Journal of Teaching and Education,
CD-ROM. ISSN: 2165-6266 :: 09(01):167–194 (2019)

Journal of Teaching and Education

DIGITAL ENTREPRENEURSHIP IN ACADEMIC ENVIRONMENT: ARE WE THERE YET?

Ratna Lindawati Lubis

Telkom University, Indonesia

Research in entrepreneurship education at Higher Education Institutions (HEIs) in Indonesia has repeatedly tried to deal with issues in relation to particular groups of students and faculties based on the gap between academia and entrepreneurial ecosystem. The variety of audiences of entrepreneurship education programs includes students with various socio-demographic characteristics and various levels of involvement and aspirations in the entrepreneurial process.

In this context, over the last five years, some specific entrepreneurship education at Telkom University in Indonesia, discuss contextual factors which help explain the creation of digital opportunities at an individual, societal, organizational and national level. It is broadly acknowledged that digital opportunities in entrepreneurship are an encompassing term that includes the development of the internet and the unique characteristics of doing business online, including the impact of the internet on various business sectors. Significant progress has been made to unveil the role of entrepreneurship education in shaping the entrepreneurial ecosystems through online platforms, from sources of finance to support structures such as business accelerator and incubators. Meanwhile, doubts have also been expressed as to the legitimacy and maturity of entrepreneurship education in shaping digital opportunities for students and faculties at Telkom University.

With an aim to explore the nurturing environment for digital entrepreneurship in academic setting, this study emphasises the importance of "institutional vision, mission, core values", "academic environment" and "digital media", as a preliminary effort for further investigation, with might, in turn, lead to participate in the implementation of the Government of Indonesia's (GoI) strategies, so-called "Making Indonesia 4.0". This study proposes a new framework which may lead to the debate if and how the current level and adoption of digital technologies in entrepreneurship education at Master in Management Program prepares graduate students to adapt, take on new roles and maximizing the digital opportunities.

Keywords: Entrepreneurship education, Higher education institution, Digital entrepreneurship, Making Indonesia 4.0, Conceptual framework.

Introduction

The starting point for this study was a desire to explore the ideas associated with the devotion of more resources and energy to the formation of the digital entrepreneurial environment at the Higher Education Institution (HEI) in Indonesia, which will help to create cultures of DE on campuses. And my conceptual point of departure here is my article released in the International Journal of Arts and Sciences (IJAS) that

was published back in 2015: *The "Triple-I" Learning Model of Entrepreneurship Education in Indonesia: Where Do We Go From Here?* (Lubis, 2015).

In the following, the author iterate and reiterate the earlier work and focus on analytically and discursively expanding the previous propositions. With this analytical expansion, the author wants to reflect the discussion since. In addition to this, the author also wants to develop a more future-oriented outlook and vision of Indonesia digital entrepreneurs, addressing the specific role of HEIs in fostering Entrepreneurship Education (EE) that is interested in DE (DE), emphasizing on how best learned and thought that brings together *The "Triple-I" Learning Model,* consists of *Inspiration, Innovative, Indonesia.*

Meanwhile, reflecting on the experience of working as one of the core Faculties for graduate students in business school since 2001 – at the Master in Management Program, Telkom University (formerly known as Sekolah Tinggi Manajemen Bandung or STMB in short) – this study takes a closer look at how a contextualized view of graduate students providing alternative and fruitful evidence to better understand the multifaceted nature of EE, focusing on the DE. In that aim, the author planned to develop a deeper understanding of what was the most important thing the students learned in business school regarding the formation of the digital entrepreneurial environment at their institution. Therefore, the originality of the study comes from various aspects such as its context, focus, subjects and elective criteria in sampling.

Implicit within this individual-opportunity nexus is the need for the university students to not only identify the opportunity but to respond appropriately in seeking to exploit it. This capacity to manage a high degree of uncertainty over potential outcomes is a key attribute of entrepreneurs that is often confused with risk-taking. As it is widely known, the ability of some successful entrepreneurs to grow new businesses and introduce new technologies and products is a key reason for governments to see entrepreneurship as a potential panacea for economic downturns and stagnation.

Talking about EE, an example of this is the World Economic Forum (WEF) who released a report in 2009 about the need to unlock the entrepreneurial capabilities of the population through education. For the WEF the challenge of the 21st Century was not just to recover from the global financial crisis, but to use entrepreneurship and innovation as a means to solve a wide range of global challenges including sustainable economic growth and human welfare. In the report, WEF (2009, p.65) explained in more detail the evaluating quality, effectiveness, and impact of entrepreneurship in higher education as clearly stated:

> For the evaluation of entrepreneurship in higher education, both quantitative (measurable), as well as qualitative (difficult to measure) indicators, are important. Quantitative criteria include the number of students who want to take the course, student enrollments and the increase in the number of participants. Such quantitative criteria are, however, only to a limited extent meaningful to assessing the quality of entrepreneurship education.
>
> As a complement to the quantitative indicators, qualitative criteria such as the quality of the start-ups and new workplaces can be useful when evaluating the outcome and implication of entrepreneurial activities of universities and colleges.

The author noted that the perspective of the organization like the WEF is to provide the explanation that entrepreneurs and entrepreneurship offer potential solutions to high unemployment and stagnating economies. This has helped to fuel the level of interest in entrepreneurship research and education programs around the world.

Meanwhile, the digital economy is developing rapidly worldwide. The term "Digital Entrepreneurship (DE)" most commonly refers to the process of creating a new Internet-enabled/delivered business, product or service. This definition includes both start-ups and also the digital transformation of existing business activity inside a firm or public sector.

At the same time, in 2018, Indonesia's Ministry of Industry has designed "Making Indonesia 4.0" as an integrated roadmap to implement a number of strategies to enter the Industry 4.0 era. The roadmap requires collaborative actions among multiple stakeholders that range from government institutions, associations, and industry players, to academic elements.

And back to 2016, the Government of Indonesia presented a four-year economic plan to transform Indonesia into the largest Southeast Asian digital economy and aims to create 1,000 high-tech start-ups by 2020, with a combined value of US$10 billion. However, serious questions are being voiced as to what should be the focus of this four-year economic plan, since the fact that the Indonesian economy and population rely mainly on a myriad of micro and small businesses that are low-tech and low-growth.

In Indonesia itself, the digital entrepreneurial environment at the HEIs has yet to fully permeate the campuses. At institutions where such things do not exist, it is imperative that there be strong administrative and student support for these goals as well as a clear vision that understands the need for long-term thinking and patience. In short, campuses that harness digital technologies stand to reap significant DE benefits in the long run. Put it in another way, campuses that are slow to embrace digital technologies run the risk of falling further behind in short order.

In the context of this study, significant progress has been made to unveil the role of EE in shaping the entrepreneurial ecosystems through online platforms. However, access to affordable, reliable, high-speed entrepreneurial broadband infrastructure is still a problem. While these factors also matter for entrepreneurship more generally, they are even more important in the fast-changing and fast-moving digital world, and for digital entrepreneurs in start-up business sectors.

Following this line of thought, this study covers the landscape of debate and inquiry regarding digital opportunities to create a nurturing environment for DE, focusing on the master-level students majoring in business and management. Thus, this study takes an early step towards enhancing the scholarly literature about how the DE may come about, particularly in the context of the Faculty of Economics and Business, Telkom University Indonesia.

Furthermore, to gauge the institution's DE as well as reflecting on the experience as the educator of entrepreneurship education at the graduate level of education, the author believe that the institution should be encouraged, supported and also take into account the students' feedback, if it could help detect problems in time teaching and learning environment. Doing so may lead to striving for the formation of the digital entrepreneurial environment around Telkom University's campus, with might, in turn, lead to participating in the implementation of the Government of Indonesia's (GoI) strategies, so-called "Making Indonesia 4.0". In other words, this study is meant to be a catalyst and call for action on the next level of EE. Maximizing digital opportunities is a key issue.

For all these reasons, it would be essential to consider the perspectives of the students towards the DE. The author believes this study would still be useful for further investigation in order to extend the other scholars understanding of DE associated with EE at HEIs in Indonesia.

Critical Review of the Discourse

From Entrepreneurship (E) to Digital Entrepreneurship (DE)

The word "entrepreneur" is probably one of the most misunderstood and abused words in the English language. Similar to this, the word "entrepreneur" and "entrepreneurship" is also probably one of the most misunderstood and abused words in Bahasa Indonesia. For example, one of the big problems with the word "entrepreneur" and "entrepreneurship", here in Indonesia today is the way people use those words as the new acronyms, such as *womenpreneur, digipreneur, creativepreneur, garudaprenuer*, *creaveteneur,* to name a few; which do not even make sense.

However, the origins of the word can be traced back to 19th Century France with the word *"entreprendre*" meaning to undertake, usually task. A few decades ago, an article published in 1971, economist Peter Kilby likened the process of trying to identify an entrepreneur to A.A. Milne's notion of "Hunting the Heffalump" in the classic tale of "Winnie the Pooh". This related to a fictional elephant that all investigators approached with improvised proxies from their disciplines, each asserting that they had discovered the ever-elusive creature's behavior. In other words, this related to the existence of an enormous mythical creature that had never been directly observed, but which various hunters had claimed to have caught.

Writing again in 2003 in an article in the Journal of International Entrepreneurship, Kilby revisited his earlier work, noting that despite the passage of over 30 years entrepreneurial activity could still not be readily quantified, only inferred from its consequences. It is widely accepted today that the field of entrepreneurship has certainly evolved over the past 40 years, however, it remains a work in progress and far too much misunderstanding and misguided hype exists around the issue of what it is and what it might offer the world.

On one hand, it is important to note that the digital entrepreneurial environment and its ecosystems at the HEIs are not built in a day. And on the other hand, it is widely accepted today that academics have continued to characterize the special qualities of entrepreneurs. For example, Timmons and Spinelli, Jr. (2009, p.44) summarized the characteristics of entrepreneurs, which refers to a wide and diverse range of the study from Mill (1848), Weber (1917), Schumpeter (1934), Sutton (1954), Hartman (1959), McClelland (1961), Davids (1963), Pickle (1964), Palmer (1971), Hornaday and Aboud (1971), Winter (1973), Borland (1974), Casson (1982), Gartner (1985), Begley and Boyd (1987), Caird (1988), Roper (1998), Thomas and Mueller (2000), Lee and Tsang (2001).

The author noted that the research on the personality traits of entrepreneurs took off in the mid-20th century, unifying approaches from economics, psychology, sociology, and business management to answer the questions: Who is an entrepreneur? What drives them? What traits define them? While the personality traits of entrepreneurs remain rife with its own set of contentions, researchers have primarily gravitated over the last few decades to the online courses, tools, and resources for entrepreneurial education because that is the fastest growing area of entrepreneurship. There is a ton of content on the Internet for entrepreneurship. The following examples illustrate the relevant actions and initiatives towards the free online courses for DE:

1. Developing Innovative Ideas for New Companies: The 1st step in entrepreneurship (Coursera)
2. Entrepreneurship Course: Start your own business (Open Learning) from Taylor University
3. Foundation of Business Strategy (Coursera)
4. Global Entrepreneurship Program (Global Entrepreneurship Institute)
5. Grow to Greatness: Smart growth for businesses (Coursera)
6. Leading Strategic Innovation in Organizations (Coursera)
7. Lean Canvas – Your Startup Blueprint
8. Mixergy
9. Stanford University's Entrepreneurship Corner
10. Starting Your Own Business 101 from international non-profit organization MyOwnBusiness
11. Startup Engineering (Coursera)
12. Technology Entrepreneurship (NovoEd)
13. The Lean LaunchPad: how to build a startup (Udacity)
14. The Lean Startup Movement
15. The Startup Library From Y Combinator

In addition to this, many countries have made impressive progress fostering its digital ecosystem and is striving to support digital entrepreneurs as well as start-up firms that will deliver new digital businesses, products, and services to create high-value jobs and economic growth. In the context of examining the digital ecosystem in Indonesia, it is necessary to know what happens to the progress of many nations – including Indonesia – in the "digital economy", as shown in Figure 1, Figure 2 and Figure 3.

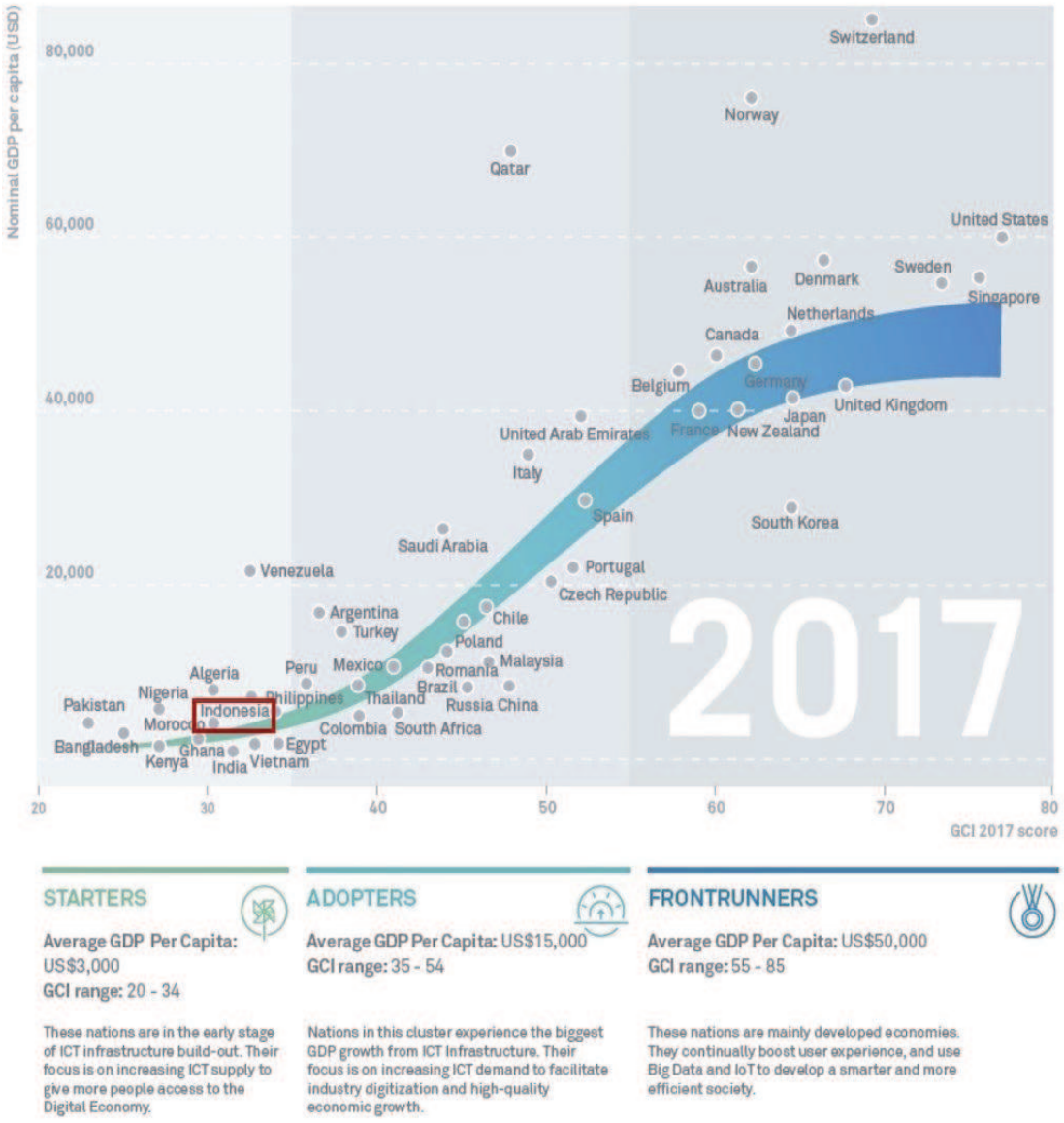


Figure 1. The Global Connectivity Index (GCI) S-Curve of 50 Nations in 2017
Source: Huawei Technologies Co., Ltd. (2017, p.17)

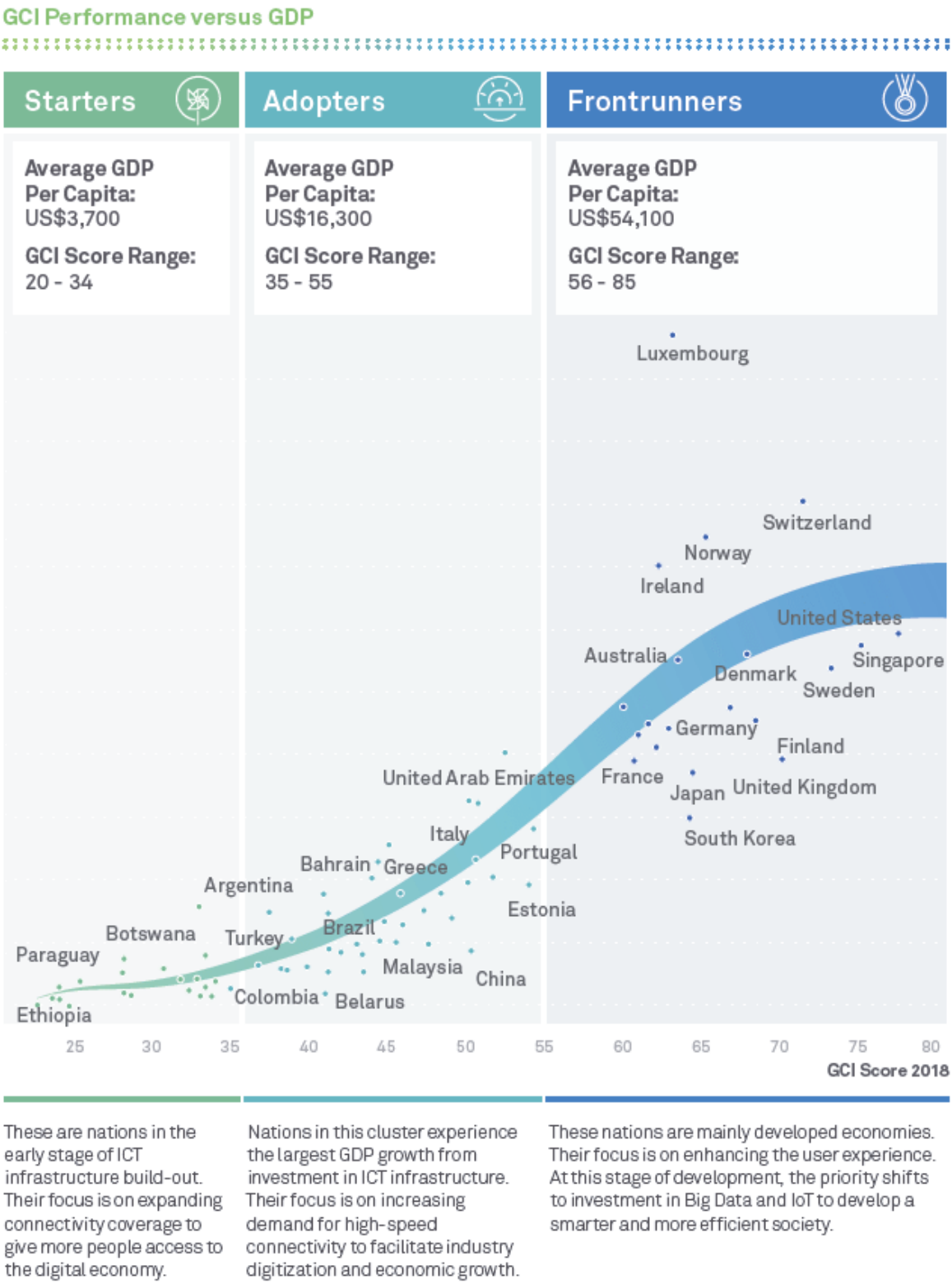


Figure 2. The Global Connectivity Index (GCI) S-Curve of 79 Nations in 2018
Source: Huawei Technologies Co., Ltd. (2018, p.17)

Figure 3. The Country Rankings of 79 Nations in 2018
Source: Huawei Technologies Co., Ltd. (2018, p.7)

According to Huawei Technologies Co., Ltd. (2017, 2018) "Starters" countries, including Indonesia need to enable high-speed broadband as the critical first step. The scope of 2018 Global Connectivity Index (GCI) has broadened from 50 to 79 nations. The author noted that by improving broadband coverage, supercharging bandwidth and building out their ability to store and process data in the cloud, some countries have seen jumps in their GCI scores, such as Egypt, China, and Slovenia. Sad to say, Indonesia's score remained at 33.

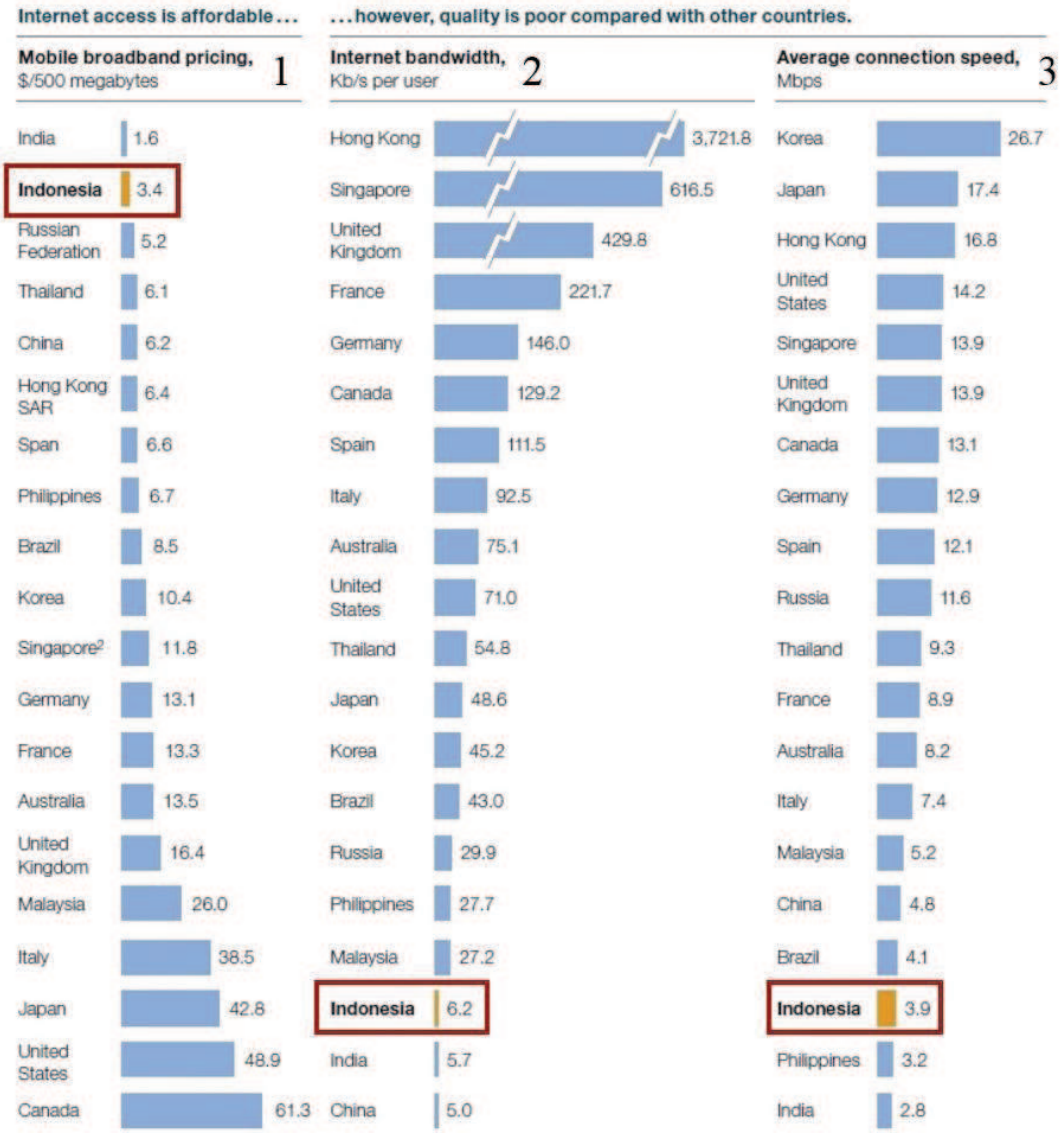
This result is similar to the previous findings from McKinsey Indonesia Office (2016) which indicate that Indonesia is in a nascent stage of digitization and has a long way to go in the digital age. However, Indonesia presents a curious paradox:

a) Indonesia's digital denizens are among the world's most active, and it has a vibrant start-up ecosystem, but overall the country lags in embracing the benefits of modern technology
b) Information and Communication Technology (ICT) infrastructure is weak and digital usage is uneven within and among various business sectors
c) Indonesia's connected citizens are tech-savvy, but Internet penetration is low

In the report, McKinsey Indonesia Office (2016, p.6) explained the digital potential for Indonesia with the following statement:

> Amid all the challenges, three mega-trends come to the fore that will enable Indonesia to capture its digital potential: infrastructure, consumers, and businesses.

In addition to this digital potential, it is also explained that mobile data in Indonesia is very affordable, costing just 50% of what consumers in some ASEAN neighboring countries pay. However, quality – defined as the average connection speed and Internet bandwidth – can be very low, as illustrates in Figure 4.



Notes:
1 Prepaid tariff for all countries except for China, Japan, and Korea, where the postpaid tariff is used
2 Singapore data price dropped sharply since 2014
3 Average connection speed from all IPs. Peak average speeds can be higher, especially with the at-scale 4G rollout.

Figure 4. Indonesia's Digital Standing Among 20 Countries
Source: McKinsey Indonesia Office (2016, p.7)

In line with McKinsey report, there were indicators evolved from the DE across the APEC Region (Australian APEC Study Centre – RMIT University, 2017) that has reported the Digital Readiness Report Card based on APEC's pillars of connectivity: physical; institutional; people-to-people. The results show that Indonesia has a strong, high quality and implemented policy on the environment for entrepreneurs

and on the mobile network coverage. However, Indonesia has a lot of indicators that need development, which categorized as follows:

a) People, skills and education indicators that consist of availability of expertise and mentorship; current skills availability; math and science education (primary and secondary);
b) Infrastructure and ICT indicators that consist of internet access and usage; internet speeds and reliability; rural inclusion;
c) Institutional and regulatory indicators that consist of the regulatory and political environment; e-Government readiness; laws relating to ICT including protection of Intellectual Property (IP) and data privacy;
d) The financial indicator that consists of flexible bank loans for start-ups and new companies; availability of venture capital.

While the study of "digital economy" made important findings, it is also important to avoid the temptation to take an early position on who will or will not be successful, and instead focus on creating an enabling environment that maximizes opportunities for digital entrepreneurs. The author believes that the tasks span the skills spectrum, from low-to high-end skills, and can be a first step into building a broader and experienced skills base.

Indeed, more work is required because there is a lack of research in different contexts, such as graduates students' DE. A more thorough understanding of graduates students' DE can also be used to develop more relevant entrepreneurship education, which may lead to creating cultures of DE on campuses.

As Indonesia has designed "Making Indonesia 4.0" that requires collaborative actions among multiple stakeholders that range from government institutions, academic elements, to associations and industry players, which could open the research on the issues that policymakers should consider to create a nurturing environment for DE. Therefore, the full speed ahead may start with the next topic of the discussion entitled, "Making Indonesia 4.0": Are we there yet?".

From Entrepreneurship Education (EE) to Digital Entrepreneurship (DE)

In an effort to learn the entrepreneurship education at the HEI's in Indonesia, the author have highlighted the entrepreneurship curricula and the students' perceptions about the entrepreneurial process (see e.g., Lubis, 2004; Lubis, 2006-a; Lubis 2006-b; Lubis, 2008; Lubis, 2009; Lubis, 2010; Nugroho, 2010-a; Nugroho, 2010-b; Lubis, 2011; Lubis, 2012; Nugroho, 2012; Lubis, 2013; Lubis, 2014; Lubis, 2015; Lubis, 2016-a; Lubis, 2016-b). The latest study (Lubis, 2017) reported the findings of graduate students' perceptions on how the "Management Competency Inventory (MCI)" self-assessment could be incorporated into their personal preferences, in terms of entrepreneurial leadership and the law.

The author noted that Entrepreneurship Education (EE) is one of the fastest growing fields of education globally. However, EE tends to be portrayed as the complex nature of greater levels of heterogeneity. For purposes of this present study and the context of this research, it is worth noting to provide the readers with the insights into the nature of the intersection of education and entrepreneurship. Klaus Schwab (as cited in World Economic Forum, 2009) offered the explanation:

> Entrepreneurship and education are two such extraordinary opportunities that need to be leveraged and interconnected if we are to develop the human capital required for building the societies of the future. Entrepreneurship is the engine fuelling innovation, employment generation, and economic growth. Only by creating an environment where entrepreneurship can prosper and where entrepreneurs can try new ideas and empower others can we ensure that many of the world's issues will not go unaddressed (p.6).

> Equally important is the power that education has in developing the skills that generate an entrepreneurial mindset and in preparing future leaders for solving more complex, interlinked and fast-changing problems (p.6).

Following this line of thought, the author noted the key concepts that help the author to recognize the very wide and varied interest in EE. Gibb (as cited in Lubis, 2014) clearly explains that there is a need to develop an understanding of where EE sits within the web of education theory and concept, as shown in Table 1.

Table 1. Mainstream education theories and entrepreneurship education

Theory/Concept	Key Constructs	Relevance to Entrepreneurial Education
Self-efficacy theory (Bandura)	Emphasis on self-action, role model observation/ coding leading to attitude development	Underlines the importance of entrepreneurial role models and observation of practice innovation
Experiential learning (Papert and Harel)	Learners to be actively involved in learning processes to construct knowledge and meaning from experience	Supports the importance of learning by doing and making things happen
Psychodrama (Moreno)	Underpins importance of role play in different contexts emphasizing creativity, leading to enhanced empathy and understanding	Provides the means for creating empathy via "feeling", a key relationship management component in entrepreneurial activity
Social learning and the zone of proximal development (Vygotsky)	Capacity to learn dependent on existing levels of knowledge and understanding, in turn, a function of social interaction	Emphasises the importance of learning on a socially interactive "need to know" and "capacity to know" basis
Situated learning and the "community of practice" (Lave and Wenger)	Learning is a "situated" event which can be enhanced "unintentionally" through the "community of practice"	Underpins the concept of learning from experience and the acquisition of tacit knowledge
The concept of tacit knowledge (Polanyi)	Learning through contextual experience, formally encoded, enhanced by personal trust and based on intention to act	Emphasises the importance of relationship learning in a wide range of contexts – a key component in entrepreneurship development
The concept of "emotional intelligence" (Goleman)	Focuses on the importance of understanding feelings and the relationship context in the learning process	Facilitates the exploration of the impact of an entrepreneurial life world on the ways that entrepreneurs accumulate and use knowledge

Heuristics and intuitive decision making (Manimala *et al*.)	Involves mind-maps based on the accumulation of experience as a basis for informed decision - making processes	Provides the basis for exploration of the way that entrepreneurs build decision-making processes by the accumulation of knowledge through problem
The concept of metacognition (Bransford *et al*.)	Emphasizes the importance of self-awareness, self-reflection and self-regulation in the learning process	Emphasizes the importance of the capacity for flexible strategic thinking
Andragogy (Knowles)	Focuses on the independence of the learner, immediacy in the application in knowledge and social roles in learning	In general, underpins the notion of entrepreneurial learning by doing

Source: Lubis (2014, p.549)

Having presented the very wide and varied interest in EE as explained by Gibb (2011, p.155), it should be noted that for EE to be successful, continuous improvement in education quality and effectiveness is necessary. Effective ways must be found to improve the assessment of the impact of EE on society and the economy. Due to the special characteristics features and goals of EE in many HEIs around Indonesia, the assessment criteria for entrepreneurship programs, courses and activities may, however, vary from general standards and guidelines (see e.g., Lubis, 2015).

For these reasons, it is considered worth noting to note some of the principal levels of impact measures of higher education entrepreneurship activities for measuring the performance of EE at HEIs in Indonesia. Therefore, here the author highlights some of the statements gathered from the World Economic Forum (2009, p.65) stated as follows:

> Student evaluation of entrepreneurship courses and activities should be paramount, although this has only a shorter tradition in many countries. In the 1990s, for example, professors often introduce entrepreneurship education without having any training themselves in the subject or being able to rely on proven concepts.
>
> Other important evaluation factors are the progress in entrepreneurial attitudes, perceptions and intentions of students taking entrepreneurship modules and changes in the image of and attitudes towards entrepreneurs.
>
> Additional indicators for measuring the performance of university-business links include commercialized inventions, the number of new patents or licenses, revenues and the number of workplaces created by the new start-ups.

The explanation from World Economic Forum seems important especially for Indonesia with higher education sectors where EE is still in the confusing stages with so many misunderstood and abused words in Bahasa Indonesia with the word “entrepreneur” and “entrepreneurship”.

In the context of EE and for the purpose of findings and discussions of this study, it is also considered important to note the findings regarding the critical skills for digital entrepreneurs. According to the Australian APEC Study Centre – RMIT University (2017, p.52), there have been many encouraging gains in tertiary education across the Asia-Pacific but there remain a number of critical areas for attention to producing sufficient numbers of graduates with appropriate digital, technical and business skills in the future. The survey results on how the skills and attributes that the respondents viewed as most critical to DE is shown in Table 2.

Table 2. Critical skills for digital entrepreneurs

Required skills and attributes	Nice to have
(1) Business model development, (2) Verbal communication skills, (3) Change management, (4) Risk-taking, (5) Adaptability, (6) Basic computer literacy, (7) Customer-centric design, (8) Foresight and vision, (9) Critical thinking and problem solving, (10) Passion, (11) Patience, (12) Effective resource planning, (13) Managerial and strategic leadership, (14) Sales skills, (15) English language proficiency, (16) Industry awareness	(1) Creativity, (2) Coding, (3) Networking, (4) Horizon scanning for emerging technology trends, (5) Marketing (incl. customer preferences, and purchasing behaviors), (6) Local ecosystem awareness, (7) Understanding regulations

Note: Sample of respondents were taken from the start-up founders, business executives, government officials, accelerators and incubators, venture capitalist, and education providers.
Source: Australian APEC Study Centre – RMIT University (2017, p.60)

The author noted that the majority of respondents indicated that first three required skill and attributes for digital entrepreneurs are (1) Business model development, (2) Verbal communication skills, (3) Change management. Although those three required skills and attributes were the presentation of a range of skills for digital entrepreneurs across the Asia-Pacific region, however, the entrepreneur educators in tertiary education across Indonesia need to rethink approaches to entrepreneurial learning and education in their institution.

Therefore, it brings to the fore and questions on how the current level and adoption of EE at HEIs in Indonesia should be delivered to their students, all which direct a more targeted and focused design of the "required skills and attributes", including the "nice to have" attributes, as shown earlier in Table 2. The next question would be how to deliver the notion of "lifelong learning" which could be enhanced and made more accessible advanced digital competence for all learners at HEIs in Indonesia. Those questions may, in turn, lead to having an opportunity to participate in the implementation of "Making Indonesia 4.0".

Following this line of thought, it is worth noting to provide the readers with the insights from Klaus Schwab's fourth industrial revolution (2017, p.4) on how we relate to one another, the way we work, how our economies and governments function, and even what it means to be human, stated as follows:

> Shaping the fourth industrial revolution to ensure that it is empowering and human-centered, rather than divisive and dehumanizing, is not a task for any single stakeholder or sector or for any one region, industry or culture. The fundamental and global nature of this revolution means it will affect and be influenced by all countries, economies, sectors, and people. It is, therefore, critical that we invest attention and energy in multistakeholder cooperation across academic, social, political, national and industry boundaries. These interactions and collaborations are needed to create positive, common and hope-filled narratives, enabling individuals and groups from all parts of the world to participate in, and benefit from, the ongoing transformations.

The author noted the challenges head-on and that the HEIs in Indonesia need to take responsibility for the actions going forward.

The next section will organize as follows: the brief explanation regarding the institution is presented; the methodology and the results are then illustrated. And finally, this study proposes a new framework which may lead to the debate if and how the current level and adoption of digital technologies in EE at Master in Management Program Telkom University prepares graduate students to adapt, take on new roles and maximizing the digital opportunities.

Research Context

In the following section, the author moves to explain the brief explanation regarding Telkom University. In December 2016, the institution published the Institutional Strategic Plan – so-called RENIP – for the period of 2013 to 2038, as illustrated in Figure 5 and Figure 6.

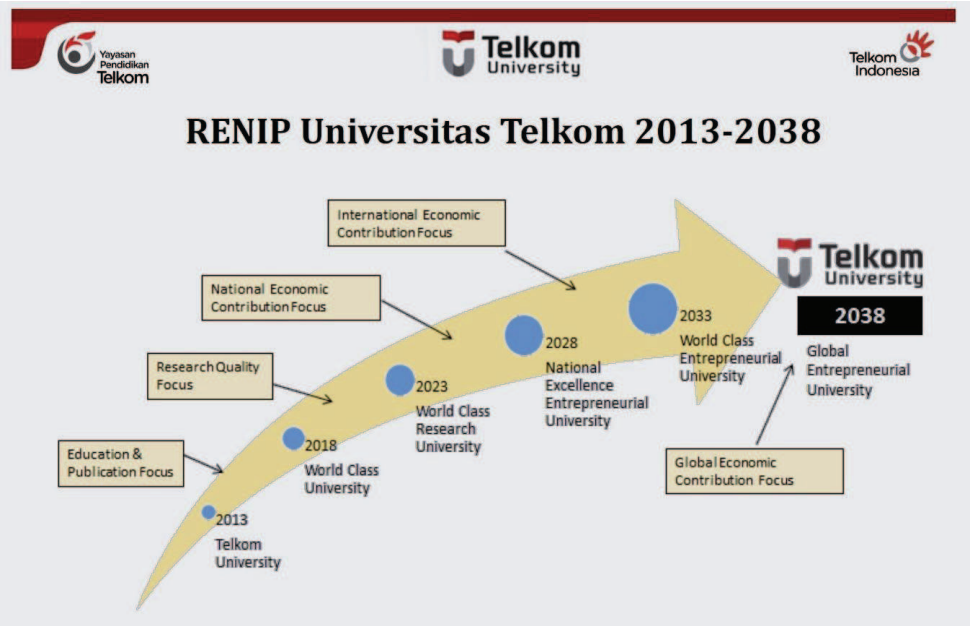


Figure 5. The Long-term Strategic Plan of Telkom University
Source: Ashari (2016) and Anwar (2018)

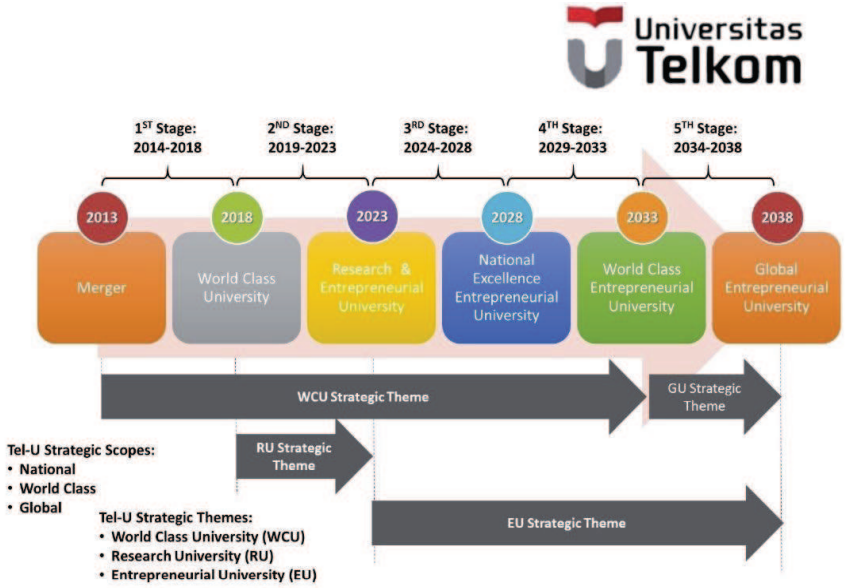


Figure 6. The Long-term Strategic Plan of Telkom University
Source: Yayasan Pendidikan Telkom (2018, p.6)

Figure 5 and Figure 6 show that the institution has specifically identified a range of long-term strategic plan for the entrepreneurial university, strongly related to the development of EE. These are:

- National Excellence Entrepreneurial University in the year 2028
- World Class Entrepreneurial University in the year 2033
- Global Entrepreneurial University in the year 2038

It is clear that the institution's policymakers acknowledge the need to promote graduate entrepreneurs and develop enterprising individuals. As regards to this, the institution announced its five core values for guidance on how to frame, design, launch and sustain its efforts to the development of its Institutional Strategic Plan.

The five core values with the acronym "PRIME", are known as Professionalism (P), Recognition of achievement (R), Integrity (I), Mutual respect (M) and Entrepreneurship (E), as illustrated in Figure 7. In addition, the institution is now preparing the Internet of Things (IoT) competition and highlight that "Visualizing the Digital Indonesia 2025" as the key issues to be discussed during its 5th Anniversary in 2018, as illustrated in Figure 8.

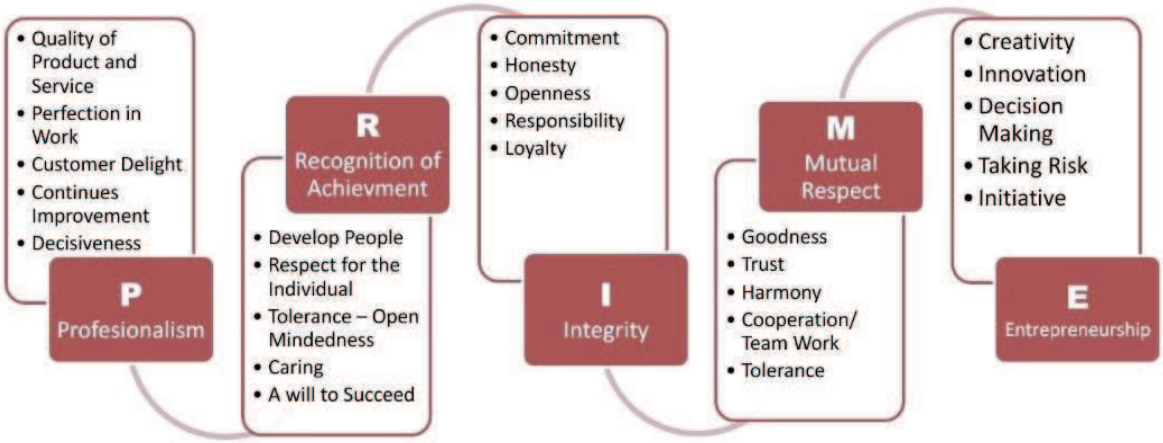


Figure 7. The Five Core Values of Telkom University
Source: Telkom University (2017)

Figure 8. The 5th Anniversary of Telkom University
Source: Telkom University (2017)

In summation, Figure 5, 6, 7 and 8 show how a clear strategic focus on entrepreneurship – linking research, teaching, and practical activities – by the institution's top-management and departmental leaders may have been significant in creating the vision to make up entrepreneurship a part of university's overall profile. The institution also has worked to complete its specialized support infrastructure for entrepreneurship through its commitment to the Bandung Techno Park (www.btp.or.id), which provides support to the start-up and growth of new ventures, including those founded by university faculty.

In the context of this research and for the purpose of findings and discussions of this study, it is certainly worth noting to address the strategic plan of Faculty of Economics and Business (FEB), as illustrated in Figure 9.

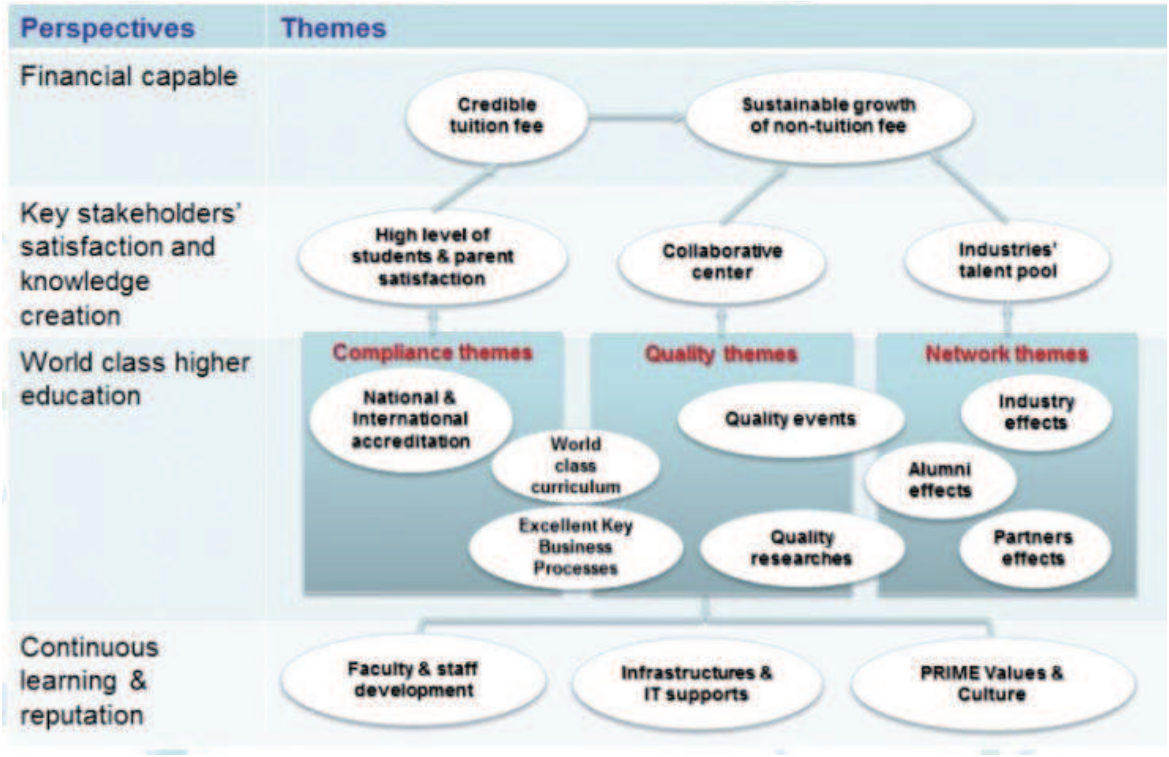


Figure 9. The Long-term Strategic Plan of FEB, Telkom University
Source: The graduation book of Telkom University (27th March 2018, p.30)

Figure 9 shows that there is no strategic policy development towards DE. In other words, the capacity and capabilities for building a more comprehensive, unified and effective program towards DE are still questionable. One key question arising in this context is: Why and how to build a policy commitment in order to create the nurturing environment for DE? What should be the focus of entrepreneurship education in the graduate level of education, particularly for the Master in Management Program?

Up to this point, it is important to note that this FEB has a long track record of delivering entrepreneurship since the 1990s and has built a reputation for a business incubator for its students. A number of previous studies by the author have highlighted the entrepreneurship curricula and the students' perceptions about the entrepreneurial process (see e.g., Lubis, 2014; Lubis, 2016-a, Lubis, 2016-b, Lubis, 2017).

Moreover, the author observed that entrepreneurship faculties acknowledge the need to promote graduate entrepreneurship and the EE was being viewed as an important element in the curriculum. Nonetheless, on the other hand, the author noted that there is a lack of education for entrepreneurship through the process of "doing". This type of education has been criticized for its use of traditional pedagogical approaches that overemphasize theory and treat functional knowledge as an "end" rather than a "means", such as approach restraints the development of entrepreneurial skills, capabilities, and attributes.

As Lubis (2017, p.54) points out,

> Knowing a lot about the topic of start-up businesses and enterprise development, is hardly sufficient to make the graduate student a successful entrepreneur, 'knowing a lot' can even be dangerous. In short, the teaching method of EE must go beyond 'knowing a lot'.

Having discussed the research context in this section, it is clear that the main barriers to DE appear to include: a specific concentration on and promotion of DE with digital opportunities is crucial.

Research Methodology

The Aims of the Study

During three academic years – 2016/2017, 2017/2018 and 2018/2019 – the author conducted the delivery of "Business and Management Case Studies" course for the Master in Management program at Faculty of Economics and Business Telkom University. During this period, the author planned to develop a deeper understanding of what was the most important thing the students learned in business school regarding the formation of the digital entrepreneurial environment at their institution.

This author's level of understanding is attributed to the growing perceptions received from many graduate students that the role of the DE in the Indonesian economy, the role of government in supporting the start-ups, and institutional barriers faced by the young entrepreneurs in Indonesia are the most discussed topics in the classroom setting. In addition to this discussion, it is widely known that Indonesia has enough new tech companies popping up each day, but the sad truth is that first-time founders are not prepared for the reality that they will need more money to actually reach the growth targets demanded by investors. Therefore, the close study of a graduate students' perceptions can contribute into ways to foster digital entrepreneurship in the context for moving towards "Making Indonesia 4.0" as a shared responsibility which may lead to creating the global connectivity.

The study was guided by the following objectives:

1) To investigate the present condition, problems, challenges, and potentials of DE in tertiary education.
2) To highlight the importance and benefits of "institutional vision, mission, core values", "academic environment" and "digital media", as a preliminary effort for further investigation.
3) To give a recommendation for policymakers and educators into ways to foster DE in the context of HEIs for moving towards "Making Indonesia 4.0".

The major focus of attention has been on how to teach graduate students about DE in order to enhance their willingness to become entrepreneurs as well as to boost their chances of creating a new Internet-enabled/delivered business, product or service. This study makes the following contributions: Firstly, it increases educators' understanding of EE by focusing on graduate degree education. Secondly, it provides educators' understanding of DE associated with EE. Thirdly, it provides a real-life case study and assessment of a Master in Management program, from which other EE initiatives can learn.

Sample Description

A total of 145 students registered in the Master in Management Program at Telkom University during two academic years, from 2016 to 2019. Based on the gathered data, 85% of the respondents have prior work experience. The majority of respondents were male and the remaining 11% were female. Some notes on the demographics of the sample are useful to show the characteristics of those students, as shown in Table 3. Although these demographic classifications would not constitute reliable data to the focus of this study, the author anticipates that there may be enough data to draw conclusions based on the demographic information collected.

Table 3. Demographics of the sample

Class type	Batch	Male	Female	Total numbers of students
Young professional	4	26	3	29
	5	28	4	32
	6	18	2	20
	7	22	5	27
	8	18	0	18
	9	17	2	19

Source: Internal author (2019)

As expected given the nature of the young professional class, the average age cohort of the respondent is between 30 and 40 years. The varied age profile of respondents provides an interesting cohort for investigation as they were born between 1978 through 1988. Some say that the "millennial generation" – the term to describe young adults – is the generation of children born between 1980 and 1998. They were born before computers and cell phones became widespread. If age and gender characteristics are applied to future research, thus it will be interesting to determine how this transfers into the use and adoption of digital technologies in their business context.

The Survey Instrument

Data collection was achieved by means of a self-completion questionnaire and the respondents were asked not to sign the questionnaire form. The questionnaire was organized into two sections and was kept as concise as possible in order to maximize the number responses and hopefully solicit the most honest responses. The questions were both open and closed in nature, and the combination of quantitative and qualitative inquiry was chosen to provide a deeper understanding of what the DE means to students and how they can learn the skills of DE in the classroom setting.

In addition to this condition, all those students were able to communicate with the author, which better guarantees the quality of the questionnaires output. They were given detailed information about the meaning of "Making Indonesia 4.0" before asking the questionnaires item. All respondents discussed the important enabling role of HEI's to provide the education and skills acquisition for the coming generation of digital entrepreneurs.

This questionnaire was given as an exercise in the classroom setting since it was considered the least resource intensive and most effective pilot study method. Moreover, it could draw out as much information as possible in a relatively short period of time. Nonetheless, it should be noted that many factors influencing the students' perspectives. Therefore, with an aim to explore the nurturing environment for DE, this study emphasizes the importance of "institutional vision, mission, core values", "academic environment" and "digital media", as a preliminary effort for further investigation.

The first section was measured by using the Guttman-scaled items. The Guttman scaling is also sometimes known as cumulative scaling or scalogram analysis. The purpose of Guttman scaling is to establish a one-dimensional continuum for concept measurement. The author seeks to develop a set of items or statements so that a respondent who agrees with any specific question in the list will also agree with all previous questions. The respondents would give a "Yes" if the item was favorable toward DE and a "No" if it is not. This means the author is not asking the respondents whether they personally agree with the statement. Instead, the author is asking them to make a judgment about how the statement is related to the construct of interest.

The first section contained 9 survey items (Q1 to Q9). This section has three headings, each representing a certain educational construct for moving towards "Making Indonesia 4.0". The three

educational constructs were: (1) institutional vision, mission, core values; (2) academic environment; and (3) digital media. This section also contained definitions for each of a certain educational construct listed. Based on this definition, it is expected that the respondents would provide their reactions associated with DE in tertiary education. All the survey items are shown in Table 4 and Table 5.

Table 4. The terms and description of the three educational construct

The Terms	Descriptive Definitions
Institutional vision, mission, core values	represent the inspiration to boost institution's capacity and to create solutions for the future that brings together the knowledge triangle of education, research and business to form digital entrepreneurial environment around Indonesia as well as in a dynamic global context.
The academic environment	represents the innovative practices and learnings in a targeted and systematic way to raise visibility, awareness, and understanding of the digital entrepreneurship activities and achievements through active engagement with external stakeholders.
Digital media	covering a number of digitized content (text, graphics, pictures, audio, videos) that can be transmitted over internet or computer networks.

Table 5. Section-1 survey items with Guttman-scaled items

Survey ítems (Q1 to Q9)	
Institutional vision, mission, core values	
Q1	I believe that my institution has a vision in setting the direction to promote digital entrepreneurship in Indonesia.
Q2	I believe that my institution has a misión for creative thought, to enable digital entrepreneurship to thrive in Indonesia.
Q3	I believe that my institution has core values to help students live up to their potential for successful digital entrepreneurs in Indonesia.
Academic environment	
Q4	My institution prepares me for my digital career through active engagement with external stakeholders.
Q5	My institution provides me with the internet and mobile broadband as utilities to develop the digital entrepreneurial environment.
Q6	My institution is opening new opportunities for digital start-ups.
Digital media	
Q7	I have learned that the internet-based social media is the key to digital entrepreneurship.
Q8	I have learned that digitized content requires digital literacy across multiple mobile devices.
Q9	I have learned that making connections across geographical borders may lead to maximizing digital opportunities.

The second section requested respondents to rank the three educational constructs of "Making Indonesia 4.0" in order of importance. A 3-point scale was used for its useful evaluative qualities, despite possible problems regarding respondents' differences in interpretation of the ranks. And the final question of this section – Q10, Q11, Q12 – was designed to solicit some personal comments regarding the respondents' views of DE associated with EE as well as the "Making Indonesia 4.0". It is important to note that the size of the input field affects how much respondents write or enter into it. The number of lines provides cues to respondents as to the expected length and number of responses. Therefore, in this section, three write-in lines were provided as the write-in areas to maximize the quality of data collected as well as the supporting evidence. The survey items are shown below.

Section-2 survey items by using the 3-point response scale

This section estimates which of the three educational constructs mentioned in section-1 are most important to you. Please rank them with the following response options: Essential = 1; Somewhat Important = 2; Not important = 3.

Example	Your ranking	
2		Institutional vision, mission, core values
3		Academic environment
1		Digital media

Please take a few minutes to answer the following questions. Your honest opinions will be very helpful to foster DE in the context of HEIs for moving towards "Making Indonesia 4.0".

Q10 What makes a successful DE at the HEI's in Indonesia?
Q11 Why is it important to foster DE in the context of HEIs for moving towards *"Making* Indonesia 4.0"?
Q12 Do you have any suggestions to add?

It is important to note that the size of the input field affects how much respondents write or enter into it. The number of lines provides cues to respondents as to the expected length and number of responses. Therefore, in this section, three write-in lines were provided as the write-in areas to maximize the quality of data collected as well as the supporting evidence.

Research Findings and Discussions

A total of 142 graduate students completed the questionnaire, a response rate of 98%. This suggests that the author can evaluate the study findings with the assurance that the sample of respondents reflects elements of the population. The results reported in this following sections present respondents' reaction based on the questionnaire.

Section-1 (Q1, Q2, Q3): The institutional vision, mission, core values

Of the 142 responses to this section, 79% indicated that they do not believe their institution has a visión in setting the direction to promote the digital entrepreneurship in Indonesia (Q1), 77% indicated that they do not believe their institution has a misión for creative thought, to enable digital entrepreneurship to thrive in Indonesia (Q2), and 81% indicated that they do not believe their institution has a core values to help students live up to their potential for successful digital entrepreneurs in Indonesia (Q3). The result findings are shown in Figure 10.

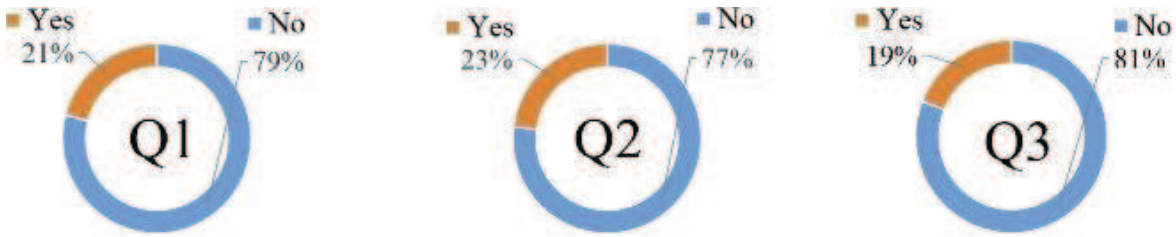


Figure 10. The findings for survey items Q1, Q2, Q3

The findings reveal that while "Visualizing the Digital Indonesia 2025" are in place to be discussed during the institution's 5th Anniversary in 2018, however, the "institutional vision, mission, core values" do not appear for helping the graduate students to take advantage of the possibilities offered by the institution. When these responses are taken into consideration, efforts must be made to ensure the graduate students become more confident with their possibilities towards the digital opportunities offered by the institution.

In other words, irrespective the digital opportunities needs by the graduate students, if the institution does not possess a specific concentration on and promotion of DE in the context of Master in Management Program, then the digital opportunities gap of the graduate students will not be bridged.

Section-1 (Q3, Q4, Q5): Academic environment

As was the case with the results of the "institutional vision, mission, core values", and indeed perhaps a consequence of, "the academic environment" do not prepare the respondents for their digital career through active engagement with external stakeholders (81%), do not provide the respondents with the internet and mobile broadband as utilities to develop the digital entrepreneurial environment (82%), and is not opening new opportunities to digital start-ups (79%). The result findings are shown in Figure 11.

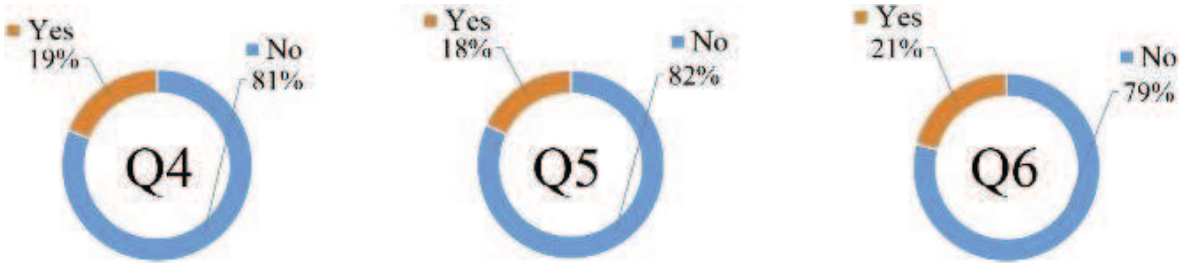


Figure 11. The findings for survey items Q4, Q5, Q6

The level of respondents' reactions is consistent with the previous report from McKinsey Indonesia Office (2016). Common across Indonesia is the needs to develop internet bandwidth and connection speed, as shown in Figure 4.

As discussed earlier, the institution has worked to complete its specialized support infrastructure for entrepreneurship through its commitment to the Bandung Techno Park, which provides support to the start-up and growth of new ventures, including those founded by university faculty. Initiatives such as the Bandung Techno Park (popular with the acronym BTP) can narrow the digital opportunities gap of the graduate students by outlining strong action plans across its key pillars which include: the enabling academic environment as well as DE in the context of EE at Master in Management Program.

Similar to the initiatives from BTP, such as technology business incubation program, co-working space, the start-ups' corner, to name a few; the policymakers at the graduate program for Master in

Management need to consider issues relating to the "academic environment". Programs must be designed to foster the foundation of DE in the context of EE, understanding new opportunities needed to build a feeder group of digitally competent graduate students able to graduate to further digital entrepreneurs, with might, in turn, lead to participating in the implementation of "Making Indonesia 4.0".

In addition to this, digital connectivity, digital literacy, innovation and knowledge hubs are critical to sharing knowledge and may provide support for maximizing digital opportunities to Master in Management students. In short, "academic environment" is a fundamental enabler for DE.

Section-1 (Q7, Q8, Q9): Digital media

"Digital media" is receiving strong positive attention from the respondents. Of the 142 responses to this section, the majority of respondents confirmed that they have learned the internet-based social media is the key to digital entrepreneurship (89%), the digitized content requires digital literacy across multiple mobile devices (92%), and making connections across geographical borders may lead to maximizing digital opportunities (91%). The result findings are shown in Figure 12.

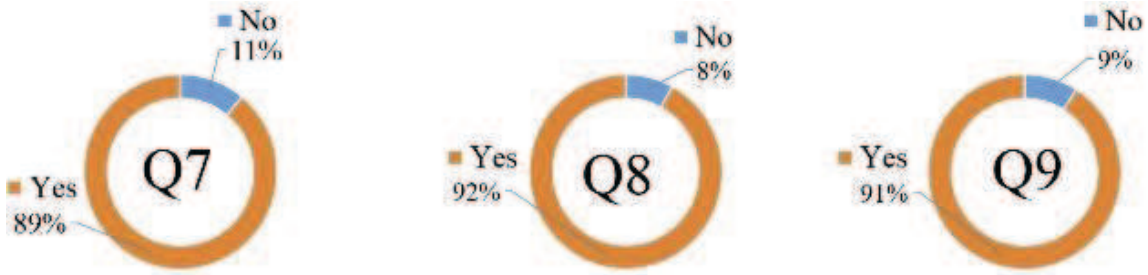


Figure 12. The findings for survey items Q7, Q8, Q9

The findings reveal that incorporating the "digital media" into learning created awareness and prepared the respondents for the digital opportunities where connections across geographical are in place. The level of strong positive reactions brings a more practical insight into the reality that the majority of the graduate students, which was born between 1978 through 1988, are as digitalized as might be assumed for the "millennial generation".

Further in reviewing the results, it is important to note that when linked with the previous report from Australian APEC Study Centre – RMIT University (2017) in terms of the critical skills for digital entrepreneurs, the development of academic workforce for Master in Management program is important pillar to create a future-ready workforce and foster DE.

Equally important is to encourage Telkom University to make DE a key priority for the education agenda, by providing "digital media" training with other stakeholders in the campus to launch specific initiatives to develop effective programs and process for EE, such as forum and events, DE centers, curriculum development, global exchange networks, competitions and awards that focus on "digital media".

Section-2 (Q10, Q11, Q12):

DE in the context of HEIs for moving towards *"Making Indonesia 4.0"*

In order to interpret the results of the three educational constructs in this study, the respondents were asked to rate these areas in order of importance. "Digital media" is ranked the most important. This result shows the fact that the benefits of using digital technology do matter to the graduate students of the

Master in Management program. This suggests that all the respondents perceive that in the growing trend of digital technology, "digital media" is the most attractive ideas for getting the speedier and greater access to maximizing digital opportunities. This result serves to heighten the digital needs of "digital media", which may lead to engaging the business community, public sector and other players in the DE ecosystem to support the development of course materials (books, cases, online games, video, etc.), bot only for EE per se, but also for personal development to become the future digital entrepreneur.

The second highest ranking is achieved by "academic environment", and this result is reasonably anticipated. This result can be explained from the standpoint of EE system at Master in Management program at FEB Telkom University, which may include all faculties and disciplines to promote the application of "learning by doing" through project-based learning, internships and consulting with external shareholders. This result shows that the graduate students' perspectives are needed to develop a clear framework of desired outcomes of DE by developing individual capabilities, attitudes, and mindsets. This result shows the fact that the "academic environment" is less attractive compared to "digital media".

Although the "institutional vision, mission, core values" is aimed to be the foremost organization building, the creative force shaping the long-term strategic plan and agendas, and the catalyst of choices for its academic atmosphere when undertaking entrepreneurial initiatives to improve the state of Telkom University, the finding reveals that this educational construct is ranked the least important. This condition indicates that future research should consider this result in more detail, using this preliminary exploration in this study as a basis to explore what happened to the "institutional vision, mission, core values".

Some clues are evident such as the responses to survey items Q1, Q2, and Q3, as shown in Figure 10. This high percentage score indicates that the respondents need greater clarity, which should be based on a broadly defined set of outcomes, not only on narrow measures such as the replication of programs that actually not working, resulting in wasted time and money for little to no impact (see Figure 10). This also means that internal support and commitment by the institution's top-management and departmental leaders show how a clear strategic focus on DE – linking research, teaching, and practical activities – enables a specialized infrastructure for DE to develop over time.

Having discussed the interpretation of the ranks to those three educational constructs, the author moves to review the personal comments regarding the respondents' views of DE associated with EE as well as the "Making Indonesia 4.0" (Q10, Q11, and Q12). Table 6 presents the quotes which illustrate some thought of the respondents.

Table 6. The results of Q10, Q11, and Q12

Survey items	The narratives provided by respondents
Q10 What makes a successful DE at the HEI's in Indonesia?	• Access to affordable, reliable, high-speed broadband infrastructure in order to créate a dynamic and competitive digital business environment. • More collaborative work between university, government and business players across industries. • The innovation agendas which provide the springboard for success, locally, regionally and globally. • The R&D grants and incentives for student-based digital business. • A crowdfunding platform which will make easier to access capital and continue the growth of the students-based digital business. • The protection for the student-based digital business. • A degree of technological awareness that allows the students to identify new technologies that will transform and shape the digital business model that will allow the students to do new things, or do things differently, and to develop new products and services, ways of delivering them, and ways to communicate with the suppliers, customers, and employees.

	• Because DE does provide greater opportunities for the graduate students, but as I have limited knowledge of this type of education, I am finding it difficult to exploit its potential for moving towards *"Making Indonesia 4.0".*
Q11 Why is it important to foster DE in the context of HEIs for moving towards *"Making Indonesia 4.0"*?	• Because DE prepares higher education students for a future digital career. • Supporting the learning experience of higher education students. • Students at the tertiary level of education can draw confidence from encouraging progress in establishments of dedicated DE programs across HEI's in Indonesia. • I will have a range of interactions with various government bodies, and this can be minimized the administrative burden arising from complex bureaucracy for the start-ups digital business. • Students at the tertiary level of education will connect with a myriad of players within their local ecosystem but will open the overseas connections. • Questions remain around the implementation of *"Making Indonesia 4.0".*
	• We, as the graduate students at the Master in Management Program, welcome any effort being made by universities, government and private enterprise to invigorate Indonesia's digital economy. In my point of view, *"Making Indonesia 4.0"* needs to be investing in and growing the students' start-ups pool from seed stage investment through developing affordable solutions that allow businesses to capture every sale as soon as they go live online.
Q12 Do you have any opinion or suggestions to add?	• I think, what is really important is how the HEIs promote *"Making Indonesia 4.0"* to the world to show how strong an ecosystem the HEIs have and how good the digital opportunities are to start a digital business here in Indonesia. • For me, DE may level the playing field in certain sectors, creating digital opportunities to work from remote areas, at different hours, from the home or on the go. • As the cloud and big data continue to gain importance, having access to the skills of digital entrepreneurs will become ever more important. • HEIs, government and business leaders throughout Indonesia should make DE a priority to encourage and support the students-based digital business to make full use of the latest digital technologies and realize the associated economic benefits. • DE associated with EE at HEIs in Indonesia should be a long-term commitment, not one that starts and then stops a few years later. • I believe the best way to learn DE is from successful digital entrepreneurs who have done something similar to what you dream of doing.

The results of Q10, Q11, and Q12 show a variety of challenges and fears from the respondents. These need to be addressed and alleviated for the graduate students of the Master in Management Program to provide greater reassurance to the formation of the digital entrepreneurial environment at their institution.

In summary, the results of this section raise debate if and how the current level and adoption of digital technologies in EE at Master in Management Program Telkom University prepares graduate students to adapt, take on new roles and maximizing digital opportunities in an increasingly digitalized marketplace?

Towards a Conceptual Framework of DE

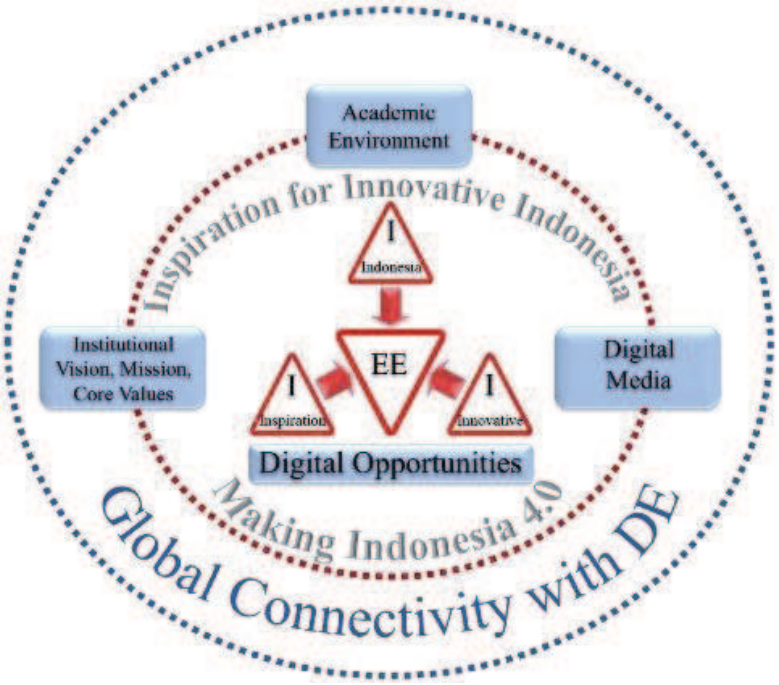
As explained earlier, the starting point for this study was a desire to explore the ideas associated with the devotion of more resources and energy to the formation of the digital entrepreneurial

environment at the HEIs in Indonesia, which will help to create cultures of DE on campuses. To this end, the author attempted to expand the study of *The "Triple-I" Learning Model of Entrepreneurship Education* (Lubis, 2015).

Since this study is approached from the standpoint of the author, therefore the findings has to be interpreted as a dynamic process of meanings in the making, rather than static meaning, which may offer wider insights to uncover the greater understanding of HEI's role to the formation of digital entrepreneurial environment at tertiary level of education.

At the same time, reflecting on the experience of working as one of the core Faculties for graduate students at the Master in Management Program, the author believes that on every campus there are students for whom such a desire to solve the crises of the world is an inseparable aspect of their personality. And there are students whose desires would be stoked if only they had the resources on hand to further develop the passions.

Following this line of thought, the author proposes a conceptual framework that connects to the empirical research findings and discussions which presented systematically based on the perspective of graduate students. The author contends that there are three educational constructs that collectively should contribute to a deeper understanding of moving towards "Making Indonesia 4.0". Therefore, with the help of *The "Triple-I" Learning Model of Entrepreneurship Education*, the following framework of DE at HEIs is proposed, as illustrated in Figure 13.



Note: EE = Entrepreneurship Education; DE = Digital Entrepreneurship

Figure 13. Author's construct for
The "Triple-I" of DE at Higher Education Institutions in Indonesia

Speaking about *The "Triple-I" Learning Model of Entrepreneurship Education,* Lubis (2015, p.256) offers the following explanation:

> The triangles model shape led to the structure of a pyramid, is inspired by "The Great Pyramid of Giza" in Egypt, which is believed to be one of the "Seven Wonders of the Ancient World". In the world of architectures, the structure of the Giza pyramid is believed to be "the world's best

> architectural achievement" and a monumental masterpiece of men. In line with the stability on the structure of Giza pyramid with a rectangular as the base, therefore The "Triple-I" Learning Model of EE is also defined as a model that possesses a stable and unchanging character.
>
> Looking for the position of the letter "I" in the phrase "Inspiration for Innovative Indonesia", someone will easily understand a pattern leading to the right, then going up. This pattern shows a process that starts with the word "Inspiration", continue to "Innovative" and ends at the top of the pyramid, which is the word "Indonesia".

Building from Lubis' "Triple-I" model on how the rectangular base of pyramid serves as a strong foundation for building the future of Indonesia and make sense of it, the new framework offers a way forward with "Digital Opportunities" serves as the foundations to radically re-think EE for Indonesian future generation. Three educational constructs to support the HEIs are the circular pattern that starts with the "Institutional Vision, Mission, Core Values"; followed by "Academic Environment"; and finally to "Digital media". This process thus will drive the HEIs to carry out its role to achieve the great national aspirations, so-called "Making Indonesia 4.0".

Having discussed the Indonesia's position along the GCI S-Curve (Figure 1 and Figure 2), The Country Rankings (Figure 3) and Indonesia's Digital Standing Among 20 Countries (Figure 4); therefore the entrepreneurship educators should explore the value of *The "Triple-I" of DE at Higher Education Institutions in Indonesia* (Figure 13) to take Indonesia to a higher level, so-called "Global Connectivity with Digital Entrepreneurship".

With regard to the way forward in which digital opportunities and students co-exist, it should be noted that the DE at HEIs is a difficult concept to define, it is also continually evolving with no one actor in the ecosystem can address these challenges on its own. This point of view leads the author to the following argument (Schwab, 2017, p.4):

> Technology is not an exogenous force over which we have no control. We are not constrained by a binary choice between "accept and live with it" and "reject and live without it". Instead, take dramatic technological change as an innovation to reflect about who we are and how we see the world. The more we think about how to harness the technology revolution, the more we will examine ourselves and the underlying social models that these technologies embody and enable, and the more we will have an opportunity to shape the revolution in a manner that improves the state of the world.

Thus, this argument leads the author to the conclusion that the challenges and opportunities to "Global Connectivity with Digital Entrepreneurship" vary dramatically in different parts of the world. Context matters. Finally, in the light of *The "Triple-I" of DE at Higher Education Institutions in Indonesia,* which represents the methodologies for forecasting and responding to emerging opportunities and challenges, the author encourages the entrepreneurship educators to start thinking about this closing quote by Albert Einstein: "The important thing is not to stop questioning".

References

1. Anwar, K. (2018). Telkom University Towards World Class Research and Entrepreneurial University: Five Main Trends, Bandung, 14-16 December 2018 [PowerPoint slides]. Bandung: Universitas Telkom.
2. Ashari, M. (2016). Visitasi Asesor AIPT BAN-PT Universitas Telkom, Bandung, December 14-16, 2016 [PowerPoint slides]. Bandung: Universitas Telkom.
3. Australian APEC Study Centre – RMIT University. (2017). DE across the APEC Region: Assessing the needs of the region's digital start-ups. Retrieved April 2, 2018 from https://www.rmit.edu.au/.../dam/.../apec/rmit-apec-digital-entrepreneurship-report.pdf

4. Gibb, A. (2011). Concepts into practice: Meeting the challenge of development of entrepreneurship educators around an innovative paradigm, The case of the International Entrepreneurship Educators' Programme (IEEP). *International Journal of Entrepreneurial Behaviour & Research* (vol.17, no.2, pp.146-165).
5. Huawei Technologies Co., Ltd. (2017). Harnessing the Power of Connectivity: Mapping your transformation into a digital economy with GCI 2017. Retrieved January 17, 2018 from

   http://www.huawei.com/minisite/gci/files/gci_2017_whitepaper_en.pdf
6. Huawei Technologies Co., Ltd. (2018). Tap Into New Growth With Intelligent Connectivity: Mapping your transformation into a digital economy with GCI 2018. Retrieved June 1, 2018 from http://huawei-dialog.de/wp-content/.../Huawei-Global-Connectivity-Index-2018-EN.pdf
7. Lubis, R.L. (2004). An option for cooperative education: Bridging the gap with Walkabout Project. *Proceeding book.* Paper presented at The Asia Pacific Cooperative Education Conference, December 1–3, 2004, Auckland, New Zealand, co-organized by Auckland University of Technology (AUT), Manukau Institute of Technology, Unitec New Zealand.
8. Lubis, R.L. (2006-a). The "Walkabout" Project: Only a first step, but it matters. *Proceeding book.* Paper presented at The Second World Curriculum Studies Conference (WCSC), May 22–24, 2006, Tampere, Finland, organized by University of Tampere.
9. Lubis, R.L. (2006-b). Learning to bridge the outside world: Insights from an evaluation of the Walkabout Project. *Proceeding book*. Paper presented at World Association for Cooperative Education (WACE) Asia Pacific Conference, June 26–28, 2006, Shanghai, China, co-organized by Shanghai Second Polytechnic University (SSPU), Swinburne University of Technology, The Hong Kong Polytechnic University (Hong Kong PolyU).
10. Lubis, R.L. (2008). Teaching entrepreneurship: Copy this! Lessons from the "Walkabout" Project. *Proceeding book*. Paper presented at Arte-Polis 2 International Conference and Design Charrette, August 8-10, 2008, organized by School of Architecture, Planning and Policy Development, Institut Teknologi Bandung (ITB), Bandung, Indonesia.
11. Lubis, R.L. (2009). Undergraduate perceptions of the need for entrepreneurship in the business management curriculum: Five years after. *Proceeding book*. Paper presented at The 3rd Triennial Conference of International Association for the Advancement of Curriculum Studies (IAACS), September 6–10, 2009, Cape Town, South Africa, co-organized by Stellenbosch University, University of Pretoria, and University of South Africa.
12. Lubis, R.L. (2010). Work Integrated Learning (WIL): Moving "from brain to market. *Proceeding book*. Paper presented at World Association for Cooperative Education (WACE) International Conference on Work Integrated Learning, February 3–5, 2010, Hong Kong, China, organized by The Hong Kong Polytechnic University (Hong Kong PolyU).
13. Lubis, R.L. (2011). Work Integrated Learning (WIL): A promising experiments in students' entrepreneurial activity. *Proceeding book*. Paper presented at World Association for Cooperative Education (WACE) 17th World Conference, June 14–17, 2011, Philadelphia, United States of America, organized by Drexel University.
14. Lubis, R.L. (2012). Work Integrated Education (WIE): How students' entrepreneurial team can capitalize on conflict. *Proceeding book*. Paper presented at World Association for Cooperative Education (WACE) 9th International Conference on Cooperative and Work-Integrated Education, June 20–22, 2012, Istanbul, Turkey, organized by Bahçesehir University.
15. Lubis, R.L. (2013). Green "E-Project": The 4-R survey of students' ecopreneurship. *International Journal of Arts & Sciences* (vol.6, no.3, pp.181-197).
16. Lubis, R.L. (2014). Students' Entrepreneurial Strategy: Connecting minds? *International Journal of Arts & Sciences* (vol.7, no.3, pp.545-568).
17. Lubis, R.L. (2015). The "Triple-I" Learning Model of Entrepreneurship Education in Indonesia: Where do we go from here?" *International Journal of Arts & Sciences* (vol.8, no.7, pp.233-264).
18. Lubis, R.L. (2016-a). Building an Entrepreneurial Thinking of Women Graduate Students: What else beyond learning and dreaming? *Journal of Teaching and Education* (vol.5, no.1, pp.469-504).
19. Lubis, R.L. (2016-b). Graduate Students, Age, and Money: Ecopreneurial challenges. *Journal of Teaching and Education* (vol.5, no.2, pp.413-450).
20. Lubis, R.L. (2017). Assessing Entrepreneurial Leadership and The Law: Why are these important for graduate students in Indonesia? *International Journal of Arts & Sciences* (vol.10, no.2, pp.41-76).

21. McKinsey Indonesia Office. (2016). Unlocking Indonesia's digital opportunity. Retrieved December 31, 2017 from https://www.mckinsey.com
22. Nugroho, R.L. (2010-a). Entrepreneurship in Indonesian Higher Education: A preliminary research on how to develop business incubator at a higher education institution. Paper presented at Doctoral School Summer Conference, June 18-19, 2010, London, United Kingdom, organized by Institute of Education (IoE) University of London. *Educate~ The Journal of Doctoral Research in Education* (vol.10, no.2, p.46). Available at http://www.educatejournal.org/index.php/educate/issue/view/34
23. Nugroho, R.L. (2010-b). Internet and Entrepreneurship: The benefit of Facebook for project-based assignment. *Proceeding book*. Paper presented at Arte-Polis 3 International Conference on Creative Collaboration and the Making of Place, July 22-24, 2010, Bandung, Indonesia, organized by School of Architecture, Planning and Policy Development, Institut Teknologi Bandung (ITB), Bandung, Indonesia.
24. Nugroho, R.L. (2012). Entrepreneurship Education in Higher Education Institutions: The study of Philosophy, Policy, Strategy and Entrepreneurship Education Program for Creating the Future Generation Entrepreneur at Institut Teknologi Bandung, Universitas Pendidikan Indonesia, Universitas Kristen Maranatha, dan Institut Manajemen Telkom Bandung. *Unpublished Doctoral Dissertation*. Bandung: Universitas Pendidikan Indonesia.
25. Schwab, K. (2017). The Fourth Industrial Revolution. New York: Crown Business.
26. Telkom University. (2017). Vision and Mission. Retrieved June 1, 2018 from https://telkomuniversity.ac.id/about-us/
27. Timmons, J.A., & Spinelli Jr, S. (2009). New Venture Creation: Entrepreneurship for the 21st Century. Boston: McGraw-Hill/Irwin.
28. Yayasan Pendidikan Telkom. (2018). *Rencana Strategis Universitas Telkom 2019-2023.*
29. World Economic Forum. (2009). Educating the Next Wave of Entrepreneurs: Unlocking entrepreneurial capabilities to meet the global challenges of the 21st Century. Switzerland: World Economic Forum.