

A Theoretical Framework on Exploring the Implementation of Digital Entrepreneurship Education in Malaysian Polytechnics' Business Incubation Program

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Abstract

The integration of digital technologies like cloud computing, social media, and the Internet of Things has transformed the current entrepreneurial processes. This shift has prompted education sectors to incorporate digital entrepreneurship as a revolutionary force into their curriculum. However, the acceptance of digital technology and its subsequent integration into entrepreneurship education in higher education institutions has been perceived as challenging. In the Malaysian context, polytechnics have been urged to respond quickly to technological changes through their business incubation program to equip students with the skills required for the evolving human-machine cooperation era. It is vital to emphasize that the existing digital education frameworks are not directly linked to addressing digital entrepreneurship education's specific demands in the TVET institutions. This study aims to explore the emerging concept of the implementation of digital entrepreneurship education in business incubation programs from multiple disciplinary perspectives. This paper develops a theoretical framework to study digital entrepreneurship education drawing from established theories and models, including institutional isomorphism theory, new venture theory, and the Student Entrepreneurship Encouragement Model. This paper has formulated four fundamental research questions derived from the theoretical framework, thus leading to a better understanding of the practice of digital entrepreneurship education in Malaysian polytechnics.

Keywords: Digital Entrepreneurship, Digital Economy, Entrepreneurship Education, Business Incubator, Industry 4.0, Vocational Education, Tvet, Digitalization

Introduction

Given the employment market upheavals caused by digitization, educational institutions have been urged to train and produce graduates who can adapt and thrive in a digitally-centered labor market that focuses on the task and not necessarily the individual job (Ho and Turner, 2019). The Digital Competence of Educators framework developed by the European Commission (2017) has provided a policy for the growing need to incorporate digitization for the current pedagogical approach. The framework specified six critical drivers of digitization, including professional engagement, digital resources, teaching and learning, empowering learning, and assessment to ensure learners' digital competence can be facilitated accordingly (European Commission, 2017). In this circumstance, the institution should develop surroundings and opportunities that support profound learning experiences, enabling students to discover and enhance their abilities (Caena, 2017).

Educators are also expected to be more than merely facilitators, as they are supposed to engage students actively in meaningful learning. They should display creativity by selecting various strategies that can be modified to the individual setting and learner (Caena & Redecker, 2019). By utilizing the technology, the institution will have the potential to enhance its type of learning and foster the development of creative and collaborative individuals in a world that relies on knowledge and interdependence (Hewlett Foundation, 2012; Caena & Redecker, 2019). In addition, contradictory data on the influence of technology use on learner outcomes indicate the need to rethink how educators use technology to enhance teaching and learning (Fullan and Langworthy, 2014). This emphasizes the need for innovative pedagogies that utilize technologies to address the issues of 4IR, encourage peer learning across education systems, and spur the development of skills such as problem-solving, cooperation, and creativity. Such pedagogies should be based on learning partnerships between students and their educators, tapping their motivation and merging system-change knowledge, pedagogy, and technology (Clarke, 2016).

Despite the progress of the digital revolution in businesses, the education system is struggling to adopt the teaching and learning practices of digital entrepreneurship education (Caena & Redecker, 2019; Mattar et al., 2022). Before this, higher education institutions must enhance their students with creative and critical and creative skills that are aligned with digitalization (González Calleros et al., 2022). As highlighted by Caena & Redecker (2019), educators must not only possess digital skills but also nurture digital abilities in their students and utilize the possibilities of digital tools to enrich and innovate their teaching and learning practices. It is vital to consider the various skills that students must develop through digital entrepreneurship, such as confidence, self-motivation, teamwork, self-reflection, creative thinking, project management, self-management, leadership, and communication in the context of digital entrepreneurship education (Rao, 2013; Jameson et al., 2016; Ho and Turner, 2019). Therefore, educational institutions are expected to blend different approaches to entrepreneurship training development using both formal and informal methods that will encourage their student entrepreneurs to adopt business digitalization aspects and be attentive to take the chance to compete in a dynamic market.

Most importantly, the increasing impact of the Fourth Industrial Revolution (4IR) is forcing the demand for new initiatives in digital entrepreneurship education development for Technical and Vocational Education and Training (TVET) shortly (OECD, 2019). Consequently, several worldwide frameworks have been developed to address the issues

of implementing digital education in higher education (Mattar et al., 2022). These frameworks, which include the European Digital Competence Framework for Educators (European Commission, 2017), the Technology, Pedagogy, and Content Knowledge (TPACK) framework, UNESCO Framework of ICT Competence for Teachers, A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 (UNESCO, 2018), Spanish Common Framework of Digital Teacher Competence, British Framework for Digital Education, European e-Competence Framework for ICT Professionals, ICT Literacy Competencies, ISTE Standards, and Global Media and Information Literacy Assessment Framework, aim to define and specify the components of digital education. They provide guidance and support for handling the problems of digital technology in teaching and learning (Thomas & Chukhlomin, 2020).

TVET institutions were identified as catalysts for most countries to produce future-ready talent that is competent, knowledgeable, and highly skilled technical individuals for the successful adoption of 4IR (Wagiran et al., 2017). In this case, it is crucial to acknowledge the current frameworks built for digital education in higher education institutions, as this will provide significant insights and recommendations for teaching and learning methods in this digital age. However, it is equally vital to emphasize that these existing digital education frameworks are not directly linked to digital entrepreneurship education. They concentrate primarily on broad digital education components and may not adequately address digital entrepreneurship education's specific demands and goals. This reveals a deficiency in the availability of guidelines suited specifically to digital entrepreneurship education. As highlighted by several scholars, even if there is no "one ideal approach" to incorporating technology into teaching and learning, it is essential to recognize the environmental settings and specific circumstances to establish the most effective ways to utilize digital technology in higher education institutions (Koehler et al., 2013; Thomas & Chukhlomin, 2020).

Due to this, digital entrepreneurship has emerged as a revolutionary force in the modern business landscape that is forcing higher education institutions to incorporate it into their curriculum (Thomas and Chukhlomin, 2020). In the Malaysian context, the TVET 4.0 Framework 2018-2025 has also been developed by the Malaysian Ministry of Education (2018) to provide specific guidance for TVET institutions in dealing with business digitalization through the implementation of a business incubation program. This is vital to equip, update, and enhance the human capital of students, guaranteeing that graduates remain applicable to the evolving needs of the business world. At this stage, Malaysian polytechnics are no exception and are required to play an essential role in implementing digital entrepreneurship education, especially in business incubation programs. Recognizing the relevance of educating students with the skills and knowledge required to flourish in the digital world, the implementation of digital entrepreneurship education has received momentum (Wibowo et al., 2023). By establishing a theoretical framework that is customized to digital entrepreneurship-related teaching methods, institutions may ensure that their pedagogical practices remain current and linked with the demands of the digital age, equipping students to survive in a technologically centric labor market and facilitate their adaptation to new ways of thinking (Caena & Redecker, 2019; Thomas & Chukhlomin, 2020).

Why is Digital Entrepreneurship Education Important?

The incorporation of digital technologies, such as cloud computing, mobile computing, cloud computing, 3D printing, social media, and data analytics, into various aspects of digital entrepreneurship has reshaped the nature of uncertainty inherent in entrepreneurial processes and outcomes, as well as the approaches employed to manage such uncertainty. Zhao et al. (2015) highlighted that these new digital technologies have fostered collaborative practices based on open system standards and sharing technologies, presenting a myriad of lucrative opportunities while significantly reducing startup costs. The purpose of smart technologies is to create, deliver and manage intelligent products, services or experiences, characterized by intensive information sharing for optimal and sustainable value creation or co-creation (Lenka et al., 2017; Ardolino et al., 2018). Consequently, this intersection of digital technologies and entrepreneurship has raised a series of critical research inquiries regarding digital entrepreneurship, necessitating a thorough exploration of the unique characteristics of digital technologies and their profound influence on entrepreneurial endeavors (Khin & Ho, 2019; Narayanasamy et al., 2019; Rippa & Secundo, 2019).

As discussed in the literature, the acceptance of technology and its subsequent integration into entrepreneurship education is not an easy process and has been perceived as challenging and complex (Mishra and Koehler, 2013). For instance, Watty et al. (2016) cited an Australian study in which 93 percent of educators' interviewees identified accounting educator reluctance as "a major barrier to technology acceptance and utilization." According to Senik and Broad (2011), time, lack of resources and technical support, insufficient institutional backing, lack of interest, and reluctance to modify teaching techniques are typical challenges to technology adoption in accounting education. Watty et al. (2016) emphasized the need for improved technology integration in entrepreneurship education based on findings from a national analysis of exemplary cases in Australian institutions. One of the study's significant findings is that teachers lack the necessary skills to implement new technology. Without the ability, faculty members frequently feel uneasy employing technology (Thomas & Chukhlomin, 2020).

Another study by Pereira and Nganga (2020) found that educators resist embracing new technology because they do not want to invest time in training or restructuring their teaching and learning approaches. The difficulties and resistance encountered by educators in adopting technology in entrepreneurship education, such as time constraints, training requirements, and various factors such as beliefs, constructivism practices, and performance expectations, indicate that the integration of technology into teaching and learning requires educators to modify and redesign their courses accordingly (Pereira and Nganga, 2020). In light of the challenges encountered by educators in integrating digitalization into their entrepreneurship education, as well as the need to redesign and modify related courses to integrate technology effectively, it is clear that institutions must have adequate guidelines to assist them in the teaching and learning of digital entrepreneurship education (Thomas & Chukhlomin, 2020).

The emergence of the digital economy has significantly impacted entrepreneurial activities, resulting in continuous societal and market transformation (Muafi et al., 2021). As a result, it is anticipated that this influence will have various effects concerning innovation and the process of risk creation (Primahendra et al., 2021; Zaheer et al., 2019). In response to this evolving landscape, various regional and national initiatives have been implemented to formulate and implement strategic plans and digital literacy frameworks, emphasizing the importance of digital literacy among entrepreneurs. According to UNESCO (2018b), digital

literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technologies for employment, decent jobs, and entrepreneurship. It includes competencies that are variously referred to as computer, ICT, information, and media literacy.

Moon and Bai (2020) present a comprehensive digital literacy framework comprising four distinct components. The first component, technical skills, has emphasized mastery of various digital tools and the ability of entrepreneurs to utilize them effectively. This element encompasses the abilities required for optimizing and navigating digital technologies. The second component, information usage, refers to the ability to access, process, and utilize information responsibly and ethically. This component has highlighted the significance of employing information for problem-solving while adhering to ethical standards. The third component, communication, emphasizes participation in digital networked environments and establishing connections via digital platforms. It underlines the ability to communicate and interact effectively in the digital realm. Lastly, the fourth component, creation, represents the pinnacle of digital literacy. It entails the consistent and active generation of ideas, innovations, and constant initiatives to address social issues, advance public interests, and foster the promotion of public goods. This component highlights the transformative potential of digital literacy in enabling entrepreneurs to contribute actively to communities around them.

As Rippa and Secundo (2019) highlighted, entrepreneurs and innovators have embraced digital technologies, expanding their entrepreneurial actions beyond traditional industry boundaries to include ecosystems, networks, and communities, accelerating the emergence of new businesses. With the digitized environment further shaped by the COVID-19 pandemic, entrepreneurship has evolved into digital entrepreneurship, which is characterized by the ability to identify, assess, and leverage opportunities presented through the adoption of digital technologies to develop new or existing business models (Kraus et al., 2019; Primahendra et al., 2021). Le Dinh et al. (2018) illustrated the digital entrepreneurship model, including three main components: (1) idea generation at the beginning, (2) startup phase, and (3) entrepreneurship business management. In this context, digital and smart technologies have received greater attention in recent years in business and management practice to offer products or services that are more competitive, sustainable, and have optimized value for the involved stakeholders (Secundo, Rippa, and Meoli, 2020).

Entrepreneurship education's challenges centered primarily on harnessing the full potential of emerging digital and smart technologies, necessitating a fundamental understanding of their potential roles (Lubis, 2019). The effectiveness of entrepreneurship education has increased significantly due to the impact of digitalization and the rapid and transformative changes it brings about. Scholars concurred that digital entrepreneurship education encompasses knowledge acquisition, attitudes, and digital skills (Giones and Brem, 2017; Nambisan, 2017; Kraus et al., 2018). These learning activities aim to equip participants with the ability to leverage ICT tools and technologies, capitalize on the low costs associated with digital entrepreneurship, and tap into a vast pool of potential customers, thus facilitating the identification of entrepreneurial opportunities and the execution of digital and non-digital entrepreneurial endeavors. Therefore, digital entrepreneurship education heavily relies on using digital technologies to reshape the design and implementation of the educational process in entrepreneurship. The underlying objective of its curriculum design is to improve the capacity of the educational system to integrate the utilization of digital tools and business competencies (Rippa and Secundo, 2019; Zaheer et al., 2019).

Digital entrepreneurship education equips students with the necessary competencies to identify and seize new business opportunities within the digitalized era. Through effective teaching and training methods, formal education facilitates the acquisition of entrepreneurial knowledge, accessibility to entrepreneurial activities, the ability to integrate these activities with digital technology, and other essential entrepreneurship-related skills (Morris et al., 2013; Shabbir et al., 2016; Yu et al., 2022). In knowledge-intensive industries characterized by constant changes in the competitive landscape as a result of digital transformation, the fusion of digital skills with entrepreneurial activities is essential to nurture entrepreneurs' creative thinking and adaptability required in the digital economy environment (Jones et al., 2018; Kraus et al., 2018; Ngoasong, 2018). Notably, education has successfully imparted and honed entrepreneurial thinking abilities, cultivating individuals who possess the necessary qualifications. By incorporating digital technology into the teaching content of digital entrepreneurship education, digital skills can be effectively developed, offering enhanced opportunities for learning and growth (Lubis, 2019; Rahmi and Cerya, 2020; Wibowo et al., 2023).

To summarize, digital entrepreneurship education prepares students for success in the digital economy by equipping them with the necessary skills and knowledge. It emphasizes incorporating digital tools and skills into entrepreneurial education to prepare students for digital entrepreneurship. Through digital entrepreneurship education, students can develop digital literacy, including technical skills, information usage, communication, and creation. These abilities are essential for navigating the digital landscape and transforming business concepts into successful enterprises. To achieve this, students require a combination of interdisciplinary knowledge and a solid foundation in business and management. Through specialized digital entrepreneurship approaches, such as digital transformation and the development of entrepreneurial skills, students can focus on identifying and pursuing digital opportunities.

The Concept of Business Incubation Program In The Business Digitalization Era

Business incubators have a beneficial influence on the longevity and development of particular businesses and focus on promoting the launch of actual products or services. It emerged in the 1950s and gradually evolved with technologies to increase economic growth through job creation (Hassan, 2020). Mian (1996) viewed business incubation as an innovation strategy and focused its research and enterprise development function. Greene and Butler (1996) stated that business incubation can help foster technology-based business development by providing the right resources to grow business to a certain maturity level. The present research defined a business incubation in higher education institutions as an organization supporting business startups through intangible and tangible services to promote the development of spinoffs (Grimaldi and Grandi, 2005; Xu, 2010; Barbero et al., 2012). UBI Global (2019) also emphasized that business incubation supports early-stage business startups through a structured process for one to five years. Therefore, according to previous researchers, an organization in higher education institutions that offers support services for young entrepreneurs to ensure that they can foster innovation in their businesses can be categorized as a business incubation program.

Bergek and Norrman (2008) discussed the various components of a business incubator, such as shared office space, a pool of shared services to minimize operating costs, professional coaching support, financial support, mentorship, and networking programs. Jansen et al. (2015) also added that the business incubator offered several services consisting of (1)

concentrate on bringing entrepreneurs into a shared working environment, (2) access to free or subsidized professional office space, (3) providing mentorship, (4) networking program, (5) competitions on business plans as an efficient way to provide visibility for entrepreneurs, (6) an accelerator program, (7) provide financial support and, (58) helps entrepreneurs to advance more rapidly by offering a rigid framework with clear deadlines for business to grow. Undeniably, a business incubator's most significant contribution is to put together startup entrepreneurs in a similar life process. Most importantly, it will also allow entrepreneurs to inspire one another, encouraging each other to solve common challenges as well as to share networks and resources.

Existing literature on business incubators has predominantly focused on countries such as the United States, the United Kingdom, China, and Spain (Bergek and Norrman, 2008b; Dalmarco et al., 2018; Jansen et al., 2015; McAdam et al., 2016; Tang et al., 2019). According to Lalkaka (2002), most business incubators in both developed and developing countries operate on a non-profit basis and with economic development goals. Developing countries often adopt practices and strategies from their developed counterparts when establishing business incubators. In the Malaysian context, business incubators have been mainly established by government-owned or government-related organizations (Sufian, 2006). The inception of business incubation in Malaysia dates back to 1996 with the introduction of MSC Malaysia, also known as the Multimedia Super Corridor project. The project aimed to promote the expansion of the ICT industry in the country by providing a testing ground for the global ICT industry (Khalid et al., 2014). In this instance, technology incubation has played a role in fostering the establishment and growth of technology-based businesses, especially in Malaysia. Combined with government-initiated grants and funding programs, this has led to increased business ventures innovating new goods and processes (Mohd Ghazali, 2010). Malaysia's first-generation technology incubator program has offered basic essential facilities and a supportive environment to foster the early development of technology-based firms (Jamil et al., 2016). Conversely, the second-generation incubation concept encompasses a comprehensive process that includes technical concept development, entrepreneur development, enterprise creation, commercialization, and market development. Notably, the services offered in this phase emphasize entrepreneur development and enterprise creation, including talent training, facility providing, consulting services, and technology transfer (Mohd Ghazali, 2010). Despite the availability of resources by several organizations and schemes, Malaysia's business incubation program faces several challenges that need to be addressed to enhance its effectiveness and sustainability. These challenges include enhancing scientific research productivity and technological innovation, developing competent incubator managers, fostering an entrepreneurial culture, and transitioning from relying on government subsidies to achieving reasonable sustainability (Ghazali, 2010).

Sufian (2006) did a preliminary study to explore the incubator program's implementation in Malaysia and the difficulties associated with aligning them with related government policy. His research has highlighted incubator management challenges within business incubators, limited funding opportunities, redundancy of government roles, and issues of resource waste. Specifically, technology-related business incubators in Malaysia have suffered from inadequate management, resulting in numerous new business failures. Insufficient experience and lack of business assistance for technopreneurs have been recognized as contributing factors. Addressing this challenge will require a well-trained and experienced incubator management team that can provide coaching, motivation, continuous support,

and mentoring to new businesses (Ruslan, 2018). Not only that, another challenge is related to the limited funding opportunities for technopreneurs because most commercial banks are unwilling to finance "developmental work," and entrepreneurs are often required to offer collateral. Additionally, the fragmented implementation of technopreneur development policies across various ministries and agencies has resulted in a lack of coordination, bureaucratic obstacles, and a waste of resources. To overcome these challenges, Sufian (2006) proposed leveraging higher education institutions as catalysts for creating new entrepreneurs by harnessing the institution's expertise through research and development capabilities within their business incubation program.

Realizing the significance of technology-based firms' role in better economic and social benefits, public and private agencies are establishing several public, private, and institution-based business incubators to foster technological support and innovation in the growth of these enterprises (Mian et al., 2016). However, different types of incubators, such as commercial, social, and institution-based business incubation programs, provide their incubator apprentices with distinct tangible and intangible resources (Wasdani, 2022). Due to the rise in popularity of business incubators, institution-based business incubation centers that allow many university students from diverse backgrounds to interact and develop their entrepreneurial ideas in a secure and creative atmosphere have become increasingly widespread (Mele et al., 2022). Institutions are becoming centers for university-industry partnerships, which can promote student interaction and the incubation of innovative ideas (Bodolica and Spraggon, 2021). As stressed by Wasdani (2022), the business incubation program provides startups with three forms of expertise, including technology knowledge, business knowledge, and market knowledge. Due to the presence of apprentices from varied backgrounds and educational levels, students can cooperate in a unique learning and informal setting to supplement the lack of technological competence in business incubation programs (Mele et al., 2022).

However, existing research has revealed a notable scarcity of recent empirical-based studies on business incubation programs in the context of Malaysian education institutions. Despite technology-related incubator programs established by MSC Malaysia in 1996 and has evolved significantly with the increasing development of business incubators, limited studies have been conducted discussing other types of available business incubators, particularly in education. Although several studies have addressed challenges faced by business incubation programs, most of these studies are descriptive and focus on the implementation of the selected business incubators to enhance the understanding of that particular program (Ruslan, 2018). Nevertheless, Jamil et al. (2016) stressed that the relative success of the Malaysian incubation program to date is primarily attributed to the convergence of services offered, continued government support, and a rising university-business collaboration through the formation of a triple-helix dynamic between academia, government, and industry.

As highlighted in the Malaysian Polytechnics' Entrepreneurship Incubator Standard Operating Handbook (Polytechnic and Community College Education Department, 2021), another characteristic of an ideal business incubation program in polytechnics involves a robust support system in terms of technical training and potential opportunities related to digitalization including providing digital solution to polytechnics, communities or small and business enterprises. In this case, extensive research should be conducted to increase the understanding of various aspects of business incubation programs in developing countries such as Malaysia. Thus, this research intends to fill this void and expand the existing body of

knowledge by providing a comprehensive overview of the implementation of digital entrepreneurship education in business incubation programs in Malaysian polytechnics. Most importantly, this study can potentially catalyze the success and longevity of student businesses, thereby achieving the Malaysian government's mission and nurturing a thriving digital entrepreneurship education environment.

A Theoretical Framework To Study The Implementation Of Digital Entrepreneurship Education In Business Incubation Program At Malaysian Polytechnics

The proposed research aims to explore the implementation of digital entrepreneurship education in Malaysian polytechnics by assembling the information obtained from each stakeholder's perspectives in business incubation programs, such as incubator managers, entrepreneurship mentors, and student entrepreneurs. In this regard, this study should be conducted to document the multiple realities seen through various aspects and the researchers have the responsibility to present the evidence reports that include thematizing the words from the chosen individuals. The crucial role of identifying the theories in a qualitative study is ensuring the researcher implicitly acknowledges the theoretical orientation in determining what occurs in the research field, selecting what to discover in detail, and how to associate with participants (Yin, 2018).

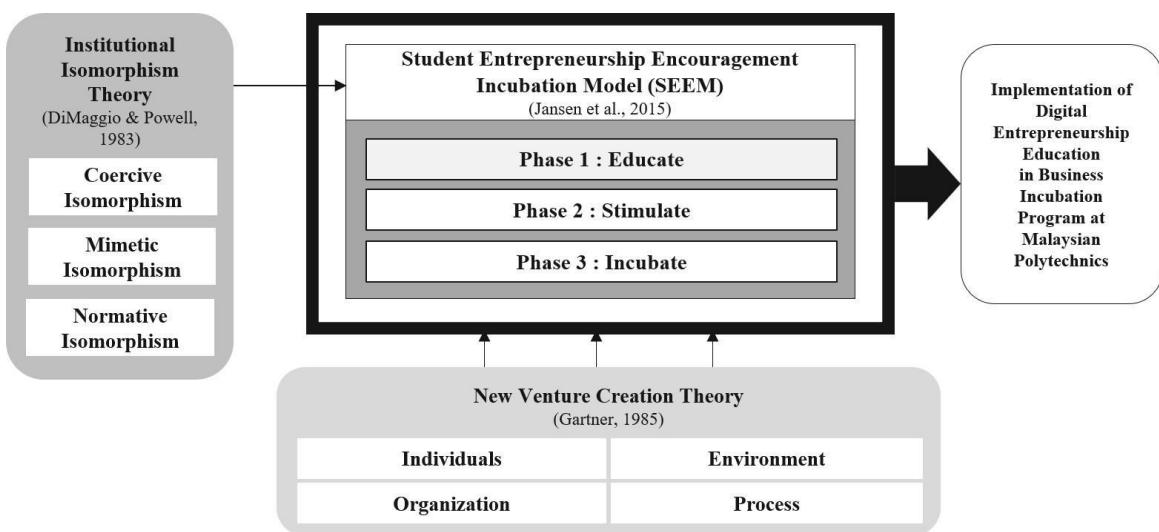


Figure 1: Proposed Theoretical Framework.

Besides providing a broad plan, the theoretical framework also played a significant role in helping the researcher make the analytical generalization of the findings from the qualitative case study. The analytical generalization does not focus on the inferences drawn from the empirical data gathered based on a specific sample to represent any larger population, but the goal is to consider the case study research as the chance to provide the interpretive logical reasoning behind a particular theoretical framework. To provide the guideline of this qualitative research based on the proposed research questions, this qualitative study will highlight the significance of integrating the Student Entrepreneurship Encouragement Model (Jansen et al., 2015), Institutional Isomorphism Theory (DiMaggio and Powell, 1983), and New Venture Creation Theory (Gartner, 1985) as the theoretical lens to underlie the entire study.

Institutional Isomorphism Theory

Institutional isomorphism theory (DiMaggio and Powell, 1983) states that an organizational environment would strongly influence the development of formal structures. Businesses will also adopt a similar design due to external pressures to increase the homogeneity of organizational structures. DiMaggio and Powell (1983) emphasized isomorphism as a constraining mechanism that causes businesses to resemble others that face the same set of environmental conditions. Three primary mechanisms of isomorphism lead to institutional convergence: coercive isomorphism, mimetic isomorphism, and normative isomorphism.

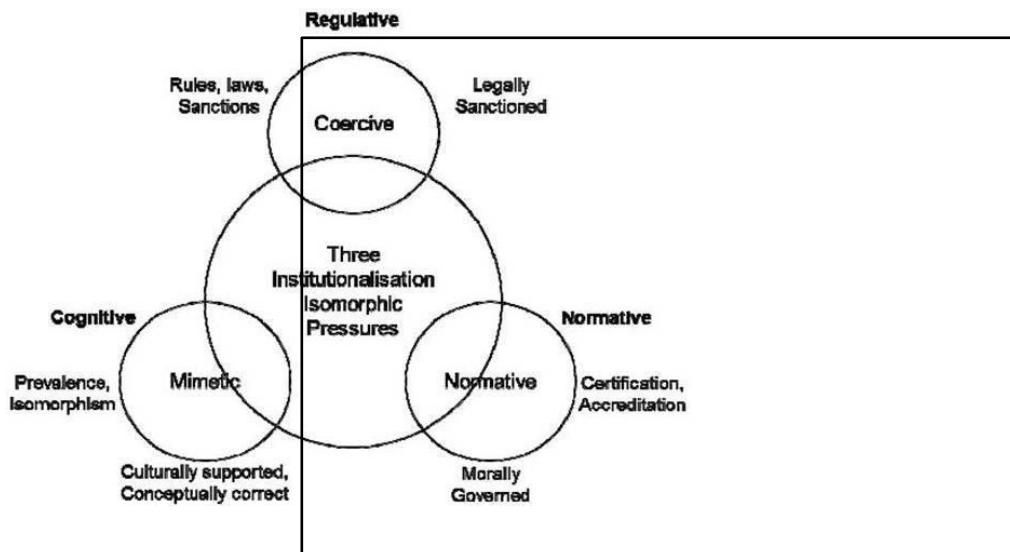


Figure 2: Institutional Isomorphism Theory.

Coercive isomorphism results from both informal and formal pressure organizations have received from the legal mandates upon which organizations are dependent. Mimetic isomorphism occurs when organizations imitate others' promising results in the same institution during high uncertainty. Finally, the legitimate professional practices and the professional values resulting in normative pressure are defined as normative isomorphism. Normative isomorphism is also primarily related to the organization's members, their professional educational background, and their interest in promoting professional norms that will enhance the expansion of new ideas and strategies.

According to the institutional theory within this study, the business incubation program at Malaysian Polytechnics is influenced to strengthen their digital entrepreneurship education due to the government regulations and policies set out for them by the Ministry of Education Malaysia (2018b). For polytechnics to meet the regulatory bodies' requirements, they may adopt specialized management strategies and practices to enhance the digitalization in their institutions. As the highest TVET provider in Malaysia, every polytechnic is also required to fulfill the entrepreneurship's key performance indicator (KPI) that includes every stakeholder, especially entrepreneurs and TVET lecturers. In terms of this research, the Institutional Isomorphism Theory can also influence the entrepreneurial motivations of student entrepreneurs, entrepreneurship mentors, and incubator managers to participate in the business incubation program at Malaysian Polytechnics. For instance, government initiatives that promote digital entrepreneurship education and the formation of incubation programs may generate coercive pressure on the respective polytechnic's management.

Students may also be driven to participate if they perceive potential opportunities and benefits offered to them.

New Venture Creation Theory

To heighten community support for entrepreneurs, the New Venture Creation Theory by Gartner (1985) highlighted four main aspects in its framework, including the individuals, the new venture process, the environment, and the organization. The individual entrepreneur dimension has been assessed based on the measures of age, work experience, educational background, family influence, and psychological characteristics such as risk-taking propensity, the need for achievement, and locus of control. As for the new venture process dimension, it is related to common entrepreneurial behaviors such as identifying business opportunities, accumulating business resources, publishing, and marketing the products or services by complying with government regulations and society.

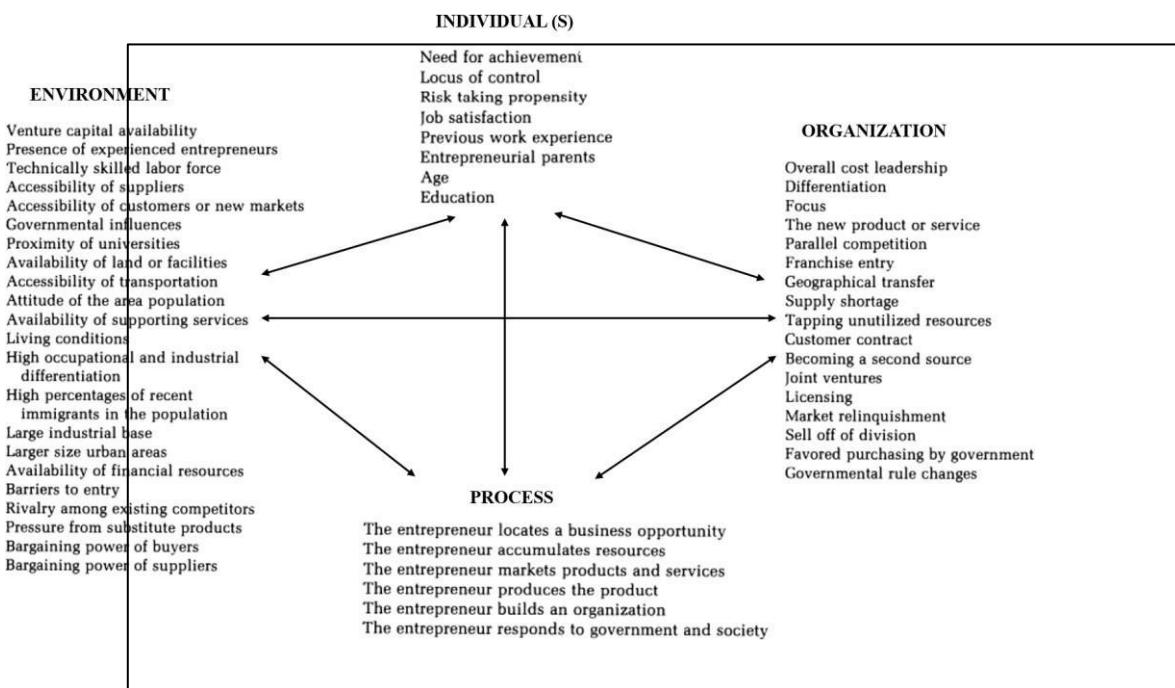


Figure 3: New Venture Creation Theory

The environmental dimension refers to the availability of venture capital, infrastructures, supporting services, the existence of skilled mentors, accessibility of resources, and the demand or capacity of products produced by entrepreneurs. The organizational dimension focused on the assumptions of how the entrepreneurs typically launch their businesses. The two main assumptions are (a) if all entrepreneurs are virtually alike and (b) if entrepreneurs went through the same process to create their ventures. Therefore, the New Venture Creation Theory is the ideal theory that should be used because the four dimensions highlighted by Gartner (1985) will help the researcher discover how each aspect can interact based on the context of Malaysian polytechnics.

Gartner's New Venture Theory (1985) highlights the importance of acknowledging the factors that may influence entrepreneurs in establishing new ventures. Based on this study's context according to Gartner's perspectives, the entrepreneurial motivations of individuals are influenced by a combination of four dimensions which are individual, environment, organization, and process-related factors. By applying this theory to this qualitative study,

the researcher can understand the underlying motives that lead student entrepreneurs, entrepreneurship mentors, and incubator managers to participate in business incubation programs. Through the proposed research, the researcher will be able to explore the ability and potential of market opportunities, innovation, financial gains, and personal satisfaction related to the implementation of digital entrepreneurship education in business incubation programs. By understanding the interconnected dimensions proposed by Gartner's theory, the researcher will be able to explore several new aspects related to digital entrepreneurship education that emerged during this study.

Student Entrepreneurship Encouragement Model (SEEM)

According to the Student Entrepreneurship Encouragement Model (SEEM) developed by Jansen et al. (2015), there are three stages to encourage entrepreneurship education in higher institutions: an education stage, a stimulation stage, and an incubation stage. Each stage contains a specific goal and includes a particular set of actions that can be provided and supported to achieve the goal and effectively promote entrepreneurship education among students. During the education stage, the most crucial goal is to increase the student's awareness of choosing entrepreneurship as their career option, resulting in a change of attitude towards entrepreneurship. This stage involves various efforts to wake up dormant entrepreneurs, such as offering entrepreneurship courses and providing supportive educators.

Next, the stimulation stage will encourage students to develop their business idea into a complete business plan through several activities supported by higher education institutions. For instance, higher institutions can provide students with a mechanism to validate their business ideas and promote multidisciplinary team formation. Lastly, the incubation stage aims to facilitate the launch of the actual businesses by offering tangible and intangible services for entrepreneurs, such as office space, mentorship, network opportunities, and fund resources. In this study, each stage in the SEEM model is crucial in developing an ideal digital entrepreneurship education ecosystem in which students are aware of the possibility of becoming an entrepreneur and the support they will gain from the business incubator at Malaysian polytechnics. Although not all of the stage's components may reflect the same entrepreneurial development in the business incubation program at Malaysian polytechnics, the SEEM model could assist the researcher in developing a comprehensive interview protocol for research participants that will permit the emergence of new themes within the context of the Malaysian education system.

As for the Student Entrepreneurship Encouragement Model (Jansen et al., 2015), the model serves as a framework to guide this study and assist the researcher in comprehending the multiple stages and strategies necessary to promote entrepreneurship education among students who venture into businesses. It also lays the groundwork for understanding the precise actions and aims needed at each phase of a business incubation program, as well as the differences that will appear at the end of this research in the context of digital entrepreneurship education. The incubation stage in the model suggested by Jansen et al. (2015) also highlighted providing tangible and intangible support to facilitate the development of university-based businesses. In this study, the researcher explores how the incorporation of multiple digitalization strategies could enhance the ability of business incubation programs in polytechnics to pursue product innovation.

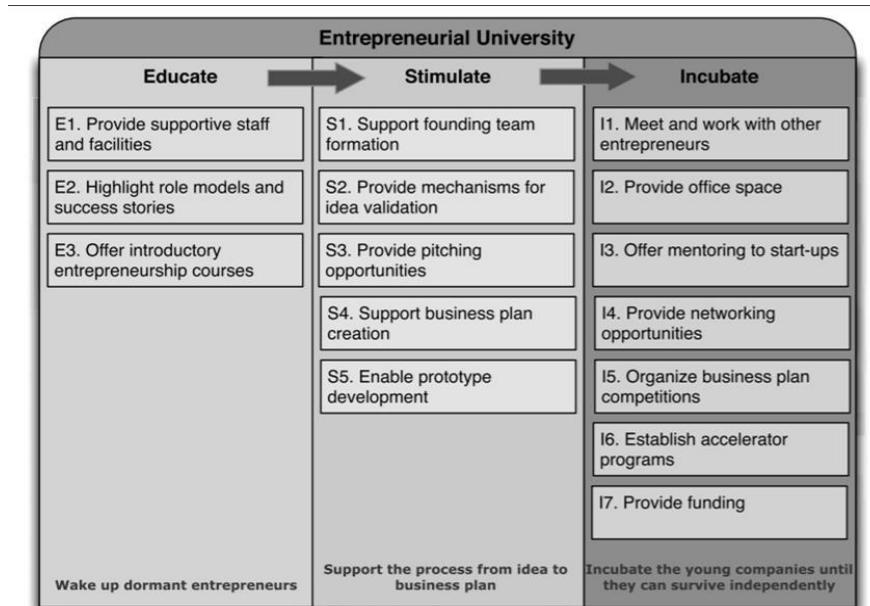


Figure 4: Student Entrepreneurship Encouragement Model by Jansen et al. (2015)

Proposed Research Questions

Based on the further clarification mentioned above, it could be concluded that each theory and model's essence has its contribution to building a strong justification for every component in the theoretical framework. According to Yin (2018), analytical generalization from a theoretical framework can be classified into two different aspects: either (1) modification, rejection, or advancement of the reference theoretical framework of a study, or (2) development of new concepts after completing the study. Cohen, Manion, and Morrison (2018) underlined the importance of having a research purpose and the research questions as the key aspects that will guide the researcher to stay focused on understanding the research's central phenomenon during the data collection process. In terms of this study's context, the researcher should explore every component in the theoretical framework in detail and consider the new themes or concepts arising from the proposed research problem statement. The results of this inquiry will complement the findings from the integration of the Student Entrepreneurship Encouragement Model, Institutional Isomorphism Theory, and New Venture Creation Theory to answer the following research questions:

1. What are the entrepreneurial motivations of student entrepreneurs, entrepreneurship mentors, and incubator managers to be involved in digital entrepreneurship within the business incubation program at Malaysian polytechnics?
2. How do management strategies facilitate the implementation of digital entrepreneurship within Malaysian polytechnics' business incubation program?
3. How are the teaching and learning practices of digital entrepreneurship education being implemented within Malaysian polytechnics' business incubation program?
4. To what extent are the impacts of implementing digital entrepreneurship education in business incubation programs at Malaysian polytechnics?

Summary of Findings And Conclusion

Integrating digital technologies across various sectors is driving an unprecedented transformation in the current business landscape. This transition has accelerated the urgent need for educational institutions to modify their curricula to nurture the skills development required to navigate the expanding digital economy. However, incorporating digital entrepreneurship into education presents several concerns, particularly in TVET institutions. As elucidated in this paper, the convergence of digital entrepreneurship and education necessitates a paradigm shift in pedagogical approaches and institutional frameworks. The call for TVET institutions, particularly Malaysian polytechnics, to promptly adapt to technological advancements through initiatives like business incubation programs emphasizes the crucial role these institutions play in equipping student entrepreneurs for the dynamic era of human-machine cooperation.

While global frameworks like the European Digital Competence Framework for Educators offer a roadmap for digital education, the lack of a roadmap tailored to digital entrepreneurship education presents a significant obstacle. Recognizing this gap is critical in exploring the stakeholders' motivation, formulating management strategies, and identifying teaching approaches corresponding to the distinct demands of fostering entrepreneurship within a digital business landscape. In Malaysia, government initiatives such as the TVET 4.0 Framework 2021-2025 (Malaysian Ministry of Education, 2018) and Malaysian Polytechnics' Entrepreneurship Incubator Standard Operating Handbook (Polytechnic and Community College Education Department, 2021) underscore the recognition of the imperative to align educational systems with the demands of the 4IR through the implementation of a business incubation program. However, there is a clear need to refine these frameworks to accommodate the intricacies of digital entrepreneurship education in the context of business incubation programs.

The theoretical groundwork established in this paper enhances a more in-depth understanding of the issues and practices associated with implementing digital entrepreneurship education in TVET institutions, with a specific focus on Malaysian polytechnics. It is evident from the proposed theoretical framework presented in this study, drawing from institutional isomorphism theory, new venture theory, and the Student Entrepreneurship Encouragement Model, that there is a pressing need to address the specific demands of digital entrepreneurship education. At the core of this discussion is the recognition that digital entrepreneurship education encompasses more than imparting technical skills. It demands cultivating an adaptable, innovative, and collaborative mindset, all of which are essential competencies for achieving success in a digitally-driven entrepreneurial landscape.

In summary, this paper serves as a clarion call for a more nuanced and personalized approach to integrating digital entrepreneurship education within TVET institutions. The proposed research questions underscore the multiple facets of digital entrepreneurship education within TVET institutions as they emphasize the importance of exploring entrepreneurial motivations, management strategies, teaching and learning practices, and impacts concerning the integration of digital entrepreneurship in Malaysian polytechnics' business incubation programs. By leveraging insights from established theories and recognizing the deficiencies in existing digital education frameworks, educational institutions will have the potential to prepare a cohort of graduate entrepreneurs capable of navigating the complexities of the digital economy, fostering innovation, and driving entrepreneurial endeavors in the ever-changing business and technology landscape.

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