

MODELING MULTI-LEVEL PREDICTORS OF  
ACADEMIC E-ENTREPRENEURSHIP: EMPIRICAL  
EVIDENCE ACROSS ASEAN COUNTRIES

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E-ENTREPRENEURSHIP: EMPIRICAL EVIDENCE  
ACROSS ASEAN COUNTRIES

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PERMODELAN PERAMAL PELBAGAI PERINGKAT TERHADAP  
E-KEUSAHAWANAN AHLI AKADEMIK: BUKTI EMPIRIKAL  
DI NEGARA ASEAN

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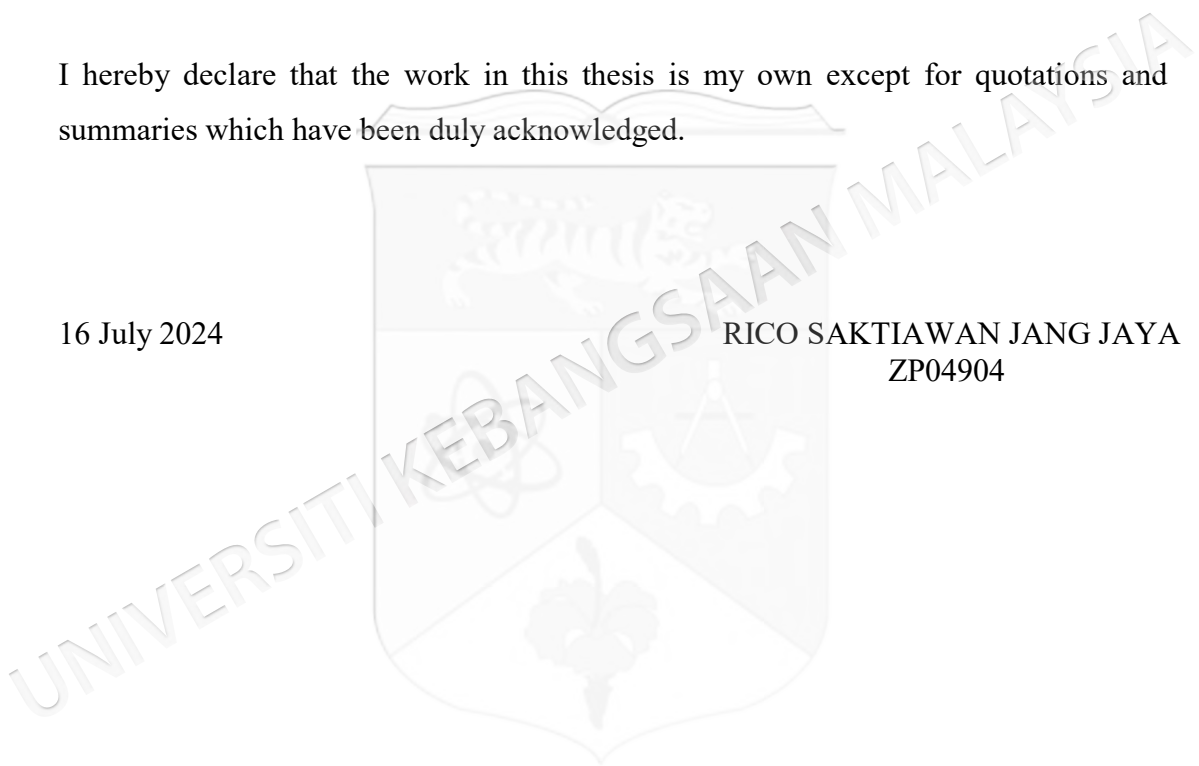
2024

## DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

16 July 2024

RICO SAKTIWAN JANG JAYA  
ZP04904



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I realize that this dissertation is still far from being perfect both in material and in the way it is written. However, I have tried with all my abilities and knowledge so that I can finish this dissertation well. Therefore, I expect constructive suggestions from readers. Finally, I hope that this dissertation will be useful for all readers.

## ABSTRAK

Universiti diiktiraf secara meluas sebagai hab pendidikan untuk memupuk keusahawanan pelajar. Walau bagaimanapun, terdapat kritikan bahawa ahli akademik bukanlah usahawan itu sendiri. Sebaliknya, mereka hanya menyampaikan ilmu tanpa praktikal menjalankan perniagaan. Untuk menjelaskan fenomena tersebut, kajian ini cuba mengkaji faktor pelbagai peringkat yang menyumbang kepada efikasi diri keusahawanan internet akademik. Selain itu, bukti empirikal sedia ada mengenai keusahawanan akademik mengabaikan pelbagai peringkat peramal dan analisis merentas negara. Untuk mengisi jurang, penyelidikan ini menguji secara eksplisit pada peramal tiga peringkat: individu (modal insan, modal sosial dan kecekapan internet), organisasi (sokongan universiti), dan peringkat negara (infrastruktur internet). Berdasarkan teori kognitif sosial dan teori institusi, kajian ini membina empat hipotesis untuk diuji. Ia menggunakan pengumpulan data tinjauan kuantitatif dalam kalangan 210 ahli akademik di tujuh negara ASEAN menggunakan pensampelan berbilang fasa. Kesan langsung, pengantaraan dan penyederhanaan diuji melalui model regresi hierarki menggunakan PROSES SPSS. Keputusan menunjukkan kedua-dua modal insan dan sosial secara signifikan meningkatkan efikasi diri keusahawanan internet akademik. Seterusnya, kesannya disalurkan dengan ketara melalui kecekapan internet. Tetapi sokongan keusahawanan universiti sebagai pembolehubah penyederhana melemahkan hubungan antara peramal individu dan efikasi keusahawanan internet akademik. Akhir sekali, infrastruktur internet negara tidak menyederhanakan hubungan antara peramal individu dan efikasi keusahawanan internet akademik. Secara amnya, kajian ini menyumbang kepada literatur dan amalan dengan membina dan menguji peramal pelbagai peringkat keusahawanan akademik merentas negara di ASEAN.

**Kata Kunci:** Keusahawanan Akademik, Efikasi Keusahawanan Keusahawanan Internet Akademik, Peramal Pelbagai Peringkat

## ABSTRACT

The university is widely recognized as an educational hub to nurture student entrepreneurship. However, there has been criticism that the academics are not entrepreneurs themselves. Instead, they merely deliver the knowledge without the practicality of running a business. To shed light on the phenomenon, this study attempts to examine the multi-level factors contributing to academic internet entrepreneurial self-efficacy. Besides, the existing empirical evidence on academic entrepreneurship neglect on multiple levels of predictors and analysis across countries. To fill the gap, this research tests explicitly on three-level predictors: individual (human capital, social capital, and internet competence), organizational (university support), and country level (internet infrastructure). Drawing on social cognitive theory and institutional theory, the study constructs four hypotheses to be tested. It used a quantitative survey data collection among 210 academics across seven ASEAN countries using multiphase sampling. The direct, mediating, and moderating effects are tested through hierarchical regression models using SPSS PROCESS. The results show both human and social capital significantly increase academic internet entrepreneurial self-efficacy. Next, the effect is significantly channeled through internet competence. But the university entrepreneurship support as a moderating variable weakens the relationship between individual predictors and academic internet entrepreneurial self-efficacy. Lastly, country internet infrastructure does not moderate the relationship between individual predictors and academic internet entrepreneurial self-efficacy. In general, the study contributes to the literature and practice by constructing and testing the multilevel predictors of academic entrepreneurship across countries in ASEAN.

Keywords: Academic Entrepreneurship, Internet Entrepreneurial Self-Efficacy, Multi-Level Predictors

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**LIST OF ABBREVIATIONS**

ASEAN	Association of Southeast Asian Nations
AIESE	Academic Internet Entrepreneurial Self-Efficacy
ESE	Entrepreneurial Self-Efficacy
HC	Human Capital
IC	Internet Competence
ICT	Information and Communication Technology
II	Internet Infrastructure
IST	Information Society Technology
IT	Institutional Theory
KPI	Key Performance Indicator
SC	Social Capital
SCT	Social Cognitive Theory
TTO	Technology Transfer Offices
UES	University Entrepreneurship Support



## CHAPTER I

### INTRODUCTION

#### 1.1 CHAPTER OVERVIEW

This introductory chapter contains eight sections. 1.2 describes the background of this study. 1.3 describes the research problem. 1.4 formulates research questions. 1.5 explores the research objectives. 1.6 describes the scope of the research. 1.7 explains the importance of research. 1.8 describes the operational definition of each variable. 1.9 briefly describes the structure of the dissertation.

#### 1.2 RESEARCH BACKGROUND

Entrepreneurship is among the national priorities in many countries, as well as the prominent domain in the academic field. Many countries encourage more entrepreneurial activities particularly among graduate university students (Abaho, Olomi, & Urassa, 2015; Sedlan-König, 2016; Malebana & Swanepoel, 2019; Memon, Soomro, & Shah, 2019). University graduates today are expected to a job generator instead of a traditional job seeker. They are considered as potential entrepreneurs to start their own businesses upon graduation (Wang *et al.*, 2016). In the same vein, universities serve as open innovation hubs (Wang, Cai, & Munir, 2020) to facilitate economic and social progress, it is imperative to focus on the commercialization of research, which entails the transfer of information into the national innovation system (Klofsten *et al.*, 2019; Halbinger, 2020).

Over the years, entrepreneurship education at higher education institutions has been greatly improved around the world (Fretschner & Weber, 2013). The significance of university education in fostering entrepreneurship and inspiring

students' entrepreneurial intentions is of significant importance (Okřęglicka *et al.*, 2017). The mechanisms include the transfer of knowledge and skills, as well as nurturing attitudes related to new business creation. As a result, entrepreneurship education has positively contributed to the prevalence rate of entrepreneurs and, thereby stimulates economic growth, and job creation (Okřęglicka *et al.*, 2017).

University is the best place to educate and deliver entrepreneurial study to students. However, there are a lot of criticisms that lecturers teaching entrepreneurship are not entrepreneurs themselves (Abreu & Grinevich, 2013; Alexander, Miller, & Fielding, 2017; Adelowo & Surujlal, 2020; Davey & Galan-Muros, 2020; Garcez, Silva, & Franco, 2022; Safitri, Huseini, & Kusumastuti, 2023). Understandably, this is because lecturers already have paid profession and stable career path. In addition to playing a significant role in education and research, lecturers are encouraged to monetize the outcomes of their research by creating start-ups, licensing, or other ways (Safitri, Huseini, & Kusumastuti, 2023). For that, both scholars and practitioners have largely neglected to explore the entrepreneurial interest among academics.

Several reasons why entrepreneurship lecturers need to become entrepreneurs at one time include becoming entrepreneurial role models for students (Li *et al.*, 2022), balancing theory and practice in teaching entrepreneurship (Alexander, Miller, & Fielding, 2017), developing an entrepreneurial environment on campus (Davey & Galan-Muros, 2020), creating renewable products (Abreu & Grinevich, 2013), and developing relationships with industry through social business networking (Hmieleski & Powell, 2018). Safitri, Huseini, & Kusumastuti (2023) conducted a study to explain academic entrepreneurship in Indonesian universities through the lens of ambidexterity. They define lecturers, as individuals who are involved in entrepreneurial activities while simultaneously holding the main job as university employees who receive a salary, can be called hybrid entrepreneurs. The phenomenon of academics involved in establishing start-ups in Singapore was also highlighted by Yee & Chan (2023). It is hoped that the entrepreneurial engagement carried out by Singapore academics can develop the industry through research products. Apart from that, by becoming an entrepreneur, lecturers can increase their income.

Due to technological advancement, venturing into online platform business or e-entrepreneur is more viable for lecturers because it does not require them to quit their current job (Oppong, Singh, & Kujur, 2020; Garcez, Silva & Franco, 2022, Paul *et al.*, 2023). E-entrepreneurship is synonym to similar terms like internet entrepreneurship so the two terms can be used interchangeably (Paul *et al.*, 2023). Internet entrepreneurship encompasses using information technology to initiate a business venture and, after that, conduct associated commercial activities only via the internet (Wang *et al.*, 2020). Advancements in communication technology, computing systems, and intelligent devices propel the expansion of internet entrepreneurship (Schumacher & Morahan-Martin, 2001; Guo, Cai, & Zhang, 2016). The proliferation of the internet has resulted in a significant surge in internet entrepreneurship (Chang *et al.*, 2020). E-entrepreneurship is growing in contemporary business due to its advantages over traditional models, such as lower costs, broader client outreach, and direct stakeholder engagement. Consequently, e-entrepreneurship has emerged as a widely embraced form of entrepreneurship in the present period (Chang *et al.*, 2020; Wang *et al.*, 2020). Becoming an internet entrepreneur can also provide an additional source of income for academics in line with an increasing cost of living (Ismail *et al.*, 2012).

The possibility of becoming e-entrepreneurs for lecturers is driven by factors at individual, organization, and country level. First, at the individual level, human capital and social capital matter to lecturers to start an online business (Kasouf, Morrish, & Miles, 2015). Based on the field of general entrepreneurship, the individual is seen as the key decision-maker of strategic decisions (Arnim & Mrozewski, 2020), such as the decision to engage in e-entrepreneurship (Finkle & Olsen, 2019; Chang *et al.*, 2020). This highlights the role of the individual for the identification and exploitation of entrepreneurial opportunities (Adelowo & Surujlal 2020; Bachmann *et al.*, 2021; Halbusi, Soto-Acosta, & Popa, 2022) and it is sensible to understand how entrepreneurs think and make decisions (Blair & Shaver, 2020; Li *et al.*, 2022) to explain why some intend to engage in internet entrepreneurship while others do not (Garcez, Silva, & Franco, 2022; Halbusi, Soto-Acosta & Popa, 2022). However, both capitals should be mediated with additional skills like internet competence (Arnim & Mrozewski, 2020). Digital capabilities and skills can be

developed using novel digital tools to enable diverse entrepreneurs' performance. Second, at the organizational level, entrepreneurship venture among academics must be supported by the university (Fini, Grimaldi, & Meoli, 2020). Lastly, at the country level, internet infrastructure will further facilitate the academic internet entrepreneurial self-efficacy (Secundo, Rippa, & Cercione, 2020; Sardar *et al.*, 2021). The interlink among those factors is the phenomenon of interest in this study.

A notable research into entrepreneurial intentions among academics pertains to the research conducted by Goethner *et al.* (2012). A comprehensive evaluation was conducted to analyze the distal predictors (academics' human capital, social capital, and expected entrepreneurial benefits) and the proximal predictors (attitudes, social norms, and perceived behavioral control) concerning academic goals to become entrepreneurs. The authors, moreover, included findings from scholarly investigations on academic entrepreneurship alongside psychological attributes. The study incorporated various indicators of human capital, such as experience in patenting and entrepreneurial experience. Additionally, it considered social capital by examining cooperation linkages with industry and linkages with public support institutions. The research also considered expected benefits, including reputational and financial gain. Furthermore, psychological factors were assessed, encompassing attitudes, social norms, and perceived behavioral control. Their findings exhibit that to become an academic entrepreneur, human capital deems important, especially the prior experience. Besides, social capital plays a vital role in academic settings as it encompasses a significant academic network and connections with industrial partners and government organizations.

In the phenomenon of academic entrepreneurship, entrepreneurial self-efficacy is an appropriate variable in explaining academic entrepreneurship. This is a solid approach because academics are unlikely to quit their current job simply to start a business. Instead, they can own an online business while holding a position at the university, or at the least demonstrate a certain degree of belief in their ability to successfully launch a business (Garcez, Silva, & Franco, 2022). Internet entrepreneurial self-efficacy is a person's belief or confidence in one's ability to successfully launch a business venture on the internet that involves activities like

business operation, leadership, technology utilization, online customer service, and internet marketing (Wang *et al.*, 2020). Internet entrepreneurship possesses distinct qualities when compared to traditional entrepreneurship (Alkhalaileh, 2021). In order to engage in commercial activities with customers, internet entrepreneurs are required to develop and employ electronic commerce systems, including various digital mediums such as websites, online platforms, and social media (Wang *et al.*, 2020). Internet entrepreneurs are required to have internet skills and competencies in running their business (Aesaert *et al.*, 2014; Arnim & Mrozewski, 2020). Hence, internet entrepreneurs must possess proficiency in leveraging technology to develop superior-quality e-commerce systems.

Within the context of the 21st-century skills movement, there is a prevailing consensus that individuals must possess diverse abilities in Information and Communication Technology (ICT) to effectively navigate the multifaceted transformations occurring within the realms of economy, society, and education (Aesaert *et al.*, 2014). This research uses the term internet competence to explain an individual's internet ability. Internet competency refers to the confident and critical use of Information Society Technology (IST) for work, leisure, and communication (Aesaert *et al.*, 2014; Conde-Jiménez, 2018, Chang *et al.*, 2020). Scuotto & Morellato (2013) found that university members need to develop better digital competence to constructively nurture the ability to interact with other individuals and effectively use available technologies. This phenomenon shows that the relationship between internet competence and entrepreneurship at the university is still an interesting topic. The higher education system faces the challenge of developing digital competence for university members. It would be interesting to analyze further the status of digital competence among lecturers who teach entrepreneurship to students.

At the second level, organizations are also playing an important role. Human behavior is influenced by the interaction between individuals and the environment. Each university has different variations in terms of support for entrepreneurial activities on campus. Research by Abreu & Grinevich (2013) found that the majority of universities remain to emphasize on education rather than the business side such as the commercialization of research output. Also Urban & Gamata's (2020) highlight

that universities need to create an environment that supports commercialization in order to spur entrepreneurship efforts among academics. In this regard, Alessandrini, Klose, & Pepper (2013) argue that the essential elements for achieving success in academic entrepreneurship are defined policies, strong commitment from senior management, and a conducive work atmosphere. Research examining the environmental and organizational factors conducive to the success of academic entrepreneurship indicates that institutions should establish a supportive culture that fosters start-ups and provides concrete investments (Huyghe & Knockaert, 2014).

At the third level, the country's internet infrastructure is also crucial for spurring e-entrepreneurship. Unfortunately, the internet infrastructure remains uneven across countries. This can be based on the level of a country's information technology development whereas developed countries certainly have better infrastructure than developing countries. For example, according to Ookla Speedtest Global Index (2022), there are significant differences in internet speed among Association of Southeast Asian Nations (ASEAN) countries. This can be seen in the following table:

Table 1.2.1 Internet Speed among ASEAN Countries

<b>Country</b>	<b>Fixed Broadband Speed (Average Download Speed, in Mbps)</b>	<b>Mobile Internet Speed (Average Download Speed, in Mbps)</b>
Singapore	298.48	143.11
Thailand	246.32	76.04
Malaysia	124.62	49.79
Vietnam	107.80	54.14
Philippines	107.16	52.08
Brunei	52.10	102.98
Laos	40.99	30.77
Indonesia	34.05	25.03
Cambodia	32.66	27.45
Myanmar	25.69	36.38

Source: Ookla Speedtest Global Index (2022)

Geographical location and state policy are determining factors in the development of internet infrastructure (Tranos, 2012). This is what causes differences in internet infrastructure conditions between countries even though they are located in one region such as ASEAN. Also, the below table illustrates the heterogeneous of internet infrastructure in terms of the bandwidth level across ASEAN countries:

Table 1.2.2 Bandwidth Level in each Country

Country	Fixed Broadband	Mobile Wireless
Brunei	TelBru initiated the construction of fiber-to-the-home infrastructure in 2010, with the aim of achieving a national coverage of 80% by 2014.	DST offers 4G.
Singapore	In 2013, the Next Generation Nationwide Broadband Network (NGNBN) achieved a coverage rate of 95%.	In 2014, SingTel achieved a coverage rate of 97% for its 4G and 42Mbps 3G networks..
Malaysia	Telekom Malaysia successfully concluded the initial stage of its High Speed Broadband (HSBB) initiative, which aimed to establish a Next-Generation Network (NGN) backbone within the Inner Klang Valley and across essential economic and industrial areas nationwide. However, East Malaysia continues to have inadequate coverage.	In inhabited regions, the extent of 3G coverage exceeds 80%, while 4G LTE technology is accessible to approximately 15% of the population.
Thailand	CAT operates a fiber backbone network that spans across most provinces within the country, however, the North-East region is experiencing inadequate coverage. To address this, provincial businesses are being served through VSAT technology;  Fixed line coverage of population: 79%;  Broadband coverage: 39%.  5.225 million Broadband subscribers.	The introduction of 3G services occurred exclusively in the year 2013.  The scheduled 4G auctions for 2015 are on the horizon, yet TrueMove is currently delivering 4G services using a 3G spectrum..  Out of a total of 97.6 million mobile users, there are 55 million members who use 3G technology.
Philippines	PLDT operates a nationwide fiber backbone that consists of a 90,000 km fiber-optic network.  Globe possesses and runs two proprietary optical fiber networks.  The Mindanao region and Palawan province are characterized by underdevelopment, with limited coverage of Very Small Aperture Terminal (VSAT) technology in certain places.	The 3G coverage provided by PLDT (Smart) encompasses around 71% of the population. This coverage is facilitated by a network of more than 1,800 LTE cell sites, catering to both fixed and mobile applications.  The availability of 4G networks is limited to urban areas with greater populations.

to be continued...

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Vietnam	Two separate North-South optical fiber cables managed by VNPT, along with metropolitan fiber networks in major urban centers, form the existing infrastructure. However, the inland Northern and Western provinces are facing limited coverage. The total available bandwidth is 475Gbps.	Vietnam is scheduled to commence the implementation of 4G technology in the year 2015.
Indonesia	There are a total of 15 domestic submarine cables, and the completion of the Palapa Ring (Nusantara Highway) has been hindered by financial issues. This is particularly evident in the Eastern provinces, where current service relies on VSAT technology.	There are approximately 90.29 million distinct subscribers, with a market reach of less than 50%. Each subscriber possesses nearly three SIM cards. GSMA approximates that over 90,000 tower locations cater to the islands nationwide, but a minimum of 9% of these sites encounter issues with power supply.
Cambodia	Fiber connectivity is established in all provinces, with Metfone (a subsidiary of Viettel) asserting coverage exceeding 80%. Additionally, other providers including Telecom Cambodia and Cambodia Fibre Optic Communication Company (CFOCN) are also in operation.	In the majority of large towns, the telecommunication infrastructure supports 3G connectivity. However, in the capital city of Phnom Penh, the deployment of 4G technology was initiated in the year 2014. Conversely, in most rural locations, the prevailing telecommunication network is limited to 2G capabilities.
Lao PDR	The primary highway accommodates the fiber optic backbone, accompanied by smaller sections linking specific provinces. A metropolitan fiber network with 24 pairs of fibers encompasses crucial government sites in Vientiane. However, there is an absence of connectivity in significant parts of the country, particularly in the eastern region.	3G network coverage spans all provinces and nearly every district. However, 4G coverage is restricted to the central area of Vientiane city.
Myanmar	The national fiber backbone solely connects major urban centers and towns, supplemented by the presence of 11 VSAT stations.	The monopoly held by MPT was disrupted through the issuance of new licenses to Yatanarpon, Telenor, and Ooredoo.

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These companies are tasked with achieving nationwide deployment of 2G and 3G networks by 2018. Ooredoo introduced 3G services in significant urban areas and nearby regions in August 2014. A consortium consisting of SingTel, KBZ, and M-Tel is working to establish a mobile network covering 95% of the population by 2016. The implementation of 4G is anticipated in 2015.

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Source: The Internet Society (ISOC) & TRPC Pte Ltd (2015)

Every day there are new internet businesses in developed and developing countries (Guo, Cai, & Zhang, 2016). Nowadays, the use of digital technologies is taken into consideration as an essential driver to promote entrepreneurship in countries (Alkhalailah, 2021). The performance of businesses all over the world is also linked to the ICT infrastructure (Kossai & Piget, 2014). The easy access to knowledge and information through the internet has created endless possibilities and prospects for growth (Schiavone, Tutore & Cucari, 2020). This phenomenon suggests the imperative role of the internet infrastructure to support entrepreneurship.

### 1.3 PROBLEM STATEMENT

Research on academic entrepreneurship is still emerging and the understanding on the determinants that underlie enterprising behavior among academics is very limited (Goethner *et al.*, 2012; Abreu & Grinevich, 2013; Alexander, Miller, & Fielding, 2017). Scholars should avoid from simply assuming that the general entrepreneurial model is also applied to a particular area of academic entrepreneurship without truly testing the assumption. Fini, Grimaldi, & Meoli (2020) posited that the peculiarities of the university environment, which is typically non-commercial and characterized by unique incentives and regulations within academia, are likely to result in distinct processes governing the development of academic entrepreneurship, diverging from those observed in the private sector. There have been suggestions to establish a distinct research agenda focused on academic entrepreneurship, considering the

distinctive characteristics of academic entrepreneurial involvement, including balancing pursuing an academic career and engaging in entrepreneurial activities (Goethner *et al.*, 2012; Blair & Shaver, 2020; Wang, Cai, & Munir, 2020). In this regard, experts especially criticize the lack of research on the entrepreneurial mindset of academics (Goethner *et al.*, 2012; Abreu & Grinevich, 2013; Davey & Galan-Muros, 2020; Shi, Zou, & Santos, 2020).

Nonetheless, few empirical studies have focused on the paradox of the academic entrepreneurs and, as a result, more research is needed to close the gap (Blair & Shaver, 2020; Adelowo & Surujlal, 2020; Wang, Cai, & Munir, 2020). This is due to limited academic literature and practice on entrepreneurship among lecturers. This is indeed contrary with the vision of the government that wants the university to be an entrepreneurial university or a place to teach business to students. To address the issue, this research foremost aims to gain a more in-depth view of factors that influence academic self-efficacy on entrepreneurship.

To this date, research on academic entrepreneurship has concentrated chiefly on explaining the many factors that contribute to the differential engagement of academics in entrepreneurial activities (Goethner *et al.*, 2012; Shi, Zou, & Santos, 2020). For example, the relevant variables of academics' entrepreneurial activity are their human capital endowments and social networks (Kasouf, Morrish, & Miles, 2015). Concerning the present study, scholars have observed that research on the correlation between human capital and entrepreneurial performance has yet to consistently produce robust findings (Davidsson & Honig, 2003). Consequently, they have proposed employing a contingency approach in examining human capital (Unger *et al.*, 2011). Previous research has examined the decision-making process of academics in pursuing entrepreneurial careers, conceptualizing it as a choice of vocation (Goethner *et al.*, 2012). These studies have considered the potential advantages of engaging in private business ventures, such as financial gains, and have compared them to the contemporaneous income and reputational benefits of being a lecturer. Nevertheless, the existing body of literature may present an imperfect depiction due to its limited consideration of psychological factors and empirical research. Psychological elements have been demonstrated to be significant drivers in

selecting an entrepreneurial profession (Goethner *et al.* 2012; Hmieleski & Powell, 2018). To fill the gap, this research attempts to integrate both economic (human capital and social capital) and psychological perspectives (academic self-efficacy) into one conceptual framework. Therefore, academic entrepreneurial self-efficacy gets attention and becomes focal variable in this research framework.

Following suit the above, research on online academic entrepreneurship is even rarer (Oppong, Singh, & Kujur, 2020; Alkhalaileh, 2021; Garcez, Silva, & Franco, 2022). The increasing utilization of online platforms and virtual technology has led to a significant focus on entrepreneurship in academic research and practical applications. Unfortunately, the entrepreneurship literature is full of research on traditional entrepreneurship intentions with a little emphasize on the internet entrepreneurs or internet entrepreneurship intentions (Guo, Cai, & Zhang, 2016, Garcez, Silva, & Franco, 2022). The literature reveals that the digital entrepreneurship field is still in its infancy and requires more understanding and research (Alkhalaileh, 2021). In fact, digital technologies have become indispensable in businesses and are gaining attention in academic institutions context (Oppong, Singh, & Kujur, 2020). Less attention has been given to developing a framework for online entrepreneurship that requires the extra skill of internet competence which absent for regular entrepreneurs. Therefore, this study includes internet competence as a mediator and focuses on the academic internet entrepreneurial self-efficacy as the dependent variable. This contributes to a novel perspective on entrepreneurial self-efficacy in two distinct contexts: lecturers and internet-related factors.

Lastly, there are limited studies that examine multi-level predictors of academic e-entrepreneurship (Oppong, Singh, & Kujur, 2020; Garcez, Silva, & Franco, 2022). The majority of literature in entrepreneurship largely emphasizes on either individual-level attributes such as experience and opportunity recognition skills (Clarysse, Tartari, & Salter, 2011; Goethner *et al.*, 2012; Wang, Cai, & Munir, 2020; Shi, Zou, & Santos, 2020), organizational context (Huyghe & Knockaert, 2014; Davey & Galan-Muros, 2020), or country level (Mueller & Dato-on, 2013; Fini & Grimaldi, 2017). Unfortunately, the integrated effects from multi-level analysis of predictors for academic internet entrepreneurship remain unexplored. Studying the predictors at only

one particular level simply neglects the potential effect of factors at different level (Wang, Cai, & Munir, 2020; Ayob, 2021).

Also, previous studies have commonly conducted in a single country. For example, UK (Abreu & Grinevich, 2013), Nigeria (Adelowo & Surujlal, 2020), US (Blair & Shaver, 2020), China (Wang, Cai, & Munir, 2020), Swiss (Blaese, Noemi & Brigitte 2021). This approach prevents researchers from testing the country level factors like country's internet infrastructure and more importantly limit the understanding on a generalizability of the findings. To advance methodologically, this research makes a significant contribution by testing on multi-level factors among academics in seven ASEAN countries. The selection of ASEAN countries as subjects was based on their proximity geographically. With its user base exceeding 350 million and a market size of US\$72 billion, ASEAN presents substantial prospects for studying various aspects of the online market (The Internet Society (ISOC) & TRPC Pte Ltd, 2015). Apart from that, the reason for choosing ASEAN is that this research adopts the reasons for research conducted by Ayob, Yakob, & Ja'afar (2021) regarding e-commerce adoption in ASEAN where the results show the development of internet entrepreneurship in ASEAN.

#### **1.4 THE RESEARCH QUESTION**

The questions in this study are based on the dynamic relationship among multilevel factors that determine academic internet entrepreneurial self-efficacy. The main research question is does academic internet entrepreneurship explained by intrinsic and extrinsic factors? Specifically, the study attempts to examine:

1. Do individual factors: (1) human capital and (2) social capital influence academic internet entrepreneurial self-efficacy?
2. Does internet competence mediate the relationship between individual factors (human capital and social capital) and academic internet entrepreneurial self-efficacy?
3. Does university entrepreneurship support moderate the relationship between individual factors and academic internet entrepreneurial self-efficacy?

4. Does country internet infrastructure moderate the relationship between individual factors and academic internet entrepreneurial self-efficacy?

## **1.5 OBJECTIVES OF THE STUDY**

The ultimate aim of this study is to examine the role of multi-level factors on academic internet entrepreneurship. Specifically, the objectives of this study are:

1. To examine the effect of individual factors: (1) human capital and (2) social capital on academic internet entrepreneurial self-efficacy.
2. To examine the mediating effect of internet competence between individual factors (human capital and social capital) and academic internet entrepreneurial self-efficacy.
3. To examine the moderating effect of university entrepreneurship support on the relationship between individual factors and academic internet entrepreneurial self-efficacy.
4. To examine the moderating effect of country internet infrastructure on the relationship between individual factors and academic internet entrepreneurial self-efficacy.

## **1.6 RESEARCH SCOPE**

Firstly, the research focuses on three level predictors: individual (human capital, social capital, and internet competence), organizational (university entrepreneurship support), and country (internet infrastructure). It does not test other possible predictors or at other level. The model also concentrates on the internet entrepreneurship instead of traditional entrepreneurship for the reason mentioned earlier.

Secondly, the variables in the model are derived from two theoretical underpinning: Social Cognitive Theory (SCT) and Institutional Theory (IT). SCT explains how individual behavior is formed by the interaction between intrinsic and extrinsic factors (Bandura, 1982), and the development of human capital and changes

in attitude caused by numerous cultural environments (Bandura, 1978). IT explains institutions define the rules of the game that shape the course of individuals' behavior and beliefs (North 1990). According to Baumol (1990), it is acknowledged that institutions play a crucial role in shaping the incentive framework, hence influencing the entrepreneurial potential of a nation.

Thirdly, the study sample includes academician at all positions (lecturers, assistant professor, associate professor, professor, etc.), at both public and private universities. The respondents are not discriminated by any demographic factors such as age, gender, working experience, etc. However, the study focuses only those at business school and business-related faculty because the faculty is often used as a center for entrepreneurship and many university entrepreneurship lessons and activities are conducted in the faculty (Adelowo & Surujlal, 2020; Bachmann *et al.*, 2021; Halbusi, Soto-Acosta, & Popa, 2022). Respondents with criteria like this are expected to deeply understand academic entrepreneurship so they can provide very objective results.

Lastly, the geographical coverage encompasses lecturers affiliated with universities in seven ASEAN nations: Brunei, Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Vietnam. The ASEAN presents a valuable research setting because it is the global leader in online market growth. With a user base of over 350 million and a market size of US\$72 billion, ASEAN offers significant opportunities for studying many aspects of the online market (The Internet Society (ISOC) & TRPC Pte Ltd, 2015). The emergence of the ASEAN economic miracle can be attributed to the region's digital transformation, which has brought forth novel ideas, technologies, mindsets, and businesses that have significantly altered how individuals live, work, and pursue education. However, the research does not include data from the other four ASEAN countries, which will be elaborated on in Chapter IV.

## **1.7 SIGNIFICANCE OF THE STUDY**

This research contributes to both the body of knowledge and practice. The former refers to the advancement of SCT in the context of academic internet entrepreneurship

by particularly examines the influence of university support. Together, IT is also applied in the same context to test the impact of national internet infrastructure on entrepreneurial self-efficacy.

Next, this study also refines the nature of academic entrepreneurship that is best examined as internet entrepreneurial self-efficacy instead of the intention to venture into traditional business. For this, the hypothesis includes a unique variable of internet competence to better explain the mechanism of the phenomenon.

The model of this study is also novel as it integrates predictors at individual, organizational, and country level. This approach addresses the existing fragmented research on a specific level that unable to explain the issue comprehensively. Thus, the multilevel analysis offers a wide perspective on the effect of various factors. Lastly, the empirical approach provides a cross-country analysis that enriches our understanding on this general phenomenon in different countries. This compensates a majority of single-country study that limits the generalizability of the findings.

For practitioners, in this case lecturers and the university's top management, the study shed lights that entrepreneurship among academics is contributed by both internal and external factors. Academics need to develop self-resources of human and social capital in order to increase their ability to venture online business. More importantly, they need to sharpen their digital capabilities to embrace the new technology era.

Also, the research suggests that university must provide supportive environment to encourage more involvement of academicians in business. This may include aspects such as the infrastructure, policies, and program. Lastly, government should exercise their regular digital obligation to improve the internet infrastructure in both wider coverage and faster connection in order to boost internet entrepreneurship in the country.

## 1.8 OPERATIONAL DEFINITION

The operational definition of each variable presented in the following table:

Table 1.3 Operational Definitions

Construct	Definition
Human Capital	The stock of personal knowledge, skills, and abilities that are collected by individuals through investments in education, training, and different varieties of experience (Becker, 1964). From an entrepreneurial perspective, human capital offers the potential entrepreneur enhanced cognitive capacities to engage in challenging tasks, such as initiating one's business venture (Schultz, 1961).
Social Capital	The benefits that individuals are capable of extracting from their social structures, networks, and memberships (Hmieleski, Carr, & Baron, 2011). Social capital encompasses the advantages individuals can derive from their social networks, social institutions, and affiliations, effectively utilized to generate social and economic value (Hmieleski, Carr, & Baron, 2011).
Internet Competence	The confident and critical use of Information and Communication Technology (ICT) for work, leisure, and communication (Aesaert <i>et al.</i> , 2014; Conde-Jiménez, 2018; Chang <i>et al.</i> , 2020). Internet competence is widely recognized as a crucial skill for lifelong learning throughout international education systems (Conde-Jiménez, 2018). It is regarded as a transversal competence due to its ability to facilitate the development of other abilities.
University Entrepreneurial Support	New internal policies, procedures, and initiatives to inspire and support lecturers and graduates to realize the commercial potential of their studies endeavors and activities through academic entrepreneurship activities (Adapted from Keat, Selvarajah, & Meyer, 2011). By embracing an entrepreneurial approach, it is probable that internal stakeholders, including administration, academic faculties, staff, students, and alumni, will exhibit a greater tendency to align their vision, commitments, successes, and play a pivotal role in supporting the entrepreneurial agenda of the university (Klofsten <i>et al.</i> , 2019).
Internet Infrastructure	Internet infrastructure refers to an ensemble of digital technology tools and systems that provide communication, collaboration, and computing skills to facilitate innovation and entrepreneurship (Schiavone, Tutore, & Cucari, 2020). The comprehensive and broad description of Internet infrastructure encompasses a multitude of components, including mainframes, minicomputers, personal computers, local area networks (LANs), wide area networks (WANs), local and long-distance telephone equipment, personal and quasi-public switching equipment, as well as wireless networking for data and software transmission, encompassing both packaged and customized solutions.

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Academic Internet Entrepreneurial Self-Efficacy	Entrepreneurial self-efficacy refers to an individual's subjective belief in their ability to effectively fulfill the responsibilities and functions associated with being an entrepreneur and their expectations regarding the outcomes and results of initiating a new business venture (Li <i>et al.</i> 2020). Internet entrepreneurship refers to entrepreneurship in which some or all of the entrepreneurial venture takes place digitally instead of in more traditional formats (Schiavone, Tutore, & Cucari, 2020). Merging entrepreneurial self-efficacy, academic entrepreneurship, and internet entrepreneurship produces a new variable, namely academic internet entrepreneurial self-efficacy which has a definition an academic's belief or confidence in one's ability to successfully launch an entrepreneurial venture on the internet (Adapted from Wang <i>et al.</i> , 2020).
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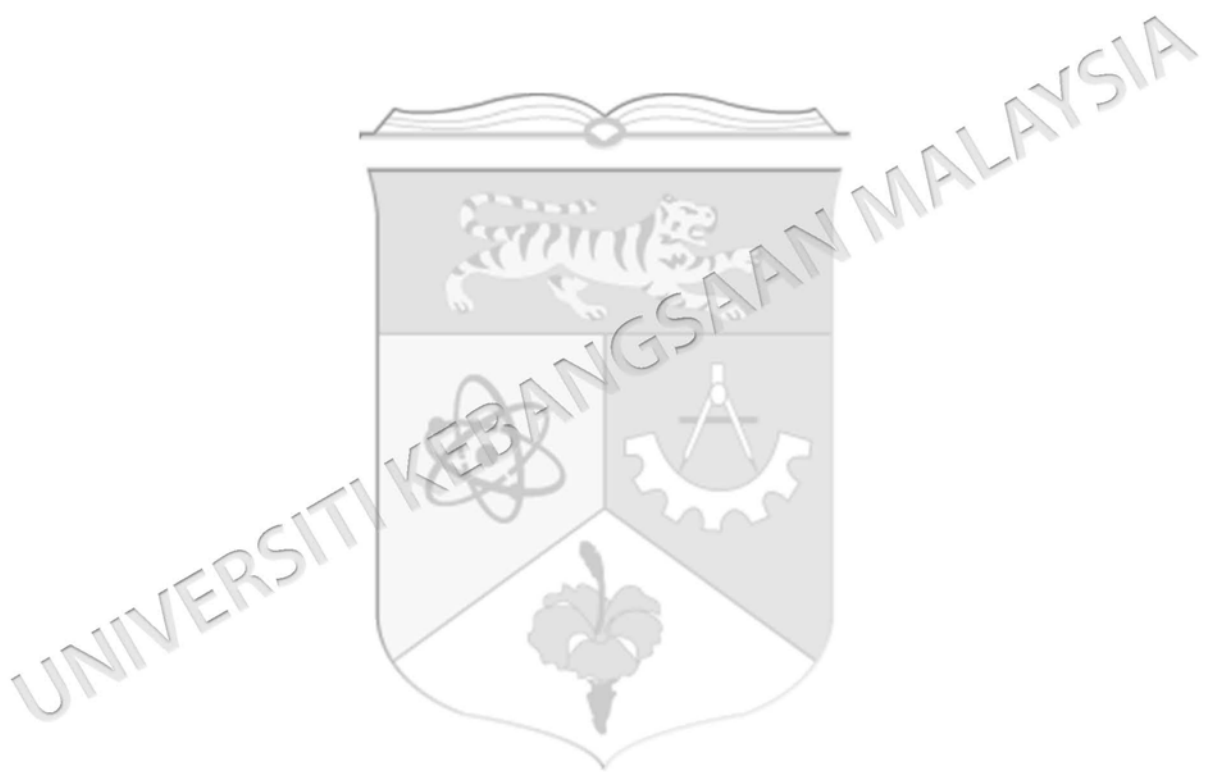
## 1.9 STRUCTURE OF DISSERTATION

This dissertation is divided into six chapters. Chapter I provides an overview of the background, problem statement, research questions and objectives, research scope, and significance of the study. Chapter II discusses the literature on academic entrepreneurship, internet entrepreneurship, individual factors (human capital and social capital), internet competence, university entrepreneurship support, and country internet infrastructure. Chapter III describes the development of hypotheses and introduces the research model. Chapter IV describes the methodology used in this research. Chapter V describes the analysis of the data and the results. Chapter VI describes the discussion of the research findings and ends with conclusions.

### 1.10 SUMMARY

Research on academic entrepreneurship is still emerging. There is a significant lack of comprehension regarding the factors that form the basis of entrepreneurial behavior among academics. Lecturers have the possibility of becoming internet entrepreneurs and this possibility is influenced by multi-level predictors. This study adds new information to complement the existing body of knowledge in terms of academic e-entrepreneurship. Internet competence is used as an internet factor variable to better explain the mechanism of the phenomenon academic e-entrepreneurship. Academic internet entrepreneurial self-efficacy becomes a focal variable and becomes a new variable introduced together with internet competence. The most fundamental

objective of this study is to examine the role of multi-level factors on academic internet entrepreneurship. Using multi-level analysis, the questions of does academic internet entrepreneurship explained by intrinsic and extrinsic factors? is addressed. The contribution of this research includes both the body of knowledge and practice.



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