=10.888, P<0.000) suggesting that entrepreneurial skill can promote innovative work behavior in NPD team. The results also reveal that entrepreneurial skill has statistically influence on new product success (β=0.144, t=2.380, P<0.05) suggesting that entrepreneurial skill can facilitate new product success. The results also show that entrepreneurial skill has statistically significant influence on innovation capability (β=0.603, t=11.280, P<0.000) suggesting entrepreneurial skill is served as a potential factor and can amplify innovation capability.

Table 4.19 Parameter Estimates for Research Constructs of the Alternative Model

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STERR|)**	**P-value**
Entrepreneurial Skills -> Innovative Work Behavior	0.301	0.304	0.073	4.114	***
Entrepreneurial Skills -> New Product Success	0.148	0.144	0.062	2.380	*
Entrepreneurial Skills -> Innovation Capability	0.601	0.603	0.053	11.280	***
Innovation Capability -> Innovative Work Behavior	0.528	0.531	0.076	6.974	***
Innovation Capability -> New Product Success	0.430	0.416	0.104	4.114	***
Innovative Work Behavior -> New Product Success	0.322	0.337	0.098	3.297	***

t-value>1.96 sig. p<0.05 *, t-value >2.576 sig, p<0.01**, t-value>3.291 sig p<0.001

Source: Original study

CHAPTER FIVE

CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

The development of a research model for this study shown in figure 3.1 that included the measurement constructs such as entrepreneurial skill, innovation capability, NPD performance, risk taking, and social competition is for testing 7 research hypotheses with the main purpose of investigating the influences of entrepreneurial skill and innovation capability on NPD performance as well as evaluating the moderating effects of risk taking and social competition on the influences of entrepreneurial skill and innovation capability on NPD performance. The summary of the empirical results for the hypotheses testing is presented in table 5.1 below.

Table 5.1 Summary of the Hypotheses Testing Results

Hypo.	Hypo. Statement	Assessment
H1	Entrepreneurial mindset has a positive influence on innovation capability	Supported β=0.578, t=11.064, p≤ 0.000
H2	Entrepreneurial mindset has a positive influence on NPD performance	Supported β= 0.271, t=4.325, p≤ 0.000
H3	Innovation capability has a positive influence on innovation capability	Supported β=0.635, t= 10.149, p≤ 0.000
H4a	Risk taking moderates the positive influence of entrepreneurial mindset on NPD performance	Marginal Supported β=0.119, t= 1.754, p< 0.1
H4b	Risk taking moderates the positive influence of innovation capability on NPD performance	Supported β=0.158, t=2.734, p< 0.01
H5a	Social Competition moderates the positive influence of entrepreneurial mindset on NPD performance	Not Supported β=0.575, t=-0.561, p>0.05
H5b	Social Competition moderates the positive influence of innovation capability on NPD performance	Supported β=0.119, t=2.300, p< 0.05

Source: Original study

For this study, several conclusions could be made. First of all, the empirical result from the statistical analysis revealed that entrepreneurial mindset has a positive significant influence on innovation capability. This study result is also consistent to the previous studies. As stated by previous studies, entrepreneurship is well known for its association with a set of skills and cognitive processes and leaders with a sense of entrepreneurship enable individuals, team, and firms to crave for creativity or innovative initiatives, hence, they can achieve or even exceed the goals (Prieto, 2012; Brettel and Cleven, 2011; Linan, 2008). Additionally, based on Sulistyo (2016) and Lee and Hsieh (2010), entrepreneurship significantly impact on innovation capabilities and business performance. Members who have higher entrepreneurial spirit in term of product innovation capabilities, the ability to take risk, ability to have initiatives and always be active in membership will intend to foster the growth of innovation capabilities in the innovation of new product, process, management and marketing.

Secondly, entrepreneurial mindset has a positive significant influence on NPD performance. The findings from previous studies also support this study result. Several literatures about entrepreneurship indicated that entrepreneurial mindset is a fundamental factor of entrepreneurship and further stated that it can amplify the NPD success and business performance by allowing leaders to be able to have a cognizant understanding of team members, to complete given tasks, and formulate right strategies (Neneh, 2012; Ireland et al., 2003).

Thirdly, innovation capability has a positive significant influence on NPD performance. This result is also supported by several previous researches. According to Ngo and O'Cass (2012) and Verhees and Meulenberg (2004), innovation capability has a significant contribution for new product development (NPD) success. The researchers further stated that innovation

capability enables NPD team to perform value-creating tasks more effectively in which related to innovation activities. Innovation capability allows NPD team leaders to allocate the resources efficiently to support innovation-related activities and be able to product new products with more innovation features to fulfill the customer 'needs in the changing market (Calantone et al., 2002; Barney et al., 2011). The higher innovation capability in form of new product, process, management and marketing, financial and marketing performance will be improved. The findings by Battor and Battor (2010), Calantone et al. (2002), Hult et al. (2004), Keskin (2006), Panayides (2006) and Thornhill (2006) also stated that innovation has a direct and positive correlation with superior performance.

Fourthly, the results of this study also revealed that risk taking have significant moderating effects on the influence of entrepreneurial mindset on NPD performance. Precisely, respondents who have higher risk taking with higher entrepreneurial mindset and innovation capability tend to have better NPD performance. These results are consistent with previous studies. Huybrechts et al. (2013) proposed that the existence of a greater propensity to take risks, investing and committing resources in the innovation process can lead to a better innovation performance. Small entrepreneurial firms are willing to take greater risk, involving in activities such as moving to a new market, technology or allocating large number of resources, and becoming highly leverage, to develop a new technology, to observe the customer needs so that they can produce new products with great innovation (Brockman, 2012).

Finally, social competition significantly moderates the influence of innovation capability on NPD performance. Specifically, higher social competition with higher innovation capability will result in better NPD performance. This result is consistent with previous researches, which showed

the moderating effect of competition on innovation-performance association. According to Chen and Liu (2019), when competition is high, high performance can be enhanced through process innovation and product innovation. While, social competition has no moderation effect on the influence of entrepreneurial mindset on NPD performance in this study. Since this result is contradict to the past studies. Based on Verreynne (2010), competition simplifies entrepreneurial activities. The moderating effect will be stronger as competitive intensity increase (Vural-Yavaş, 2021). Therefore, future researcher should investigate this issue to confirm the validation, specifically in NPD context.

5.2 Academic Implications

The results from this study can provide many academic implications. First, the empirical result from this study can be adopted to give the explanation regarding the phenomenon to achieve better new product development performance through entrepreneurial mindset and innovation capability by identifying the interrelationship among entrepreneurial mindset, innovation capability, and NPD performance and results revealed a positive impact of entrepreneurial mindset on innovation capability and NPD performance and a positive influence of innovation capability on NPD performance. Through adoption of self-theory and personal traits theory which can explain how the process of individuals with entrepreneurial mindset within NPD team use to create opportunities in an age of uncertainty to produce successful innovation and adopt to changes which can further improve their performance in NPD project. Second, in order for firms to achieve better NPD performance, NPD team needs to involve in risk taking and social competition that can amplify entrepreneurial mindset and innovation capability within team.

5.3 Managerial Implications

The results from this study can also provide many managerial implications. Initially, to confront with competition in the market, firms can implement the strategy by employing entrepreneurial mindset to connect with innovative research and development to promote innovation and launch new products. To stay survive in a rapidly changing market environment, firms must enhance their flexibility and responsiveness and improve their capacity to produce innovation and changes. Therefore, leaders with entrepreneurial mindset can significantly promote creativity or innovative initiatives within team so it is essential to realize that individual with leadership alone cannot come up with something new and adopt to changes quickly unless it combines with entrepreneurship or entrepreneurial mindset. Moreover, managers should be more aware of the requirement for achieving NPD success such as innovation and creativity as well as entrepreneurial mindset because in term of new product development, the firms heavily rely on NPD team performance to produce new product to satisfy the customer needs in the changing market and to gain the competitive advantage over the competitors and also to be able to adopt to the technological evolution as well. Moreover, firms can enhance NPD performance by encourage NPD team to involve in risk taking to promote higher entrepreneurial mindset and innovation capability. Last but not least, social competition is also considered to be significant in enhancing innovation capability of the NPD team that can further improve NPD team performance.

5.4 Research Contributions

This study contributes to the understanding of the certain business practices that in the dynamic world, individuals with entrepreneurial mindset can enhance the growth of innovation capability in team and NPD team performance. This study also contributes to the existing knowledge regarding

new product development (NPD) literatures by proposing a research model to examine the influence of entrepreneurial mindset and innovation capability on NPD performance with the moderating roles of risk taking and social competition. In term of contributions for practitioners from this study results, with the technological evaluation and the rapid changing of market, entrepreneurial mindset for leaders in a company is significant to lead NPD team members and encourage them to have innovative initiatives that can further improve NPD performance. To gain the competitive advantage in the market in the changing business environment, the companies need to depend strongly on the NPD team performance so the business practitioners can achieve better performance through fostering innovation capability and developing entrepreneurial mindset.

5.5 Limitations and Future Research Suggestions

Even if this research results provide many contributions for the academics and business practitioners, some limitations exist in this study. First, the researcher obtained only 170 data from team leaders and members in the high-tech companies. Hence, the result of this study cannot be generalized. Secondly, this study carried out a short and direct assessment of NPD success, decreasing the likelihood that proximal predictors influence more distant results (Chiocchio et al., 2015). The author employed NPD success measurement items that are similar to those developed by Akgun et al. (2006), but a more accurate measurement scale should be employed in further research. Thirdly, this research collected data from Amazon Mechanical Turk (MTurk), the results may not be applied to other cultures, more work need to be done to assess the generalizability of this study's findings in such contexts. Fourthly, another limitation of this study is about the small research framework using entrepreneurial mindset, innovation

capability to assess the success of NPD team so future researcher should determine potential research constructs that are considered as important factors for assessing NPD success. Finally, this study was conducted using quantitative research so future research should adopt another method (qualitative) or even mix method (quantitative and qualitative) for deeper understanding.

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